



200 YEARS

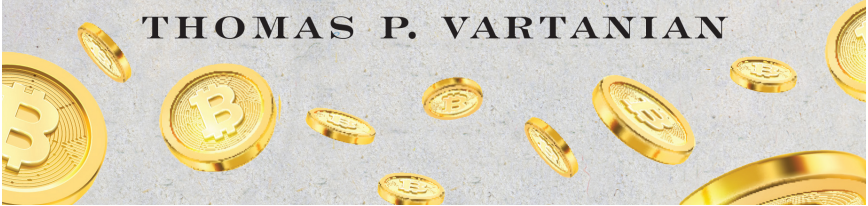
of

AMERICAN
FINANCIAL

PANICS

*CRASHES, RECESSIONS, DEPRESSIONS,
AND THE TECHNOLOGY THAT WILL CHANGE IT ALL*

THOMAS P. VARTANIAN



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**200 YEARS OF
AMERICAN FINANCIAL PANICS**

***Crashes, Recessions, Depressions, and
the Technology That Will Change It All***

Thomas P. Vartanian

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This book is dedicated to the three people who supported, loved, and endlessly inspired me: my wife, Karen, and my two daughters, Alana and Mackenzie.

It is also for the two men who taught me the most important lessons about wisdom, courage, compassion, and kindness: my father, Paul, and my brother-in-arms, Richard T. Pratt.

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PREFACE

After leaving the Reagan administration in 1983, I was subsequently approached to lead the Federal Home Loan Bank Board, the Office of the Comptroller of the Currency, and become the vice chair of the Federal Deposit Insurance Corporation (FDIC) by three different republican and democratic administrations. When I received a call from Treasury Secretary Mnuchin on Saturday, March 11, 2017, about possibly being nominated by the president to be the first vice chair of the Federal Reserve Board for Supervision, I was extraordinarily honored. I had already served in the government twice, but this would be the cherry on top of a charmed career. I walked into the West Wing of the White House on March 15, 2017, with eight years of experience as a federal bank regulator in the Carter and Reagan administrations, and then another thirty-eight years as a financial services attorney representing a wide variety of financial companies and investors in mergers, regulatory matters, and litigation. I had largely been untethered to any political party, believing more in the substance of issues than the politics of them. I knew and greatly respected Secretary Mnuchin, having worked with him on his acquisition of the failed IndyMac Bank from the FDIC to create OneWest Bank in southern California. I had never met or represented Gary Cohen, director of the National Economic Council, who also participated in that meeting among others. When I left the White House ninety minutes later, I realized that as exciting it would be to be the world's top bank regulator, rather than returning to government service for a third time, it was time for me to advocate for

the renovation of the country's badly broken financial system in other ways that I thought might be more effective and fun. Before I exited the gate on Pennsylvania Avenue, I had decided to write this book.

How I reached that point in my life was largely serendipity. My wife Karen and I had left New York in July 1976 when I joined the Office of the Comptroller of the Currency (OCC) in Washington, DC, as an entry staff lawyer after graduating from law school. I was assigned to the team there working on the seizure and receivership of several failed banks, including Franklin National Bank in New York. The Franklin failure was the largest bank failure that the country had ever experienced at that time. I recall asking the senior deputy comptroller at that time why he had determined a bank that we were planning to close was insolvent when the financial statements I had in my hand still showed a positive net worth. I have never forgotten his response: "Listen kid, a bank is insolvent when I say it is." What he was telling me was that valuing financial assets of banks is an art that takes years of experience to learn, and that what a company records on its financial statements may have nothing to do with their actual value. My journey through decades of bank failures and financial panics had begun. I have worked on the recapitalization, receivership, or disposition by the FDIC of about thirty of the fifty largest bank failures that the country has experienced.

After I left the OCC in early 1981, after ninety days in private practice, I was appointed general counsel of the Federal Home Loan Bank Board (FHLBB) and the Federal Savings & Loan Insurance Corporation (FSLIC) in March, just in time for the beginning of the savings and loan (S&L) crisis in the early years of the Reagan administration. It did not take long for me to wonder how every S&L in the country could have done something so wrong as to bring themselves to the brink of collapse. Some commenters attributed it to the traditional robber-baron story that accompanies every financial crisis. They labeled S&L executives as crooks who had engaged in endless fraudulent schemes. To someone who was a regulator, that seemed odd given the fact that the S&L and banking industries are so closely supervised. In fact, no industries and no set of executives are as closely watched by so many federal and state overseers. Could the regulators have been that inept? In the years I spent regulating and representing financial institutions after I left the government, occasionally I came across some dishonest people,

but they were a tiny fraction of those I worked with. The Bonnie and Clyde explanation for the S&L crises did not ring true. I eventually learned that it was not. The Congress of the United States, not S&L executives, inadvertently created the crisis. As I began to appreciate how that had happened, I wondered whether that could have been the case with other financial crises.

I mostly retired from the practice of law in August 2018 after being the chair of the financial institutions practices of two international law firms, Fried Frank LLP and Dechert LLP, as well as chair of the Cyberspace Law Committee of the American Bar Association during the internet explosion of the late 1990s and early 2000s. I had regulated or advised many of the world's most important financial companies, executives, or their investors and been a participant in and observer of massive structural and technological changes in the financial markets. I worked with or advised the White House in at least three different administrations on financial services policy. I worked on or around the collapse, recapitalization, or sale of about five hundred failing US financial institutions.

This story is not about me. It is about what I have learned from experience and my research about financial panics in the United States, and how they are created. However, my background is responsible for my views about financial regulation and the impact I believe that technology is having on our system of finance and perhaps our democracy. This is a story about how government policies cause or contribute to financial crises, albeit not without the enthusiastic assistance of markets, companies, and people by combining a combustible concoction of economic, social, and political interests. The goal of *200 Years of American Financial Panics* is to identify how the system can be fixed to avert financial crises, extend the time between them, and mitigate the financial pain that they create. Technology will be a big part of that. It will either empower humans or cause the next financial Armageddon. It is our choice.

I loved every minute of my years as a federal banking regulator. I learned to respect and appreciate the people who worked by my side and showed up every day determined to do the right thing for the country. I never sensed a lick of partisanship in my fellow regulators. I learned with them and from them every day as we were continually required to make complicated financial decisions on short notice with

limited resources and data. The years have brought me perspective, and I have come to understand some mistakes that we made and what they cost. I also began to appreciate how government interventions and supervision can cause or contribute to financial panics as the system created by Congress haphazardly regulates some financial risks and not others. I came to realize that government oversight of financial services was becoming less effective as it became more pervasive, formulaic, and unnecessarily burdensome. I have accepted the fact that no matter how much regulators sweat over a problem and no matter how well-intentioned they may be, they will never be right all the time. I applaud and respect everyone who has served the government and put themselves in the unenviable position of having to make these difficult decisions in challenging circumstances. They are well intentioned and dedicated people who deserve our gratitude. But they also deserve better resources, better laws, and more respect so they can more effectively do their jobs.

Government policies—most often the result of congressional or executive action—have inadvertently caused or facilitated nearly every one of nine major financial crises in America through 2019. Often, these policies have put regulators in a no-win situation. We can fix this problem, but only if we understand how and why it occurs. To have any hope of avoiding future financial crises, decreasing their frequency, or shortening their duration, government oversight of the economy must become smarter and harness technology to do so. It must be given the resources, data, and freedom to intelligently oversee America's financial services businesses and evaluate alternative futures that we may face. It must better anticipate the financial incentives created by the regulation of evolving markets and how executives rationally react to those incentives. Congress must stop conflating financial and political issues. We must learn from our past mistakes if we have any hope of avoiding them in the future. *200 Years of American Financial Panics* identifies the well-intentioned mistakes made in monetary and financial oversight over the last two hundred years in the hope of developing a formula to avoid them in the future. It also zeros in on the unprecedented financial benefits and the stunning threats that technology adds to this challenge. Finally, it makes the case for greater financial literacy so that the financial services system will need less government regulation distorting fi-

nancial markets and incubating perverse economic consequences. I hope this book will be a blueprint for improving our financial future.

As this book goes to print, the world has been physically struggling with the coronavirus (COVID-19) pandemic of 2020. The ensuing financial chaos was not caused by policies of the government or the behavior of American businesses. It did, however, highlight the role of the government in a financial crisis and the risk of making major decisions without sufficient data. The government could not have predicted or stopped the financial crisis in 2020, but it could have had better data and analysis to respond to you. That can be fixed, and we should be serious about doing it before the next crisis.

INTRODUCTION

The United States has experienced more financial panics in the last two hundred years than almost every other country in the world. Let that sink in for a minute. Not what you might expect from the largest and most prosperous economy with the most comprehensive system of monetary and institutional regulation. About twenty thousand banks have failed in the United States in the past two centuries. This is likely more banks than there are in the rest of the world.

Here are even more troublesome facts. Technology is barely being used to support the many important financial decisions made by the government. Moreover, although a number of federal agencies and private-sector consortiums are discussing, analyzing, and coordinating financial cybersecurity issues, no government or private sector entity in the United States is comprehensively coordinating and preparing to defend the country's economic infrastructure against the malicious use of technology. While technology will surely benefit and empower users of financial services (all of us) through unimaginable innovations, it can just as easily be used to overpower financial infrastructures for political and malicious purposes. As unparalleled artificial intelligence systems, advanced algorithmic capacities, large databases, and supercomputing powers are deployed around the world with limited guiding global principles, rules of engagement, or agreed-upon sanctions for cyber-aggressors, we hurtle toward a future in which we could suddenly be defenseless. As some experts suggest, these gathering clouds may ultimately threaten democracy.

Yes, there are government and industry efforts studying issues, training constituents, and sharing some information, but there is no one dedicated entity or public/private sector consortium in charge of comprehensively coordinating and defending against future potential technological threats to our economy, central bank, payments systems, and financial infrastructure. There is no cyberspace financial defense command, no monetary coast guard, and no payments systems' early defense warning systems that can defend the economy. Each company to a large degree defends its own borders. But there are surely growing threats and enemies willing, able, and eager to fire the first digital shot. Just look at what the Chinese government is doing to create an algorithmically controlled totalitarian society that once fully deployed is unlikely to be undone. How prepared were we for the 2020 pandemic and what it could do to the economy? How prepared were cities to deal with the unrest after the tragic death of George Floyd? The sad fact is that governments may be adequate at reacting, but they are less effective at anticipating and preparing for problems. Technology can help solve that.

The thesis of *200 Years of American Financial Panics* is straightforward. Future financial crises can only be averted and prudently addressed if we understand the constellation of intended and unintended drivers that are unleashed by businesses and governments and how they collide in unanticipated ways. Sadly, government intervention has facilitated, enabled, or created nearly every financial crisis that has occurred in the last two hundred years. With good intentions, the government has often over-managed or mismanaged the economy and financial institutions, causing or allowing executives, investors, and markets to alter their behavior to take advantage of those dynamics. This book is about identifying the factors that create an unwitting conspiracy between the government and the private sector that distorts financial incentives and instigates economic booms, busts, and panics. It is about determining how financial oversight of the economy and financial services can be restructured around the use of technology to be more effective and efficient in the war against financial calamities. There are endless analyses of the sins of the private sector. *200 Years of American Financial Panics* seeks to balance the playing field by evaluating the role that the government plays and determine how it should be changed. I leave the

elaborate blame-shifting gymnastics that occur after each crisis to those more adept at dissecting the venality of politics.

Financial panics happen so often in the United States and are so severe in part because the country's financial markets have expanded faster and become more complex and leveraged than any other in the world over the last two hundred years. They have in some cases outgrown their overseers' ability to effectively supervise them. The United States has the largest, most sophisticated, innovative, and interconnected financial markets on the planet supporting the largest number of mega-institutions, community banks, diverse financial companies, non-bank lenders, private sources of capital, and transactional counterparties. The US economy relies on leverage that allows it to expand and forces it to contract at high velocities. Its interconnected network of banks, borrowers, consumer lenders, insurers, peer-to-peer lenders, crypto companies, broker-dealers, mutual funds, investment companies, financiers, and asset managers all too often interreacting in a lethal mixture of economics and politics. When markets perceive trouble, lines of credit shrink as the value of the collateral securing them disappears, trust evaporates, and lenders make collateral and margin calls to protect themselves. The reaction is always contagious as lenders and borrowers run toward cash and quality.

The common belief proffered after every crisis is that the greed and chicanery of ruthless and immoral bankers, speculators, and robber barons resulted in the economy overheating and then collapsing, causing people to lose their jobs, money, and self-esteem. While it may be true to some degree, it is not the full answer and is far too simplistic an explanation to be helpful in averting future financial crises.¹ Blaming a profiteering corporate culprit for complicated economic disasters is both cathartic and distracting. The hunt for and execution of financial boogymen is a necessary psychological part of every crisis—it makes people feel that they have closed the loop and solved the problem. But history also underscores that seemingly innocuous and well-intentioned government actions, often implemented through monetary policy, financial regulation, and tariffs can disrupt the fragile equilibrium of the market and have outsized impacts and catastrophic financial results. Consider the following:

- The imposition of high tariffs by the Monroe administration to protect fledgling US manufacturing businesses along with the creation of dozens of poorly regulated, uncapitalized state-chartered banks to finance an expanding westward economy that all but collapsed in 1819.
- President Andrew Jackson's undercutting of the country's currencies and termination of its only central bank when it was most needed in the 1830s in the name of freeing Americans from the chains of a centralized federal economy.
- How government fiscal policies created economic chaos battling over whether gold, silver, or paper money should be the preeminent median of exchange throughout the nineteenth century, adding to the conditions that caused financial panics in 1857, 1873, and 1893.
- The Federal Reserve's stubbornness in keeping interest rates low in the 1920s to assist the European central banks, thereby allowing an overheated stock market in the United States to shift into overdrive and crash in 1929.
- How Congress and the states imposed artificial caps on deposit and mortgage interest rates to keep mortgage rates low and encourage greater homeownership in the 1960s, eventually giving birth to the money market fund industry and putting S&Ls in an unprecedented and inescapable financial vise when the economy spun out of control in the 1980s.
- The attempts of several administrations and Congresses to increase homeownership in the 1990s and 2000s by pressuring financial institutions to offer mortgages to more low- and moderate-income borrowers while expanding the affordable housing goals of the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac), leading to an increase in unqualified borrowers and the greatest economic crisis since the Great Depression.

Every financial crisis that the country encounters is like a twister with its own trigger, velocity, direction, and life span. While reading about past events and stitching historical factoids together to create economic theories about why they may have occurred is a useful exercise, it often cannot get close enough to the events that really drove the crisis. Some

such analyses seem to treat the symptoms, correlations, and causes of a crisis as interchangeable. Many critics who point to “weak regulation” as a cause of institutional or systemic failure have never been regulators and do not understand how it works. Many who focus on corporate greed and the drive to make money have never been businesspeople. Some castigate income equality from pedestals that antiseptically try to evaluate economic trends after the fact. I approach the analysis of financial history in this book from the vantage point of a former federal bank regulator and practicing financial services lawyer who has spent more than four decades at ground zero. I learned my economics, accounting, and risk management on the job. It is through those eyes that I attempt to analyze the crises I was not involved in.

Gary Gorton reminds us in his insightful book *Misunderstanding Financial Crises: Why We Don't See Them Coming*, that “[t]o really understand a financial crisis one needs to be an eyewitness, to *see it*.”² I agree, but I would go one step further. It is even a greater benefit when it comes to diagnosing the economic and psychological factors that create a crisis and what it takes to extinguish it if you have lived through, addressed, and had the responsibility to resolve one. You must have lost sleep over the collapse of financial institutions and possibly the economy itself. You must have wondered what will happen if you take the next unprecedented step if it does not extinguish the financial fire. You must have stayed up nights searching for solutions to unsolvable economic problems. You must have been in the room to see the personal vendettas, conspiracies, and petty human emotions that caused events to unfold in the unexpected ways that they do. There is an emotional and economic rhythm to every crisis that must be felt, just as we are feeling it now. Humans and all their faults, customs, and biases make the decisions that create, drive, and solve a financial crisis. Those factors cannot be neatly packaged into an economic explanation of what happened. Can you understand today the handling of the 2020 financial crisis just by looking at the underlying economics and news reporting? The politics and personal relationships are indispensable to that analysis.

Perspective is also important in understanding financial crises. As easy as it may be to recognize errors in hindsight, few critics identify financial problems in advance.³ In that regard, financial mistakes made in one crisis become clearer as time passes. Frankly, given the structure

of banking and the system of government oversight, the government is lucky to get it right as often as it does. When examining the entrails of our economic past and trying to piece together policies that guide our financial present, there will always be certain levels of uncertainty. That is why financial markets bring us the recurring spectacle of very smart people making very big mistakes. While financial regulation is necessary, because of politics, misdirection, and lack of resources, policy makers sometimes regulate the wrong activities at the wrong time for the wrong reasons. The many books about US financial crises attempt to explain *why* they occurred. But their cross-examination of the facts often stops too early and does not ask the next several levels of questions. Why and how did the market grow in a particular way, why did the government act or not act, and what actions created the financial environment that armed reckless companies and investors that incubated the crisis? As importantly, how long were the events that led to the crisis percolating and why? What were the germinating events and when were they planted? For example, some identify the growth of nonbanks and particularly the reverse repurchase market as a “cause” of the Panic of 2008. Even if that were the case, it is like saying that an automobile accident occurred because two cars hit each other. To really understand what happened and prevent the next accident, we need to understand the complete timeline that explains why the two cars hit each other. Was one driver in a bar for an hour before? Did a traffic light malfunction, or did one car’s brakes fail? Was the crash intentional?

Timing is also a critical factor in the dissection of financial disasters. Financial crises cannot be evaluated after the fact as self-contained events. Most are part of a continuum of financial cycles and behavioral reactions that are culturally and financially connected to each other. The identified causes of a crisis, therefore, often depend on how far back in time one tracks them. Each recession, depression, and bout of inflation or deflation creates economic dynamics and market psychologies that feed off each other and create emotional reactions that impact a generation of people for as long as they live. From 1819 to 1907, there were almost as many years spent in economic chaos as there were in prosperity. Was it a century of economic growing pains and crisis sprinkled with some years of economic boom, or a prosperous period stained by periodic excesses and financial collapse? However one describes it,

the nineteenth century was both a period of dynamic economic development and unbridled chaos as the country expanded from the East to the West Coast. The twentieth century saw the establishment of extensive regulatory oversight of financial institutions, but severe financial crisis still occurred in 1929, the 1980s, and 2008, not to mention several stock market crashes in between. Including the periods that incubated those financial crises and the time it took to return the economy to its precrisis status, another three to four decades of financial dislocation occurred in the twentieth century. A large part of the twenty-first century has already involved the creation of or recuperation from the subprime lending crisis that turned into a massive global crisis and the financial pandemic.

Alex Pollock, in his book *Finance and Philosophy*, and Carmen Reinhart and Kenneth Rogoff in their book *This Time Is Different* note that the world is literally almost always in economic chaos. The latter book contains a list of global banking crises that is forty-five pages long. Studies in fourteen countries between 1870 and 2008 reveal seventy-nine banking panics—“one every 1.75 years and 5.6 per country.”⁴ Embedded in this history is a telling fact: the system of extensive regulation created and embellished since 1913 has not eliminated severe financial distress. That is in part because it is not regulating markets and institutions correctly or smartly and has done little to help consumers keep up. The current form of financial oversight can distort markets and take prudential regulators perilously close to operating the institutions that they oversee, at least through the power of a regulatory veto. That type of regulation takes a significant amount of their time and resources, so when crises inevitably occur, the government is usually unprepared for them. In the subprime crisis beginning in 2008, the government had to create emergency plans on the fly. Some were in the form of an asset purchase turned capital augmentation program for banks, such as the Troubled Asset Relief Program (TARP), and mortgage modification assistance plans for homeowners whose mortgages were upside down—they owed more to the bank than the house was worth. In his book, *On the Brink*, former treasury secretary Paulson said that policy makers had no choice but to “fly by the seat of our pants, making it up as we went along.”⁵ Why is that? That crisis was not the first that the country endured in the last two hundred years. It was the ninth!

Technology is the new wild card in this complicated financial system. It is changing our financial futures by impacting the way that financial services are being delivered and regulated. Used effectively by regulators—which it is not today—it could also be the most constructive cure for the common crisis. Artificial intelligence and large data sets could provide government overseers with more reliable and predictive information than the government has ever possessed. They could create the institutional knowledge that governments populated by revolving door officials appear unable to develop. J. P. Morgan Chase is using such data analytics and artificial intelligence to map out the buying habits of residents in Detroit to help revitalize the city. Why isn't the government using it to decipher future economic alternatives?

The current technology explosion makes it even more critical that the causes of financial crises in the country be understood and carefully analyzed. For example, we cannot keep overregulating the fraction of the financial services market represented by banks and ignoring what happens in the balance of financial businesses in the country. It is financially ineffective and competitively unfair. It migrates risk to unregulated businesses and increases the likelihood that smart people will make mistakes. Indeed, the landscape is changing yet again as thousands of cryptocurrencies, dozens of crypto exchanges, and numerous blockchain and artificial intelligence applications are impacting money supplies, lending decisions, the role of banks, and their position as the economy's financial gatekeepers.⁶ I will dive deeper into these technologies, how they work, and what they signify later in the book. But technologists, businesses, and consumers are increasingly experimenting with a variety of financial technology (fintech) money products that are impacting capital investment, liquidity, and business psychology. Similarly, traditional financial institutions are necessarily investing in new technological products and delivery systems to compete with fintech companies and continue to serve the needs of their customers.

Facebook is threatening to revolutionize money, commerce, and regulation with its Libra cryptocurrency. Apart from the political firestorm surrounding it, the critical financial issue that it and similar crypto products raise is whether they signal the beginning of a new age of financial services, and whether that should trigger a new approach to regulating it according to what a company does rather than what it calls itself. Historically, the application of financial regulation has generally

been driven by the identity of a company, not the nature or impact of the financial activities being conducted. Banks are prudentially regulated because they are chartered by the federal and state government and enjoy the benefits of federal deposit insurance, access to the payments systems, and federal preemption that may alleviate the need to comply with state laws. That concept of prudential regulation was developed in the wake of the Depression in the 1930s when commercial and private investment banks controlled almost every aspect of the movement and investment of money in the country. Nearly ninety years later, mutual and money market funds have more assets under management than banks have deposits on their books. Private equity and hedge funds manage almost six times the assets as all the credit unions in the country have. Blackrock Inc. alone has about \$7 trillion of assets under management, which is about 35 percent of all bank assets. Once the impact of technology—the use of Big Data, artificial intelligence, quantum computing, and cloud applications—is factored in, there will be very little about money, banking, and commerce in the next decade that looks anything like it did when the current federal regulatory mechanism was established in the 1930s.

In this environment, constantly expanding the regulation of banks without true correlation to how markets are evolving is dangerous and provides a growing competitive edge for nonbanks that are not prudentially regulated. It also complicates the business of monitoring the safety of financial systems by incentivizing risk to migrate to sectors that are not prudentially regulated. In the 1980s, the explosion of money market funds impacted the competitive and consumer choice aspects of almost every facet of financial services in America.

Today, fintech companies are remaking the nature of money and the role of financial intermediaries in the housing finance and payments businesses with low-cost, real-time, peer-to-peer verified products and delivery systems. When a bank wants to launch a novel financial product, it usually must speak to and file applications with several state and federal regulators explaining its business plan, profit potential, management expertise, capitalization, liquidity, consumer protection mechanisms, and community lending goals. Cryptocurrencies may be subject to certain federal and state money transmission and securities laws, but when they enter the business of creating and distributing electronic money, they usually need to seek permission from no banking authority

and are not subject to prudential requirements simply because they are *not* banks. Unless a company is backed by federal deposit insurance, the thinking has been that there is a limited basis to subject it to comprehensive, prudential financial regulation because the government does not stand behind the institution's business or customers. This has left a blind spot in government oversight through which economic opportunists as well as purveyors of malicious technology will take the opportunity to run.

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act)⁷ began to move away from this linkage between prudential regulation and federal deposit insurance largely because the government was forced to stand behind companies like money market and mutual funds that did not have federal deposit insurance to prevent the economy from collapsing in the Panic of 2008. Nonbanks that do not have federal deposit insurance but are determined to be systemically important to the stability of the US economy can now be made subject to prudential regulation by the Federal Reserve. That delinkage of deposit insurance and prudential regulation invites the Congress to consider further whether we have reached the point where financial regulation should be tethered to the nature of the activity rather than the identity of the company. Alternatively, perhaps bank regulation should be scaled back to level the competitive playing field.

If we regulate financial activities in a uniform way notwithstanding the identity of the company, we can then be consistent about the regulation of transactions and financial relationships between affiliates, executives, and other related parties. In effect, it addresses the nearly hundred-year-old Glass-Steagall debate over whether the businesses and regulation of commerce and banking should be separate. It will also allow for a more uniform oversight of the creation and allocation of risk throughout the economy.

Regulating the financial threats in traditional ways is likely to put the entire US financial services system at risk of collapse in the future. If advanced technologies end up in the wrong hands and are used in the wrong ways, they could destroy the country's economic infrastructure. The potential for malicious use of technology by rogue nations, fanatics, and terrorists increases each day, as does the threat to economies around the world. The fact that the US government is unprepared to

defend and protect the country's financial ecosystem against these threats should frighten us to death. It frightens me.

The actions of private sector financial companies are a fundamental component in the creation of financial crises. Reckless lending, speculative investing, mispricing of risk, and substandard corporate behavior always play an important role. Those actions may, however, be the result of completely rational decision making by executives linked to the financial incentives embedded in the economy. Frankly, it should be expected that rational executives will try to take advantage of profit opportunities that the market and the government intentionally or unintentionally create when they appear to outweigh the risks involved. Executives know how to identify and value such optionalities. Short-term profit-oriented compensation structures, tax loopholes, accounting conventions, and the ability to profit from portfolios whose risk will be borne by others have an aggregate impact on markets that may be entirely rational but may also create enormous systemic risk. Reckless lending, speculative investing, mispricing of risk, and substandard corporate behavior is not criminal, so it becomes an economic risk/reward analysis. The private sector should be blamed for its excesses, and routinely is in book after book. *200 Years of American Financial Panics* focuses, however, on the fact that government policies are also to blame for the creation of such options and risks, which are rarely admitted or analyzed. Until we identify the ingredients added by government policies, we will never be able to fully understand the deficiencies in our financial ecosystem. And if we do not appreciate how to adjust or correct them, we have little chance of averting future financial crises no matter how much we rein in the rational and irrational financial behavior of companies and executives.

An intriguing and creative new book, *The Rise of Carry*, published in 2020, explains the boom and bust phenomena analyzed in this book from the perspective of a parallel economic universe.⁸ It emphasizes the mispricing of risk, the way that crises are driven by compensation, and the clever ways that financial engineers can use blindingly complicated financial instruments and transactions to short volatility with large leveraged bets that eventually require central banks to come to the rescue. Those alternative financial universes that function below the view of most individuals and businesses, and how they create risk, vola-

tility, and profit are beyond the scope of this book. *200 Years of American Financial Panics* does not attempt to evaluate the risks that created in the markets by securities, commodities, currency, foreign exchange, derivatives, credit default swap, or other similar trading markets. There are more than enough books that expertly dissect those risks created by businesses. It sticks to the basic concepts of banking, how it is regulated, and how it should be regulated in the future.

It is not easy to decipher what happens and why it happens in Washington, DC. Often the truth is expertly camouflaged, so that much of what the average citizen hears is convoluted and shrouded in political speak. Conflicting economic, political, and regulatory dogma create a tower of babel in which nonsense becomes important, and important things are treated like nonsense. After all these years in Washington, I consider myself an expert in deciphering its mumbo jumbo and well equipped to take readers on a journey through the history of financial crises and the impact that technology will have on our financial future.

As I use the term *government* throughout the book, it is catch-all mostly for federal and state legislative and executive branches of government, and sometimes, the federal and state administrative agencies that implement the decisions that those policy makers create. *Financial institutions* refers to regulated commercial banks, S&Ls, savings banks, and credit unions—institutions that take deposits that are insured by the federal government. I refer to what many identify as *shadow banking* institutions as *nonbanking* institutions to avoid what seems to be a largely derogatory term used to identify investment banks, securities firms, broker-dealers, deposit brokers, money market and mutual funds, nonbank lenders, commodities firms, hedge funds, and private equity firms that are not subject to prudential regulation. They are distinct from banks largely because they are not prudentially regulated from cradle to grave. Confidence in them is generated by disclosure and transparency rather than extensive regulation of their capital, liquidity, risk management, consolidations, geographic locations, and operations. Only these companies, their shareholders and lenders decide how well they are doing and whether they should continue to operate. As I use the term *prudential regulation*, it describes the highly supervised arrangement where a government agency (1) charters a financial institution; (2) determines its capital, liquidity, and risk parameters; (3)

examines it on a periodic basis to assess compliance with these and a host of other regulatory standards that must be met; and (4) enforces that compliance and decides if and when the institution should be closed.

Part One

The Recipe for Panic Stew

I

HANDLE WITH CARE

Fragile Financial Ecosystem

Stars inevitably hurtle through space toward extinction as they implode only to take on a new form and begin their next career. Similarly, the US economy is always racing toward its next recession or financial crisis. Every financial explosion is always followed by some form of financial downturn and then a reemergence of the economy as a Phoenix rising from the ashes. No one anticipated the COVID-19 financial crisis of 2020, which exploded just as I thought I had completed this book. Whether it qualifies as a full-fledged financial crisis, which it certainly would have been had the Congress, Treasury, and the Federal Reserve not acted, it has set in motion a different set of dynamics from the other nine financial crises that have occurred since 1819. It also has punctuated the deficiencies in the system that require fixing. More on that later.

Recessions—financial markers denoted by points when the economy stops growing and the value of goods and services produced declines for two consecutive quarters—happen relatively frequently and are not cataclysmic financial events. Still, even they are rarely predicted with any regularity by economists. Andrew Brigden, chief economist at London-based Fathom Consulting, determined that of 469 international downturns since 1988, “the International Monetary Fund had predicted only four by the spring of the preceding year.”¹ That is a batting average of 0.008. Hardly Hall of Fame material. By the spring of the year in which the downturn occurred, it had predicted just 111 slumps, increasing its

batting average to 0.236. A fair minor league showing. Of the more than 150 recessions in 63 countries between 1992 to 2014, only 5 were predicted by a consensus of private-sector economists in April of the preceding year.² So much for economics as a predictor of anything. There are just too many variables to calculate—at least without the effective use of supercomputers. I also do not believe that economic analyses can accurately capture the causes of crises after the fact. They are driven by numbers; crises are driven by emotion.

Financial crises happen less frequently than recessions but are far more devastating economically and emotionally. In good times, we tend to be blind to the flashing yellow lights of a rapidly expanding economy until they turn bright red. Much like the latest death-defying roller coaster, folks enjoy the rush of the ride up an economic peak. Quite often, financial crises have emerged when certain assets became overpriced and their holders overleveraged. But no one wants to be the skunk at a garden party and miss the economic euphoria or advantage when it is rolling. As markets and financial products and interrelationships become more complicated, we must be able to better identify and decipher the warning signs that may suggest economic collapse and launch mitigating actions based on that information. To do that, we need new information-gathering tools, more effective and efficient methodologies of government oversight, more sophisticated technological tools, and a higher level of consumer financial literacy. Most importantly, we need less politics in the financial affairs of the country.

The history of financial chaos and how it has impacted the operation and regulation of the US financial ecosystem explains a lot. First, to call it an ecosystem probably suggests more stability than it deserves. The economy rarely stays the same; it is dynamic and constantly impacted by and reacting to a myriad of economic, social, regulatory, psychological, and political events, many of which are random. The loss of some \$3.5 trillion of value in the stock market in one week in February 2020 due to the coronavirus is proof of that. In this ecosystem, financial institutions generally do not prosper in tough and uncertain economic times. That is not necessarily because they have been reckless, engaged in fraudulent behavior, or poorly regulated, although all those things may be true. It is just the way the system functions. Financial institutions make the economy work because they “manufacture” money and lend it out, assuming the risk of nonpayment. They do that by borrowing them-

selves—levering their balance sheet against the relatively small amount of capital that they maintain—and by making informed judgments about a borrower's capacity to repay. They are not fortune tellers, however, and they cannot guarantee what the future economy holds for those borrowers. Lending is inherently a risky business, but someone must do it if we want a dynamic economy like the United States has. The better it is done, the more valuable will the credit extended be, because of its enhanced chances of repayment.

When there is too much money and credit available, institutions still must put those funds to work to earn a profit. With such a surge of lending comes an increasing likelihood of reduced underwriting standards, which leads to the creation of imprudent loans, leverage, and volatility followed by defaults and financial dislocations when economic fortunes turn. Added to these challenges is the fact that much bank lending creates assets inherently difficult to value, making the balance sheet of a bank somewhat opaque and systemic risk hard to quantify. Trying to construct endless rules and regulations to lessen the likelihood of a financial crisis instead of building an urgent financial care system that can deploy safety nets when the inevitable collapse arrives is an inefficient use of government resources. Take the simple example of a bank financing a developer that wants to transform a vacant lot into a twenty-story office building. When the economy turns, interest rates may increase or other financial variables change, and that borrower may lose its lines of credit and stop building. When that happens, it will also likely stop paying the loan, pushing the economic loss back on the bank. At that point, the lender must determine whether it will foreclose on the defaulting borrower or ride out the storm with it to preserve the value of the loan and perhaps their own survival. This latter approach—a loan workout—has been a key element in the history of finance. It has been resurrected, as I will discuss later, in the Financial Pandemic of 2020 as forbearance. But historically, forbearance has received mixed reviews.

In the United States, before the S&L crisis, the concept of forbearance was an accepted tool to work through economic crises. It worked in two directions. Banks extended loans or rolled them over so that borrowers would not be forced to default, and the economy could continue to move forward. The assumption was that the economy would right itself eventually as it always has, and the borrower and its loan

would regain its value when that happened. At the same time, government regulators would also forbear, adopting a less stringent attitude to the evaluation of those loans and allow banks some leeway before writing them down and forcing losses to be booked. They might even allow banks to operate with deficient capital during periods of severe economic duress if they thought that they would return to profitability when the economy normalized. Forbearance recognized that banks take financial risks without knowing the future and sometimes need time for the economy to stabilize to prove that their lending judgments had value. Closing or punishing banks because economies have cycles may feel good but can be terribly counterproductive.

Then the S&L crisis occurred, and the country's policy makers, looking to reallocate the blame, identified forbearance as part of the problem rather than a part of the solution. In effect, the political convenience of blaming bankers for the losses created by a stressed economy overwhelmed rational financial thought. That was by no means a new trend, but it has now become a well-worn formula. It also has significant implications for the future. If there is no room for forbearance when the market turns, banks will be incentivized to be much more conservative about lending so that they can avoid blame and keep more liquidity than they need. That impacts credit availability and market competition, which eventually creates a government-made economy that is more likely to encounter financial crises because of the distorting impact and perverse economic incentives that get built into such a system. When banks provide less credit, fewer buildings are constructed, fewer cars are manufactured, and the economy guardedly lurches forward. That hurts low- and moderate-income consumers and struggling business owners who need credit the most but likely have more problematic credit histories. That sets off alarms in Congress. As politics answers the call and increasingly dictates the nature of financial regulation and allocation of credit, the government initiates an economic chain reaction that ultimately may impact its ability to prevent financial crises or resuscitate troubled economies. In fact, it may cause a financial crisis, as I will discuss later.

The rush to judgment to simultaneously fix economic disasters and affix blame before the financial flames have even been extinguished can create the dynamics that lead to the next financial crisis. The concept of practical compromise and judicious oversight has increasingly been

overwhelmed by unyielding political rules and concepts of retribution. That is the worst way to run the largest economy in the world. Former secretary Geithner explains this phenomenon in his book *Stress Test*, noting that what seemed most inequitable—bailing out the banks—was in fact the most efficient thing to do.³ Give him credit for recognizing that and doing the right thing anyway.

At the same time, a government that is always bailing out its economy is creating aberrant financial incentives that lead to economic moral hazard. There is no doubt that these are difficult decisions that take smart, dispassionate, and apolitical policy makers to make it all work. And that is also why it does not always work. If the public knew that the crowded, clumsy, and costly financial system of government oversight in the United States increases the rates they are charged for car loans and home mortgages, they would be unhappy. If they understood that some of the financial pain that they endured over the last two hundred years was the result of ineffective government policies, they would be angry. If they knew that the system could be fixed, they would demand that Congress implement those changes immediately.

The country needs better, smarter, leaner, and more effective systems of financial oversight with the means of attracting and retaining people with the highest level of financial skills. There should be fewer static rules and ratios, and more commonsense judgments about safety, soundness, and risk management. Less political tinkering and more adult supervision is needed. Rigorous cost-benefit analysis of everything that the government imposes on financial institutions must be mandatory. Financial literacy must be improved so that less regulation is necessary and more financial innovation is permitted. These solutions have been around for decades and are readily attainable. The economic benefits they would create would flow directly to the American consumer and investor. I can only surmise, therefore, that the system's imperfections are politically and institutionally embedded. But now, solutions are even more available through the technological developments that are being made. Thanks to technology, we find ourselves at a new financial crossroads, offering the country the option to take a data-driven path to financial stability.

A QUESTION OF BALANCE

The financial system in the United States is built to allow institutions to fail. Congress could build one in which few if any banks ever failed. The system would have little if any leverage and massive amounts of capital; it would strictly limit the investment activities of financial institutions. A “fail-free” banking system would look and operate somewhere between the US Post Office, an unleveraged mutual fund, and a public utility. Businesses would likely find it difficult to address all their financial needs through such institutions, and only consumers with the best credit histories would be able to get loans. But few banks would fail. Limiting leverage would reduce risk but would also limit profitability and slow the economy. These new fail-safe banks would make less money and necessarily pay lower salaries, giving them fewer chances of attracting top-notch financial talent, guaranteeing that they remained in a state of financial mediocrity. US banks would eventually become non-competitive, and the economy would become more and more sluggish. Such a financial system does not reflect the economic and policy choices that have been made in the United States.

Given the complicated financing needs of US companies and the globalization of commerce, dumbing down the US financial system to ensure fewer failures would have a significant adverse impact on the US economy. It would surely force companies to look elsewhere to satisfy their credit needs. In that regard, the five largest banks in the world are foreign banks, and four of them are Chinese. This is a trend that is not consistent with the United States maintaining global financial superiority. A fail-safe banking system has, knowingly or not, been traded for a more vibrant, growing economy. The trade is exponential growth in return for the risk of financial collapse. That creates a dynamic financial environment in which the government, regulators, bankers, and consumers will make mistakes and then must solve them. The challenge is to find a balanced system that limits the number and impact of those mistakes but more importantly, is prepared with emergency resources to prevent the economy from hitting bottom so it can quickly bounce back after it takes an economic punch.

Government oversight should be a smart, stabilizing force that promotes confidence and equilibrium in the financial system. For example, where there is asymmetry in the access to market information, or where

the cost of such information is significant, government regulation levels the playing field, bolsters confidence, and decreases execution costs. By aggregating deposits from consumers as a go-between, banks can lend those funds to borrowers whose ability to repay they can more efficiently evaluate than their individual depositors could. Until the introduction of recent technologies that facilitate peer-to-peer lending, it would have been too inefficient for each depositor to underwrite the deployment of those funds. When the government steps in as a guarantor as it has done with deposit insurance to facilitate efficient financial transactions, it has a legitimate interest in the prudent behavior of the banks that it insures. It imposes regulations to take the place of individual bond indentures, private loan contracts, or due diligence. While regulation may appear to banks to be a burdensome interference, it is often less onerous than their having to execute private credit contracts between each supplier of funds and each borrower. Smart government regulation should benefit all the parties in the process. Depositors get a guaranteed return, borrowers receive much-needed funds to buy homes and start businesses at a reasonable rate, and financial institutions accept the price of regulation to relieve them of the capital and information requirements that would be required to satisfy individual creditors (i.e., depositors).⁴ In the right doses, government regulation counters the normal human instincts of herding, euphoria, fear, and panic and protect the country's national security and democracy itself.

But too much government intervention is economically suffocating; it distorts the market with perverse economic incentives that encourage "loophole" business strategies. Moreover, much of the major capital and liquidity rules that banks must follow are effectively set by international bodies, the Basel Committee and the Financial Stability Board (FSB), albeit with a heavy input from US regulators. Getting the regulatory balance properly calibrated is difficult and often impacted by nonfinancial elements such as politics. When Congress sought to increase housing in America and unwittingly put the S&Ls in a position where they could not earn a profit from their mandated portfolio of thirty-year fixed-rate mortgages in the 1980s, they naturally were drawn to more speculative commercial real estate and junk bond investments just to stay in business. When the Federal Reserve lowered interest rates and the government encouraged lenders to make mortgages to low- and moderate-income Americans in the 1990s and early 2000s to increase

homeownership rates in America, a wave of subprime and alternative mortgage instruments was inadvertently triggered. There is always a market reaction to every government action, making it even more difficult to find and maintain the right balance of economic freedom and government oversight. Balance is the ultimate challenge.

How the Regulated Market Works

To underscore the choices that make up this complicated balancing act, consider two simple hypotheticals to illustrate how markets are impacted by government policies. In hypothetical one, loosely based on the Panic of 2008, assume borrower X has a substandard credit history with a 620 credit score. She applies for a mortgage to buy a home from a local national bank (NB). NB must operate within the constraints of the market as well as the comprehensive federal and state regulation to which it is subject. It acquires its lendable funds primarily from customers who have FDIC-insured deposit accounts with it. Because of federal deposit insurance, NB has access to long-term deposits at rates that are much lower than what it would normally have to pay to borrow in the market. It can pass that savings on to X in the form of a lower interest rate on her mortgage. But NB is also subject to comprehensive federal oversight, the cost of which offsets some of the savings that it could have passed on to X. It has mandated capital, liquidity, and many other regulatory requirements that increase its cost of doing business and impact its ability to make loans. For example, it must hold capital against almost every asset on its books. If it is close to falling out of capital compliance, it will be more selective in the loans that it makes. Therefore, it may reject X's mortgage application based on the risk inherent in lending to a 620 credit score applicant. But in the managed economy that exists, as in 2008, it has two incentives to approve the loan: it can earn an origination fee, and then it can sell the loan, removing much of the risk from its balance sheet while it services the loan for additional monthly fees.

In the early 2000s, NB would have offered X a thirty-year fixed mortgage at 4.30 percent for example, backed by a commitment from Fannie Mae to purchase it. Since Fannie Mae is nearly treated by the markets as if it is backed by the full faith and credit of the US government (even though it is technically not), it can borrow money to pur-

chase the loan at a more favorable price than a private company. That in turn allows NB to offer a lower mortgage rate to X. NB may not have offered to make a thirty-year fixed-rate loan to X if it had to hold the loan in its portfolio given the interest and credit risks it would have to assume by doing so. But it has the option of selling the loan into the secondary market. Once NB transfers the loan to Fannie Mae for cash, it can then lend that cash to a new mortgage borrower and start the process all over again. Fannie Mae will purchase mortgages across the country and package them into mortgage-backed securities (MBS), which it sells to banks, insurance companies, mutual funds, other institutions, and investors, guaranteeing their timely payment of principal and interest. Since NB and Fannie Mae are closely regulated by the government, there is a presumption by the market that the basic safety and soundness concerns in the process have been addressed and that the loan is a reasonably solid credit.

Assume that within two years, mortgage interest rates increase to 10 percent, reducing the market value of X's loan—now held by Fannie Mae—by approximately 50 percent. Since credit is more expensive, home sales plummet and the value of homes decreases by 15 percent, putting a strain on borrowers such as X who can no longer rely on the equity value of her home through a second mortgage or sale of the home. Markets deteriorate and unemployment increases, leading to increasing defaults, including X's. Fannie Mae ultimately must absorb the losses and either pay the MBS investors their agreed-upon contract rate of return or repurchase the mortgage, which effectively acts as prepayment of it. If X's loan had been pooled and included in a privately issued MBS, when the market went south, MBS investors would simply stop receiving payments as homeowners stopped making them. As losses increase, the viability of Fannie Mae becomes questionable because of the risk it has assumed, the markets constrict, and there is a crisis in confidence and a corresponding flight to quality by investors. Ultimately, the taxpayers underwrite Fannie Mae's losses as the government steps in to avoid its failure and infuses capital and liquidity into Fannie Mae and the economy. Some of the risks inherent in this hypothetical were smartly addressed by the Dodd-Frank Act's imposition of risk retention requirements so that parties in the line from origination to securitization must now hold a portion of the risk on their balance sheet.

How an Unregulated Market Might Work

Hypothetical two assumes the elimination of government involvement in the financial markets—consider it a fantasy. NB adheres to capital, liquidity, and reserve requirements dictated by the market and its competition. It has little to no federal regulation and provides depositors no federal insurance backed by the government or an agency of it. There is no Fannie Mae; the secondary market is composed of private sector purchasers of mortgages and MBS. When X requests a mortgage, NB must consider the fact that it may have to hold her loan in portfolio. For that reason, it may simply decline X's application based on her lack of creditworthiness, ending the story. X can't buy the home, and NB avoids a problem, as perhaps the entire country does to the extent that the amount of bad credits that could be pumped into the economy is reduced when lenders and borrowers understand that they must have skin in the lending game.

Assuming, however, that NB does make the loan to X, it will scrupulously underwrite it since it may not have as many outlets to sell the loan to remove the risk from its books. Accordingly, NB refuses to offer X a thirty-year fixed-rate mortgage, not wishing to assume the interest rate risk inherent in a thirty-year instrument. It has no confidence that it can match such a mortgage's duration and interest rates with the funds it borrows to fund it for such an extended period. Instead, it offers X a fifteen-year adjustable rate mortgage with an initial rate of 5.00 percent and a lifetime interest rate adjustment cap of 5 percent. Since NB does not have access to subsidized funds through a federally insured deposit system or Fannie Mae's purchase of the loan, it must borrow at market rates to lend to X, which makes her mortgage interest rate higher than in the first hypothetical. Lending rates would no longer be subsidized by the government. With the 5 percent lifetime cap, the interest rate on the mortgage cannot rise above 10.0 percent. Because the mortgage's interest rate will rise and fall along with changes in market rates, it should mitigate the loss of its value simply because the interest rates it charges also increase. NB also imposes certain payment and debt ratio terms, and most importantly, requires X to make a 20 percent down payment so that her monthly payments are reduced and her ability to continue paying the mortgage as interest rates increase is strengthened. In this hypothetical, X is forced to assume the risk of interest rate

increases that would decrease the value of her mortgage rather than moving that risk to investors and in so doing, has been underwritten into a more reliable loan. NB later attempts to sell and securitize X's mortgage loan privately in a pool of mortgages sold to investors by a Wall Street investment bank in the form of an MBS. This process is subject to a serious due diligence effort by the investors to assure the quality of the pool of mortgages that is being offered given the lack of regulation of NB. X's mortgage is rejected from the pool and NB must continue to hold it in portfolio. When interest rates increase to 10 percent, X's mortgage payments increase to a level that puts a strain on her, but given her investment in the house and higher down payment, which creates a lower monthly payment, she can continue to stay current and avoid default.

The Implications of Eliminating Managed Markets

In the first hypothetical, the subsidization of borrowers and the risk assumed by the ultimate investor is glaring. X gets the benefit of lower interest rates because Fannie Mae can borrow at near government interest rates and pass that discount on, and NB is funded by low-cost federally insured deposits. This creates more mortgage credit at lower rates, which allows a greater percentage of Americans to buy homes and homebuilders to build more of them. In addition, X enjoys the benefits of a thirty-year fixed-rate mortgage that allow her to avoid any risk that interest rates may rise and increase her monthly debt obligations. They are frozen for thirty years. The risk of rising interest rates is completely borne by the investors in the MBS that her loan becomes a part of. This scenario incentivizes the concentration of enormous amounts of interest rate risk in the secondary market, which at the same time may lessen the interest in properly underwriting that risk in the assembly line that leads to investors. When this scenario explodes, the taxpayers must bail out the system.

In hypothetical two, consumers end up paying higher mortgage interest rates as well as assuming the risk that interest rates increase because the government has not put its thumb on the scales to favor borrowers. Presumably, that decreases home sales, which moderates the economy as the demand for everything related to the construction of a new home decreases. Consumers would have to be more cautious

about how they borrow, including putting down more money to make the transaction work. Because there are no government guarantees in the system, there is a greater incentive for the market to police the creation and concentration of risk.

The tradeoffs between these two hypotheticals are striking. It is certainly within the discretion of the Congress and other policy makers to choose where along the spectrum between these two opposites they want the system to land. In the first hypothetical, the government attempts to manage the financial system largely for the benefit of residential borrowers. In return for lower mortgage interest rates and uniform financing costs over the term of the loan, the government assumes the risk, which we know since 2008 is more than insignificant. Too many parties enjoy too much upside and have too little risk to bear in that hypothetical. It is the naked socialization of risk. But it does energize the economy by stimulating every inch of the housing business, from real estate agents to washing machine manufacturers.

In hypothetical two, the safety and stability of banks and the economy are left to market competition and corporate behavior. Such completely unregulated banking systems have also proven to be volatile and unstable because of moral hazard and clever financial engineers who know how to manage risk, volatility, and the system. The question, therefore, is which of these hypotheticals is less likely to cause a financial crisis. Viewed this way, the distortion in the market and the risk reward ratios are obvious. The first scenario elevates the benefits of lower rates and is willing to risk the market distortion that may occur in return for the political benefits of higher homeownership and an energized economy. The second scenario completely trusts the market to do the right thing. As we will learn, these tradeoffs happen all the time—that is how governments and markets operate. But we seem to have great difficulty getting the balance exactly right and moderating the amount of distortion that government oversight creates. Today, post-Dodd-Frank Act, we still have a system skewed sharply toward hypothetical one. I will come back to consider the nuts and bolts of how this balancing works in the next chapter.

THE ELEMENTS OF A FINANCIAL PANIC

Financial crises in the United States share similar ingredients and causes. They erupt because of the way that government policies, human nature, market forces, consumer preferences, and confidence interact with each other.⁵ When markets get frothy and begin to grow rapidly, money and credit become abundant. That can lead to overpricing of assets, underwriting standards becoming more lenient, and investment strategies becoming more aggressive because there is simply so much money around that must be put to work earning a return. This trend usually means that without care, trouble will not be far behind. Unfortunately, it is not always clear that too much risk is being taken, that it is being mispriced, or that speculation is in full swing during the blissful heat of the economic moment. Too often, government policies misidentify financial incentives in the market that encourage (1) long-term risk-taking, (2) mispricing of risk, (3) the migration of risk to nonregulated portions of the economy, and (4) hedging based on the expectation of a government bailout. Finding the cure for this—a formula to avert, mitigate, and treat financial collapses—requires an evidence-driven analysis and understanding of the causal ingredients that have created them in the past. It demands that policy makers focus on the financial incentives (how companies and individuals are compensated and incentivized to allocate risk) that drive economies as much as they do in regulating the lending and investment activities of banks. Businesses will act rationally to take advantage of the financial incentives that exist in a market, so they can't be ignored when devising a system of oversight and supervision.

Prior to the financial pandemic of 2020, which is *sui generis*, there have been nine financial panics involving economic meltdowns over the last two hundred years that tell the story of how and why they occur and what the solution is. The short answer is that the creation of a bubble through the overvaluation of assets acquired in too leveraged a manner is usually the precursor to a financial disaster. But it is more complicated than that. Each major financial crisis in the United States since 1819—defined for these purposes as the combination of severe economic distress throughout the country and the collapse or imposition of severe pressure on a significant segment of the financial services sector—has been the result of the collision of six different elements.⁶

1. Managed Economies. The unanticipated collision of laws, monetary policies, political engineering, tariffs, and government supervision of economies and financial institutions distorts the incentives that drive markets, money, and commerce and encourages risk to be less transparent and concentrated in less regulated sectors of the economy with disastrous consequences.

2. Overheated Markets. New geographic and financial markets, an overabundance of private credit, increasing leverage, mispriced risk, and shiny new financial products (often real estate related) provide the fuel for economic booms that inevitably explode when credit is constricted.

3. The Psychology of Keeping Up. The irresistible psychological attraction to get rich quick like everyone else and run from economic ruin never changes. Similarly, there is a seductive drive in businesses to emulate the business behavior of successful competitors like lemmings, even though some may turn out to be taking dangerous shortcuts. The initial success of failed companies like Drexel Burnham, Enron, Washington Mutual, Countrywide Savings, and WorldCom all created competitive environments in their respective industries, which led to copycat behavior among their competitors. These reactions are hard-wired behavioral responses in humans that drive financial booms and busts.

4. Loss of Confidence. Bad financial news echoing through markets—whether the result of accurate information or the inability to get it—is the firing pin of financial crises. The more that bad news is amplified and repeated, the more likely that consumers, investors, and companies approach the breaking point, causing everyone to pull back at the same time, making markets illiquid.

5. Unanticipated Events. Unanticipated financial and physical events change markets. No one thought that the price of oil could drop 80 percent as it did in the 1980s, that one company—American International Group (AIG)—would write a majority of credit default swaps (CDSs), or that consumers would ever default on their mortgages before their credit cards. Similarly, earthquakes, wars, pandemics, fires, famines, gold rushes, and other natural and humanmade events occur and change the flow of commerce and the psychology of the moment in ways that were not anticipated. They build uncertainty and create unexpected change in a financial ecosystem that thrives on certainty. They

challenge the preparedness of governments in unprecedented ways, which naturally impacts public confidence.

6. Market Fermentation. Time changes financial relationships and makes smart strategies look dumb. The normal maturation of markets adjusting to new styles of business, new forms of government regulation, new financial incentives, new product advancements, and new customer preferences eventually make even the smartest financial policies obsolete. When technological innovation is added to that mix and begins to outpace the ability of laws and regulations to remain relevant, that “pacing problem” adds even more uncertainty.⁷

The collision of these factors is not always as random as it might seem. While human behavior and the desire to “make a killing” never change, the government often inadvertently creates an incubator that helps a boom become a bust through its financial policies or economic inattentiveness. The two businesses of operating and regulating financial institutions are tricky and difficult ones. Financial executives are always adapting to changing markets and government regulation to meet the needs of customers and shareholders. Markets tend to naturally overheat when given the opportunity during times of rapid economic expansion and available credit. They never stand still. Like water, financial markets and companies seek their own level, constantly shifting in reaction to external forces that include government regulation. When the government prohibits an activity, institutions may then pursue alternative strategies to replicate the lost revenue. In some cases, the activity simply migrates to a form of business that is not regulated, increasing risk in the economy. If the government has not considered the impact of the resulting shift in capital, liquidity, and risk created by that alternate path, then the rationale for prohibiting the prior activity may disappear.

Financial expert Gary Gorton tells a story about police purchasing radar speed monitors to increase revenue only to learn that revenue actually decreased because predictive models failed to incorporate the reactive behavior of drivers slowing down to avoid getting a ticket.⁸ On the other hand, he points out that when speed traps encourage drivers to purchase radar detectors, they tend to drive faster and cause more accidents. He poses an interesting question—are the police then responsible for causing those accidents?⁹ Governments are similarly con-

fronted with the challenge of regulating constantly changing institutions and markets with increasingly aging and backward-looking tools.

GETTING SMARTER ABOUT GOVERNMENT INTERVENTION

Financial supervision includes a system of carrots (financial subsidies) and sticks (financial penalties). The carrots are embedded in the benefits of federal deposit insurance (which allows banks to borrow from consumers at a favored rate because of their government guarantee), access to the payments system (which is an extraordinarily valuable franchise right), free call options (riskless securitization), the willingness to invest in assets classified as low risk (which allow banks to operate with lesser capital), and the fractional deposit reserves established by the Federal Reserve (which allow banks to lever their balance sheets). The sticks are higher capital requirements, examination and compliance costs, operating restrictions, regulatory impositions, and punishments that are imposed on financial institutions when they deviate from these standards. Eventually, however, the carrots and sticks begin to clash, creating operational confusions. The interconnection between an increasing number of capital and liquidity rules can encourage banks to take on more risk because they are being surcharged as if they have. Similarly, liquidity, capital surcharge, and reserve requirements may work against each other as they apparently did in the fall for 2019 and March of 2020, causing significant increases in repurchase agreement (repo) rates and the need for Federal Reserve intervention. The result is that banks become programmed to construct their balance sheets for better or worse to satisfy the financial requirements that Congress, the regulators, and accounting principles impose, thus creating a financial universe where the government is ultimately making fundamental business decisions and indirectly managing the economy.

Because financial regulation tends to focus on operational dos and don'ts, it can fail to anticipate how the market may impact the financial incentives that drive business behavior and priorities. Sometimes this resulting distortion in the market is good, sometimes it is neutral, and sometimes it is disastrous. If the government is wrong—and it is from time to time—and the economy does not cooperate, there are thou-

sands of financial institutions whose balance sheets may react the same way in a financial crisis. This book does not advocate that government policies are the sole source of financial crises or that financial regulation should be eliminated. At the same time, all regulation is not created equal and necessarily effective, particularly as markets evolve often in reaction to them. As gasoline needs a spark to ignite, government policies and market forces often interreact to create the perfect storm. The only mystery is untangling what the cause, trigger, participants, and receptors of the crisis were.

Stability in the current financial world requires a new form of smarter, effective, efficient, and targeted oversight by the government that is economically rather than politically driven. *Smart regulation*, as I refer to it throughout the book, is supervision that is based on rigorous analysis, sound principles, and grounded judgments rather than hard and fast one-size-fits-all rules and ratios. Second, it should also be enlightened by technology. The more data that supervision is based on, the more predictive it can be and the less mistakes that Congress, the administration, the Federal Reserve, and bank regulators will make. Third, the regulation of financial services must be functionally adjusted to focus on those that create and transmit risk rather than just those that are established as banks. Finally, oversight can be smarter when the consumer is smarter. To the extent that the woeful level of financial literacy in the country is increased, the likelihood, severity, and length of financial crises will also be reduced.

A New Theory of Financial Oversight

The elimination of regulation is not the answer when it comes to financial services. It is a matter of finding the right form of regulation. Before the 1930s, when financial institutions were largely unregulated, human behavior left unchecked led to a variety of scandals and financial panics. *Economic liberalism*—the right to function without government intervention—revealed its deficiencies, particularly in the Great Depression. There was no balanced, rational form of oversight to avert a crisis, and no government buffers or safety nets to douse the financial fires once they started. It was not the answer. At the other end of the spectrum, as regulation started to become pervasive in the early twentieth century and move toward the Keynesian theory of *managed econo-*

mies, the more it slipped toward government micromanagement of the economy and financial institutions under the false impression that it could avert financial distress, the more the economic equilibrium of the system became unbalanced. Financial crises did not stop when comprehensive regulation began in the 1930s, suggesting that a balance between the two economic theories was needed. Indeed, the more that regulation proliferates, the more likely that it will “crowd out” actual market discipline. Government oversight can create a sense of false security that encourages consumers and businesses to assume that someone is watching and protecting their money and the system. If that regulation is not effective and smart, it will confuse the market and create perverse financial results.

There is a way to reduce the likelihood of unprincipled corporate behavior and the distorting impact of government intervention on the economy. This approach seeks to balance market dynamics with the government’s interest in maintaining financial equilibrium. It uses technologically driven financial buffers that reduce the likelihood of a financial free fall, is prepared to deploy safety nets when the economy falters, and imposes meaningful enforcement and punishment for reckless and fraudulent behavior, holding real people accountable for the acts of their companies. I refer to this type of regulation as *targeted buffering and enforcement* (TBE). TBE is not about eliminating regulation, but about right-sizing it in a rational, cost-effective way. It removes regulation of minutia, focuses oversight on the financial variables that really matter, and emphasizes that corporate ethics and governance principles make a difference. It seeks to remove incentives in the system that encourage executives to take advantage of them. TBE mandates the use of intelligent operating goals, reasonable business plans, and rigorous corporate governance standards. It focuses on rational regulation rather than rules and ratios. In such a regime, capital and liquidity buffers would be determined based on the risk profile of an institution relative to current and future macroeconomic factors rather than absolute capital levels. When executives defy those standards, it imposes real sanctions and punishments on the guilty party rather than on the institution and its shareholders.

When I represented institutions in enforcement proceedings, I always found it counterproductive—although great for my clients—to have the bank pay the fine that was imposed, as well as my legal fees.

One example of executives losing their jobs, having to disgorge their salaries, or an institution losing its charter has a much greater impact than requiring banks to comply with hundreds of ineffective and redundant regulations, the violation of which normally involves a meek slap on the wrist. TBE also requires constant cost-benefit analyses and testing of the relevancy of regulatory principles against evolving markets based on state-of-the-art analysis of gargantuan amounts of micro- and macroeconomic data about institutions and the economy.

A TBE-driven model of financial supervision would also emphasize the need for institutions to decide how best to employ prudent corporate governance and risk-management principles where every business act is accompanied by the assumption of proportional economic risk. If an institution has a rigorous system of corporate governance, a demonstrated respect for its customers, a solid operating plan that produces adequate capital and liquidity, and a record of reliable and transparent risk management and financial disclosure, there is little need for the government to micro-supervise it. In that way, the system can shift to identifying and controlling institutional and systemic risk rather than compliance with rules. When this happens, the government can reorder its priorities and focus more of its resources on addressing future economic downturns and financial crises. Since regulators have significant influence over who manages a financial institution and can remove or fine anyone who fails to do their job properly or legally, and even close the bank when it does not perform, they already have all the authority they need to require banks to operate safely and soundly. More laws and rules are not the issue. Congress should stop trying to turn regulators into monitors walking the financial halls of the country with regulatory punch lists. They are too good to be sentenced to a supervisory life of reading and interpreting ratios and rules. Markets flourish when regulators and executives are using judgment informed by the surrounding economic conditions. Rules create loopholes, distort financial incentives, and require endless interpretations.

In short, TBE would seek to establish basic operating standards with less of a slavish reliance on regulatory rules to reduce the distorting impact of unnecessary regulation. It would apply financial oversight more minimally, customize it, and instead of constant regulatory interference, deploy artificial intelligence and machine learning to continuously monitor and identify institutional and macroeconomic red finan-

cial flags that may suggest future financial distress requiring a change in course or intervention. In that way, it would also use technology to determine how the natural financial incentives that derive from market practices such as compensation structures, risk assumption, securitization, credit ratings, taxation, and insurance intertwine with regulatory requirements to drive business practices.

In a TBE system, the government would devote more time and technological resources to the evaluation of business, regulatory, and economic incentives, be more capable of predicting financial outcomes, and be better prepared to deploy predetermined safety nets and crisis strategies sooner than they ever have. Regulators would spend more time evaluating the forest than counting the leaves on the trees. In return for greater discretion and reliance on regulatory judgments rather than rules, the system would also have to improve the traps that supervisory decisions have to run to ensure that they are accurate, appropriate, and fair. If we can achieve a system built on TBE principles, it would not be so difficult to apply those safety and soundness principles to every kind of financial company, not just banks. But until we get there, we cannot move toward functional regulation of financial services that would throw investment banks, broker dealers, asset managers, mutual funds, and private equity and hedge funds into the dysfunctional regulatory stew that currently exists.

The distortion that too much regulation has been built into the US economy is quite apparent to those who wish to see it. It must be reduced before we can develop an effective system of financial oversight. The storyline of the 2014 movie *Interstellar* presents an interesting lesson. Illustrating theories of modern astrophysics, the movie focuses on the warping effects of gravity and how it distorts space and time. The extreme mass and the distorting gravitational pull of the singularity of a black hole formed by a collapsed star is believed to hold the physical secrets of the universe. And in the movie, it did. Similarly, the natural space and time of financial markets is necessarily distorted for better or worse by government regulation that changes the way that institutions and markets react. An excellent companion to this book is John Allison's *The Financial Crisis and the Free Market Cure*. Mr. Allison, a seasoned banker and economist (we also share an educational background in philosophy) explains in easy-to-understand examples how shifting and unprincipled government policies, and particularly the

Federal Reserve's attempts to fix the cost of money, constantly force markets to correct and create business incentives that inevitably force businesses to make the wrong choices.¹⁰

Financial Oversight Is Upside Down

Bankers and callous businesspeople are not the *cause* of every financial crisis. Are there unscrupulous financial executives? Absolutely, probably as many as there are unscrupulous plumbers and scientists. Most bankers do not go to work each day intending to defraud their customers. The inability of their customers to understand the nuances of the financial services that they need may create advantages and financial incentives for bankers to steer customers in directions that are profitable to the bank.¹¹ But there are significant counterbalances created by the fact that the banking business is more closely regulated than almost any in the country other than nuclear power. Bankers go to work each day worrying about how they will satisfy their regulators.

There are nuanced and complicated reasons why so many financial crises occur in the United States, and that means much more sophisticated solutions are needed. The S&L crisis is a perfect example. It was almost entirely caused by federal and state miscalculations that assumed that deposit and mortgage interest rate caps would innocently increase homeownership by keeping borrowing costs down. The actions taken by many S&L executives were the *results* and *symptoms* of long-term government policies that created the crisis. Some experts theorize that the United States has witnessed so many financial crises and bank panics because financial services are badly structured. The incentives created by deposit insurance and the geographic limitations imposed by branching restrictions created structural moral hazards and prevented natural asset diversification. Others suggest that it is the unbridled creation of private debt that leads to financial disasters. Still others are convinced that the existence of any leverage whatsoever in the banking system increases opacity that fosters economic collapse.¹²

In an article about the causes of the Panic of 2008, Larry Kotlikoff argues that the banking system is "built to fail" because it permits leverage, which effectively begs for a run to occur at some point. He suggests that *limited purpose banking*, where banks resemble unlevered mutual funds and deposits are not repayable on demand, is the way that the

banking business can operate in a more safe, sound, and stable manner. In effect, he believes that fractional banking and leverage have been the main culprits in the creation of financial chaos, and that if everyone who deposits money in a bank can always get it back, albeit not exactly on demand, financial crises will be less prevalent.¹³ His theory may be sound, but converting the largest economy in the world to that model at this point seems unrealistic. Limited purpose banks would look something like mutual funds, but mutual funds are a different kind of financial creature. They do not take deposits or make loans. The by-product of banks is money—they create it by making loans—and that allows the economy to expand. While one can envision a banking system that prohibits fractional banking and leverage and does emulate a money market or mutual fund, those institutions would not function like banks and depositors would likely resist a system where they did not have immediate access to their money. The economy, for better or worse, would be much less dynamic because of less money and credit in the system. That is the tradeoff.

The current financial oversight structure does not work well either. It is clumsy and not able to execute its oversight responsibilities clearly and efficiently. The laws that federal and state legislatures pass, and the implementing regulations promulgated by dozens of federal and state regulators, often graft political, social, and ideological goals onto economic engines whose long-term consequences may not be fully appreciated. Moreover, federal and state supervisors often compete and battle with each other, sometimes overregulating to avoid underregulating. Financial oversight lags the markets, but often tries to drive them.

Additionally, the fermentation and mutation of static financial government policies over long periods of time lead markets to unintended places as they react and do what they do best—seek to make a profit no matter the hurdles placed in front of them. Therein lie the principal defects. No matter what the business structure, the government ought to be able to regulate smartly and tailor its oversight to the markets that we have. Instead, over the last five decades, the pyramid of financial oversight that governments have deployed to foster economic safety and soundness has been inverted, making the current system of financial oversight less effective and more susceptible to financial crises. In effect, regulation can get in the way of comprehensive safety and soundness while the government allocates the most resources to regu-

lating what should take the least resources. I will illustrate this point since it is critical to the theory of this book.

Incidentally, the concepts of *supervision* and *regulation* have often been conflated and confused. Regulation is the deployment of a skeletal structure of the business of financial services that determines who can obtain a license to be a bank, what activities banks can engage in, how much capital and liquidity they must have, and when they may branch, merge, pay dividends, and acquire other bank and nonbank subsidiaries. Regulation determines the structure in which financial institutions operate and how they are prudentially monitored through the promulgation of administrative rules of the road that seek to inform institutions about what is expected. That goal has not been consistently achieved. On the other hand, supervision is the art of evaluating how prudently, safely, and soundly financial institutions and systems operate and what their performance and prospects are. It is typically done by bank examiners who, to their consternation, have little to do with the creation of the rules that they are deployed to monitor and enforce. It is the process through which financial institutions receive their report cards on how well they are managing risk, building capital, serving their customers, and operating within the bounds of financial prudence. Supervision decides under what conditions, whether, and how long institutions will be allowed to stay in business. It is where the financial rubber meets the road. The appropriate boundaries of bank supervision are often debated. There are benefits to encouraging bank supervisors to use judgment and discretion. But there are also risks to widely varying and potentially conflicting exercises of that discretion by individual supervisors.

Supervision today is built on a trinity of fundamental pillars: (1) responding to financial emergencies; (2) monitoring risk, capital, liquidity, and behavior to foster financial stability; and (3) micro-supervision of high-risk institutions and their activities. Randy Quarles, the vice chair of the Federal Reserve, seems to agree with this formulation and suggests that each have a proportional role to play in the business of financial regulation.¹⁴ He appears to suggest that the relationship between regulation and supervision has become disproportionately biased toward rule making and that the art of supervision has become too opaque. He rightly proposes greater transparency regarding a wider range of agency pronouncements beyond formal rules.

My solution seeks to resolve a different problem—the decreasing use of judgment in favor of formulas and ratios and the unpreparedness of the government when economic chaos arises. While greater transparency will improve the system, it will not solve the fundamental issues that are deflecting government oversight from being more effective and efficient. Schematically, the prioritization and allocation of time and resources deployed by the government for the purposes of overseeing financial services should look like an inverted pyramid as set forth in figure 1.1.

The methodology of financial oversight created by Congress over the last fifty years through the enactment of a blizzard of new laws and implementing regulations has perfectly inverted this pyramid of supervisory responsibilities, to devastating effect. The result is that government regulators have been forced to allocate the bulk of their time and resources to thinking about and policing the day-to-day activities, investments, and operations of competent financial institutions, rather than anticipating and planning for the next potential financial crisis. A supervisory system that spends extraordinary time on micromanage-

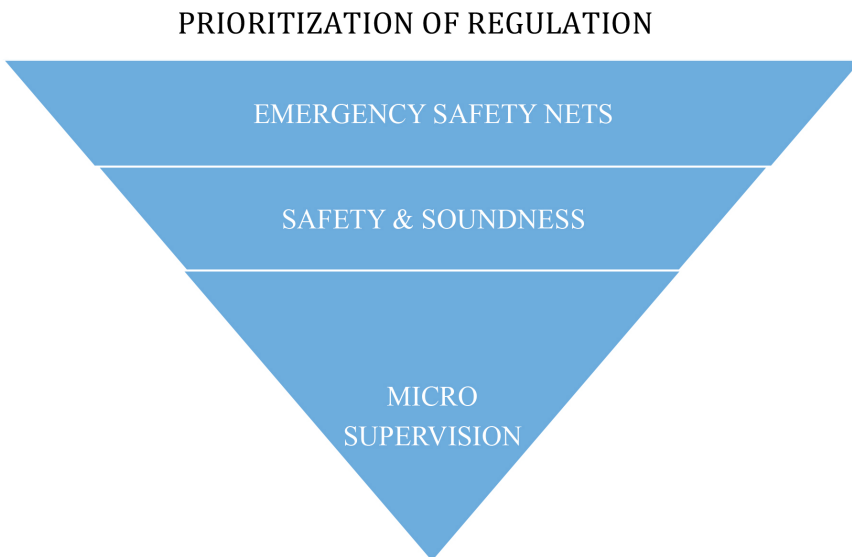


Figure 1.1. Governmental prioritization and allocation of time and resources for financial oversight.

ment of vendor relationships sometimes wastes valuable regulatory resources. A former bank executive at one of the largest banks in the country told me that when he was in charge of compliance, he had to determine whether OCC vendor management guidance required that he do a background check on the driver of the bus that shuttled between two of the bank's buildings. The proposition that every financial institution and its board of directors must be second-guessed and regulated as if it has lost its way is wrong and counterproductive. If it were correct, it would necessarily mean that Congress and bank regulators know best how to operate financial institutions, which even they would tell you is not true. The ineffectiveness of this system is even more stark when you consider that banks make up only a fraction of the financial services business and much of the financial risk in the economy is created by nonbanks.

TBE assumes that financial institutions know their markets, understand how to make a profit, and can do so within the parameters of capital, liquidity, leverage, governance, and risk management buffers imposed and monitored by the government. After all, the managers and directors of every bank are carefully screened and required to have financial experience. If they cannot meet expectations, their institutions fall into the category requiring micro-supervision. The regulators can sanction executives or the bank, which might ultimately be closed if things do not turn around. That should normally include no more than a fraction of institutions at any one time, thereby freeing up regulators to worry about the big issues, deploy technologies to analyze large sets of financial data, evaluate predictive scenarios, and develop safety nets that can address the most likely range of crises on the horizon. Such a system, were it to be created, would eventually need to be equally applied to nonbanks based on the role they play in the financial services business.

Let's turn to the point I have made about financial services regulation being too bank centric. Today, banks control less than half of the country's consumer and business financial assets, a far cry from the overwhelming majority they managed in the 1930s, when the current regulatory structure was devised. There is currently more "banking" being done and money being moved and invested outside the banks, but the regulation of nonbank intermediaries such as investment banks, fintech companies, hedge funds, private equity funds, mutual and mon-

ey market funds, and crypto companies, all of whom make a valuable contribution to our modern economy, is far less prudentially focused. In short, the government spends most of its time and resources drilling down into the minute operations of a portion of the country's financial services businesses that control only a fraction of the money moving in the system. It spends even less time preparing for the next financial crisis. Thus, in the relative scale of things, banks seem to be overregulated while other financial companies that also play a significant role in the economy are underregulated. If two companies play similar roles in the financial services market and one is a bank or bank affiliate and the other is not, only the bank and its affiliate are prudentially regulated. That makes no sense in today's economy. Either can light the spark that starts a financial fire as money market funds proved in the Panic of 2008.

It is even worse when you consider that a regulatory system created in the 1930s, when financial and economic characteristics were entirely different, is the firehose that regulators are still using today to put out financial fires. That fact is even more disquieting when you understand that risk is being created, transmitted, and regenerated in ways that are remarkably different from the 1930s. For example, the risk created by the banking business was traditionally underwritten by salaried employees with a long-term view of the value of each credit. Today, the compensation system in many financial sectors incentivizes taking on more leverage and risk to increase short-term gains and therefore more short-term returns and compensation.¹⁵ The noted economist Raghuram G. Rajan describes it as a problem of incentives and how aligned the incentives of managers are with investors in modern economies. He points out that changes in the financial sector have altered managerial incentives and the nature of risks undertaken by the system, with resulting distortions.¹⁶ Modern-day compensation incentives put a greater burden on regulators to ensure stability in the system. Therein lies the challenge and the reason why there is today such a distinct regulatory focus on bank capital, liquidity, and risk management, all of which feed a regulatory tendency to be risk-averse while overseeing a business that generates risk. In Rajan's view, today's complex interconnected global financial system has more participants able to absorb risk, but at the same time is creating a far greater risk of a catastrophic meltdown from financial-sector-induced procyclicality.¹⁷ In short, we are using a dated

regulatory system to oversee a completely new set of dynamic financial relationships. The problem is exponentially increased by the fact that the world is hurtling toward new technologies while financial regulation stands on the side as an interested spectator.

The crisis of 2008 was a notable example of these deficiencies at work. The government focused its regulatory resources on the operation of banks, while esoteric derivative financial products and nonbanks such as AIG, Bear Sterns, Lehman Brothers, and state-licensed subprime mortgage originators were creating and stockpiling risky subprime assets destined for securitization, all beyond the watchful eyes of prudential regulators. Once packaged as MBS, those toxic loans were considered to have been credit enhanced and less risky, so they could then be purchased by regulated banks and a wide range of other conservative companies. In short, the aggregation of risky mortgages in MBS was deemed to be safer than the individual mortgages themselves based on the financial alchemy of securitization. In fact, it was simply the socialization of the risk—it was spread among a substantial number of players, many of which had no skin in the game—to make it less visible. How did that work out for us? Such an inconsistent, segmented form of regulation based on whether a company is a bank or not does not work. An effective system of financial oversight would regulate risk and not chase it from one regulated part of the economy only for it to reappear in another that is unregulated like a game of financial whack-a-mole. It would supervise financial services and risks in whatever form they took, applying prudential standards evenly based on the activity and risk involved. However much practical sense that makes, it does raise complex, fundamental issues that will be difficult to resolve, if there is a will to do so. Moreover, while nonbanks should not be immune from some form of prudential regulation just because they are not banks; neither should they be thrown into this dysfunctional system of supervision until it is fixed. The last thing the country needs is for ineffective regulation to be imposed on the entire economy. There is much work to be done to repair a system that has been badly constructed brick by brick over the last ninety years.

THE CHALLENGES OF MANAGED ECONOMIES

Among the concepts that I hope you take away from this book is that while there are significant economic and societal benefits that flow from government regulation of financial services, we should fully appreciate and understand the unintended distortions and potential damage that too much or poor regulation can cause. There should be a balance between too much and too little regulatory intervention. Politics cannot drive economics no matter how much politicians try to wish it so, and making decisions with little to no meaningful data is always a gamble. The good news is that there is a path to a more effective and efficient system of regulation that will be less likely to enable or cause financial crises in the future and more likely to see them coming.

When executives see investment and arbitrage opportunities in the economy, they will take advantage of them. Financial incentives drive business behavior. That is a completely rational business behavior that the government should anticipate and factor into its regulatory strategy. Too often it does not. Moreover, when government oversight is intertwined with political goals and attempts to socially engineer lives through financial regulation, it becomes detached from fundamental economic goals and principles. To be effective, prudential regulation must be “proportional,” reasonably balancing the real costs and benefits it creates and avoiding the imposition of hidden taxes that are ultimately borne by consumers.¹⁸

Former secretary of the treasury Henry Paulson lists many high-level changes that will make the US financial system safer and more stable in his book, *On the Brink*.¹⁹ Timothy Geithner does the same in *Stress Test*, his chronicle of events about the last financial crisis.²⁰ They were correct about many things in their renditions of how they addressed the huge economic challenges of the Panic of 2008. But I disagree with any suggestion that there is still *not enough* financial regulation in the United States. There has been and is *too much* regulation, and a lot of it is misdirected and fueled by political ideology. That kind of regulation often creates perverse economic incentives and aberrational financial behavior. There simply isn't enough smart regulation in place. The conventional wisdom that the more regulation there is, the safer the economy will be, has repeatedly been rebutted by history. Government intervention, no matter how prudent it is when created,

may eventually threaten market equilibrium as the financial landscape evolves. Regulation requires that it be continuously examined, measured, and tested against reality to remain effective. That rarely happens, so the less of it there is, the fewer rules will become obsolete and counterproductive.

How did we get to the managed economy that currently exists? It has largely been created in reaction to financial crises. After each one, the solution of choice is more government control and economic intervention. In the early nineteenth century, federal and state governments had limited tools to manage the economy. But that did not stop them from intervening in it. They financed the sale of their own land, often imprudently, encouraged westward expansion, politicized banking, and created different forms of money as needed while allowing a schizophrenia to proliferate over which form was valuable at any given time. Even though the US economy was only minimally managed then, there was enough of it to distort markets and inject perverse financial incentives that enabled financial crises that the government had no tools to address. Each time that a financial crisis occurred, Congress built another level of regulatory infrastructure, believing that it was the key to ensuring economic security and stability.

Most people probably assume that we have an economy where financial factors alone drive where money is invested and how credit is allocated. That is not the case. As we will consider in more depth in the next chapter, the Federal Reserve influences interest rates through a complex system of securities transactions that credit or debit the accounts of the largest financial institutions. That in turn impacts credit decisions across the country. The Federal Reserve became particularly adept at using these monetary tools in the late 1970s and 1980s when Chairman Paul Volcker took the reins to defeat inflation and deal with the economic chaos caused by US dependence on foreign oil. When thousands of S&Ls and commercial banks failed in the 1980s in part because of the dramatic increase of interest rates to counter double-digit inflation, policy makers reacted by creating more regulation. In effect, more regulatory management tools were deemed to be the elixir for the devastation created by the government's use of its financial management tools. That was an excellent example of confusing the *correlation* and *causation* of economic events.

After the Panic of 2008, Congress gave the Federal Reserve and other federal financial regulators even more authorities and responsibilities, enlarging the scope of the government's control of the economy. The underlying predicate for all these regulatory enhancements was that institutions and the people who ran them were the problem, and more government regulation was the solution. But the continuing enlargement of the government's role has impacted the market's judgment of risk and reward, pushing some firms to assume greater amounts of risk because the assumption is that when the inevitable collapse occurs, the Federal Reserve will bail out large institutional players. "Capitalism without bankruptcy is like Catholicism without hell," Howard Marks, director of investment fund Oaktree Capital Management LP, said in his April 2020 letter to shareholders. "Markets work best when participants have a healthy fear of loss," he went on to say.²¹

Marks's admonition has been completely jettisoned in the 2020 Financial Pandemic, where economists have projected that the central bank's portfolio of bonds, loans, and new programs would swell to between \$8 trillion and \$11 trillion from less than \$4 trillion last year. By doing that, the Fed is risking that "some programs won't work, that officials won't be able to unwind them, that politicians will grow accustomed to directing the central bank to fix problems its tools aren't designed to solve, and that public discontent about the central bank's choices will erode its authority over time."²² At the same time, the capacity of commercial banks to act as go-betweens and backstops in a crisis has also been significantly reduced given changes in regulation required by the Dodd-Frank Act that have reduced their presence in trading markets and focused them on maintaining high cash reserves and capital.

The economy is managed in direct and indirect ways. Consider just one example of how government rules can influence your ability to get a loan. After 2010, about two dozen domestic capital and liquidity requirements were imposed on banks by federal law, as well as a handful of international capital surcharges and supplementary liquidity requirements. They affected how US banks loaned out or invested the nearly \$18 trillion in customer deposits that they held. For example, bank regulators set the risk weighting of every asset and investment that a bank values on its financial statement for purposes of determining how

much capital it must hold against them. The more capital it must maintain, the fewer dollars it can lend. Some loans and investments require a bank to set aside no capital on its books, while riskier loans and investments require significantly more capitalization.

Naturally, if a bank maintained a portfolio of 100 percent risk-weighted assets, it would have to maintain greater capital and have fewer funds to lend to make money. Therefore, it must manage its asset and investment allocations to both satisfy its regulatory requirements and put enough dollars to work to satisfy the expectations of investors. Banks that fall behind on maintaining adequate capital can raise new capital in the markets or restructure their balance sheets by decreasing their liabilities or the amount of highly weighted loans on their books. In short, they may sell commercial loans and buy Treasury bills. Thus, regulation influences how much credit is available and how it is allocated throughout the markets. If a manufacturer needs a loan but its bank cannot make it without negatively impacting compliance with its capital requirements, the manufacturer may not get that loan. Similarly, since the enactment of the Dodd-Frank Act, the application of the Volcker Rule and various liquidity coverage regulations have elevated the status of government securities over private sector investments, potentially resulting in significant redistributions of capital and liquidity across various segments of the market and direct support for a growing national debt.

As the economy gets increasingly choreographed by government rules and goals, it can also become increasingly distorted as it reacts to noneconomic incentives. Running an economy to achieve a political or social goal creates many perils. Look no further than the collapse of the S&Ls and Fannie Mae and Freddie Mac to demonstrate that point. The problem is even more complex, however; once the economy is artificially managed, it becomes difficult to find the right time and way to reverse the actions that have been taken. Some of the actions taken by the Federal Reserve in the Panic of 2008 created financial results that are still largely in place, meaning that the economy was still being managed with crisis tools long after the crisis had passed. The Federal Reserve still held about \$1.5 trillion MBS securities that it bought to stabilize the markets in the Panic of 2008 even before it ballooned its balance sheet by another \$2 trillion in the first month of the Financial Pandemic of 2020. Similarly, with such large financial interventions, it becomes

difficult for the Federal Reserve to find the right time to reverse them and allow interest rates to rise to more “normal” levels after a crisis without creating both a political and economic firestorm. Before the Federal Reserve could reverse the impacts that it had on the economy in the last crisis, it has been faced with another thanks to COVID-19 that is once again giving it significant control of an economy that will now be managed for even more years to come.

The authors of *The Rise of Carry* suggest that it is more than just the government participating in this managed economy. They argue that the combination of leverage, liquidity, short-term risk, compensation methodologies, and volatility trades effectively create a complex, subterranean financial universe that is driving the financial world both economically and politically as it takes advantage of the incentives and vectors created by government regulation.²³ Ruchir Sharma, the chief global strategist at Morgan Stanley Investment Management and author of *The Ten Rules of Successful Nations*, argues that modern society increasingly relies on government for protection from major crises.²⁴ Pointing to the blizzard of financial intervention by governments in 2020 in reaction to the pandemic, Sharma suggests that research shows that such constant government stimulus fuels the rise of giant firms and keeps alive heavily indebted “zombie” firms at the expense of startups that typically drive innovation. He says that this pattern leads to low productivity, the prime contributor to the slowdown in economic growth and “a shrinking of the pie for everyone.”²⁵ The idea of government as the balm for all crises is appealing in the short term, but it ignores the unintended consequences. Without entrepreneurial risk and creative destruction, capitalism doesn’t work.

The question is how much further capitalism will be deformed by government intervention on this scale. When the government is willing to buy just about anything, it distorts market prices, which normally guide people to buy into profitable, promising companies. Now investors are simply buying what the Fed buys.²⁶

The United States has increasingly become locked in a managed economy that is the polar opposite of those that crashed in the nineteenth century. Unfortunately, both models have significant defects.

In 2019 and 2020, there were disruptions in the repo markets that may have been a warning that the Dodd-Frank Act had imprudently shifted lending away from banks to private equity and hedge funds and

limited the ability of banks to address liquidity disruptions.²⁷ A repo is an overnight sale of securities structured to perform like a short-term borrowing. An institution will sell securities to counterparties, for example, usually on an overnight basis, and buy them back the following day at a slightly higher price, reflecting an implicit overnight interest rate. According to analyses by the Bank Policy Institute in Washington, DC, banks and broker dealers could not alleviate the supply-demand imbalance that was created in September 2019 in the repo markets because of the conflict between regulatory priorities that favored banks holding on to their reserves and their need to consider future capital surcharges.²⁸

To address the financial chaos in the 2008 financial crisis, the Federal Reserve had to purchase huge amounts of mortgage and Treasury securities. At the same time, it modified its monetary policies by significantly increasing the interest rates paid on excess reserves banks deposited with it. In the post-crisis atmosphere, the federal banking agencies began to prefer that banks continue to hold increased reserves over other types of liquid assets, ultimately limiting their ability to address market illiquidity in September 2019. The Federal Reserve had to step in to address the problem by once again expanding its role in the market. In some ways, the Federal Reserve intervened to address issues created by its past interventions, making it the “commercial bank of last resort for the entire economy.”²⁹

The different forms of regulatory distortion that are created in a managed economy can veer off in unanticipated directions as competition and the supply of credit is impacted. They can increase the risk of moral hazard, procyclicality, and systemic risk as the impact of deficient regulations is amplified.³⁰ As I will discuss, historians and scholars point to a number of regulatory factors that have over the last two centuries increased the risk of financial failure, such as branch banking limitations that discouraged risk diversification and deposit insurance that created a systemic moral hazard. I believe that it is much more complicated than that. When increasing regulation of operations and investments occurs without a clear understanding of the costs, benefits, and exit strategy of such regulation, it can create a game of financial roulette that some executives will take advantage of much better than others. This is the unintended but dangerous effect of regulation that I reference throughout the book. Oversight and management of the economy

must be intelligently balanced if we are to have any success of averting future financial crises, particularly in an increasingly technologically enabled financial environment.

HOW THE SYSTEM WORKS—UNTIL IT DOESN'T

Our world is full of unexplained complexities that work exceptionally well. In *A Short History of Everything*, the engaging author Bill Bryson explains how many things must work correctly in a specific order for the human body to function. Upon conception, the first human cell splits into two and then four until after forty-seven such doublings, ten thousand trillion cells have been produced. The simplest of these cells defies human understanding. To construct one yeast cell, the same number of components found in the Boeing 777 would have to be miniaturized within a sphere just about five microns across and then programmed to reproduce.¹ Given the complexity of our bodies and minds, one might expect that we could master the economic challenges that surround us. That project has attained limited success.

It has taken more than two centuries to build what is far from an effective, safe, and stable financial regulatory system. To begin our journey, we should establish a baseline of understanding about how the country's complicated web of financial regulation and economic oversight currently works. Aside from two experiments with a central national bank, the federal government first formally imposed federal regulation in the mid-nineteenth century with an attempt to nationalize the banking industry and money, which previously had been under the control of the states. Until the twentieth century, commerce was complicated by the war over what form of paper money was acceptable and how it performed miles from where it was issued. The Coinage Act of

1792 established a national mint located in Philadelphia, which delivered the nation's first circulating coins on March 1, 1793: 11,178 copper cents.² Unfortunately, it was difficult to get enough coins into circulation, partly due to the rise in the cost of copper. Because the Coinage Act set the ratio of silver to gold at a different one from the rest of the world, US gold coins were exported and melted, while silver dollars were also exported and used in international trade or stored as bullion.³ At the same time, to the extent that specie—gold and silver—was the preeminent form of value behind banknotes, there was a natural limiting factor on how much the economy could expand. Banknotes, greenbacks, checks, and Federal Reserve notes were introduced as the economy grew, wars arose, and economic cycles evolved. Banks moved to a fractional system where only a small amount of assets were segregated to provide liquidity and not all notes that were issued were actually backed dollar-for-dollar by gold or silver. Not until the aftermath of the Great Depression was the massive federal regulatory structure that we have today overseeing money and finance created. In 1933, President Roosevelt prohibited banks from exchanging gold for paper money, and in 1971 during the Nixon administration, the United States officially abandoned the gold standard.⁴

MONETARY CONTROLS

In 1913, the framework of the Board of Governors of the Federal Reserve System and its twelve Federal Reserve Banks were established. The launch of the Federal Reserve System was intended to end the possibility of future financial crises in the United States. That certainly has not happened. Today, the Federal Reserve creates economic policy through a variety of interest rate setting, asset disposition, and purchase transactions with its member banks and large financial institutions known as “primary dealers.” It monitors and moderates various aspects of the economy and accordingly, economists and historians attribute to it equal amounts of economic brilliance and ineptness.

Traditionally, the Federal Reserve impacts interest rates through its regularly scheduled Federal Open Market Committee (FOMC) meetings, where it sets a target rate for commercial banks to lend to each other to meet their regulatory reserve requirements (fed funds rate). It

influences the rates that banks charge each other by adjusting the accounts that the largest lending dealer banks maintain at the Federal Reserve. Banks can also borrow directly from the Federal Reserve at its current discount rate, which indirectly impacts market rates. Unfortunately, however, the “discount window” carries a stigma that makes it a disfavored source of credit because banks that borrow there may be viewed as being in economic distress. The Federal Reserve can adjust reserves that banks must keep on deposit with it as another means of implementing monetary policy and interest rates. During the financial crisis that began in 2007, the Federal Reserve lowered the fed funds rate to 0.25 percent while adding \$2.6 trillion in credit to banks’ reserves.⁵

There are continuing debates over the need for and benefit of a central bank, and how it acts as a stabilizing force in financial crises as the lender of last resort. Experience with financial crises has made me an advocate of the theory articulated in 1873 by Walter Bagehot in his famous *Lombard Street* thesis.⁶ Central banks should at the least be the lender of last resort and lend freely at high rates during times of financial distress. That is the primary purpose of the government—to be there in times of crisis in a nonjudgmental way to prevent the economy from collapsing. Beyond that, Bagehot generally believed that central banks are destabilizing influences, particularly when combined with the artificial and manipulative forms of regulation that the government often promulgates. Indeed, a host of economists and academics see central banks as creating artificial economic situations, making monetary decisions that distort the market, and eliminating the incentive for banks to be prepared to solve their own financial problems.⁷ Some argue that since the establishment of the Federal Reserve System, financial crises in the United States have been just as if not more severe than those between the Civil War and World War I, when there was no central bank.⁸

Advocates and opponents of a central banking system are each correct in part. A central bank is critical to the confidence-building role that a government must play. The problem occurs when it and other financial regulators take too much of a day-to-day role in directing economic affairs and begin to replace natural economic influences and goals with regulatory or political ones that are not based on hard data. It is easy and often effective for the government to intervene, create stan-

dards, and impact the flow of money and commerce, but as I have discussed, it is difficult and sometimes impossible to fully reverse those actions when they are no longer necessary or helpful. Every time the government intervenes with the best of intentions to impact economic or regulatory policies, it increases the likelihood of altering financial incentives and creating economic mutations that can lead to perverse financial reactions. There is always a line of economic dominoes that government action triggers. I will discuss specific examples in some detail throughout this book, but it is fair to say that the Federal Reserve is now the most powerful that it has ever been at any time. It has full discretion over monetary policy, a massive balance sheet that owns over one-third of US mortgages, omnipresent supervisory authority over the largest banks in the world, regulatory authority over large, nonbank financial companies and a market maker in Treasury, repo, and fixed income markets. It has come a long way from the somewhat apologetic description of it presented by chair William McChesney Martin in 1955 when he equated its recent increase in the discount rate to a “chaperone who has ordered the punch bowl removed just when the party was warming up.”⁹

It is difficult to resolve the debate between those who want more and those who argue for less government intervention in the economy and the financial services sector. While government mistakes that have blossomed into financial crises can be identified, it is much harder to know how many financial crises may have been averted, shortened, or mitigated by financial oversight and regulation. In a dynamic market economy with the velocity of financial events that occur each day in the United States, it is not possible to create a system in which government miscalculations do not occur. Because targeted financial regulation and intervention is necessary, the challenge is developing a more effective and smarter system that will reduce the frequency of those mistakes. The enlargement of the data that is collected and enhancement of how it is analyzed is one path to that future.

FINANCIAL SUPERVISION AND REGULATION

The role of prudential regulation is a centerpiece of this book and what is most in need of rehabilitation. Banks are still a principal focus of

money and finance in the United States, making their regulation by state and federal regulators important to the functioning of the economy. But there has been a quiet revolution in America over the last eight decades as individual and commercial investments have shifted from banks to a variety of other financial companies, including nonbank lenders, fintech companies, online lenders, marketplace lenders, mutual and investment funds, insurance companies, investment banks, and private equity and hedge funds. Simply by measuring consumer and business financial assets, banks have receded from controlling about 95 percent of that money in 1935 to around 40 percent in 2018. Insurance companies, mutual and money market, hedge, and private equity funds together hold most of those dollars today.¹⁰ These are raw approximations, but the magnitude of the shift in dollars demonstrates the fundamental problem with government regulation. Most of the government's prudential regulation resources are still focused on supervising FDIC-insured depository institutions, while the characteristics of the markets that gave birth to that form of regulation have completely changed. Prudential regulation has also remained tethered to the corporate entity of a company rather than what it does. If it is a bank, only then is it comprehensively regulated. That is a fundamental defect. Effective oversight requires a system that can adapt to the size, technological capacities, and velocity at which markets evolve and money moves. Besides federal banking regulation, not much else about the financial landscape in America is the same as it was in the 1930s.

The problem is even more serious to the extent that key regulatory decisions about safety and soundness are still based on historical financial and compliance information collected through periodic filings and an annual on-sight, physical examination of the bank and its operations. While banks move money and assume risks in real time, all but the very largest are still largely evaluated using data that is not real time. Notwithstanding massive changes in markets and technology, Congress and the regulators have been slow to devise a more technologically enabled, real-time system of oversight to supplement and inform what examiners see on the ground. For that reason, problems have often not been identified until they are staring everyone in the face. The Dodd-Frank Act began to change this by testing the adequacy of capital under hypothetical stressful periods, requiring the creation of "living wills" to better understand how to resolve large financial institutions in distress and

mandating enhanced risk management standards. But until financial institutions fully report on a real-time basis, and Big Data and artificial intelligence programs are a significant part of the toolbox that the government uses, government oversight will be limited in how successful it can be. In recent months, regulators have begun to deal with this challenge, as I will discuss later in the book.

Consider the regulatory nuts and bolts of the system. Beyond monetary policy, the Federal Reserve has a significant regulatory and supervisory role through its oversight of bank holding companies, financial holding companies, and state-chartered banks that choose to be members of a Federal Reserve Bank, as well as nonbanks designated for prudential regulation by the Financial Stability Oversight Council (FSOC). In addition, the Federal Reserve has initiated macro prudential supervision over the last decade under its Dodd-Frank authority to enhance the prudential regulation of US GSIBs—globally systemic important banks. Critics argue that it is not based on financial rigor or hard data. The twelve Federal Reserve Banks participate in the monetary and supervisory roles, while being technically “owned” by their members banks, which also populate their boards of directors.¹¹ This system is either a massive conflict of interest or a seamlessly effective way to regulate the banking system, depending on your point of view. In addition, the federal regulation of depository institutions is executed through the FDIC, which regulates state-chartered banks that are not members of the Federal Reserve. It also administers the federal deposit insurance fund, which insures deposits in all banks, and acts as receiver for all failed banks insured by the FDIC. The OCC charters and oversees national banks and federal savings institutions, while the National Credit Union Administration (NCUA) regulates federal credit unions and insures the deposits of federal and state credit unions. “Cradle-to-grave” federal regulators—the OCC and NCUA—charter financial institutions, oversee their operations, determine their capital and liquidity levels, approve their expansion and payment of dividends, and close them when they fail. There is no more pervasive or redundant financial regulatory system in America.

The regulation of securities and commodities markets, including broker dealers, investment advisors, mutual and money market funds, and asset managers runs through the Securities and Exchange Commission (SEC) and the Commodities Futures Trading Commission

(CFTC). To be clear on a point that the popular press and many people misconstrue, traditional investment banks and broker dealers such as the pre-2008 Merrill Lynch, Bear Sterns, Lehman Brothers, Goldman Sachs, and Morgan Stanley, for example, were *not* prudentially regulated, as J. P. Morgan Chase, Wells Fargo, and your local community bank or S&L were and still are. During the crisis, some investment banks failed, some were acquired by commercial banks, and others converted a subsidiary company to a commercial bank charter in 2008 so that the parent could become a bank holding company and qualify for financial assistance from the Federal Reserve. That effectively merged the large investment banks and the commercial banking business from that point forward, completing a blurring of the lines between securities companies and banks that began in the late 1990s. But when those investment banks ran into trouble, they were not prudentially regulated banks, they did not take deposits insured by the FDIC, and their capital, liquidity, and operations were not overseen by the Federal Reserve, OCC, or FDIC.

Insurance companies are not federally regulated; they are supervised by the states in which they are licensed and operate. Fannie Mae and Freddie Mac, the government-sponsored enterprises that underwrite the country's secondary market in mortgages, and the Federal Home Loan Banks, wholesale lenders to commercial banks and S&Ls, are regulated by the Federal Housing Finance Agency (FHFA). The FSOC, the umbrella regulatory agency established by the Dodd-Frank Act, is an amalgamation of the heads of all the federal financial agencies charged with regulating financial systemic stability. It is a remake of President Reagan's Working Group on Financial Markets established in response to the "Black Monday" stock market crash of October 19, 1987. The Dodd-Frank Act also established the Consumer Financial Protection Bureau (CFPB) to enforce consumer protection laws and ensure the fair treatment of consumers in financial matters. Finally, as was reflected by the actions it took as a result of the conduct of large institutions in the financial crisis related to the issuance, packaging, and sale of mortgage-backed securities (MBS), the Department of Justice has also emerged as a ferocious financial regulator, even though its application of certain governing statutes is questionable. Nevertheless, it extracted the largest penalties and settlements from banks ever paid as a result of the fraud that it alleged in the subprime crisis.¹² Not to be

left out, Treasury's Financial Crimes Enforcement Network (FinCEN) has concurrent enforcement and civil money penalty authority over banks in the case of money laundering and Bank Secrecy Act violations.

This may seem like a lot of agencies to do pretty much the same thing. It absolutely is. The federal system is cumbersome, and no one would re-create it today. But it is just one part of this picture. The fifty states, US possessions, and the District of Columbia each have multiple agencies that regulate financial institutions. State banking departments, insurance regulators, consumer protection agencies, and securities authorities all look to assert their jurisdiction. In addition, in this era of hyperactive US attorneys and state attorneys general with political aspirations, they are also increasingly becoming significant protagonists in the regulation and prosecution of financial institutions. I recall a meeting years before the Panic of 2008 and the enactment of the Dodd-Frank Act regarding accounting irregularities at a bank holding company where I was representing the audit committee. My law partner, my client, and I walked into an ornate room in the state capitol and were met by more than two dozen regulators from the Office of Thrift Supervision, FDIC, OCC, Federal Reserve, SEC, DOJ, the state banking commission, and state and federal criminal prosecutors. You can imagine how long the introductions at the beginning of the meeting took. In this archaic, redundant, and costly system, state and federal regulators often find themselves bumping into each other's subpoenas and debating each other's assertions of jurisdiction. Indeed, in this particular meeting, the bank regulators argued with the criminal prosecutors present about who had priority and whether the civil investigations would take a back seat to the criminal proceedings. It took years to reach settlement with everyone in the room. With each crisis, as the amount of regulation grows, the redundancies increase. It is not an efficient use of taxpayer money. Figure 2.1, showing what types of companies are regulated by federal and state agencies, underscores that fact.

This is a dizzying picture of financial oversight that gets only more complicated with each new congressional stroke of the pen. Regulation seems to increase each year. In 1976, when I joined the OCC, its rules governing national banks filled approximately 200 pages in the Federal Register. Today, there are more than 1,200 pages of OCC regulations in the Federal Register. Depending on your point of view, you can argue

that the national banking system is either 600 percent safer, 600 percent more complicated, or 600 percent more influenced by noneconomic factors. Unfortunately, these formal rules are often overshadowed by the more nuanced and subjective forms of regulation encased in concerns about reputational and operational risks that can provide regulators with a supervisory blank check.¹³

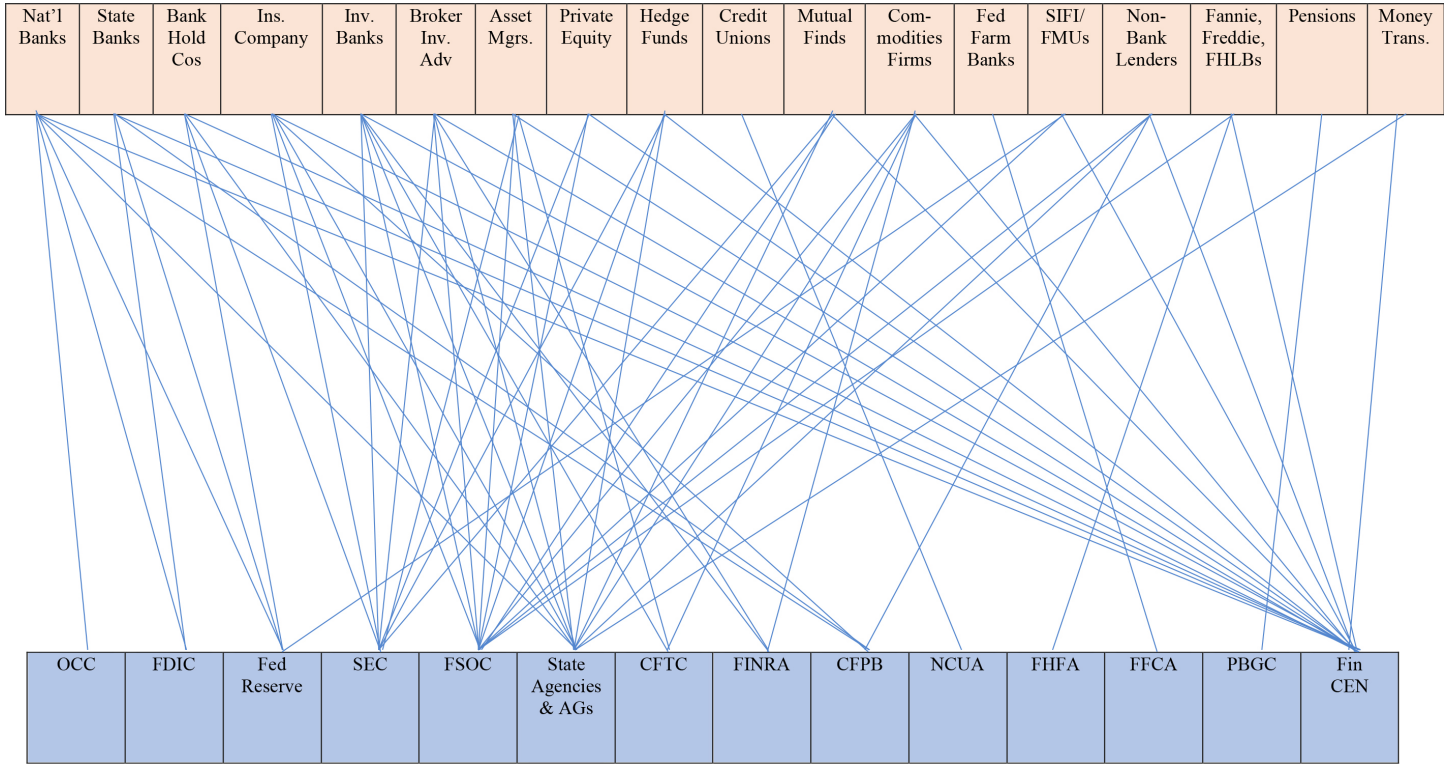


Figure 2.1. Companies regulated by federal and state agencies.

As each new set of regulations is promulgated, regulators get one step closer to operating the institutions they oversee, if not affirmatively, through a veto over actions that they do not want the company to take. It is possible to find some regulations of which a bank may be in violation on any given day. Banks, particularly larger banks, have been subject to more than two dozen overlapping quantitative and qualitative US and international financial regulatory standards measuring capital adequacy that are as complex as they are mysterious.¹⁴ The Federal Reserve finally has begun to unbundle that spider's web of capital requirements created after the last financial crisis, reducing them to a mere eight such requirements and simplifying the calculation of stress tests that they generate.¹⁵ But no less than an army of financial experts is still required to address the requirements of this "regulatory spaghetti" and the various international accords that also apply. All these regulations also often conflict with each other. Banking executives argue that bank capital requirements are too high¹⁶ and that the many capital and liquidity rules are often at cross-purposes, incentivizing banks to take on more risk because they are being surcharged as if they already had more risk on the books than they actually do.¹⁷ The country's dual system of regulation has evolved into an entanglement of multiple federal and state regulators supervising toward their own view of safety and soundness and competing for jurisdiction, civil fines, and headlines. Banks that find themselves on the business end of such enforcement actions experience this painful redundancy in the system most acutely.¹⁸ Evidence that this current regulatory system needs to be recalibrated is underscored by the fact that these regulators all missed the signs of the last crisis and were not agile enough to resolve it quickly or efficiently.

Government oversight is meant to ensure that the economic environment and financial institutions operate in a safe and sound manner, do not abuse the trust of their customers, and avoid failure. When the economy deteriorates and bank failures occur, the government's role converts to ensuring that too many financial institutions do not fail at one time, overwhelming the system and causing the economy to crash. Regulators cannot and should not operate the institutions they regulate, and regulation cannot and should not be constructed to prevent all failures. When that regulation becomes more risk-averse than practical, it treats financial institutions like post offices. When that happens, fi-

nancial innovation and performance becomes mired in mediocrity, and the economy suffers. Finding the right balance is the government's challenge.

With each new financial disaster, that balance gets skewed as Congress increasingly tends toward a prescriptive regulatory system that relies on an increasing number of static laws and rules to maintain financial stability. It is a natural reaction; reckless behavior causes or contributes to a financial crisis, so lawmakers decide that more laws are needed to better police that behavior, which in turn drives institutions toward alternative strategies and incentivizes market risk to move to less regulated areas of the economy. The constant proliferation of regulation ignores the dynamism of the market and makes financial supervision a formulaic exercise. It also elevates the art of finding loopholes in the many words of the new laws and rules and converts supervision into an exercise driven by ratios and metrics. Regulatory standards that are based on formulas tend to distract regulators and force them to forget that experience and judgment about risk management and safety and soundness create sound oversight. In short, executives and regulators are falling into the trap of becoming too mechanical, abandoning the exercise of their expertise and judgment in favor of punch list compliance that can distract them from the big picture. As a result, the financial system is becoming less safe as more regulations are promulgated.

As explained throughout this book, the great regulatory challenge moving forward is finding the right balance of oversight that will protect the economy, investors, and consumers without stifling business innovation, profit, or financial development. What does that mean in practical terms? For one thing, we should be modernizing financial oversight and moving toward a TBE system enabled by artificial intelligence and Big Data. The government must ensure that it does not inadvertently incentivize excessive risk-taking or the creation of volatility because it is hampered by having so many federal and state regulators using out-of-date tools. It also means that the government should resist the temptation to insert itself into the decision-making process in financial companies, whether it be to second-guess the safety and soundness of lending strategies or the efficacy of socially responsible programs. There should be fewer rules and more decisions based on principles applied to the situation at hand. As a student once wrote in an exam paper, the

government must decide whether it should be a gardener or a police officer.

OTHER FACTORS THAT AFFECT FINANCIAL REGULATION

Politics

Wherever there is money, politics is not far away. Politics has played a significant and often counterproductive role in the oversight of complex economic and financial events in the United States. There are authors who identify the “corruption” in the system created by the nexus between money and politics, deftly correlating political contributions and legislative action.¹⁹ I take it as given that the system is built around money and that it is a convenient target to attack. The fact remains that contributing money to politicians is the system we have and is entirely legal. Complaining about money in politics is akin to being shocked that there is gambling in casinos.

Congress passes the laws and has oversight authority of the federal financial regulators who then implement those laws by enacting rules and regulations. Congress has a variety of other ways of impacting the nature of oversight and the operations of financial institutions. Banking crises are not apolitical, particularly when you dig down into the data and realize that they are far more frequent and severe in countries like the United States where regulation and politics play major roles in the economy.²⁰ “If such catastrophes were random events, all countries would suffer them with equal frequency.”²¹ However, the United States “had major banking crises in 1819, 1837, 1839, 1857, 1861, 1873, 1884, 1890, 1893, 1896, 1907, the 1920s, 1930–33, the 1980s, and 2007–09.”²² Compare that to Canada, which had only two bank crises in 1827 and 1839, with no significant bank failures. The United States lags only Argentina in the frequency of crises, a country that has been described as “so badly governed for so long that its political history is practically a synonym for mismanagement.”²³ How can the United States and Argentina be in the same league in terms of banking crises? Something is very wrong.

While politicians typically are not overly financially literate, that has not ever stopped them from tinkering with the economy. Examples of damaging political interference or nonintervention in economic events are extensive. In 1837, President Jackson was instrumental in undercutting the US monetary and banking systems through actions that impacted accepted forms of money and eliminated the central bank in the United States. In 1907, President Roosevelt was either asleep at the switch or issuing inflammatory populist statements as the New York banks faced a growing economic crisis and the stock market melted down. The bruising political battle over the creation of the Federal Reserve in the early twentieth century produced an entity unable to be effective in times of financial crisis until after the depression. In 1966, Congress decided to cap S&L deposit rates to subsidize home lending, thrusting S&Ls in the 1980s into an inescapable asset-liability mismatch that created a financial vise that ultimately squeezed them to death. Beginning in the 1990s, the Clinton and Bush administrations pressured banks and Fannie Mae and Freddie Mac to offer mortgages to low- and middle-income borrowers, eventually combining with other market incentives to lead to an overheated subprime lending binge enflamed by the growth of Fannie Mae and Freddie Mac and then their placement in conservatism by the government.

In addition to the passage of laws, there are indirect ways that Congress or even individual members of Congress can impact economic policies. Congressional letters and inquiries, hearings, subpoenas can rain general aggravation on federal agencies and individual institutions. Letters from Congress arrive at regulatory agencies with great frequency, particularly when one or both houses are dominated by the opposition party of the administration. They are usually accusatory in tone, even when they are simply asking for information or documents. In *Harry Potter* vernacular, they resemble “howlers.” Moreover, congressional hearings and subpoenas may represent more than just innocent fact-finding endeavors. Too often they can be driven by external sources such as political activists, competing businesses, and large donors.

There is no doubt that at the margin, all these congressional actions impact the implementation of policy and the manner of execution of the laws that Congress has enacted. Agency personnel are only human, and

for the good of their careers, they would rather avoid doing anything that results in them being called out or publicly shamed by a senator. All things being equal, regulators would like to make Congress happy, no matter how ridiculous or politically motivated the inquiry or request may be. Former secretary of the treasury Timothy Geithner was clear in his book *Stress Test* about his disdain for the venal and show-boating political events that he had to endure during the last crisis.²⁴ He suggested that the regulators were successful in controlling the crisis *despite* the Congress. One example of this is Senator Charles Schumer's attack discussed below on IndyMac Bank in California, which seemed to exacerbate a depositor run that was the proximate cause of the bank's closing.

While other private sector and market dynamics contribute to and may even play a more prominent role in US financial crises, they need a hothouse in which to breed. The combination of political maneuvers and agency mistakes can create the perfect environment for something to go very wrong. While congressional oversight is important, it should be thoughtful, restrained, and wise when it comes to the oversight of money and the economy. I would recommend the establishment of a bipartisan group of legislators, such as the Joint Committee on Taxation, so that we can begin to depoliticize financial services. The Joint Committee on Taxation is a nonpartisan committee staffed by experienced PhD economists, attorneys, and accountants who support and provide sophisticated analyses to the majority and minority parties in both houses of Congress on tax legislation. It is chaired on a rotating basis by the Chairman of the Senate Finance Committee and the Chairman of the House Ways and Means Committee and traditionally enjoys a high level of prestige and trust. Given the Congress's emotional attachment to money, financial services should be another area that benefits from such a less partisan approach.

Tariffs

Tariffs are the oldest trade policy tools used to protect and ignite national economies. They are essentially a tax on an imported good either as a fixed charge per unit or an ad valorem tariff levied as a proportion of the value of imports. They can be potent defensive weapons with a variety of national ramifications, including an increase in the price of a

product on US shelves, a reduction in export prices, reconfiguration of trading partners, shrinkage of the overall volume of trade between the countries, and a decreasing demand for and supply of the goods being tariffed. Strategic tariffs often cause trading partners to respond and degenerate into a trade war. In short, this is another way that politics impacts the economy and adds levels of distortion, some good and some bad, to the operation of financial markets.²⁵

Confidence, Communication, and Social Media

Confidence, or the lack of it, is the *most* significant element of any properly functioning financial system. Perhaps the most in-depth analysis of how confidence and the lack of it relates to the economy is set forth in Robert Aliber's and Charles Kinderberger's iconic *Manias, Panics & Crashes*.²⁶ Confidence—or overconfidence—helps to create financial mania, but when it disappears, the economy disintegrates. When deployed wisely, confidence can also stop a crisis. Confidence is usually a remedy that the government is in the best position to administer, but that has not always been the case, as we will see. Confidence draws its power from the psychological trust in the integrity of the government, currencies, payments systems, products, institutions, people, or markets. It is part of the human behavioral characteristics that no economy can escape. When confidence shrinks or dissipates, markets sense it, runs occur, and there is the inevitable flight to quality. Panic begets panic, and in a financial world in which no person or entity can simultaneously satisfy all its obligations, the feeling of desperation to be the first in line to get one's money is overwhelming. Runs can affect bank deposits, commercial lines of credit, debt instruments, equity securities, and the reputations of companies, industries, and countries. The rapid and sudden dislocations and movements of capital and liquidity in a run increase as bad money drives out good and the markets experience a flight to quality. In the Subprime Crisis of 2008, the flight to quality saw enormous amounts of capital shift to treasury notes in the United States, which significantly impacted the dynamics of the market.

Most financial companies and systems cannot liquidate assets and satisfy their customers and creditors if they all demand payment at the same time. Trust and confidence are critical to their businesses. Every-

thing works because of confidence, which resides within the complicated elements of human behavior that are hard-wired in humans and are not likely to ever change. There are chemical and emotional responses that impact the financial decisions that people make. In an expanding market, the greed centers in investors chemically react with anticipation of reward.²⁷ When markets are collapsing, another chemical response inside our temples causes a judgment-blurring fear of financial loss. As noted above, “every time we borrow, loan, or invest, our rational, calculating cortexes do battle with our limbic systems.”²⁸

When confidence erodes, the normal rules of engagement disappear. For example, both in 2008 and 2020, the economies had experienced significant increases in credit outstanding when financial vectors all pointed upward. Consider just one example. Many nonbank commercial entities borrowed to build multifamily and office buildings. The commercial mortgages and lease financings created by those transactions became the inventory for a variety of asset-backed securities that were sold to investors or repackaged as collateralized loan obligations (CLOs) and collateralized debt obligations (CDOs). Investors then used those securities as collateral for additional borrowings to start the process all over again. When the first signs of credit quality or illiquidity begin to emerge, the value of those commercial mortgages and the securities created from them decreased as their repayment slowed or stopped because borrowers became short of cash. As this happened, the value of these instruments as collateral similarly decreased, requiring the commercial issuers and borrowers to provide additional collateral, address margin calls, repay lines of credit, or lose those lines altogether. That created a cascading constriction of credit, particularly when combined with the similar pressures being felt by consumers as their credit availability decreased. This chain reaction of liquidity and balance sheet deficiencies caused by everyone running toward whatever cash they can accumulate results in economic shrinkage, financial losses, and bankruptcies. When the banks can no longer handle the liquidity needs of the economy and they begin to book large losses that cause them to fail, the situation spirals into a full-fledged financial crisis. In 2008 and 2020, we saw how the Federal Reserve and the Treasury provided cash, credit, and capital to rebuild confidence.

While the government is usually the principal source of confidence, once a crisis starts rumbling downhill, there may be other saviors when

the government cannot or will not step up. Most notably, as I will discuss later, J. Pierpont Morgan played that rule in 1907 when he assembled the big banks to infuse liquidity and capital into struggling components of the US economy. Whoever plays the role of the financial messiah in any crisis needs innovative ideas, smart technicians, and a savvy spokesperson to rebuild confidence and stop a crisis. In 2008, the government had smart technicians, but by its own admission, fell short when it came to identifying convincing spokespeople and political magicians. As I read Secretary Geithner's book describing the inner workings of the government's response in 2008 and 2009, I am reminded of how much I learned closing and selling more than four hundred failed institutions, and how much better I could have done it after that experience. Experience really matters, but unfortunately, most of us get to do things like that just once.

Confidence lives or dies with transparency. Markets need information and transparency to function and nurture confidence. This is a fundamental concept in Gary Gorton's book, *Understanding Financial Crises: Why We Don't See Them Coming*.²⁹ Opacity, uncertainty, and imperfect information make markets volatile and suspect to manipulation. A lack of accurate information makes financial markets little more than casinos where investors are essentially guessing financial outcomes. No one likes to be surprised, and markets are high on the list of those who hate it. History is replete with instances where markets reacted negatively once they began to digest accurate financial information.

A perfect example is the Panic of 1837, which worsened as financial information needed to traverse the Atlantic before London bankers could make lending decisions. This led to London bankers becoming quite conservative when they could not get timely information from America. Similarly, in the early 1980s, markets reacted badly because crippled mutual S&Ls did not make public filings under generally accepted accounting principles (GAAP) that the market could compare to every other public company. The largest irony perhaps is that the most sensitive and arguably material information for any depositor or investor of a bank is confidential examination material produced by the regulators. However, it may not be disclosed by the bank in the absence of regulatory approval without committing a felony. Moreover, hard to

value commercial loans can be the epitome of opacity, so true transparency in the banking business has always been a challenge.

The communication of accurate information is a critical element of the confidence matrix. It is the arbiter of certainty and the foundation of financial markets. At the other end of the spectrum, market amplification of disinformation, rumor, and innuendo is often an accelerant of a financial crisis. It can take many forms, all of which may stoke public fear and erode public confidence. Andrew Jackson enflamed the economic situation in 1837 with his remarks about the Bank of the United States (BUS) and disdain for banknotes. Senator Charles Schumer inserted himself into the collapse of IndyMac Bank in 2008 when on June 26, 2008, he sent a letter, which he made public, to the FDIC and Office of Thrift Supervision (OTS) questioning the viability of the bank while it was still open: “IndyMac’s financial deterioration poses significant risks to both taxpayers and borrowers,” which “could lead to its failure” if prescriptive measures were not taken. Depositors ran on IndyMac after Schumer expressed concern that it might have “serious problems,” pulling \$1.3 billion out of IndyMac accounts over the next three days. John Reich, director of the OTS, said that although the bank was already in some financial distress, the immediate cause of its July 11 failure and closing by the OTS was a “liquidity crisis”—the withdrawal of deposits.³⁰

Indy Mac’s failure poured gasoline on an already tense situation that was rapidly eroding confidence throughout the economy after the collapse of Bear Sterns in March 2008. Whether happenstantial or not, the dominoes began to fall more rapidly after that. On September 7, Fannie Mae and Freddie Mac were placed into conservatorship. On September 15, Bank of America rescued Merrill Lynch, and Lehman Brothers filed for bankruptcy-court protection. On September 16, AIG, the world’s largest insurer, was rescued in an \$85 billion federal bailout that gave the government a 79.9 percent stake in the company. Twenty-seven major financial companies in America would fail or be acquired. Some lost more money in one year than they had made in the last twenty.

Newspapers and magazines have in the past been vehicles for the amplification of financial distress. Today, the internet, social media, and cable TV increase the stakes and chances of a devastating economic event occurring. As someone who is routinely interviewed for financial

stories, it appears to me that reporters today sometimes have only minutes to get a story online, with little time to double-check facts and assertions. As a result, the dissemination of information or disinformation can now be pervasive, instantaneous, and indistinguishable from reality and move much faster than money and governments can. In today's wired culture, people can also be overwhelmed by an unhealthy addiction to the new forms of digital, cable, and social media. It can create a ubiquitous blur of visual and digital media circulating fringe positions and disinformation at the speed of light, all for the purpose of attracting clicks and eyeballs. The driving lust for those views is financially driven—it is the only path to the media's survival—but it seems to be eroding the quality of intellectual analysis, ethics, and morality. We should expect that in stark contrast to the past where a fair amount of time and care went into public communications, the speed at which accurate and inaccurate information can move will be able to ignite future financial crises and panics as we have never seen before, particularly when there are malicious forces behind it.

Economic Complexity and Interconnectedness

There are billions of galaxies alongside our Milky Way in the known universe, each with billions of stars held in a mysterious perpetual dance driven by gravity. That is the economic analogue of the complex, interconnected relationships between the many financial institutions orbiting around central banks throughout the world. The system and these companies have become both too big to manage and too complicated to regulate, at least with traditional tools. Twenty-eight banks in the world have more than \$1 trillion in assets.³¹ Most have offices and employees around the globe engaged in every type of financial transaction. J. P. Morgan Chase, for example, has 256,000 employees worldwide, all technically reporting up a chain of command that ends at its CEO. Even if the CEO of a financial company is a genius, by the time that a problem hits his or her desk having traversed through the many layers and silos within such a large organization, it has likely already been resolved or become entirely out of control.

The growing lines of financial interconnectedness among financial companies is an increasing advantage and threat. More and more large financial institutions become counterparties to each other in the myriad

of simultaneous lending, borrowing, financial trades, payments, and securities transactions that occur around the globe each day. It creates an effective, efficient, and vibrant financial environment in which all companies, big and small, can prosper.

On the other hand, it also creates an interconnected web of financial risk that can accelerate the tipping of these economic dominos. A loss of confidence in one sector of the economy or company can quickly transmit economic contagion to others across the globe. This growing complexity of financial services also complicates regulatory and supervisory processes as the government tries to match the significant new risks that are embedded in the system. The government needs the tools and strategies to deal with new risks such as this, but that does not always happen quickly. When market innovation and technology outrun the regulators, they are often left with two practical options: don't interfere with what you do not understand, or don't let what you do not understand happen. Neither approach is constructive. When the government does react, businesses then respond to what the government is doing to regulate them by changing their operating behavior, and on and on it goes. As I will discuss later, this is an area of concern that can be better regulated with real-time information, artificial intelligence, and high-speed technologies, particularly as financial services become more complicated. Large banks, asset managers, insurance companies, and a blizzard of private sector fintech companies are well on their way to assimilating state-of-the-art technology applications to improve their management of risk in a complex interconnected financial ecosystem. Government overseers are lagging in doing the same.

The Consistency of Human Nature

Human behavior that damages the economy falls somewhere along a spectrum between an honest mistake and criminality. The disincentive to engage in fraud and other criminal behavior is damage to one's reputation and jail. In my experience, whether driven by greed or desperation, a small percentage of executives tends to dismiss the possibility of such repercussions and engage in inappropriate risk-taking or fraud, particularly when things get tough. After all, "that's where the money is." These tend to be one-off situations in a highly regulated industry like banking, and while they may be the cause of a bank's failure, they

are rarely the cause of a systemic crisis. The more frequent behavioral characteristics that impact markets are honest mistakes and aggressive risk-taking, which at the time may seem completely appropriate. As I will demonstrate, the S&L crisis is an example of insider fraud being mistakenly blamed for a crisis that it did not cause. Any fair diagnoses of the human behavior that causes or arises in a financial crisis must include an analysis of whether that behavior created the crisis or was in reaction to the circumstances created by the crisis. Both in terms of timing and causality, those are two different things. Understanding the roles that they play in financial crises is crucial to understanding how to prevent financial crises from developing in the future.

Financial Accounting

Financial accounting principles are as important as any regulatory oversight—they determine the integrity of a company's financial statements. Sadly, however, financial accounting has consistently been the center of an ongoing debate about whether it has negatively contributed to how institutions have acted and reacted to economic and regulatory events. Accounting for financial institutions such as banks differs from typical manufacturing companies that make and sell physical products. Banks deal in “green goods”—financial instruments that are largely intangible representations of value whose worth can change hourly. The science of valuing a loan—a bank's asset—its potential losses, and the economic value of its stream of income over the long term is admittedly a complex endeavor. Therefore, when the accounting industry makes mistakes, and it seems to have made its share, it can be just as devastating as when the government does.

There is a constant temptation for financial institutions to implement financial strategies based on the favorability of their accounting effects rather than their actual economic consequences. For example, many banks and S&Ls that acquired failing S&Ls in the 1980s were permitted to record the difference between what they paid for a company (\$100) and the value of its assets (\$80) as “goodwill” and write that asset (\$20) down over the next forty years. Companies that began to rely on that goodwill were often eventually upended because although they had a financial asset on their books, they did not have the cash value of the goodwill that could be spent. So too, the shifting accounting treat-

ment over the years of mortgage servicing rights, loan loss reserves, mark-to-market valuations, off-balance-sheet items, and asset valuation have backfired on companies, causing severe economic consequences when the financial environment shifted. As is often said, you can't see who is swimming naked until the tide goes out.

Accounting principles are implemented by a private body that is largely unsupervised and sometimes changes positions as it appears to experiment with live markets. That unique structure has led to the accounting industry's share of miscalculations. Accounting conventions—GAAP—are not always as principled as the Financial Accounting Standards Board (FASB), which creates those principles, would have us believe. No law establishes the FASB, it does not operate pursuant or subject to agency-like rules, and it cannot be challenged in court for the standards that it promulgates as any federal agency could under the Administrative Procedure Act. It is not subject to the Freedom of Information Act or presidential executive orders. Yet whatever the FASB says effectively becomes federal law because SEC-registered companies and banks must prepare financial statements and make disclosures in accordance with GAAP.³² As I will discuss later, critics argue that too many FASB principles have been procyclical and caused too many balance sheets to overreact in the same way at the same time, adding to the factors that have created financial crises.

Unanticipated Events

As today's events demonstrate ever so clearly, no matter how effective a system of regulation is reconstructed in the future, it still must accommodate and plan for unanticipated events. Aberrational movements in interest rates, shifts in consumer habits or preferences, national disasters, pandemics, massive frauds, wars, technological attacks, international economic and monetary crises, and sudden changes in the economic or political environment are just some that we have encountered. The list is always growing, but the storyline is generally the same: businesses and the government are caught unprepared by unfolding events. The 2020 COVID-19 pandemic could not be a better illustration of how unanticipated events can undercut the brightest of financial horizons. Similarly, the fermentation of seemingly innocent events over a long period of time is an often-ignored factor in the management and regula-

tion of financial companies and markets. A decision made today may be irrelevant or wrong tomorrow as financial, human, and governmental factors constantly interreact with each and change the context. Business is dynamic; government policies and regulation tend to be relatively static. Congress and regulators adopt new laws and regulations and often forget about them until there is a crisis. The crippling impact of this fermentation factor has been apparent in many financial disasters. Interest rate deposit caps put in place in 1966 turned out not to be an economic advantage for banks but a ticking time bomb when market interest rates and inflation skyrocketed in 1979, giving S&Ls the choice of death by illiquidity or the recognition of massive lending losses.

SUMMING UP

Historians and economists often evaluate each financial crisis as a self-contained event. The facts suggest that most are a continuum of financial cycles and economic gyrations in the market that are culturally and financially connected to each other by the psychological sentiment that individuals and businesses carry with them. Each recession, depression, and bout of inflation or deflation creates economic dynamics, government reactions, and market sentiments that feed off each other and can be generational in duration. Children of the depression lived the rest of their lives replaying the lessons they learned—avoiding large amounts of debt, favoring cash transactions, saving only in FDIC-insured accounts, and avoiding the stock market. Every financial disaster is the result of many events, some of which may have stretched over decades before they ripened into a crisis.

The impact of government oversight of financial markets and banks is a continuing influencing factor, mostly positive. But when it is not fully thought through or analyzed, and even if it initially does what it is supposed to do, it may have unintended consequences that are economically dire over long periods of time. When Congress creates government regulation that is not well-thought through or based on analytics, the corresponding distortion of markets increases the chances that such regulation eventually damages institutions and markets. History details this, perhaps no more clearly than in the crises of 1837, the 1980s, and

2008. Regulation is not the only distorting influence in the economy today, however.

The natural state of markets is to evolve and expand according to economic pulls and pushes driven by the goal of making money. Markets are influenced by many things, including new developments that alter the nature of products and the way that they are delivered. The internet and subsequent digital technologies have become substantial drivers of economic change and, therefore, are impacting financial services so much that the two are converging. In the last twenty years, the pace at which technology has been driving toward a conceptual singularity between man and machine has been dizzying. In fact, at times it seems so fast as to be out of control. In those periods of hypercentrifugal change, the distortion of market forces increases exponentially, causing aberrations in market behavior. New companies are overhyped, most rise and fall rapidly, and capital aggregation, liquidity, and business psychology are all impacted. At times, technology moves so fast that humans begin to fall behind physically and emotionally. The question that futurists are asking is whether the increasing velocity of technological development that we see today will leave humans hopelessly behind and unable to catch up. Will super and quantum computers, algorithms, Big Data, and artificial intelligence eventually begin to regulate people, markets, economies, and financial systems?³³

The challenge that governments face is not an easy one, and technology is making it even more complex. The possibility of malicious intelligence being unleashed by rogue nations or terrorists, and the complicating factors that cloud and quantum computing add to this create clear and present dangers to the financial infrastructure of the country. When the government regulates technology, it is accused of stifling innovation. If it sits on its hands and does not intervene, the development of new markets, financial technologies, and artificial intelligence may pass the point where effective regulation is possible. When comprehensive artificial intelligence technologies are deployed in every nook and cranny of our personal and business lives, they will think and do for themselves. If the Federal Reserve cannot control monetary policy and the United States cannot effectively sanction a country because the world has transitioned to a global economy driven by non-government cryptocurrencies, vast amounts of political and economic power will shift. If the US government does not appreciate this, China

and Russia certainly do.³⁴ Unfortunately, future threats, no matter how significant, rarely get the attention they require before they erupt.

If the public knew that the financial system could be fixed so that the country did not have so many financial crises and was not so economically exposed, wouldn't it demand that those fixes be implemented immediately? The fixes are clear. First, better, smarter, skinnier, and more effective systems of functional monetary control and financial regulation are required that have the means of attracting and retaining people with the highest level of financial skills. That means we need to compensate them commensurately with the awesome responsibilities that are imposed on them. Congress, regulators, and the banks would have to expend enormous political capital to revamp the regulatory system. It is possible if we educate the public about the causes and solutions of financial crises and the fact that the creation of more regulation is rarely the best approach.

The second elixir is a combination of offensive and defensive technological tools. Artificial intelligence and Big Data analytics can provide powerful oversight tools, but technology is also the source of new, unprecedented financial threats. Technology is revolutionizing current forms of money and payments systems and in turn increasing the volume and velocity of commerce and disturbing traditional economies. Is that good or bad?

Finally, financial literacy must be improved. It is potentially the most powerful tool that consumers can use to better understand financial products and markets, improve their lives, and at the same time reduce the costly amount of government oversight that is required. Given that regulation distorts markets and eventually becomes out of date, it stands to reason that the more the need for regulation can be reduced, the more that variables may impact the likelihood and nature of future financial crises, which can be eliminated. Making consumers financially literate is the cheapest and most effective antidote for financial crises.

Part Two

How the Government Creates Financial Crises

3

THE S&L RECKONING

Perhaps you do not believe that government policies can create financial crises. I certainly did not in 1981 when I became general counsel of the FHLBB overseeing 4,500 failing S&Ls. How could it happen? How could all 4500 S&Ls in the country be failing at the same time in 1981? Could every single one of them have engaged in reckless lending and fraud without the regulators noticing or acting sooner? That would have been highly improbable under the watchful eye of hundreds of federal and state bank examiners in such a highly regulated industry. And yet, that was the popular story circulated about the S&L crisis. The fact is that the causes of the S&L crisis were largely government-manufactured by Congress over a period of twenty years. It is the clearest and starkest example of financial conjuring by the government resulting in economic devastation. The more than two years I spent handling the first stages of the S&L crisis in the Reagan administration shook my confidence in government regulation. But it pointed me in the direction of understanding how to avoid the mistakes of the past in creating regulation of the future. It raised the question in my mind of the role that the government plays in creating and enabling financial crises through well-intentioned actions.

DRIVERS OF THE S&L CRISIS

Failed government policies cost more than \$200 billion to liquidate and stabilize what was left of the S&L and sectors of the banking businesses throughout the 1990s. The S&L crisis is the clearest example of a financial crisis created by government policies—both federal and state—albeit unintentionally. It also represents perhaps the most energetic effort to shift blame away from the government's mistakes to focus on those made by industry executives after they were faced with financial challenges that were insurmountable.

The true culprits of the S&L crisis were policies initiated in the 1960s to limit the deposit costs of S&Ls so that they could make inexpensive thirty-year, fixed-rate home mortgages so that more Americans could afford to buy homes. Simply stated, the S&L crisis was the result of the federal and state governments attempting to subsidize home borrowers at the expense of savers.

These policies were ill considered by Congress and left in place long enough to become obsolete and then financially destructive as the economic assumptions on which they were based imploded. The law, not business decisions, locked the S&L industry into an economic vise from which there was no reasonable escape, causing executives and regulators to make business decisions that ultimately deepened the problem. When interest rates hit double digits in the early 1980s and deposit caps had finally been lifted after some fifteen years, S&Ls were losing money every minute of the day, paying depositors twice the rate that they were earning on the long-term mortgages in their portfolios. They could not sell those portfolios without taking huge losses that would have left them with no capital. There were few options for S&Ls to escape from that economic trap created by the government. It led to the failure or merger of more than 1,400 S&Ls. The fermentation of well-intentioned government policies, unstable markets, human behavior, and loss of confidence were all a part of this story.

Faced with a distorted financial environment in the early 1980s, regulators also had few options to deal with the crisis. The FHLBB could be tough and bring the S&L industry and perhaps the US economy crashing down, or it could buy time and hope for the best.¹ It did the latter, relaxing capital, liquidity, and accounting requirements solely to manage the unprecedented pace of failures. The regulators were

captivated by the “we are good people and didn’t cause this problem” argument made by S&L executives and their trade associations and allowed the industry to increase in size by 50 percent between 1983 and 1987, hoping that it could grow its way out of its financial issues. That turned out to be another critical mistake that exacerbated the problem and increased the final losses that the government incurred. Much of that growth was by state-chartered S&Ls. At the time, several states, including California, Texas, and Florida, granted their S&Ls a broader set of lending authorities than federal S&Ls had. To outrun the interest rate crisis of the early 1980s, many S&Ls opted for the best solution that they had; they purchased high-yielding junk bonds and made seemingly lucrative real estate development loans throughout the southwest United States funded by high-cost brokered deposits, seeking to average up the below-market returns of their mortgage portfolios. As this was happening, regulators failed to increase safety and soundness regulation commensurately with the increased levels of asset quality risk that were building. That greatly reduced the government’s margin for error in preparing for and dealing with the S&L asset quality explosion in 1988.²

Congress made a massive financial mistake in attempting to manipulate US housing finance, as did several Democratic and Republican administrations that saw the problem and did not fix it. Congress added to the calamity by enacting the Tax Reform Act of 1986. It contributed to the collapse of real estate development first in the southwest United States and then throughout the country by creating an environment of declining values as a result of the limiting of interest expenses, the taxation of capital gains, the elimination of the investment tax credit, and the restrictions on the use of passive losses to offset capital gains.³ Finally, Drexel Lambert was forced into bankruptcy in 1990 due in part to the government’s actions, tanking the junk bond market and the value of assets in which many S&Ls had invested.

In real time, the options facing S&L regulators were limited as events unfolded in unexpected ways in the fog of panic. The regulatory accounting that the regulators adopted earlier in the 1980s to slow the pace of failures was not all bad; it made sense at the time given the unique characteristics of S&L balance sheets and the limited options available to prevent the collapse of the industry.⁴ But it should have been viewed as what it was—a temporary fix intended to control the

pace of failures and avoid an economic meltdown at a time when interest rates were in the double digits. These measures did indeed avoid or forestall the insolvency of hundreds of S&Ls in the early 1980s, but kicked the can down the road with regard to other problems.⁵ Actions by the Congress and the administration taken to intentionally undercut the efforts of the regulators to address the problems affirmatively added to the ultimate economic pain.

The official report on the S&L crisis by the National Commission on Financial Institution Reform, Recovery and Enforcement (National Commission) in 1993 laid the blame on many factors, both structural and theoretical. They include the moral hazard created by federal deposit insurance, high interest rates, deregulation of interest rate deposit caps, relaxation of regulatory and supervisory standards, a breakdown in the political system, the declining competitive position of the S&L industry, changes in tax laws, fraud and abuse, faulty accounting practices, regional economic collapses, the FSLIC's inadequate capitalization, ineffective congressional oversight, and a silent news media.⁶ As Professor Lawrence White points out in his book, *The S&L Debacle*, there were no "Cassandras" or voices in the wilderness at the time warning about the dangers that would follow the various legislative and regulatory actions that were being taken.⁷ He was also correct that "virtually everyone within the Washington policy community (and outside it as well) was mesmerized by the hemorrhaging of the thrifts and focused myopically on measures that would stop the bleeding."⁸

S&L executives were pushed to the brink by regulatory policies and acted as rationally as they could in that context to avoid failure. But what is rational in one economic environment often looks irrational from the vantage point of the chaos that follows. The inescapability of the crisis led to risk-taking, recklessness, and in some cases, criminal behavior, none of which was the prime mover of the demise of the industry. Academics, historians, and other self-anointed experts often conflated the reactions of executives to severe economic crises with the causes of the crises. There was fraud and negligence that may have caused institutions to fail, but contrary to widespread belief, fraud and criminality were not the causes of the crisis. Many of the acts taken by S&L executives were set in motion by the futility of the circumstances that the government had placed them in. That is neither an excuse nor a justification, simply an explanation. The National Commission estimat-

ed that fraud accounted for 10 to 15 percent of the total losses in the S&L collapse.⁹ Those numbers, however, are guesses and based on assumptions that may or may not be accurate. After a crisis, thresholds for fraud become somewhat fluid as the need to blame someone and extract retribution becomes a priority. In addition, what may be considered acceptable risk-taking in good times tends to look like fraud after the bubble bursts.

HOW IT HAPPENED

The Creation of Deposit and Mortgage Interest Rate Controls

The creation of the S&L crisis was many decades in the making. The Banking Acts of 1933 and 1935 authorized the Federal Reserve to set interest rate ceilings on commercial bank time and savings deposits, which it did to limit costs so that community banks in particular could lend more in their local communities (e.g., make low-rate mortgages).¹⁰ From the mid-1930s to the mid-1960s, the deposit ceiling rates set by the Federal Reserve were generally at or above market interest rates, so those caps had little to no impact.¹¹ But between 1965 and 1966, interest rates shifted upward and mortgage rates rose from 5.80 percent to 6.65 percent.

As housing starts decreased, political concern about the allocation of credit led to the enactment of the Interest Rate Adjustment Act in 1966.¹² It applied bank interest rate caps in the Federal Reserve's Regulation Q to savings deposits held by mutual savings banks and S&Ls, the principal mortgage lenders in the country. S&Ls and savings banks were awarded a competitive advantage: a one-quarter of a percent differential to pay more to their customers on deposits than commercial banks because of their concentration on home lending. The assumption was that interest rate caps would decrease competition for deposits, fix borrowing costs, allow thrift institutions to attract more low-cost funding, and make more mortgages at lower interest rates. It was a direct attempt to subsidize housing finance and increase homeownership. After all, how could that be anything but great for the American economy? In one final triumph of politics over economics, in 1972, the FHLBB effectively limited the use of adjustable-rate mortgages, forc-

ing S&Ls to spend the next decade loading up their balance sheets with mismatched, fixed-rate mortgages.¹³ While Congress viewed deposit interest rate caps as a *temporary* stopgap in 1966 to deal with the credit crunch, they were in place for sixteen years.¹⁴

Reg. Q could keep S&L costs down, but it could not insulate them from the market and normal fluctuations in interest rates.¹⁵ Markets do what they do, sometimes in reaction to government policies. While market interest rates rose to 10 percent, as they did by 1979,¹⁶ S&Ls could still pay only 5.5 percent to their depositors to attract funding. That would mean that in those periods, they would experience “disintermediation”—customers would withdraw their deposits, seeking instruments paying higher rates of interest. In the late 1970s and early 1980s, alternatives for those depositors appeared in the form of money market funds (MMFs) being offered by securities firms such as Merrill Lynch, Shearson, Paine Weber, and Pru Bache. An MMF is an open-ended mutual fund. It invests in short-term debt securities such as US Treasury bills, commercial paper, repos, and certificates of deposit. MMFs are managed with the goal of maintaining a highly stable asset value through liquid investments, while paying income to investors in the form of dividends. They are not insured by the government against loss. When depositors yanked their deposits from banks and S&Ls and placed them with MMFs, it caused a liquidity crunch, making it difficult to operate and exposing the unsafe matching of assets (i.e., mortgages) and liabilities (i.e., deposits) that S&Ls had been required by law to do. In those circumstances, having lower-cost deposits became irrelevant when S&Ls were losing the funding they used to make mortgages.

In this government-made economic biosphere created by Reg. Q, S&Ls generally had portfolios of thirty-year fixed-rate mortgages that they normally held to maturity. Variable-rate mortgages were disfavored and actually prohibited under federal law until 1981. Consumers naturally preferred long-term fixed-rate borrowing that put the risk of increasing rates squarely on the shoulders of the lending institutions rather than on the borrower. Fixed-rate lending was a political imperative. The situation was compounded by local politics—many states had usury laws, some that capped mortgage rates as low as 6 percent.¹⁷ When the interest rate environment accommodated paying depositors 5.5 percent and charging borrowers 7–8 percent for their mortgages,

S&Ls could make a profit. Because this worked for a while in the economy, policy makers naturally assumed that it would work indefinitely. In 1970, mortgage usury rates existed in almost every state, limiting thirty-year fixed-rate mortgages to between 6 and 12 percent.¹⁸

A few states in the country did permit state-chartered S&Ls to make variable-rate mortgages where the interest paid by the homeowner would fluctuate in relation to rates in the market. But most S&Ls were compelled *by law* to do what no sane businessperson would ever advocate: borrow short (take overnight consumer deposits at 5.5 percent) and lend long on a fixed-rate basis (thirty-year, fixed-rate mortgages in the 6–12 percent range). As it turned out, holding single-digit, thirty-year fixed-rate mortgages in portfolio was akin to storing nitroglycerine in a fireworks factory. Eventually it would explode.¹⁹ When US interest rates moved toward 20 percent in the early 1980s, it was obvious that the S&L explosion was about to occur. A portfolio of thirty-year fixed-rate mortgages yielding less than 10 percent was worth less than fifty cents on the dollar in that interest rate scenario. The FHLBB predicted that all 4,500 S&Ls would eventually become insolvent in that rate environment. Institutions experienced liquidity problems as funds flowed out into MMFs, unable to sell their below market mortgage portfolios to remain liquid without also wiping out their capital after booking the loss from such a sale.

The decisions to make thrifts subject to Reg. Q, enact state usury laws, and prohibit the offering of variable-rate loans until 1981 turned out to be one of the worst that Congress and the states ever made. It led to the S&L crisis as directly as an arrow being shot at a target; it cost the United States more than \$200 billion. Yet, shockingly, no one analyzed the potential consequences of Reg. Q before it was enacted. A case study of the Federal Reserve's consideration and reasons for lowering Reg. Q rate ceilings in 1966 when thrifts became subject to it indicates that it did so with "very little discussions of the basic issues."²⁰ The Federal Reserve did know, at least in a quantitative sense, the problems that Regulation Q might create, but it did not engage in evidence-based analysis at the time.

The Interagency Coordinating Committee (ICC) was eventually empowered to set deposit interest rate caps for banks and S&Ls. The ICC was a combination of representatives from the relevant federal bank regulatory agencies. In 1970, President Nixon's Hunt Commission ad-

dressed the interest rate cap issue and recommended partial deregulation. That was followed by a series of recommendations by President Nixon in 1973.²¹ When innovative new MMFs and cash management accounts were launched to compete with banks and S&Ls for consumer dollars, the ICC began to allow insured institutions to pay higher rates, but only on long-term certificates of deposit.²² That was good to the extent S&Ls could continue to attract long-term deposits and remain liquid. It was bad because it was raising their cost of funds against a fixed-yield portfolio of thirty-year fixed-rate mortgages. Nothing was done, and so five years later in 1978, President Carter appointed an Interagency Task Force on Deposit Interest Rate Controls and Housing Credit. It concluded that deposit interest rate controls were not functioning the way they were supposed to and were hurting small savers. President Carter also recommended that Congress give federally chartered S&Ls the authority to make variable-rate mortgage loans and align the duration and yields of their assets and liabilities to avoid getting caught in an economic squeeze. Again, that didn't happen.

The FDIC characterized the 1970s and 1980s as a complicated mix of business and financial factors:

In the 1970s, exchange rates among the world's major currencies became volatile after they were allowed to float; price levels underwent major increases in response to oil embargoes and other external shocks; and interest rates varied widely in response to inflation, inflationary expectations, and anti-inflationary Federal Reserve monetary policy actions. . . . In an environment of high market rates, the development of money market funds and the deregulation of deposit interest rates exerted upward pressures on interest expenses, particularly for smaller institutions that were heavily dependent on deposit funding. . . . The banking industry's share of the market for loans to large business borrowers declined, partly because of technological innovations and innovations in financial products. As a result, many banks shifted funds to commercial real estate lending—an area involving greater risk. Some large banks also shifted funds to less-developed countries and leveraged buyouts and increased their off-balance-sheet activities.²³

When increasing oil prices helped push inflation to hit historic double-digit highs in the late 1970s, Paul Volcker, the new chair of the Federal Reserve, sought to bring inflation under control by whatever means he

could, allowing rates to climb upward of 20 percent.²⁴ That alone solidified the collapse of the S&Ls. Fourteen years after what was supposed to have been a “temporary” adjustment to interest rate caps, Congress finally acted and passed the Depository Institutions Deregulation and Monetary Control Act (Monetary Control Act) in March 1980. I drafted parts of that law while at the OCC, not realizing then that I would be appointed general counsel a year later of the agency that would be overwhelmed by the further aggravating impact that this law would have on S&Ls. The Monetary Control Act established a procedure for phasing out Regulation Q rate controls under the authority of the Depository Institutions Deregulation Committee (DIDC).²⁵ It would be too late, however, to have any immediate impact on the developing crisis. Indeed, it made things worse as interest rates continued to increase and S&Ls were forced to pay double-digit interest rates on deposits to retain them and stay liquid. Short-term interest rates were then hovering in the range of 16 percent²⁶ and inflation was at 14.8 percent.²⁷ New thirty-year fixed-rate mortgages were being issued at 15.28 percent.²⁸ Interest rates sometimes moved 2 percent in one day! Contrast that to minuscule interest rate movements that we have experienced in the last decade where the rate has been around 2 percent.

By 1981, after President Reagan took office, covering over the S&L problem was no longer an option. The problem was easy to see in hindsight. If a federal S&L had done what it was required to do by law, it was paying depositors a maximum of 5.5 percent interest, becoming increasingly illiquid as those depositors left to earn 10 percent or more interest from uninsured MMFs. At the same time, the value of its portfolio of largely thirty-year fixed-rate mortgages decreased as interest rates increased, making it difficult to sell it in the market to increase liquidity. No one would purchase (except at a deep discount) a mortgage portfolio throwing off a return of 8 percent at par when they could invest in new mortgages yielding 16 percent in the current market. If the sale were at market (50 percent of the book value of the mortgages), the S&L would take a loss, likely wiping out much of its remaining capital. This financial gross negligence had been imposed on S&Ls by federal law, leaving absolutely no escape hatch. The collapse of the S&L industry over the next decade would negatively impact the housing business in America as well as the US economy.

Pratt Takes Control and Acts

President Reagan appointed Richard T. Pratt chair of the FHLBB in March 1981. His first action was to ask me, the agency's newly appointed general counsel, to draft a regulation authorizing S&Ls to make something other than thirty-year fixed-rate mortgage loans so that they could begin to address the grotesque mismatch embedded in their mortgage portfolios. As general counsel of the FHLBB, I was also general counsel of the FSLIC.

On April 30, the FHLBB adopted a ground-breaking regulation that permitted S&Ls to offer alternative-rate mortgages.²⁹ By using adjustable-rate mortgages, S&Ls could theoretically increase what they earned when rates rose, rather than being locked into a below-market return for the life of a thirty-year mortgage. At that time, the thirty-year mortgages turned over—the house was sold, and the loan paid off—on average in about twelve years. That was still a long time to finance something with overnight money. With new thirty-year fixed mortgages being originated in the range of 16.50 percent plus two points, and S&Ls still restricted to paying 5.5 percent on short-term deposits, the new adjustable-rate mortgage rule would help, but it could not save every institution. The flow of deposits out of banks and S&Ls into mutual and MMFs that were paying double-digit rates of return continued as America became more comfortable with those types of “deposit” alternatives and became willing to abandon federally insured deposit accounts for a higher rate. An FHLBB survey indicated that when the rate differential exceeded 2 percent, consumers abandoned low-yielding accounts insured by the FDIC to obtain a higher rate.

The FHLBB was a unique federal agency—well ahead of its time in terms of efficiency. It had a pervasive reach over the housing finance industry. It regulated all the S&Ls in the country, both federally chartered and state chartered. Its jurisdiction over state-chartered S&Ls arose from the fact that it operated the FSLIC, a federal deposit insurance fund of \$6.5 billion. It also oversaw Freddie Mac because its board was also Freddie's board of directors. With such broad authority over so many parts of the housing finance business, the FHLBB could have an immediate and decisive impact on housing finance issues in America. We came to understand in 1981 that even with so much control over the system, it was too late to overcome the \$100 billion nega-

tive value of the S&L industry at that time. Chairman Pratt knew that some heroic things would have to be done simply to avoid a total meltdown of the S&L industry and with it, the US housing finance and homebuilding industries.

In early 1981, Chairman Pratt and I had several meetings with Chairman Volcker and his general counsel, Mike Bradfield. We wanted to make sure that the Fed discount window would be open to S&Ls needing cash to stay afloat and that the Federal Reserve would permit bank holding companies to acquire failed S&Ls from the FSLIC across state lines. Technically, the commercial banks rescuing failed S&Ls purchased their assets and assumed their deposit liabilities from the FSLIC after the S&L was closed, but if it were in a state other than their home state, they would often have to establish new branches in that state or hold it as a separate subsidiary institution of its holding company. The FHLBB had the authority to preempt state laws, but these transactions raised novel interstate branching issues for the Federal Reserve, OCC, and FDIC that we worked with those agencies to solve. We did not appreciate at the time the burden Chairman Volcker was carrying as he was implementing interest rate strategies to win the war on inflation and in his view, save the US economy. We also did not appreciate that saving the US economy in this way would have a devastating impact on the S&L industry, mutual savings banks, farmers, and other American businesses. Chairman Volcker must have known that the interest rate shocks that the Federal Reserve intended to orchestrate would annihilate many S&Ls. While he showed concern for the problems that S&Ls were having, he never let on that it was only going to get much worse. Such are the complex decisions that federal policy makers must make. There is never a perfect solution, only a collection of bad ones to choose from.

Trying to Outrun the Grim Reaper

When the housing finance industry is disrupted, homebuilding is disrupted, and when that happens, an economic downturn is not far behind it. Without more human and financial resources at the agency to handle the problem, we feared that the economy would come tumbling down with the S&L industry as confidence was shaken. The initial plan in early 1981 was to present the cold hard facts to the administration

and the Congress and work with them to address and resolve the problem. As we made the rounds to Congress, the Office of Management & Budget (OMB), the White House, and Treasury, it became clear that no one considered the problem as pressing as we did, and few were willing to admit reality given the politics involved. We severely underestimated the disinterest and belligerence that the administration, Congress, and our fellow regulators would have toward us and the S&L industry's problems. It was our problem, and we had to fix it.

As rates kept rising in 1981, the FHLBB knew that it had to control the pace of S&L failures given the modest human and financial resources it had. Even if rates and inflation returned to normal levels at that point, the bottom quarter of the S&L industry could never turn around. The rate of decline was too steep for them to get healthy in the foreseeable future. All they were doing was running up interest rates "buying" deposit share to remain liquid, forcing healthier S&Ls to have to pay more for their deposits. The FHLBB was not capable of handling more than five or six failures a week. If it did not get some help from Congress, it would have to get creative and conjure up a set of regulatory accounting rules and forbearances to slow the pace of failures to one that was manageable. Each failure took dozens and often hundreds of lawyers and supervisory staff to draft the closing documents, assure that the standards of the law were met, and on the day of the closing, secure each branch with a team of people who did everything from changing the locks on the doors to taking inventory of what was there to be sold. Every picture on the wall had to be inventoried. The closing of Fidelity Savings in San Francisco, one of the largest in the country at that time, took several hundred people to close and transfer it to Citibank.

The FHLBB saw some flexibility in the fact that most S&Ls at that time were mutual in form. They were technically owned by their depositors, had no shareholders, and were not required to publicly report their financials according to generally accepted accounting principles (GAAP) as public companies were. Therefore, a combination of bookkeeping and accounting changes could more easily be used by mutual companies for a short period to control the rate of failures to one that the beleaguered agency could manage. It was all meant to be a *temporary* Band-Aid to allow markets to continue to function without severe disruption. As policy makers have learned in each financial crisis, the only thing that the markets really care about is whether an institution is

going to be allowed to continue to operate with a government imprimatur.

On May 18, 1981, the FHLBB closed and the FSLIC liquidated the \$74 million Economy Savings & Loan Association in Chicago. This signaled the beginning of a new but short-lived approach in dealing with failing S&Ls. The depositors were paid off by the FSLIC, which then liquidated its assets. We learned that it was the most expensive and resource-intensive way to handle failures, so, the next eleven failed S&Ls between May and September were sold to other S&Ls with FSLIC financial assistance. This also would prove too expensive a way of solving the problems that laid before an agency with just \$6.5 billion to deal with 4,500 failing institutions. With the Congress and the administration dead set against providing any money or resources to address the problem, the FHLBB was locked in the same closet that the S&L industry was in. We began to focus on stretching the FSLIC fund, and in doing so, ultimately changed the face of banking in America.

Prior to Pratt's tenure, resolving a failed S&L was handled in the easiest but most costly way. The agency would approach the other S&Ls in town (never a commercial bank or industrial company simply as a matter of policy) and invite them to bid confidentially on the assets and liabilities of the failing S&L. The law, as it does today regarding the FDIC, prohibited the agency from giving buyers financial assistance that would exceed the estimated cost of liquidating the failing institution. So neighboring S&Ls knew that if their bid were \$1 less than the FSLIC's cost of liquidation, they would be awarded the failed institution. If the cost of liquidating a \$100 million institution was estimated to be \$30 million (typically it was around 30 percent of the book value of the assets), a bid for \$29.9999 million in financial help from the FSLIC would be acceptable. That had to change.

The agency—primarily due to the genius of Chairman Pratt and the FSLIC director, Brent H. Beesley—decided to bid out more attractive packages of failing S&Ls to a wider range of prospective buyers. As a matter of law, the agency could provide them some regulatory “favors” known as forbearances to attract potential buyers. Such favors would include exemptions from or relaxations of capital, liquidity, and branch banking requirements. At the time, commercial banks were subject to city, county, or state branching restrictions, so a package of failed S&Ls with branches in three states was attractive to them. It provided them

the *only* path at the time to create an interstate or national branching franchise. Federal law permitted the FHLBB to sell failing S&Ls to *any* entity *anywhere* on the planet, notwithstanding state law. The agency had just never taken advantage of it. Consequently, to increase the bidding gene pool, the agency opened it up to commercial banks, investment banks, and commercial and industrial companies across state and national boundaries. It also began packaging failed S&Ls in multiple states to create valuable interstate branch banking franchises. Banks were anxious to leapfrog over federal banking laws to create an interstate branch network through the acquisition of failed S&Ls. Commercial and industrial companies and investment banks jumped at the chance of owning a bank and having access to the payments systems and the advantages of federal preemption. That started a stream of executives from every major company in America pounding on our doors to get into the game. Changing the competitive dynamics of the bidding process for failed S&Ls turned out to be an efficient way of husbanding the funds of the FSLIC and radically reducing the cost of resolving failed S&Ls. But this approach naturally angered the S&L industry, which feared being gobbled up by, among others, the commercial banking business. The US League of Savings Institutions was furious with us. That rage forced it to take its eye off the real ball—there was an excellent chance there would be no S&L industry left under any other scenario. The agency also sought to increase the value of the S&L charter to attract capital investment. It drafted regulations and new legislation to give S&Ls sweeping new consumer and commercial lending powers to make it more like a bank charter.

The FHLBB continued to refine how it packaged interstate, interindustry, and industrial acquisitions of failing thrifts with a variety of creative financial assistance mechanisms guaranteeing the acquirer a certain profit on the assets acquired over a ten-year period. This spread out its risk and played the odds that the economy would eventually turn around and it might not have to pay any assistance. A cornucopia of regulatory forbearances were developed to give acquirers time to bring the failed S&L into compliance with applicable capital, liquidity, dividend, and other operating restrictions, increase the stable of bidders, and reduce the cost of assistance that the agency would have to pay. It was like chumming in shark-infested waters. Major companies such as Equita-

ble, Citibank, Shearson Lehman, Dreyfuss & Co., Ford Motor Co., and National Steel visited early and often, trying to determine the best way and terms that they could take advantage of to purchase an interstate banking franchise. The message back to them was simple and clear—be the best bid and you will win. This strategy got the boost it needed on September 8, 1981, when the FHLBB, Citizens Savings & Loan, and National Steel jointly announced a deal in which Citizens, a California S&L, would acquire failed S&Ls in New York and Florida as it appropriately changed its name to First Nationwide Savings & Loan.³⁰ The FSLIC provided modest assistance compared to all the transactions that came before it. First Nationwide was willing to absorb many of the losses in return for the valuable franchise it received. National Steel infused capital into First Nationwide to make the numbers work.

This was the jackpot of model transactions to stretch the FSLIC fund and prime the pump. Between January 1, 1981, and October 1982, the agency approved 673 S&L mergers and acquisitions involving roughly \$94 billion of assets and the disappearance of 759 institutions. Of those mergers, 256 were supervisory, meaning they were engineered by the FHLBB under distressed financial circumstances that included some form of regulatory forbearance, and in 62 of those cases, the FSLIC paid financial assistance to the acquirers. There were two liquidations, hundreds of receiverships, and several conservatorships used to facilitate these transactions.³¹ In April 1982, Citibank won the bid to acquire the failed Fidelity Savings in San Francisco, the largest failure that had occurred at that time.³² With an additional acquisition of another failed S&L, Citibank had gained the right to branch in Florida and California with financial assistance from the FSLIC. It could not have established bank branches in these states as a New York bank. It was another home run for the FHLBB and FSLIC, which were single-handedly changing the face of banking in the United States. Indeed, the standardized agreements that we developed and the many financial structures and assistance instruments that the FHLBB and the FSLIC used were later adopted by the FDIC. The FHLBB reduced its cost of assistance in failing S&L cases from about 85 percent to 18 percent of the cost of liquidation, making the meager FSLIC fund able to support more assisted acquisitions.

While the deal flow was at a maximum, things were not improving fast enough economically, so the agency needed more tools. It began

using purchase accounting to enable merged thrifts to book the difference between what the acquiring institution paid and the market value of the acquired institution's assets as "goodwill," which could then be amortized and written off over up to a forty-year period.³³ Internally, this was referred to as "two drunks holding each other up." But the agency had no other good options—it was still in the position of having to choose among a set of bad alternatives. With purchase accounting, two or three failing S&Ls could merge and end up with more capital than they began with because of goodwill. With only 20 percent of S&Ls being publicly owned stock companies and 80 percent mutual, the agency knew that it could dictate the accounting that most S&Ls used.³⁴ This allowed the FHLBB to experiment with a host of regulatory accounting principles (RAP) to buy time, or creative regulatory accounting principles (CRAP), as some referred to them.

As rates continued to escalate, the agency promulgated a string of regulations to allow institutions to prop up the values on their balance sheets. In 1991, Professor Carl Felsenfeld of Fordham University School of Law chronicled many of them in a remarkably insightful article.³⁵ For example, the FHLBB authorized S&Ls to amortize gains and losses from the sale of their mortgage portfolios and smooth the violent economic shifts over a longer period. The agency also saw a way to increase balance sheet assets by recognizing the increased market value in certain assets such as real estate held by an S&L. After all, if mark-to-market accounting (MMA) were permissible when assets decreased in value, why not apply it when they increased? Many S&Ls owned their buildings for many years, and the value of those buildings had increased significantly. The FHLBB's Appraised Equity Capital rule authorized S&Ls to record the value of those appreciated assets at market value instead of their historic book value.³⁶

Similarly, the agency permitted S&Ls to sell below-market mortgages and instead of requiring an immediate loss be recognized, amortize the losses over ten years.³⁷ The invention by my general counsel's office of income capital certificates, a precursor to TARP used in the 2008 crisis, allowed the agency to directly increase the capital of failing S&Ls by providing them with a government IOU that only had to be repaid when the S&L had a certain level of income and net worth.³⁸ Income Capital Certificates morphed into Mutual Capital Certificates and finally were later codified into law in the Garn-St Germain Deposi-

tory Institutions Act of 1982 as Net Worth Certificates.³⁹ Given the opposition and animosity of the administration and the Congress, there were no other alternatives to buy time and prevent a larger economic collapse.

As the crisis deepened, capital requirements became a larger problem because most thrifts had no way to meet them as they continued to lose money in the extraordinary interest rate environment that existed. In 1980, the FHLBB had established a 4 percent capital requirement for

S&Ls. It was later reduced to 3 percent because of the rising cost of deposits and the diminishing yield on loans.⁴⁰ While a troubled institution's capital requirement should increase to provide a better cushion against losses, the FHLBB's reduction of its capital requirements was intended to slow the pace of failures. Increasing capital requirements would have satisfied regulatory purists but been economically counterproductive by accelerating the pace of failures, rapidly bleeding the FSLIC of money and stoking public fear and panic. The explanation in the preamble to the rule was pragmatic, stating that the FHLBB's supervisory staff was able to resolve troubled institutions even where their capital levels were below required levels.⁴¹ In other words, why make things worse by having to remind the markets we had more and more inadequately capitalized S&Ls? When combined with the long-standing practice of averaging liabilities upon which capital was computed over a five-year period, the S&Ls that could make it through the crisis had as good a chance as they were ever going to get. All of this was *temporary*.

Friendly Fire

Things deteriorated even faster in 1981 than expected, as the Monetary Control Act's DIDC went to work phasing out Regulation Q.⁴² As deposits flowed out of banks and S&Ls to MMFs, the commercial banks pressured Secretary of the Treasury Donald Regan, who was also the chair of the DIDC, to eliminate Reg. Q as quickly as possible so that they could pay depositors a market rate of interest and stop the continuous outflow of deposits to MMFs. The heads of the banking agencies and the Secretary of the Treasury, who constituted the DIDC, all had a differing set of concerns depending on whether they regulated the

economy, banks, credit unions, or S&Ls. In effect, the segmented style of regulation that had been created pitted them against each other because each type of financial institution had a different financial problem. Chairman Pratt pleaded for money, time, and support for his agenda, including slowing down the DIDC's elimination of Reg. Q. As a result, his relationship with Secretary Regan deteriorated to the point where they did not speak to each other. If Pratt called the secretary, an assistant secretary would usually return the call. The chairman would refer that call to me to return, but my call would be returned by a staff person, which I would refer to one of my staff to return. There was no telling how far down into the bowels of each agency that telephone tag reached and whether anyone actually ever talked to each other. Personal dynamics had a significant role in the handling of the S&L crisis and no matter how many numbers and metrics are analyzed, they will never show up.

In June 1981, the DIDC adopted a schedule for a gradual phase-out of interest ceilings, beginning with longer-term accounts. Within one year, the DIDC had removed a substantial portion of the rate restrictions of Reg. Q, and within two years they were almost eliminated for all intents and purposes.⁴³ The FHLBB sued the DIDC and slowed it down temporarily. But the seeds of the next S&L debacle that would explode at the end of that decade had now been planted; S&Ls were forced to pay interest rates in the vicinity of 10–12 percent, while their mortgage portfolios yielded 3–4 percent less. By March 1982, the average new thirty-year fixed-rate mortgage was being originated at 17 percent, plus two points. S&Ls were forced to operate with a significant negative spread between what they paid depositors and what they earned on their mortgage portfolios. There was no escape hatch to this financial problem.

We had always assumed—naively I would add—that with such a severe economic problem on our hands, we would receive support and resources from Congress and the administration, both of which were in Republican hands until the fall of 1982 when the House went Democratic. We could not have been more incorrect. No one wanted to help. In 1981, we had a continuous set of meetings with the White House, which included Chief of Staff Ed Meese and senior policy advisors Martin Anderson, Edwin Gray, and Shannon Fairbanks. At the OMB, we met with David Stockman, the director, and his lieutenant, Law-

rence Kudlow. We worked with an array of Treasury officials. On the Hill, we met often with Representative Fernand St. Germain (D-RI), Chair of the Housing Banking Committee, Senator Alan Cranston (D-CA), and Senator Jake Garn, chair of the Senate Banking Committee. Jake was a gentleman and one of the most honest legislators with whom I have ever dealt. I recall him telling us how much he appreciated what we were doing, even as he warned that he would have to lambast us publicly. These meetings only served to solidify opposition to what the agency was doing. Everyone wanted the problem to go away and to find someone to blame. They wanted us to stop closing failed institutions and wait for economic conditions to improve. It was an expedient political answer. Pratt refused to accept it because it was a financial gamble at best and economic malfeasance at worst.

The Reagan administration opened a new front against the FHLBB as if we were the enemy. It attempted to use the OMB to ensure that the FHLBB and FSLIC would not have the money to assist in the closure and acquisition of failed S&Ls. This resulted in a less-than-polite battle between the OMB and the FHLBB. Eventually, the OMB did force the FHLBB to reduce its number of examiners significantly. In fact, it went one step further, attempting to use archaic statutes to handcuff the agency financially from closing S&Ls. The Antideficiency Act, enacted in 1884, prohibits federal employees from spending in excess of the amount available to an agency through appropriation or related funds.⁴⁴ Employees who violate the act are subject to administrative and criminal penalties. While the FHLBB and the FSLIC were not appropriated and never outspent their total budget that was based on assessments the agency charged to the S&Ls they regulated, they had spent in excess of the amounts on certain line items of the budget. The line that was most conspicuous was the money spent on FSLIC-assisted transactions to entice acquirers to buy failed S&Ls. That was all the OMB needed. It alleged that it was illegal for the agency to spend more than any single line item, believing that if the agency could not provide financial assistance, no one would acquire them, and the agency would have to stop closing them. I was told that the OMB had filed a criminal referral against Chairman Pratt with the Department of Justice, so I hired outside counsel to represent him. Counsel filed a brief in opposition to the referral, but the referral never went anywhere. My friend Rex Lee, the solicitor general at the time, called me and said that

the adults at the Department of Justice had no intention to charge the chairman of an agency for doing his job and closing failed S&Ls.

At the same time, Treasury Secretary Regan was forming an alliance with other members of the DIDC to secure their votes to get deregulation of interest rates approved as quickly as possible, just as commercial banks wanted. He dispatched his assistant secretary for domestic finance at Treasury, Roger Mehle, to convince the FHLBB that the S&L problem was manageable and would be short-lived, so there was no need to close failing S&Ls. This pressure seemed to stem from the fact that many of the S&Ls in California were run by direct or indirect friends of the president. Ronald Reagan had a “kitchen cabinet” that advised him through his days as governor of California to the presidency of the United States. Several southern California S&L executives were friends of members of the kitchen cabinet or knew the president and Nancy Reagan. They did not want S&Ls to be closed, and that created pressure on us. In early 1982, senior Treasury officials approached me and “suggested” that I issue a legal opinion concluding that the FHLBB had no authority to close an S&L *unless* it was insolvent on a *liquidity* basis—meaning that it could no longer raise money from depositors. The legal precedent was clear and contrary to this theory. The statutory definition of insolvency that both the FSLIC and FDIC had operated under was based on the regulator’s discretion to determine that an institution had zero capital and therefore no shareholder equity. If liquidity were the sole test of insolvency, banks and S&Ls would rarely be closed. Federally insured institutions would remain liquid simply by increasing the rate paid for deposits even though it would force them to lose capital as they incurred losses from paying more for their money than they could earn lending it out. But that was Treasury’s point; they did not want S&Ls closed.

When the agency refused to play along, Treasury raised the stakes and threatened to testify against the FHLBB in a high-profile challenge to its authority to close an S&L in Cleveland. We did not believe it would or could do that until Roger Mehle was deposed in *Telegraph Savings v. Schilling* and later testified that the FSLIC had improperly relied on the book net worth definition of insolvency in closing the S&L. The appeals court backed the FHLBB and held that the book net worth method of evaluating an institution was valid under the law. The

agency's determination that Telegraph was insolvent on the day of its closure was found to be reasonable. The appellate court zeroed in on Mehle's testimony:⁴⁵ "While reasonable people may differ as to which witnesses were more credible, we cannot say that the trial judge's reliance on witnesses other than Mehle was clearly erroneous."⁴⁶ A few years later, Chairman Isaac of the FDIC had his own dispute with the Treasury over whether FDIC funds could and should be used to bail out Continental Bank or its holding company. When Isaac and McNamar agreed to disagree, McNamar asked the Justice Department to issue a legal opinion on whether the FDIC had the authority to infuse capital into the bank's holding company. Isaac was incensed and told McNamar that the FDIC would not follow a legal opinion by the Justice Department.⁴⁷ Treasury played hardball even with other players on the Reagan administration team!

The Problem with the Dual Banking System

The other federal agencies were not the only adversaries that the FHLBB had to confront. State regulators that chartered and oversaw state S&Ls were formidable opponents, creating serious risks for the feds. They tended to be understaffed, underresourced agencies with limited capacity to comprehensively supervise state institutions. They also tended to be slow to close failing institutions and highly attuned to local politics. The more institutions that they supervised, the larger their assessments were and the bigger budget they had. One can see where that leads. State and federal regulators were always competing for institutions, hawking federally chartered S&Ls to convert to a state charter and vice versa. Naturally, the institutions would look for incentives to convert from one charter to the other. The most obvious incentives were greater operating authorities, less stringent oversight, and lower assessment fees.

Several states became accomplished at that game. California, Florida, and Texas allowed their S&Ls to engage in a wide variety of investment activities prohibited for federals, suggesting that their charters provided an easier path to profitability and survival. In 1982, Governor Jerry Brown (his first time around) signed legislation giving state S&Ls the authority to invest in subsidiaries in virtually any business. In 1983, California suspended restrictions on making nonresidential loans.⁴⁸ The

states had much to gain and nothing to lose in this battle. If they attracted new institutions to oversee by offering them greater flexibilities, their budgets and salaries increased. If an institution failed, the state would lose some assessment income, but the FSLIC or FDIC would lose millions merging, liquidating, and disposing of it. Moreover, at that time, only the states could close state-chartered institutions. The FHLBB would have long and acrimonious arguments with the California S&L Commissioner's Office, for example, over its reluctance to close failed S&Ls in California that were piling up millions in losses each day that the FSLIC would ultimately have to cover. It was a frustrating and inefficient kabuki dance that the agency had to engage in to convince some state regulators to act. Inevitably, this ineffective and inefficient system would lead to many of the losses that resulted from the S&L debacle.

The Illusion of Victory

Throughout 1982, the FHLBB worked on a longer-term solution to get new legislation in place to provide S&Ls with the ability to create a balance sheet in which its asset and liability durations and yields could be matched. It was not expected to be a panacea. But it was intended to attract new capital into the industry, particularly through the acquisition of failed S&Ls, and shift the mood of impending doom. The Garn–St. Germain Depository Institutions Act of 1982 (Garn–St. Germain Act) was passed on October 15, 1982.⁴⁹ It was largely drafted by the lawyers on my staff with the guidance of Chairman Pratt and the senior staff at the FHLBB. We all attended its signing in the Rose Garden, a great opportunity for us to meet President Reagan and congressional officials. The Garn–St. Germain Act allowed S&Ls to construct their balance sheets to look more like those of banks by allowing them to offer more consumer, commercial, and real estate development loans, as well as more freely invest in a variety of debt instruments, including junk bonds. The ten-year Treasury yield was then at 10.55 percent and inflation slightly below 4 percent. Things were rapidly moving in the right direction. The Congress had worked in a bipartisan way to produce the legislation. Perhaps this was the beginning of a return to normalcy and profitability?

In March 1983, Pratt departed the agency, wisely saying that he wanted to leave Washington before he started believing his own press releases. His administration left a plan for the next chair built around the reversal of the temporary stopgaps that had been put in place, a steady increase in capital and liquidity requirements as the economy normalized, conversion of the industry from mutual to stock so it could access the capital markets, reevaluation of deposit insurance, and stronger safety and soundness regulation. It also left a prophetic parting message about what we had done, why the fixes should be viewed as temporary, and what needed to be done in the immediate future to avoid further crises from the perspective of insurance of deposits and safe and sound oversight:

In the future, insurance agencies must limit risk through regulations that constrain the activities of insured institutions or through pricing mechanisms that provide proper incentives for risk-taking. If neither option is available, then the insurance agency is exposed to considerable risk.

Although the reregulation of the past few years was a necessary response to marketplace innovations, it has substantially limited the ability of regulatory agencies to constrain the risk-taking of insured institutions. Moreover, this has occurred at a time when there are a number of insured institutions that are operating with impaired capital and have strong incentives to engage in very risky investments. In light of the competitive pressures that the industry will face in the next few years, this deregulation could result in substantial losses.⁵⁰

None of the things that should have happened after Pratt left the FHLBB occurred. Edwin Gray became the next chair of the FHLBB. As rates receded, the economy and the banking industry began to stabilize, providing the FHLBB a great opportunity to change course and create an environment where S&Ls could survive and transform into banks or whatever they were going to have to become. That did not happen. The industry's trade associations lobbied for a return to the way things were. In the mid-1980s, the FHLBB was not converted into a first-rate safety and soundness regulator, nor did it take advantage of the reduction in interest rates to transition the remaining S&Ls to the new competitive environment. To the extent that the FHLBB proposed changes, the Congress blocked legislative reforms opposed by its S&L

benefactors and trade associations. The opportunity to revitalize the S&L industry was missed.⁵¹ Between May 1983, when Pratt departed, and July of 1987, when Gray left the agency, the yield on the three-month T-Bill rate decreased from 8.19 percent to 5.69 percent. That return to “normalcy” was a godsend for the S&L industry.⁵² But the missteps that the government, the industry, and its regulator had taken simply transitioned S&Ls from an interest rate squeeze to an even greater threat in the late 1980s as nonpaying loans and worthless investments began to appear. No one saw the second and much larger crisis coming in 1988.

The Final Phase of the Crisis

As interest rates declined to more normal levels, Gray attacked brokered deposits and the dangers that they created, but at the same time, the FHLBB allowed the S&L industry to use them to attempt to grow out of its problems. Growth records were set between 1983 and 1986, dwarfing that of the commercial banking business.⁵³ In the four years that Ed Gray was chair of the FHLBB, the S&L industry increased in size by 54 percent, while the total number of S&Ls was declining even though the agency approved the chartering of more than 160 new S&Ls.⁵⁴ In that time, about 400 S&Ls converted from mutual to stock form, increasing their access to capital but limiting the ability of the FHLBB to use RAP accounting to address financial problems.⁵⁵ The influx of new cash from these initial public offerings attracted a number of new types of investors hoping to use an S&L to finance real estate and other businesses more cheaply with deposits. The actions taken to address the crisis, when not reversed after the crisis, inadvertently encouraged some aggressive and corrupt people to infiltrate the S&L industry.

Brokered deposits became the bridge to the next S&L explosion in 1988. Brokers acted as agents, bundling hundreds of millions of dollars of individual consumer funds, which they deposited with institutions that paid the highest rates in a way that provided FSLIC and FDIC insurance of each deposit. Thus, \$10 million collected from 250 people could be deposited in a financial institution and each depositor would be fully insured even though the total deposits placed by the broker far exceeded the applicable limitation on deposit insurance for a single individual account. Brokered deposits are “hot money” and are not

“sticky”—they have no loyalty to any institution. They seek out the highest rate, which is often offered by the sickest institution that needs deposits to maintain liquidity. But because the deposits were insured, it did not matter to despositors that the institution might fail. This was by definition the creation of risk that had to be closely monitored and controlled, particularly because failing S&Ls had nothing to lose by throwing a brokered deposit Hail Mary.

This was not how federal deposit insurance was supposed to have worked. Brokered deposits became attractive to both consumers and S&Ls. Consumers could earn the highest rates and enjoy deposit insurance up to the legal limit, while S&Ls that accepted those deposits could grow rapidly to offset and average up the low rates of return that they were earning on their thirty-year, fixed-rate mortgages. A billion-dollar S&L whose mortgage portfolio was earning 8 percent but was paying its depositors 12 percent had a 4 percent negative spread. It was losing money every minute of every day. Its best strategy was to double or triple in size by taking on assets or making loans yielding 16 percent to produce an average portfolio yield on assets of 14 percent so that it would have a positive interest rate spread. Much of the industry did just that, notwithstanding the risks that were being created. With the new powers provided by the Garn–St Germain Act and many of the temporary rules allowing S&Ls to use accounting gymnastics to prop up their balance sheets, brokered deposits provided S&Ls significant funds to invest in a new range of higher-yielding assets that would naturally carry greater risk. Where was the data to send up red flags to regulators about this new risk that was being created? Where were the regulators?

At the same time, Drexel Burnham Lambert’s Michael Milken was marketing high-yield junk bonds throughout the S&L industry as a way of boosting their revenue in the mid-1980s. The issuance and sale of these securities is a story far too complex to recount here, particularly as I later learned in private practice representing institutions in acquisitions and securities offerings brokered by Milken. Suffice it to say that what you saw was not always what was happening. Additionally, commercial real estate development loans in the southwest United States also produced high-yielding assets and significant lead lender fees for starving S&Ls. Consequently, junk bonds and commercial real estate projects became a favored asset to buy with brokered deposits to grow out of the asset liability mismatch that almost every S&L had. It was an

entirely reasonable risk to take if the government allowed it, which it did. But the economy and events once again turned on the S&Ls.

On September 7, 1988, the SEC accused Drexel, Milken, and three other employees of securities laws violations. On December 21, Drexel agreed to plead guilty to six felonies and pay a record \$650 million in fines and restitution to settle what became the biggest securities fraud probe in history. On March 29, 1989, Milken was indicted by a federal grand jury on racketeering and securities fraud charges in a ninety-eight-count indictment. Drexel filed for bankruptcy on February 13, 1990, and the junk bond road to success was obliterated, and with it the value of those bonds on the books of many S&Ls. For good measure, a new law in 1986 upended the favorable tax treatment that commercial real estate projects had enjoyed as collapsing oil prices depressed the economy in oil-centric states such as Texas and Oklahoma. S&Ls now faced a deepening asset quality problem as borrowers began defaulting, causing a massive amount of new failures. The extraordinary amount of money that the FSLIC needed to address this second crisis would dwarf its fund, exposing the fact again that the FSLIC would not be able to handle all the failing institutions this time around.

Danny Wall succeeded Ed Gray as chair of the FHLBB in 1988. He was a terrific person, but he seemed underequipped to deal with the new S&L crisis that was emerging. He had been the staff director for Senator Jake Garn when he was chair of the senate Banking Committee. During Wall's tenure, the FDIC's chair, William Seidman, went to war with him and the FHLBB over what Seidman viewed as lax regulation that was causing the crisis. This interagency squabbling was peculiar and mostly defensive at that point; the damage had already been done and where the blame landed was important only for peoples' legacies inside the Beltway. Seidman did a respectable job of putting a negative spotlight on Wall, even though more banks than S&Ls failed at that time. As real estate development, the energy business, and commercial lending turned sour in a worsening economy, the S&Ls confronted a new and even more devastating financial problem in the late 1980s created by their moving beyond their traditional business of making home loans—increasing defaults from bad loans and investments.

More than 550 S&Ls would fail between 1988 and 1992. These events were all made cosmetically worse by the excesses, fraud, and criminality of several figures such as Charlie Keating who entered the

S&L industry in the 1980s and spent time in prison for their S&L crimes. While their crimes made for lurid financial reading, they did not cause the S&L crisis.

THE JOB LEFT UNDONE

In the years after the S&L industry officially collapsed between 1989 and 1992, the accolades for the Pratt administration's actions eventually turned into criticism for changing accounting standards and lowering capital requirements to allow failed S&Ls to continue to operate. In hindsight, some critics labeled those actions as exacerbating the situation and increasing the losses that eventually would have to be realized. Few historians or economists really understood or pinpointed why this crisis really happened and why the Pratt FHLBB did what it did. That is both a sad and disturbing fact. There never was a good answer to the financial conundrum that Congress and policy makers had put S&Ls and the FHLBB in. The decisions made by Chairman Pratt's board were all made by dedicated, brilliant people who had a limited set of options to work with and many enemies in the administration and on the Hill. Therein lies the story of how government policies and politics create financial crises. It is not visible in the numbers and colorful stories about financial crimes that were recounted. To this day, regulators are often forced by Congress to do their job with one hand tied behind their backs and then blamed for not succeeding. In forty-five years, I never once saw a politician take the blame for a financial error or mistake in judgment. Never once.

Many of us from the Pratt administration who have spoken to each other regularly over the years after the S&L crisis regretted that we had left the agency in 1983. We felt some guilt for what happened later—not because we thought that we had not done as good a job as we could. We all knew that was not the case. It was because we knew that if we had stayed at the FHLBB for several more years and kept doing what we intended to do to complete the job, the S&L explosion in the late 1980s might not have happened, and if it did, it would not have been so severe. My first opportunity to confront those feelings was when President George H. W. Bush's senior advisor, Richard Breedan, called me in early 1989 after the president had been inaugurated. Rich-

ard was working for the president and would later become chair of the SEC. Richard and I were born several weeks apart in 1949, him in Levittown, just twenty-four miles away from Forest Hills, New York, on Long Island where I was born. He came to my law firm's office on Pennsylvania Avenue and explained that he was putting together legislation in reaction to the S&L crisis for the newly elected president to unveil. He laid out a set of new statutory provisions and asked me to review them and provide him comments. In our several meetings, I told Richard that while some of the legislation made sense, it should not try to do too much too quickly. I suggested that the more stringent regulatory environment he envisioned be phased in over a period of ten to fifteen years. Anything shorter, I said, was economic suicide—it would ensure that much of the remaining S&L industry failed and further adversely impact the homebuilding industry and the US economy. Richard knew the president had to be able to say that this problem would “never happen again.” “Never again” he kept repeating in our meetings. I tried to budge him off the point by explaining that it was politics that had caused the problem.

That July, Richard Breedan and the new president got what they wanted when the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) was enacted into law.⁵⁶ The world got a bloated 372-page punitive law that ensured that losses in the S&L crisis would climb even higher as capital requirements would force the seizure of more institutions and their hand-off to the Resolution Trust Corporation (RTC) for their assets to be sold at fire sale prices. FIRREA had established the RTC to replace the FSLIC and liquidate the billions of assets it inherited in the crisis and created a redundant set of agency jurisdictions so that every one of them, including the Department of Justice, could punish anyone responsible for the crisis, including what the law designated as “S&L kingpins.”

Many of the assets of failed institutions that were transferred to the RTC were purchased by private sector companies for pennies on the dollar and sold over the next several years at prices nearing their original value. I know that because I represented some of the Wall Street firms that purchased them. The difference between the purchase price from the RTC and the subsequent disposition price monetized the loss that the government incurred in a crisis that it had largely created. In some cases, assets bought at thirty cents on the dollar from the RTC

were sold at seventy-five cents within a year of two. Bad policy decisions years before had caused the crisis, and fire sale liquidation strategies at the back end locked in the losses.

POSTSCRIPT: THE POLITICS OF HOME LENDING

Chairman Pratt would say that thirty-year fixed-rate mortgages were the neutron bombs of mortgage finance. They could economically obliterate everyone involved, but leave the house standing. When he first said that to me in 1981, I was not sure exactly what it meant. I quickly came to understand it as we worked through the wreckage of the S&L crisis. No financial company in its right mind would generate and hold a portfolio of thirty-year fixed-rate mortgages if it did not have to or the market risk were not fixed. Any executive who thought it prudent to take money from a depositor that could be withdrawn the next day to fund a thirty-year mortgage commitment should not be running a bank. But it was the government that not only thought it was prudent; it mandated that it happen. Let me say it another way. Just because rates today are at 3 percent, why would any lender commit to lend to you a large sum of money for thirty years at 3 percent? Who would make a bet that a 3 percent rate would be a money maker for thirty years? Who can tell the future that well?

Consumers love thirty-year fixed-rate mortgages. Why wouldn't they? They create no interest rate risk for the borrower and force the lender or ultimate investor to assume it as well as the risk of default. What a great deal for consumers. Why wouldn't that system collapse as it has several times? While sound economic policy might frown on thirty-year fixed-rate mortgages, when politics gets involved, the exact opposite happens. And it is likely to keep happening, if not with mortgages, with other financial products that are mispriced and misstructured to favor consumers. The United States is still unique for its high proportion of long-term fixed-rate mortgages with no prepayment penalties.⁵⁷

Part Three

The Pre-Regulation Era: A Century of Panic

BOOM, BUST, PANIC, AND REPEAT

I thought about the S&L crisis for many years after I left government service. Perhaps the mistakes that led to the S&L crisis were not unique and government policies had enabled or caused other financial crises. If so, couldn't it happen again? I also wondered whether there were ways to correct the problem and reduce the incidence, depth, or longevity of future financial crises. To answer these questions, I decided that I must better understand the other financial crises that have occurred in US history, and why they occurred.

The nineteenth century was a dynamic period of economic growth and financial chaos. It was driven by unprecedented geographic expansion and only modest government intervention in the expanding economy. With every step to the west, there was more land to settle, railroad tracks to lay, businesses to start, homes to build, and products to bring to market. In many respects, the nineteenth century was one hundred years of economic disruption and crisis interrupted by intermittent periods of stability and prosperity. There was no real infrastructure to the banking business, and even less oversight. Wide-scale financial panics erupted every twenty years. With at least a three-year run-up and run-off of aberrant financial activity before and after each crisis, more than a third of the century was spent in crisis or spiraling into or out of it. The causes asserted for this century of economic chaos range from politics to sunspots.¹

1819

Just like teenagers, young economies expand in growth spurts. Such was the case described in Murray N. Rothbard's comprehensive critique entitled *The Panic of 1819: Reactions and Policies*.² Several events randomly collided to cause the first depression of the nineteenth century: (1) postwar events, (2) an economic growth explosion, (3) the expansion of state banks to create money and credit to support the economy, (4) confusion and disagreement over the forms of acceptable money, (5) credit blunders by the Bank of the United States (BUS), and (6) the imposition of trade tariffs.

Drivers of the Panic

The Panic of 1819 was caused by the collision of events and actions that would reoccur in different forms throughout every crisis in the century. It was marked by unbridled growth, corporate abuses, overheated markets, monetary confusion, a misidentification of risk, increasing international trade, the imposition of tariffs, and governmental intrusion, all of which undercut confidence in money, banking, and commerce. The government—federal and state—was not responsible for the unbridled economic enthusiasm that led to this crisis. But its failure to establish a stable form of currency that could scale with the economy, moderate the lending habits of the BUS and state banks, and provide a sense of confidence and stability when it was needed only served to enflame the situation, deepening the hole that the economy had dug for itself.

The reestablishment of the BUS was supposed to create a centralized national bank to stabilize monetary and economic growth in the United States. It turned out to do neither as it steered itself into financial distress and became a protagonist in the Panic of 1819. At the same time, states and their legislatures played a particularly destructive role cheerleading for the formation of dozens of new banks to feather what they thought were their own economic nests and finance the economic explosion. That trend of rapidly chartering new banks to issue banknotes and finance local commerce continued through the twentieth century. In that atmosphere of growth, the concept of sound, well-capitalized banks that could weather a financial crisis was low on the list of the states' priorities. Given the rapid growth enabled by poorly regu-

lated banks with flimsy capital and liquidity bases, there should have been no doubt that the bubble would burst.

At the same time, the growth of manufacturing and farming in America and Europe created a complex economic tug-of-war between the exportation of some products and the importation of others. Politicians and policy makers assumed that was something that they could adjust with tariffs and other government controls, not realizing that artificial manipulation of the markets would only distort them and create perverse economic incentives. President Monroe (1817–1825) and his administration thought it best to ignore or camouflage the growing financial problems. Benign neglect as a strategy was used because it could be in a world where communication moved at a snail's pace and accuracy was always in question. The government was an enabler of the crisis, although not the only one. Businesses and investors fueled the frothy economy, and with no stabilizing governmental forces to mitigate or curtail a panic, disaster was inevitable. Like a forest fire, it simply had to burn itself out, something that is not as feasible an option today as it was in a much smaller and simpler economy.

The Panic of 1819 was a good example of how a haphazard, diverse set of economic goals and events that are partially supervised can run amok. While the economy and the surrounding landscape of 1819 is not comparable to the twenty-first century, the events of that era establish principles that are relevant to this day. First, flying economically blind with few working instruments toward a supposed pot of gold at the end of a financial rainbow with no guardrails or safety nets always creates major financial risks. Second, while government action can stabilize a chaotic market, if it isn't going to act prudently and consistently, it should not act at all and further distort markets, adding to the economic distress.

How It Happened

For better or worse, wars are an economic stimulant. The aftermath of the industrial output necessary for the War of 1812 and continuing westward expansion provided a jumping off point for a new wave of economic development, particularly once the naval blockade of US ports by the British ended in 1815. US imports increased twentyfold in each of the next three years, supported by inflation and credit expansion

of the banks. The federal government added to this mixture by extending the time for the payment of import duties. New products were farmed (cotton), new land was settled (westward expansion), manufacturing plants began to spring up (textiles particularly in New England, New York, and Pennsylvania), international trade and finance flourished between New York and London, new industries and investment opportunities emerged (railroads), new sources of precious metals were discovered (gold), and different forms of money (gold, silver, banknotes, etc.) competed for prominence and confidence. While only four cotton factories had been established during 1807, forty-three were launched in 1814, and fifteen more in 1815.³ The war had helped to transform a rural, agrarian economy into one with many new cotton, woolen, and textile manufacturers. All this seemingly good news also described the predicates for the significant financial dislocation that eventually erupted. When it did, politicians pretended that nothing had happened until it was over. In his annual message to Congress in December 1818, President Monroe “hailed the abundant harvest and the flourishing of commerce” in the country, and in 1819 briefly referenced some “currency derangement and depression of manufactures.”⁴ The solutions proposed for the depression were in the nature of personal improvement: people needed to be more industrious and frugal.⁵

This economy needed credit to grow and more banks were thought to be part of the answer. There was an explosion of new state banks issuing banknotes to support an expanding economy.⁶ Between 1811 and 1818, banks in the country increased by about 500 percent,⁷ fueling an economy that was focused on federal construction, speculative real estate development, increasing Treasury balances in western banks, international trade, and turnpike development.⁸ State legislators and regulators wavered between acting as modest overseers to barkers promoting economic growth through the chartering of these new banks. In March 1817, the New York Stock Exchange was established.⁹

The country was ambivalent about money, how it was valued, and whether it was backed by specie—gold or silver. With money tied to the amount of precious metals, there was a natural moderator on economic expansion. Banknotes issued by state banks increased exponentially and redemption in specie was often suspended to deal with shortages of coins and the expanding new economy. Because a banknote was tied to the credibility and locality of its bank issuer, and given the slow trans-

mission of information, varying exchange rates developed for banks' notes depending on the issuer's perceived health and the distance it was to be used from where it had been issued. The farther away the note was from the bank, the harder it was to ascertain the health of the bank in this horse-driven world. Someone accepting a note drawn on a bank 150 miles away in 1819, for example, would have to do some significant detective work to determine if the bank and the note were real and valuable. And then, there was the cost of traveling back to that issuer to redeem the note. All of that resulted in each banknote having a different value. Specie was a stable, uniform currency that could serve as a stabilizing form or value exchange throughout the country, but bags of gold and silver were not easily transportable in large amounts. The more that lending increased, and economic expansion continued, the more the number of banks naturally increased to create money in the form of banknotes and support growth.

States vs. Feds

The first central bank in the country—the BUS—was established in 1791 and had a significant influence on finance in the country and whatever forms of financial uniformity there were until it disappeared in 1811. Before it did, however, it was the subject of one of the most significant Supreme Court decisions in the country's history. In *McCulloch v. Maryland*,¹⁰ the State of Maryland challenged Congress's authority arguing that the power to establish a corporation such as the BUS had never been specified in the Constitution. Chief Justice Marshall's unanimous opinion articulated principles that are the source of controversy to this very day: “[I]f any one proposition could command the universal assent of mankind, we might expect it would be this—that the Government of the Union, though limited in its powers, is supreme within its sphere of action.”¹¹ The Court added that in reserving powers that are necessary and proper for carrying into execution the powers of the government, the Constitution provided a wide and commonsense set of powers to the government to effect what it had the power to do.¹² Additionally, the Court concluded that Maryland did not have the power to tax the BUS because the power to tax could be exercised as a power to destroy.¹³ The Supreme Court laid the groundwork for the creation of a pervasive federal system of overriding regulation of fi-

nance in America. It would be another forty-five years before it would appear in the 1860s.

The Second BUS, authorized by Congress in 1816, opened in January 1817. It redeemed its notes in specie and was not strictly regulated. Its desire to grow and make a profit became a driving force that fueled its expansion.¹⁴ You could compare this natural business instinct to what would exist in any company, but when it is a company established and operated by the government, that natural instinct can be a serious problem. Fast forward to Fannie Mae and Freddie Mac for evidence of that. By 1818, the economy was becoming volatile as a growing trade imbalance and specie shortages increasingly occurred. The BUS found itself under pressure from the drain of specie, payments for imports, and the payment of federal debts such as that which financed the Louisiana Purchase. Tensions overhanging from the war between Europe and the United States led to tariffs being used as an economic tool to protect their respective business interests. They would, however, prove to be a potent and often toxic way of distorting markets, particularly when tariffs increasingly became tools to flex raw political power. Sensing economic trouble, the BUS reversed gears and adopted deflationary strategies as it contracted its credit lines and called in notes from state banks. That was a critical moment. Confidence in the economy was undermined, and businesses began to fail as credit lines disappeared. The fires of the Panic of 1819 began to ignite and there were no firefighters to douse them.¹⁵

The Economy Collapses

The effects of the panic were felt by much of the country outside New England as prices fell, complicating the repayment of debts. When land prices collapsed, buyers argued, with the assistance of President Monroe, that because they had purchased the land when prices were high, they should not have to repay their loans when prices declined.¹⁶ Because the government was on several sides of those transactions as seller and lender, Congress considered various proposals to permit purchasers to give up a prorated part of their land equal to the amount that they were unable to pay. After extensive debates in Congress about the fairness of the proposal, the impact on market discipline and the pros and cons of bailing out consumers, a bill was passed to provide debt relief.¹⁷ The focus then moved to the states, which considered enacting

“stay laws” or “replevin laws” to postpone process against consumers’ property.¹⁸ The mortgage forgiveness programs enacted after the Panic of 2008 were not unlike these efforts to help consumers in 1819. It was not until 1821 that the fog of this depression lifted, and the embers of the fire slowly burned out and cooled.

1837

In less than twenty years, the country was once again on the brink of a financial collapse. The BUS was the closest equivalent of today’s Federal Reserve System. But it was highly controversial, and President Andrew Jackson disliked it immensely for a variety of ideological reasons, forcing it to become a pawn in a game of political chess that erupted into the Panic of 1837.

Drivers of the Panic

The blame for this panic generally moves between the government and reckless markets depending on the source of the analysis.¹⁹ Historians do not seem to doubt, however, the destructive role that President Andrew Jackson played in creating this panic during his two terms as president between 1829 and 1837. He was a one-man economic wrecking crew driven by political ideology and personal conviction. While he was a populist who was often in error, he appeared never to be in doubt. Many of the wounds in the Panic of 1837 appear to have been self-inflicted whether they were corporate excesses, political myopia, or the general ineptitude of the government to make the right decision at the right time. The overwhelming desire that always arises to scapegoat a villain and explain the crisis as an aberrant event is like the psychology that surrounds plane crashes. People take some comfort when such a disaster is caused by pilot error and not a defect in the equipment that they may fly in next. No matter how comforting it may be to ascribe blame, financial panics are usually the result of a collage of intentional, unintentional, and random government, human, and market-driven events colliding in the same place at the same time after years of fermentation. Yet there is almost universal agreement that the role that Andrew Jackson played was pivotal, and not in a positive way. But for

his actions and those of his administration, the Panic of 1837 might not have been as serious or as long.

Consider what would have happened if there were no Treasury Department as we know it, no FDIC, and the Federal Reserve had been shuttered in 2008 as the economy began to be rocked by deteriorating quality of subprime mortgages and a global liquidity crisis. Some would argue that perhaps the crisis might not have been stoked as it was by government policies or been conditioned into relying on its orchestration of money and credit markets. But there clearly would have been no governmental tools to dampen the impact of that crisis and would have been a greater chance of a complete meltdown of the economy as confidence eroded. Jackson's veto of the bill to recharter the BUS eliminated a central source of financial strength precisely at a time when a symbol of financial stability was needed. The resulting transfer of federal revenues and securities portfolios from the BUS to various local "pet banks" across the country transferred specie away from the nation's main commercial centers and made liquidity and credit tighter there. This was worse than simply eliminating the tools to stabilize the economy. The government was an active participant in the creation of the instability in the market by arbitrarily relocating liquidity and capital. Flush with cash, state-chartered banks in the West and South relaxed their underwriting standards to lend that money out. There were no federal regulators to intervene, and whatever state authorities existed would have been reluctant to rain on the economic parade occurring in their states. It would not be the last time in history that state-chartered banks were given free rein by the states, adding fuel to an already large conflagration.

Jackson was not finished impacting the economy. His action in 1836 to require that federal land be purchased with specie was also badly thought through. He had intended to curb speculation in public lands, but he caused real estate and commodity prices to crash because buyers were unable to come up with enough hard specie. Whether economically principled or not, the change and uncertainty created in the markets would curtail commercial growth and undermine public confidence. Jackson's actions set the stage for the unwinding of economic events that then triggered a crisis in confidence. The actions taken by the government created an economic petri dish in which financial distress was able to incubate and grow beyond what might otherwise have

been the case. The absence of a safety net and the disarming sense that what was money today may not be money tomorrow created a short-term investment psychology. Make your fortune now before things change! Whatever confidence there was in the economy could and did vanish at the first sign of trouble. There was little margin for error in this economic pressure cooker.

The government was not alone in fueling this crisis. There were ample private sector coconspirators. Speculative and highly risky commercial activities by land speculators, trade merchants, banks, and other businesses seeking to make a killing in what originally seemed to be a flourishing economic environment took their toll when the psychology of the market began to shift. Some were honest if not aggressive mistakes and some were rank speculation and unfettered risk-taking. Transatlantic economic forces impacted events in ways that were not anticipated. News traveled slowly across the Atlantic and the Bank of England (BOE) tightened credit policies when it thought that the US economy was fraying. As London knocked down the trade house of cards that had been built between itself and New Orleans, inaccurate, fantastical, and biased reporting of events enraged the public and increased the sense of panic. Overheated markets, speculation, and human behavior all played a role, but the government was the prime mover of the Panic of 1837 and the most important element in the destruction of confidence in money and markets.

How It Happened

As artfully described in Jessica Lepler's comprehensive analysis, *The Many Panics of 1837: People, Politics, and the Creation of a Transatlantic Financial Crisis*, the US economy was again expanding in the 1830s, driven by westward expansion, increased production of goods, and increasing trade between Britain and the United States. An explosion of construction accompanied the opening of the West and federal land sales. In the six years leading up to 1837, the federal government sold vast amounts of land. In just two years, nearly 51,000 square miles were sold, approximating the size of England.²⁰ Cotton was the product of this period, with acres under cultivation increasing more than 200 percent in the decade. The growing trade relations between Britain and the United States, which centered on cotton, played a significant role in

the development of this panic. New Orleans became the fastest-growing city in the United States as cotton farming grew. It went from four banks with \$9 million in capital to sixteen banks with \$46 million in capital in the six years ending in 1837.²¹ Prosperity was everywhere; the country's major financial institutions seemed invincible, as they always do before they aren't.²² While government debt decreased, private debt skyrocketed.²³

President Jackson was increasingly out of his depth as the economic velocity increased. He churned the economic stew that was brewing by continuing and deepening the country's currency confusion, enflaming the money wars that complicated the financial landscape. An excellent explanation of this currency confusion and how the courts added to it is set forth in Richard Timberlake's *Constitutional Money: A Review of the Supreme Court's Monetary Decisions*.²⁴ We can see an analogue today with the current confusion being created by the growing presence of various forms of cryptocurrencies. These money wars in the nineteenth century went on, surprisingly enough, for more than eighty years. Although the stability of money is fundamental to the safe operation of any financial system or economy, it proved to be an elusive goal throughout the century. How could the government make the same mistake repeatedly, stoking the fires of five economic meltdowns in the nineteenth century, one almost every twenty years? Well, as we will see, government decisions are not usually driven by economics or financial expertise. Therein lies a fundamental problem when it comes to governments deploying fiscal policies. When they are driven by a mix of politics, ideologies, arrogance, and economic populism, they can combine to create a volatile economic stew that periodically boils over. After President Jackson eliminated the prime lever to stabilize the economy by terminating the BUS, the ingredients of the financial meltdown were in place.

A Financial Frenzy Develops

The Second BUS was reestablished in 1816 after it was allowed to expire in 1811. It was the only truly "national bank" in the country. Its being headquartered in Philadelphia annoyed New York financiers and politicians. Andrew Jackson questioned its constitutionality and criticized its inability to establish a sound currency.²⁵ He disfavored any national debt and wanted to use the revenues from the sale of federal

lands to reduce it. He believed in regulation by the people based on the information that a free press could provide.²⁶ At the time, state-chartered banks were the only other types of banks in existence, so the BUS nationalized local currencies by exchanging them for specie. It also underwrote foreign bills of exchange that were good for specie in London banks (equivalent to personal checks) and supported the growth of transatlantic trade. By the early 1830s, the BUS was the largest company in America.²⁷ There were no federal bank regulators; state regulators were undertooled and ineffective.

As the economy overheated, the BUS overshadowed the states and their banks.²⁸ But in 1832, Jackson vetoed the bill that would have extended the charter of the BUS past 1836.²⁹ The hyperbolic and outrageous political rhetoric we see today was in vogue in the nineteenth century—particularly at times of economic turmoil. Jackson condemned the BUS at the time as an elitist affront to “the humble members of society—the farmers, mechanics, and laborers—who have neither the time nor the means of securing like favors for themselves.”³⁰ Reactions to the Jackson veto of the BUS compare to the hyperbole employed by politicians and the press today. Henry Clay labeled the veto as a vestige of royalty and Jackson a would-be tyrant. Daniel Webster accused the president of trying to set “the poor against the rich.”³¹ Unfortunately, this all sounds familiar.

As to the constitutionality of the BUS, Jackson ignored two important Supreme Court decisions, including *McCulloch v. Maryland*, perhaps because of his disposition toward state banks and against what he viewed as government interference that impedes the rights of the people.³² But the law was not in dispute. In *Gibbons v. Ogden*, the Supreme Court again concluded in 1824 that the power to regulate commerce was exclusively vested in Congress and the federal government.³³ Despite a censure by Congress and allegations that he was exercising the power of a monarch, Jackson transferred the federal surplus in the BUS—approximately \$10 million—to his “pet” state banks. This impacted the public’s confidence in a centralized monetary system,³⁴ and enflamed the war between those who favored centralized and decentralized banking.³⁵ Apart from the war of words over the policies involved, the transfer of federal deposits to the state banks made them flush with cash that they had to put to work to make money. Jackson appeared not to appreciate how such a transfer of wealth and liquidity

could impact financial markets. Indeed, it did help fuel land speculation and reckless bank lending. Between 1830 and 1834, banking capital of the United States increased 70 percent from \$61 million to about \$200 million, and loans jumped 62 percent from \$200 million to \$324 million.³⁶ The increase over the next two years was even more rapid, with banking capital and loans increasing another 25 percent and 40 percent respectively.³⁷ Growth like that often leads to financial problems. It provided a basis for reckless lending by new banks that needed to keep up with the market and competitors. Banks make money by lending. The more funds they have, the more they need to lend. Funds that are not deployed do not earn a return. When there is an abundance of credit, banks may lower credit standards, increasing the chances that bad loans are put on the books. By 1837, the economy began to spiral out of control. Circulating banknotes had a face value of about \$22 million but were reportedly backed by gold and silver reserves of only \$2 million.³⁸

New York City merchant banks financed the majority of US trade at this time.³⁹ Cotton was a driving factor in this growth with the trading financiers known as “cotton factors” anchoring the import and export business centered in New Orleans.⁴⁰ With the creation and expansion of so many banks in the 1830s, it became difficult to differentiate between those that were healthy, prudent, or reckless given the lack of transparency, so all banks were impacted by the growing concerns about them. The term *wildcat* or *free banking* began to be applied to both the many new banks and their banknote currencies that popped up often with no approval or oversight and may or may not have been able to redeem the notes that they issued.⁴¹

London markets increasingly became concerned, limiting the amount of credit provided to the growing number of merchants and exporters in the United States. The gold supply in London began to shrink as specie went to America in return for high-yielding paper. As we will see throughout the panics in the nineteenth and twentieth centuries, this would be a continuing process of deploying financial strategies to return and retain gold, which seemed to mimic a game of maritime ping pong as it was transported back and forth across the Atlantic. The communication delays between New Orleans, New York, and London only exacerbated the situation as markets were growing and changing faster than information about them could be transmitted. The tele-

graph was only being developed in the 1830s and 1840s, while the telephone did not emerge until the mid-1870s. Consider the market differences between information traveling by two-week steamer and instantaneously over the internet. This lack of market transparency and opacity became a growing problem for market confidence as economic concerns grew.

To make it worse, in July 1836, President Jackson's Treasury issued an executive order that required that all public lands be paid for in specie—gold or silver.⁴² This Specie Circular undercut confidence in the “money” that individual banks issued through their own paper currency. Naturally, foreign investors did not want to accept US currency as payment. This financial confusion was further exacerbated by contradictory opinions issued by the courts about what constituted legal tender. In 1830, the Supreme Court decided *Craig v. Missouri*,⁴³ concluding that a loan to three businessmen who immediately defaulted was unconstitutional because the Missouri certificates that they received were intended to be “legal tender,” whether denominated as such or not. Therefore, the notes were “utterly void” under the Constitution and did not need to be repaid. This was certainly a disquieting precedent to have on the books amid all the confusion about what was money, legal tender, and acceptable value. However, it was effectively reversed by the Supreme Court in *Briscoe v. Bank of the Commonwealth of Kentucky* in 1837.⁴⁴ Although the facts were slightly different in that the notes were issued by a loan office in *Craig* and by a bank in *Briscoe*, the Court, agreeing with Briscoe's counsel, the eminent Henry Clay, determined that the notes were not legal tender but part of the “incidental power” of the state sovereign. This Court understood that given that banknotes were routinely issued by state banks, any other decision would threaten commercial banking and the economy generally. This concept of incidental powers has been a frequent subject and issue in bank cases to this day that the courts have expanded.⁴⁵

The Economy Hits the Wall

The economy contracted as concerns increased. The BOE increased interest rates from 3 to 5 percent, pushing rates up at US banks as well.⁴⁶ Tight money decreased the demand for cotton in 1837 by 25 percent.⁴⁷ London's financial concerns and the economic bumps in Britain were having a clear impact on the US economy, and vice versa.

An increasingly negative view of American business in London and the increasing disquiet over the “bank wars” that were occurring in the United States led to a series of actions by the BOE to protect itself.⁴⁸ When the BOE stopped discounting US bills of exchange in 1836, eliminating an important form of payment for goods shipped across the Atlantic, a pillar of the booming economy was removed. Jackson left office praising the US economy, but when Van Buren became president in 1837, economic contraction, uncertainty, and confusion was impacting the economy and monetary system.⁴⁹ Cotton prices were falling, and without a “real-time” mode of communication, rumors ruled the day. Riots began to erupt over increasing prices, fueled by the rhetoric of political groups and activists. As always, it was unclear just whose interests they had at heart. Banks were blamed for a litany of things, including the depreciation of money. Activists demanded a reduction in the prices and that the people be paid in specie. People attacked warehouses and merchants in New York.⁵⁰

In March 1837, the New Orleans cotton factor Herman Briggs and brokerage firm J. L. & S. Joseph & Co. both collapsed.⁵¹ These were triggering events that further destroyed public confidence and ignited a panic. By May, the redemption of banknotes for gold was suspended throughout the country.⁵² Many states stopped paying interest on their debts. Crop failures added to the financial distress as real estate values and stock and commodity prices fell. New York was particularly hard hit, enduring 250 commercial failures and 20,000 newly unemployed.⁵³ President Van Buren was as ineffective as Jackson. He refused to reverse the Specie Circular or even to ask Congress to meet in emergency session.⁵⁴ In May, depositors lined up in front of Dry Dock Bank in New York as it failed, triggering a run on New York City banks. That was followed by the failure of 343 of the country’s 850 banks.⁵⁵ A depression mentality set in that was played out as a fight between debtors and creditors.

The identification of economic scoundrels and financial boogymen responsible for the chaos was as ardent a sport then as it is today. The war between those who wanted bank-issued paper money and hard coinage and those who preferred a central bank grew, taking on moral connotations: “paper money mongers . . . destroy money, morals, law, order, industry and liberty.”⁵⁶ Banks were viewed as evil, and paper money was considered dishonest and not Christian.⁵⁷ On September 5,

President Van Buren offered to postpone the final distribution of the BUS surplus and proposed the establishment of an independent Treasury,⁵⁸ with major cities having subtreasury offices there.⁵⁹ Congress eventually enacted all of this into law, except the independent Treasury. The political parties blamed each other, and the partisan press did little to shine a light on the factors that contributed to these disastrous economic events.⁶⁰

Financial Cooperation and Collaboration

Out of this chaos the benefits of financial cooperation through collaboration first began to be recognized. For example, to deal with bank failures, New York established a Safety Fund System in 1829 to protect the creditors of banks involved in various resolution and protection plans. It was constructed much like a modern-day federal deposit insurance fund operated by the FDIC, pooling money paid in by New York banks, but it only protected creditors of New York banks. This was the beginning of the conceptual evolution that eventually led to the construction of mechanisms such as clearing houses, the Federal Reserve System, and the federal deposit insurance system administered by the FDIC. But they were still many decades away.

The concept of a central bank would continue to be controversial; it was fraught with politics and regional competition. Britain had a centralized banking system in the BOE that could function as a lender of last resort and was able to rescue companies. But that led to a familiar criticism that it created market uncertainty because it selected winners and losers and rewarded the villains who had purportedly caused the crisis, in the eyes of the public driven by a biased press.⁶¹ In addition, the free-banking movement in the United States led to a proliferation of state-chartered banks where it seemed that “every village plot with a house . . . if it had a hollow stump as a vault, was the site of a bank.”⁶² This created even greater opposition to centralized banking, unless of course if it could bail out banks in a crisis. Indeed, notwithstanding their disdain for the BUS and a central banking system, the New York banks and merchants sought financial support from the BUS at that time, even though it had little financial capacity to assist.

By the end of the Panic of 1837, 40 percent of the banks in the country were out of business and half a million Americans were out of work.⁶³ By the mid-1840s, the states that had issued bonds to assist the

banks were going bankrupt themselves. Jackson's misdirected actions and the BOE presence suggested that the country's economic stability and health could benefit from an independent counterbalancing economic force—a central source of confidence and credibility. Congress would not create a national banking system until 1863–1864, or the Federal Reserve until 1913. In hindsight, this was a warning of the vulnerabilities that economies would develop in the modern era.⁶⁴ It was an indication that financial intervention by the government often makes further intervention necessary if it is not finely calibrated and carefully targeted to be effective and not distortive.

1857

The effects of the Panic of 1837 lasted well into the 1840s, when a new economic boom began, marked by the construction of railroads and canals to support westward expansion and the sale and development of land.⁶⁵ It led to the Panic of 1857, which was devastating but short-lived—more like a flash-panic in the parlance of the twenty-first century. Its causes were economically diverse and the prime movers of it vary based on the interpreter of the events. Some blamed New York City banks and an “inexplicable 10-year cycles of financial distress,” while others cited deposit withdrawals by New York country banks, excessive speculation, and the “misapprehension” of financial danger.⁶⁶ Government policies played an important role.

Drivers of the Panic

The blame for this crisis was allocated among (1) the questionable ethics of corporations, (2) the exponential growth of railroads that attracted more than their fair share of investment and operating scandals, (3) the economic system, and (4) personal vices. But no group was more vilified or blamed than bankers.⁶⁷ Money, banking, and finance in America was indeed a confused mess, and federal and state politics and politicians either purposefully or inadvertently enabled or ignored the problem. Once again, the constantly changing forms and value of money and banknotes, the on-again/off-again reliance on gold and silver, the wide-scale chartering of inadequately capitalized state banks to issue ban-

knotes and energize local economies and the use of tariffs to adjust imports and exports were all actions taken by governmental entities that essentially set the table and determined the menu of choices that businesses had to pick from. Government set the rules, established the players, provided the raw material for the crisis, and then threw incendiary words on the financial fire that had erupted, stoking hate of banks and a sense of class warfare to allocate blame away from itself. When the economy frayed at the edges, government was nowhere to be found and could do little to bring stability to the situation.

The Panic of 1857, like the Panics of 1819 and 1837 and those that would follow, was the result of a collision of highly combustible financial, human, and governmental mistakes. The 1850s saw dynamic shifts in the economy, which often collided in ways that dislocated financial trends and undercut confidence. As we will see throughout history, rapid movements of people, money, and credit can dislodge traditional economic habits and foster financial chaos. That happened in the 1850s, driven in part by the discovery of gold, which rapidly increased the movement of people and money westward. Railroads were needed to move people and goods west, resulting in increasing investment in railroad securities. Securities brokers and companies overextended themselves and incurred too much debt in the process of financing this growth. These failures may have been more significant as symbols than for the impact they had on the economy, but as we know, symbols in a crisis are critical to the strength or disintegration of confidence.

Banks were not a principal cause of this crisis, but as receptors of the impact of it, they became both a financial casualty and aggravating factor of it. Credit began to dry up, causing more bankruptcies, particularly of railroads that had banked on rapid westward expansion. The absence of a central currency backed by the government or a central bank that could create a sense of balance and stability were aggravating factors. As the central financial entities in the market, New York City banks were critical to stability but also highly suspect. The suspension of note redemptions from banks—an action meant to protect them—resulted in the demise of many as the inability to get specie for notes caused runs. Runs on city banks, which functioned as the closest thing at that time to a central banking system, only added to the panic. Banks that worked together in a cooperative fashion and coordinated the responses to the events did better and were often able to remain solvent.

Who or what were the prime movers? A post-1837 sense of economic euphoria driven by the gold rush, speculation, and a government-driven westward expansion, coupled with the absence of any stabilizing governmental presence, were the main culprits. Confusing signals from the government about the validity and value of banknotes again worked hand in glove to nurture this panic. While government actions were ineffective both with respect to the events that led to the panic and the handling of it (as some would prefer it to be), they were not the prime movers of this crisis. They were, however, an important enough aggravating factor and enabler. The crisis might not have been as devastating but for the complicit actions and inactions of the government. An effective governmental presence employing a multifaceted strategy could have stabilized events and limited the impact of the crisis. That did not happen.

How It Happened

The pain of the last crisis was still in the minds of the public, and well it should have been. The generation of people that created and lived through the Panic of 1837 were still largely in the workforce. It is understandable that the lessons of a financial crisis may be lost as generations replace each other and governments change. It is harder to imagine how nearly the same generation of workers and government officials can replicate similar mistakes, bouncing the country from one panic into another within twenty years of each other. That, however, is precisely what could be said about the fifteen-year transition from the S&L and banking crises and the Panic of 2008. There are important lessons that derive from the constant and rapid repetition of events that create financial crises that I will take up later.

The immediate triggers of the panic that have been suggested include the sinking of the SS *Central America*, which was bringing a shipment of gold to New York banks, and the failure of the Ohio Life Insurance and Trust Company, which had invested in railroads and land development. The early 1850s saw the money supply being naturally enlarged by the gold discovered and mined in California, which also impacted the westward movement of people and commerce.⁶⁸ The California Gold Rush (1848–1855) began on January 24, 1848, when gold was found by James W. Marshall at Sutter's Mill, Coloma. That event

attracted some three hundred thousand people to California from the rest of the United States and abroad.⁶⁹ The availability of land, gold, and hopes of prosperity fueled westward migration toward those shiny new objects, which in turn created another explosion of railroad stocks. People needed a way to get to the west, which led to feverish construction of tracks across the growing country. The government encouraged that expansion, giving railroads free land, which they used as collateral for their financings. This again led to creative lending schemes such as “railroad farm mortgages.”⁷⁰ They may sound familiar to those who are students of the Panic of 2008 and those who appreciate the role that real estate has played in the creation of financial crises. Railroads offered farmers in the vicinity of tracks that were to be constructed shares of stock in the railroad that they could purchase with loans secured by a mortgage on their farms. The selling point was that dividends on the stock would service their debt. Of course, that storyline changed. When the railroads could not pay dividends, the attraction of this scheme quickly disappeared as stock purchase loans went into default and farms were foreclosed on. US railroads built over 9,500 miles of track from 1853 to 1856, more than doubling track mileage in the nation, bringing the total debt of the US railroads to \$400 million.⁷¹ The economy was once again on the move chasing a new economic space to invest in, build on, and speculate about. It was both a bonanza and a disaster waiting to happen.

Imports had been growing and surpassing exports, which inevitably meant there was a continuous drain of gold and silver from the United States to Europe.⁷² Tariffs again became an important point of debate in the 1850s.⁷³ The supply of money in circulation was negatively impacted by the reduction of gold in US vaults as goods were traded internationally. The food needs of Europe increased due to the Crimean War between 1854 and 1856, covering over the economic distress that was actually developing.⁷⁴ The bubble began to burst when on August 11, 1857, N. H. Wolfe and Company, the oldest flour and grain company in New York City, failed. In the same month, Ohio Life Insurance and Trust Company collapsed. These failures were at least symbolic triggers that shone a spotlight on the overheated economy, the overbuilding of railroads, and reckless land speculation. As normally happens when the tide appears to be turning and confidence disappears, credit availability shrank and the economy contracted. A half

dozen railroads shut down or declared bankruptcy in 1858. As the inter-related parts of the economy began to react to each other, farmers struggled, and banks began to foreclose on recently purchased lands.⁷⁵

Those who had lived through the last crisis were well aware of what they needed to do to protect their interests. What began as a limited stock market panic evolved into a broader economic crisis as investors familiar with what they thought was coming reacted in fear to what they were seeing. Noteholders, depositors, and banks around New York State began to convert their bank debt into specie—the equivalent of a modern-day run on New York City banks. In June 1857, New York City limited the city bank discount rate and the number of notes that could be returned without sufficient notice. Naturally, this latter restriction encouraged people to try to redeem more notes, further draining specie from New York City banks.⁷⁶ Between the end of August and the middle of September in 1857, deposits in city banks dropped by more than 20 percent.⁷⁷ In mid-October, between twenty and thirty thousand “frenzied New Yorkers” filled the streets and bank entrances demanding specie for notes and checks.⁷⁸

The Economy Collapses and Panic Sets In

The stabilizing impact of gold on the pressure to redeem notes at New York banks was highlighted when the SS *Central America* sank off the coast of South Carolina with \$1.5 million worth of gold bullion on board.⁷⁹ As gold reserves in the country fell, securities brokers who had borrowed from eastern banks to finance their trading in railroad securities and western lands liquidated their portfolios. When the banks refused to roll over their loans, many backers were forced to declare bankruptcy.⁸⁰ On September 25, the Bank of Pennsylvania suspended specie payment, creating a run on banks across the nation.⁸¹ Farmers and manufacturers were quickly affected as the demand for their products and ability to ship them was impacted by their inability to find credit to underwrite them. An “epidemic of fear” set in.⁸² Banks around the country joined the New York banks in suspending specie conversion of banknotes and currency.⁸³ The use of note redemption suspensions can defuse the immediate pressure to make all the depositors whole at the same time—something that no bank can ever do. At the same time, it can also destroy confidence in the system when customers cannot see or touch their money. When banks are struggling to maintain their

reserves in the face of a persistent demand for specie, they must contract lending, which ultimately causes an expanding economy to abruptly shrink.⁸⁴

Unemployment in New York City skyrocketed.⁸⁵ The iron, coal, shoe manufacturing, and shipbuilding industries were particularly hard hit.⁸⁶ Unemployment in the Northeast and Midwest increased sharply.⁸⁷ In the end, several hundred banks failed in this crisis.⁸⁸ But there was some good news and some valuable lessons were learned. On October 20, 1857, banks in Charleston agreed to receive each other's notes, the notes of other South Carolina banks, and banks in Augusta and Savannah at par, creating some sense of stability.⁸⁹ Noted economic historians Charles Calomiris and Larry Schweikart astutely observed that southern banks were relatively more stable through the panic in part because of cooperation and coordination between them and merchants with regard to bank suspensions.⁹⁰ Similarly, in New York City, the Clearing House (NYCH, still in existence today) coordinated the behavior of its members during and after the panic.⁹¹ NYCH banks required country banks to resume convertibility and forged an agreement among city banks *not* to request immediate redemption of all interior bank currency. This ultimately increased bank reserves and made withdrawals "more orderly and predictable."⁹² Not surprisingly, the NYCH banks were criticized after the fact for postponing suspension and elevating their own reputations over the health of the markets.⁹³ It seems natural that private companies would be trying to balance their own financial best interests with those of the common good. But the benefits of collaboration and cooperation as tools to address both the financial and psychological aspects of a financial crisis and restore a sense of confidence that the government could not or did not achieve became clear. These are themes that recur throughout history, but more on that when we get to the creation of the Federal Reserve System sixty years later.

By 1859, the economy was stabilizing, and the government acted to "fix" the problem, assuming it understood what the problem was. President James Buchanan was elected in 1856 and served for one term. Like Jackson, he thought that paper money was the root cause of this panic and wanted to withdraw banknotes under twenty dollars, decrease the paper money supply to reduce inflation, pass legislation that would cause the immediate forfeiture of a bank's charter in the event that it suspended specie payments, and require state banks to keep one

dollar in specie for every three issued as paper.⁹⁴ By the time Congress got around to considering his legislation, the problem was a memory and banking systems in the United States had resumed specie payment and redemption once again.⁹⁵ The problems caused by paper money and its uncontrolled expansion of the economy were quickly forgotten.⁹⁶ Three years after financial stability had returned in the United States in 1858, the Civil War began.

Parenthetically, an expedition lead by Captain Tommy Thompson in the late 1980s found the SS *Central America*'s gold more than a mile below the surface. As reported, about \$50 million in gold was retrieved, but investors who helped finance the \$13 million expedition claimed Thompson never paid them. He disappeared along with hundreds of gold coins. He was found two and one-half years later and was jailed for refusing to answer questions about the missing coins. A second salvage effort was launched in 2014. It retrieved some 3,100 gold coins and more than 10,000 silver coins. After years of legal wrangling over ownership of the treasure, the coins were put up for sale.⁹⁷

THE ERA OF FEDERAL REGULATION

Congress passed the National Bank Act of 1863 to create a mechanism to fund the Civil War and establish a system of federally chartered national banks. That created the dual banking system—a largely unique system in the world to this day.¹ The free banking or wildcat era of banking was presumably ended. The act also established a national currency: national banknotes. In 1863, the act was repealed and replaced by the National Banking Act of 1864, which included the establishment of a national bank regulator—the Comptroller of the Currency—and a system of regular bank examinations.

This first federal bank regulator and the new national banknote were intended to create the economic stability that was missing from the state banking systems. Toward that end, Congress became even more aggressive in 1865 when it levied a tax of 2 to 10 percent on state banknotes to eradicate them (and perhaps their state bank issuers). That tax was challenged in 1869 as being confiscatory, effectively eliminating a franchise (the chartering of state banks) that belonged to the states and imposing a tax that should have been apportioned among the states according to population.² The Supreme Court upheld the act and the taxing authority of the US government, notwithstanding the fact that it had duly noted in *McCulloch v. Maryland* when the shoe was on the other foot that the power to tax is indeed the power to destroy. Presumably in this case, the preemptive importance of national commerce was an overriding principle. But for every regulatory action, there is always a corresponding market reaction that all too often the

government has not anticipated. In that regard, state banks began to substitute the issuance of checks to customers instead of banknotes that they could use to pay for goods and services against a deposit they had made in their bank or as the proceeds of a loan made to them.³ This avoided the tax but unintentionally changed finance in America. The era of national bank regulation had begun with high hopes that this new system would prevent future crises.

1873

On September 20, 1873, the New York Stock Exchange closed for the first time, forcing dozens of stock exchange members and thousands of financial houses to disappear. Police in New York broke up a demonstration by unemployed workers in Tompkins Square Park after a permit to march had been suddenly revoked, causing a violent riot.⁴ This was the climax of a growing series of economic events that led to the first “Great Depression.”⁵ It was global in nature and was the product of various interconnected causes: an inflation hangover from the Civil War, another economic boom related to continuing western land rushes and exponential railroad growth, the demonetization of silver, foreign wars, currency confusion, new financial products, corporate corruption, fires, and government ineptitude. Another railroad boom in America occurred between 1868 and 1873. Once again, it was driven by land grants and western movement. The railroad industry built 7,500 miles of track in 1872 alone, becoming the largest employer in the nation.⁶ The collision of all these factors so soon after the Panic of 1857 created an enormous strain on the new banking system, the global economy, and the capabilities of governments.

Drivers of the Panic

Economic lessons are rarely learned in a way that produces long-term preventative fixes. The Panic of 1873 underscores that fact. Businesses and the government should have learned by the 1870s that some self-imposed and government-driven buffers should have been put in place to avoid economic extremes and abuse. Yet once again, western expansion, land rushes, and railroad growth combined to create an overheat-

ed market. This growth required credit and an expanding monetary system that, after the establishment of national banks, had the added feature of competition between the states and the federal government. Investment flowed into railroad stocks, and investment banks once again prospered from financing all construction of the new tracks. Rapid economic expansion fueled by new markets and evolving forms of financing, along with increasing incidents of corporate corruption, misguided government policies, and unanticipated world events was too much for this fragile economy to bear just fifteen years removed from the last financial panic. There were few if any overseers to monitor, regulate, or penalize imprudent or illegal behavior. With the market as the regulator, often payback only came when the market collapsed, and everyone paid the price.

President Grant added uncertainty by attempting to constrict credit. When the Treasury intervened to calm the markets with purchases of bonds, he suspended the program. He wanted to avoid the creation of the moral hazard from the use of government funds to bail out the economy. When Congress wanted to expand the issuance of US notes, Grant vetoed it, undercutting the future of greenbacks. Finally, out of financial expediency, the Treasury decided not to retire greenbacks as they were cashed in, thereby permanently expanding the money supply. All these actions were done flying blind for the most part with little or no analysis or understanding of the economic impacts that they would have. Clutching economic principles and steadfastly avoiding the dangers of moral hazard created by government safety nets is often shortsighted and self-defeating during a financial meltdown.

With the development of checking accounts by state banks, which effectively authorized the creation of money and greater leverage in the system, the economy experienced a bulge in credit availability that impacted monetary strategy and fiscal conservatism. Congress never thought about, nor did any financial regulator consider, evaluate, or cost-benefit the impacts of the new checking account mode of financing America. Market ingenuity made it happen at a time when ballooning credit was as unwelcome as credit restraints. As history demonstrates, the continued absence of deliberative consideration and any real balance or vision leaves the economy in what I call a “let’s-see-if-this-works” mode.

The debate over who the prime movers were in this crisis has never reached a clear conclusion among historians—the number of causal events around the world, while not unique, certainly seems to have complicated the allocation of blame. In any event, the actions and inactions of the government, federal and state, driven by the political instincts of those in power, were clearly a significant contributing factor. A combination of random back-and-forth monetary policies, currency confusion, politics, and failed safety nets allowed the financial panic to deepen, if not facilitate, its development. Again, the question arises as to whether the economy would have been better off if it were left to succeed or fail on its own without the intervention of federal and state authorities, which may have falsely signaled a sense of security that did not exist.

How It Happened

The Panic of 1873 was another eruption of the growth crisis that afflicted the country between 1837 to 1907. It also forewarned, however, how the increasingly global nature and interconnectedness of economies could impact economic stability. This was a truly international depression in which foreign events, wars, and politics unexpectedly played into economic events in the United States.

Continuing Money Wars

The confusion over what constituted money increased during this time. The Legal Tender Act in 1862 and several subsequent acts resulted in the issuance by the federal government of US notes known as *greenbacks* to finance the Civil War. After the war, Confederate money had become nearly worthless as it approached a 9,000-percent inflation rate.⁷ Treasury secretary James McCulloch instituted a policy of greenback retirement, which the Treasury used to its advantage.⁸ When it received payments in the form of greenbacks, the notes would be stored and spent later when government revenue was insufficient if there was a federal surplus in that fiscal year.⁹ Congress supported the elimination of greenbacks in a resolution issued in December of 1865, but just four months later, it changed its mind, realizing that “taking money out of the economy turned out to be much more painful than spending it into the economy.”¹⁰ The Contraction Act followed in 1866, limiting

greenback retirement, and then in 1868, Congress suspended the further retirement of them entirely.¹¹ Ultimately, the Treasury established a gold reserve for the redemption of greenbacks, but never destroyed the greenbacks when they were redeemed. That permanently increased the US money supply by about \$350 million, and no matter the rate of inflation, \$1 of greenbacks was transferable for \$1 in gold coins.¹²

At the same time, state banks refused to accept the obsolescence that the federal government had planned for them by taxing the notes that they issued. They continued to use a creative workaround, taking deposits and making loans that could be accessed through accounts against which the borrower could write checks.¹³ This was another significant change in the development of commerce and payment alternatives. In effect, the credit that these banks created arose out of thin air and formed yet another new money supply and basis for the economy to expand.¹⁴

The multiple personality disorder afflicting the country's currency continued as the Supreme Court decided *Bronson v. Rodes* in 1868,¹⁵ yet another case that cast a shadow over the value of banknotes relative to specie. In that case, the borrower had signed a note with a "gold clause" requiring repayment of principal and interest in gold or silver or, presumably, the gold-standard equivalent of the value of the debt. These clauses protected the value of the debt from the volatile fluctuations created by ambivalence over which of the various forms of currency and money were acceptable or more valuable at that time. The Supreme Court concluded that the repayment of the loan by the borrower in greenbacks that were equivalent to approximately 50 percent of gold value of the note did not satisfy it.

In 1870, the constitutionality of the Legal Tender Acts and the use of greenbacks was considered by the Supreme Court. Its chief justice, the colorful Salmon Chase, had been the secretary of the treasury who underwrote the creation and circulation of greenbacks. In *Hepburn v. Griswold*, the Court considered whether greenbacks were legal tender under Article 1, Section 8 of the Constitution when Hepburn attempted to repay a loan using them when their true value was about 20 percent less than the equivalent of gold.¹⁶ The Constitution authorizes Congress to "coin Money, regulate the value thereof, and of foreign coin, and fix the Standards and Weights and Measures" and "to make all laws which shall be necessary and proper." The Supreme Court concluded that

neither provision could be interpreted to mean that greenbacks were legal tender under the Constitution. Griswold did not have to accept payment in greenbacks from Hepburn. The Court reversed itself, however, just a year later in two companion cases, *Knox v. Lee* and *Parker v. Davis*,¹⁷ ruling that the Legal Tender Acts were constitutional, and greenbacks were eligible instruments that should have been apportioned among the states according to population for debt repayment. Clearly, this to and fro regarding the legal status of the various forms of money and value undercut public confidence and systemic stability. Indeed, the Grant administration was alarmed by the *Hepburn* decision, believing that it threatened to destabilize the monetary system. It was even seen as a political plot to undercut the Republican administration. Congress then passed the Coinage Act of 1873, effectively putting the United States, which mined most of the silver, on the gold standard. This depressed western silver mining interests and increased the cost of borrowing for businesses, particularly farmers.¹⁸

Other unanticipated events impacted confidence in the economy and added to the general economic and political stew that was simmering in the United States. They included the Black Friday panic of 1869, the Franco-Prussian War of 1870–1871, the Chicago fire of 1871 that was pinned on Mrs. O’Leary’s cow, an outbreak of equine influenza in 1872, the overexpansion of the Austrian and German markets, and, for good measure, a spate of corporate corruption cases particularly with regard to overheated railroad stocks.¹⁹ In the face of growing economic and money supply growth, President Ulysses S. Grant was a contrarian. He was an advocate of contracting the money supply, taking actions that would contribute to an increase in interest rates and a shrinkage in available financing. There were increasing signs that the economy was sputtering as rumors of economic problems circulated. The fragility of the markets was demonstrated by the fact that when Charles F. Carleton, a manager of the Union Trust Company who was less than twenty-seven years old, “disappeared” after defaulting on more than \$400,000 gambling on stocks,²⁰ a run ensued that resulted in Union Trust suspending payments and caused an angry crowd to form outside its doors.²¹

Corporate Shenanigans and Excesses

Jay Cooke & Company, an investment bank founded in New York in 1861, never imagined that it would be a trigger of the Panic of 1873. It was rapidly expanding and preparing to finance the construction of the second US transcontinental railroad. It had been one of the select investment banks that Secretary Salmon Chase called on in the 1860s to place US bonds, but it assumed tremendous risks in this assignment, which it saw as a “call of Divine Providence” that Cooke had to accept as a “Christian and a patriot.”²² Cooke shouldered the expense and risks, seemingly establishing an “agent in every village, and a standing advertisement in every newspaper.”²³ When Cooke was unable to sell several millions of dollars in railroad bonds after having made advances to the company, the music stopped playing and there were not enough chairs. Cooke declared bankruptcy on September 18.²⁴ This was followed by failures of other investment houses that had invested based on an expectation of continued appreciation in stock values. In late September, the banking establishment of Henry Clewes & Co. suspended operations, creating wide-scale fear and a loss of confidence.²⁵ In that same month, the New York Stock Market closed when checks were no longer accepted in order to stop the downward spiral and rebuild confidence in the system. Banks, again the receptors of the impact of the crisis rather than the triggers, began to close one after another.

Thus, while men rushed wildly from point to point—first to the First National, retelling something that occurred at the Union Trust, then to the Stock Exchange, bulging with what had occurred at both banks, and back again to the banks to empty a budget of romance as to matters transpiring at the Exchange—the excitement was steadily maintained. Meanwhile the gale had become a hurricane; the palatial offices of New York’s magnates were swarming with check holders and check makers, whilst a few hovered between leaving their money where it was or at once trying to gain possession of it.²⁶

Some bankers again collaborated to pool resources and issued loan certificates to support the cooperating banks.²⁷ Unregulated corporate greed and excess played a role in fanning the flames of this crisis. For example, Congress chartered the Union Pacific Railroad, whose board members set up a shell company that overbilled the railroad, allowing them to pocket the difference. This and other “stock watering”²⁸ scan-

dals such as the Erie Railroad stock scandal that defrauded Cornelius Vanderbilt were typical at this time.²⁹ Fifty-five railroads failed by November, and another sixty went bankrupt within a year. The country's bankers and financiers met with government officials asking the Treasury to use \$44 million of reserves to stop the panic. It was proposed to the president and secretary of the treasury that the Treasury deposit \$25 million in select New York City banks, with all other banks agreeing to be responsible for repayment. While this approach seemed to be of doubtful legality, it was viewed as necessary. Compare that to the Federal Reserve's decision discussed later to lend to Bear Sterns, AIG, etc., but not Lehman Brothers in 2008 based on a dubious legal conclusion.³⁰ In any event, the president would not go along unless "capitalists" in the city agreed to deposit \$10,000,000 in these banks.³¹ A number of political representatives drafted a proposal in the form of a letter to President Grant saying that "the people warranted you in this stretch of power by a re-election unparalleled in the history of the country." Secretary Morton said that he would stretch his authority "if he had any legal precedent," noting that "the Government was not a trust company or a loan institution."³² The program was rejected and Grant terminated other programs involving Treasury money, believing that it would create a moral hazard.³³

What began as a stock panic turned into a broader financial problem; the government stood by as credit constricted and eventually farmers were impacted despite their bumper crops.³⁴ The government announced that it would not make interest payments on its bonds and then canceled a Treasury gold sale.³⁵ The riot in Tompkins Square Park punctuated the crisis on January 13, 1874.³⁶ Unemployment during this panic hit 14 percent.³⁷ Later that year, Congress voted to expand the issue of US notes, but Grant vetoed it, leading to the Specie Payment Resumption Act, which authorized the unlimited redemption of notes in gold coin.³⁸ Several hundred commercial banks closed, punctuating the worst depression that the world had known to that point. Another national depression had arrived that would stretch around the globe. Across the United States, 18,000 businesses had failed by 1878.³⁹ More than seventy stock exchange members and thousands of "financial houses" collapsed; while the interest on railroad bonds went unpaid, railroad construction was severely reduced. The depression was essentially left to burn itself out as businesses and individuals picked up the

pieces and started over again. Out of these ashes came Chase National Bank, which was chartered in 1877.⁴⁰

1893

Joseph Coxe, an Ohio businessman, led the country's first march on Washington in May of 1894 to lobby for a \$500 million stimulus "good roads bill" to be funded with a new issuance of federal greenbacks. "Coxey's Army" of protesters arrived in Washington after leaving Ohio several weeks before for what was to be a peaceful march to convince the federal government to take action to address the country's serious financial issues. The march's leaders were arrested for walking on the grass of the Capitol grounds and spent twenty days in jail. The bill to fund public works programs died.⁴¹

Drivers of the Panic

As bizarre and self-destructive as it may seem, a century-long struggle over currency and specie, along with reckless economic expansion westward by railroads and the creation of hundreds of new banks creating money to keep the system pumped up, were again fundamental factors in the Panic of 1893. Notwithstanding the creation of national banks thirty years before to stabilize and federalize the national currency, financial instability was still created by government indecision and lack of leadership and direction of the most basic of monetary and banking issues. These money wars and waffling by the government were increased by efforts to maintain parity between gold and silver, which was a direct reflection of the pressure exerted on the monetary system by the economy and political ideology.⁴² Politics driven by currency schizophrenia were undercutting the stability of the US economy yet again. The government was not alone in continuing to be tone deaf to economic reality. The private sector continued to be driven by the lure of money emanating from westward expansion. The building and infrastructure that would be needed to support it was the 1800s equivalent of the 1990s internet explosion, and it was just as fickle in terms of who it rewarded. Everything from drought to railroad construction specula-

tion added to a spectacular collapse in the economy when things slowed and credit availability began to shrink.

Could this crisis have been averted? Probably not, but better government policies on currency could have created a more stable base for the economy when it ran into trouble. Continuing money wars on top of the natural economic stress that had been in some ways self-inflicted on industries and investors was a serious aggravating factor—perhaps a prime mover of the panic. After all these financial crises, one would think that policy makers and politicians would begin thinking about creating a more reliable and consistent system of buffers and stability.

How It Happened

The events that led to Coxe's march were all too familiar. America was still engaged in money wars and the economy was still largely supported by westward expansion, which in turn drove and was driven by railroad construction. Along with overbuilding of railroads and overheated speculation in railroad stocks—yet again—new mines were opened as settlers pushed further west. Aligned with the growth of railroads across the country, profits in the iron and steel industries were unprecedented.⁴³ Total annual imports increased about 38 percent between 1885 and 1890, with huge amounts of unregulated equity and debt securities issued in that period.⁴⁴ As imports grew, so too did the revenues of the government from customs duties. The railroad industry grew, increasing its total indebtedness by two and one-half billion dollars,⁴⁵ and there were record amounts of debt-financed federal land sales in the period leading up to the crisis.⁴⁶ As the economy heated up, Midwest farmers suffered a series of droughts that left them short of cash to pay their debts. That drove down the value of their land and created inflation, causing the interior of the country to suffer severe economic pains. This fueled a desire in the heartland to turn to the government and hence the march on Washington by Coxe. The Panic of 1893 became a serious economic depression that some suggest was comparable if not a continuation of the previous one that began just twenty years before.⁴⁷ This time, however, it was the interior of the country that suffered the most, rather than New York City.

Gold vs. Silver

In 1873, the US Mint had been closed to the coinage of silver, favoring the gold standard. Democrats came up with a workaround to address the interests of western silver mining businesses to continue the minting of silver on a limited basis without repealing the Coin Act of 1873. Congress enacted the Bland-Allison Act in 1878 over the veto of President Hayes (1877–1881), directing the Treasury to purchase in its discretion \$2 to \$4 million a month of silver with yet another new form of paper money—“silver certificates.”⁴⁸ The money supply was effectively expanded when these certificates were exchanged for the new silver dollar.⁴⁹ When the Treasury redeemed silver certificates, it chose to do so in gold because as nations moved to the gold standard, the declining value of silver made it difficult to establish an exchange ratio between the two metals. Congress then enacted the Sherman Silver Purchase Act of 1890, requiring the Treasury to purchase 4.5 million ounces of silver per month, instead of the \$2–\$4 million required by Bland-Allison. This new supply of currency in the United States raised prices relative to other countries and reduced the international value of the dollar, encouraging foreigners to redeem fixed dollar claims in gold and increase the gold outflow.⁵⁰ When the economy started to look a bit shaky, people converted their holdings into gold, creating a gold shortage at the Treasury. In yet another flip-flop of monetary policy, Congress repealed the Sherman Silver Purchase Act in 1893.⁵¹ These dizzying and contradictory policy decisions, largely driven by politics, were hardly conducive to economic stability.

Trading partners in Europe refused to accept securities in place of gold when British investments in Argentina soured in 1890. The fear of an economic collapse caused foreign investors to sell American stocks to obtain American funds backed by gold.⁵² Reserve limits were reached, and a suspension of convertibility into gold was initiated on August 3, 1893.⁵³ Inflation followed, and the signs of economic weakness were reflected in the bankruptcy of the Philadelphia and Reading Railroad in early 1893. It was followed by the collapses of four other major railroads as banks pulled in credit lines shrinking the money supply. In 1892, there were nearly 7,500 banks in the country, almost equally divided between state and national banks.⁵⁴ More than 500 financial institutions failed by the end of the 1893, including 158 national banks, 172 state

banks, 177 private banks, 47 savings banks, 13 loan and trust companies, and 16 mortgage companies.⁵⁵

Corporate Collapses

The company with the most actively traded stock at the time, the National Cordage Company, went into receivership as a result of its bankers calling their loans in response to rumors regarding its financial condition. This had a definite impact on the increasingly pessimistic mood of the nation. As the demand for silver and silver notes fell, the price and value of silver dropped, and holders worried about a loss of face value of bonds. Pig-iron and coal production, raw cotton consumption, and merchandise imports were all impacted by the depression.⁵⁶ Mercantile and industrial failures in 1892 and 1893 reached more than 25,000.⁵⁷ In 1894, the Pullman Strike amplified the sense of economic panic. The Pullman Car Company in Pullman, Illinois, was an industrial version of indentured servitude. Salaries of workers did not cover their living expenses at the factory. When the workers went on strike and members of the American Railway Union (ARU) refused to work on trains manufactured by Pullman,⁵⁸ the strike was broken when President Grover Cleveland classified the ARU as a conspiracy in restraint of trade under the Sherman Antitrust Act. It had never been anticipated that the act would be used against unions instead of the corporations that employed them. This new round of class warfare in turn put politicians in full battle mode, bringing out their very worst traits and instincts, decrying that “from the same prolific womb of governmental injustice, we breed the two great classes—tramps and millionaires.”⁵⁹

Between 1892 and 1894, unemployment rose from 3 percent to 18 percent depending on the source you chose to rely upon.⁶⁰ In Michigan, unemployment reached an astounding 43 percent.⁶¹ High unemployment and the loss of savings kept in failed banks crippled the middle class. Many walked away from recently built homes just as in 2008–2010. Unemployment did not come down to 5 percent until 1900.⁶² The government did little if anything to ameliorate the crisis. The new century was greeted with the hope that the many financial crises were something that would remain in the young country’s past. They would not be.

6

TROUBLOUS TIMES

1907

On Thursday, October 24, 1907, J. Pierpont Morgan sat in his locked office with the presidents of the largest banks in New York. He would not let them leave until they had pledged \$25 million to rescue the New York Stock Exchange. It took him twelve minutes to get those commitments. Financial chaos had been averted that day. But it would not wander far from his office over the next many weeks. He would have to lock his door and pressure executives several more times that year to save his city and his competitors. Not the secretary of the treasury, not other bankers, not good luck, and not the president of the United States could stop the collapse of the economy. Pierpont could and did.

The Panic of 1907 largely played out over a several-week period starting in mid-October. The New York Stock Exchange fell almost 50 percent from its peak the previous year, causing uncontrollable panic in the markets and runs on banks and the newest financial high-flyers, trust companies. Economic disaster eventually spread throughout the nation as state and national banks and businesses failed. There was a random collage of events that caused markets to collapse and confidence to disappear. Most notably was the happenstantial collaborations of Charles Tracy Barney, F. Augustus Heinze, and Charles Morse, which created a financial firestorm that could not have been anticipated. The reputations of the Heinze brothers and Charles Morse were destroyed by the unwinding of their financial escapades. Their banker,

Charles T. Barney, saw his efforts to convince J. Pierpont Morgan to rescue his beloved Knickerbocker Trust Company completely rebuffed. On the morning of November 14, 1907, Barney turned his revolver on himself. His death further enflamed the growing financial crisis.¹ He had prophetically said, “these are troublous times.”²

Drivers of the Panic

The combination of an expanding economy, reckless stock market investments, concentrations of corporate power, the emergence of trust companies, slow and imperfect communication, and the lack of a central source of strength were among the factors that combined to create the perfect storm in 1907. Scott Nations diagnosed the causes in his book, *The History of the United States in Five Crashes*, as the proliferation of trust companies fueled by new, poorly understood, unregulated financial engines that introduced leverage into the system that was already unstable.³ As the markets unwound, the pace of acceleration increased simply because as always, the demand for liquidity outpaced the ability of the system to respond, translating concern into fear and fear into panic.

The situation was aggravated by the fact that many high-profile financial titans had intertwined financial relationships that were impacted when their reputations in one business were sullied and called into question. The state of communication and media were such that information could not move quickly or accurately enough to quell the storm and stay out in front of rumors. There was no central financial source of regulation or strength that could quickly and effectively police or rescue institutions and systems as they began to topple. The clearing houses played an important role and suggested the potential importance that a central bank or strong Treasury could have. But the manipulation and escalation of stock and money rates, increasing investment in illiquid real estate, speculative loans being made by trust companies, sales in railroad securities, Congress’s capping of railroad rates, continuing money wars driven by imports and exports of gold, the California earthquake, and the government’s investigation of life insurance and other companies all played a role in fanning the flames of financial disaster.⁴ As in most crises, the further one analyzes why things happen,

the more one finds answers that inevitably indict the devastating impact of the politicization of money.

The Panic of 1907 was a perfect combination of problems that eventually stripped away any veneer of confidence in the system. There were limited tools or people to rebuild that confidence as the psychology of the moment took over. Pierpont Morgan did what he could.

How It Happened

The Panic of 1907 involved the complicated relationships of several powerful men and a slow-witted economic response by the government. Teddy Roosevelt ascended from governor of New York to vice president of the United States in 1899 when President McKinley (1897–1901) selected him as his running mate to replace the sitting vice president, who had died. In September 1901, Roosevelt became president (1901–1909) when McKinley was assassinated. At the time that McKinley was shot, Roosevelt was hunting in the Adirondacks. The Dow Jones Industrial Average dropped 10 percent over that week, so Roosevelt assured the country that he would continue McKinley's policies for “peace and prosperity and the honor of our beloved country.”⁵

Industry in the United States had matured, and large business combinations were beginning to take place at an increasing pace, supporting the stereotype of big, bad business. In return, the government became more intrusive, launching investigations for both the right reasons and political benefit.⁶ There is always a fine line between the government's efforts to protect consumers, maintain safe and sound institutions, and unnecessarily intervene for purely political purposes. The economy had expanded between 1896 and 1900, with the Dow Jones Industrial Average (Dow) surging nearly 75 percent. In the decade leading up to 1906, annual growth was about 73 percent, doubling the size of industrial production in the country.⁷ The United States was without any central bank, so the money supply in New York City fluctuated with the country's seasonal agricultural and industrial cycles, along with the gold supply. The new economic boom created an enormous demand for capital, a task that financiers in New York and London would be happy to undertake. Gold inflows into the United States spiked sharply upward to \$165 million.⁸ From its January 1906 high of 103, the Dow would

begin to correct as events unfolded that impacted the financial and psychological stability of the nation.⁹

Roosevelt Takes on Business

In January 1882, Samuel C. T. Dodd, Standard Oil's general solicitor, conceived of the corporate trust to help John D. Rockefeller consolidate his control over the many acquisitions of. In these trust agreements, the individual shareholders of many separate corporations agreed to convey their shares to the parent trust.¹⁰ Standard Oil ended up owning fourteen corporations and also exercised majority control over twenty-six others; nine individuals acted as the trust's board of trustees.¹¹ By 1904, there were 318 corporate trusts in the steel, copper, and crude oil businesses, among others.¹² Between 1894 and 1904, business consolidations combined 1,800 companies into just 93.¹³ This was the new economic frontier from which a new crisis would emerge, using corporate acquisitions and the resulting economic power instead of land rushes and railroad growth. Trust companies became another shiny new investment contraption of the early twentieth century.

Roosevelt considered the excesses of capitalism to be a direct threat to it and the wealth that it created. He sought to save the system from itself, but in relying on his political instincts, overreacted. He decided that the government should regulate all corporations because they were the heart and soul of American productivity. In 1903, his attorney general successfully blocked the merger of Knox Sugar and Northern Securities, a company that relied on the brains and money of J. Pierpont Morgan. Pierpont was angered by Roosevelt's intervention, but the government campaign against trusts became clear, with each next step driving the stock market lower. By December of 1903, the market had lost 25 percent of its value after the Northern Securities decision.¹⁴

On April 18, 1906, a massive earthquake crippled San Francisco as the Dow hit 100 for the first time early that year. The city that was central to western commerce in the country reported damage in the \$350 to \$500 million range (\$10 to \$15 billion in 2020), or 1.2 to 1.7 percent of the US gross national product.¹⁵ The stock market declined as the value of insurance companies and railroads declined. Capital moved from New York to San Francisco to aid in the reconstruction. At the same time, the BOE raised interest rates from 3.5 percent to 4.0 percent. In July 1906, Congress added to the confusion by passing the

Hepburn Act, which authorized the Interstate Commerce Commission to cap railroad rates. This naturally caused the value of railroad securities to decrease. The Dow would hit a low of 56 in November 1907,¹⁶ causing a massive shift of gold from London to the United States.¹⁷

On June 22, 1906, President Roosevelt had announced that Standard Oil was under investigation, launching a war with John D. Rockefeller. In April 1907, Standard Oil was found guilty of 1,463 separate counts of violating the Elkins Act for accepting secret rebates on oil shipments.¹⁸ Faltering railroads, securities brokers, copper, trust banks, and the absence of any stabilizing government presence would all play a role in what became the early-twentieth-century version of a stock market flash crash without the aid of modern-day computer program trading.

The Collision of Copper and Banking

Historians seem to agree that a trigger of the panic was the ill-fated attempt by F. Augustus Heinze and Charles W. Morse to corner the market in copper mining stock. The fate of the Knickerbocker Trust Company was effectively sealed by Charles T. Barney's relationship to Augustus and Otto Heinze. The Knickerbocker was one of the one thousand trust companies operating at the time. Trust companies were state-chartered savings banks for the wealthy possessing private bank investment authorities. They took deposits, made loans, played a role in railroad reorganizations, acted as trustees, and functioned as underwriters, distributors, and depositories for securities. Weakly regulated, they were perfectly situated to underwrite the risky and speculative investments that were occurring in the expanding economy. Trust companies were also commonly used as registrars and transfer agents,¹⁹ and they often paid higher deposit rates than commercial banks or savings banks.²⁰ Between 1897 and 1907, their assets grew by 244 percent, while national bank assets grew by only 97 percent.²¹ Their CEOs were rock stars in New York's financial and social circles. They were not required to hold reserves against deposits until it was too late. In 1906, New York imposed a 15 percent reserve requirement, only one-third of which had to be held in cash. What could go wrong?

Fritz Augustus Heinze, a copper-mining magnate born in Brooklyn, formed the Montana Ore Purchasing Company (MOPC) in Butte, Montana in 1891.²² Heinz was litigious and often tried to lock up his

competitors in continuous lawsuits to distract them from the business of mining. One of those competitors was John D. Rockefeller's Standard Oil Company. It had formed the Amalgamated Copper Company, which after much litigation with Heinze bought MOPC for \$12 million.²³ Heinze used this money to become a banker, linking up with Charles Morse, who controlled the National Bank of North America and New Amsterdam National Bank. Morse had a questionable reputation, having been involved in some "disreputable" matters.²⁴ Nevertheless, in 1907, Heinze transformed himself from a mining to a banking executive when he bought the Mercantile National Bank in New York and became its president. He and Morse became directors of multiple state and national banks, as well as a half dozen trust companies and four insurance companies. Heinze eventually consolidated his real estate holdings in the United Copper Company, which was controlled by his two brothers, Otto and Arthur, and purchased a seat on the New York Stock Exchange.²⁵ Heinze acquired companies by using the stock he held as collateral for the loans to buy successive ones, making it critical that the prices of each company, particularly his principal company, United Copper, remain high.

In a world where branch banking was not allowed, investors used a practice known as "chain banking" to create a network of connected banks. Chain banking refers to situations where a person takes an investment interest or an executive or board position in a number of banks, thus creating interlocking ownership or management relationships between them. This chain of banking relationships creates special risks in time of financial duress because the failure of one could lead to or facilitate the failure of all of them because of the intertwined financial dealings and reputations of their directors and officers. In the early 1980s, the collapse of the Butcher bank empire—consisting of ownership and management interests by the two brothers from Tennessee in twenty-seven banks with \$3 billion in assets—was an example of how the control of banks by a small cadre of individuals could keep assets and liabilities in perpetual motion among many related banks, making it difficult for depositors, shareholders, and regulators to determine the health of the intertwined banks at any given time. It would also inevitably cause the related banks to be toppled when just one failed.²⁶ Congress and regulators would eventually address this practice.

In the industrial markets, copper was becoming king. Electricity made copper a valuable commodity as companies competed to string wire to illuminate every industrialized nation of the world in the early twentieth century.²⁷ Otto Heinze, Augustus's brother, was a financial player in his own right. He had decided that with more shares of United Copper trading than existed, many were being shorted, allowing him to raise the price and then call in the borrowed shares if he could purchase enough shares. Copper prices had spiked in 1888, 1899, and 1906–1907.²⁸ Augustus did not want to risk his position as president of Mercantile National, which was having its own financial issues, so he declined to finance this scheme,²⁹ as did Charles Barney's Knickerbocker Trust Company, which had financed previous Morse deals. Otto proceeded purchasing shares of United Copper anyway. When the shares rose in one day from \$39 to \$52 per share, on October 15, 1907, he issued a call for short sellers to return the borrowed stock.³⁰ The price continued to increase, but as short sellers were able to cover their positions and trading in the stock became chaotic, the price dropped fifty points in three days. Otto's brokerage house, Gross & Kleeberg, went into bankruptcy. Augustus's State Savings Bank of Butte, Montana, which had held United Copper stock as collateral against some of its lending, announced its insolvency. Mercantile forced his resignation from the bank, and as news spread, depositors rushed to withdraw money from it and other banks that the Heinzes and Charles Morse were associated with. Depositor runs occurred at the National Bank of North America and New Amsterdam National. The New York Clearinghouse forced Morse and Heinze to resign all their banking interests in return for its assistance. The air was coming out of the economy.

Knickerbocker Trust Company was the third largest trust company in New York City with \$65 million in deposits (\$1.9 billion in 2020 dollars).³¹ Because of the association between Charles Barney, Charles W. Morse, and F. Augustus Heinze, Knickerbocker depositors began pulling their deposits. On October 21, Barney went to see Pierpont Morgan in his library in Manhattan to seek assistance to save his company. Pierpont refused Barney an audience. The same day, Barney's board of directors asked him to resign. Other institutions refused to act as clearing houses for the Knickerbocker and eight million dollars in deposits were withdrawn in less than three hours, forcing it to suspend operations.³² By the afternoon of October 21, loan interest rates in New

York increased to as high as 70 percent.³³ Barney and the Knickerbocker were destroyed by the crisis in confidence created by their association and the company's loans to the Heinzes and Morse and companies associated with them. When Charles Barney shot himself on November 14, the news spread, and so too did the panic. Public confidence was eroding rapidly. The Dow moved toward its low of 56 as a parade of bank failures in New York proceeded.³⁴

Bankers and Politicians Act

Where was the president and the government when all this was happening? To the extent he was visible in the crisis, President Roosevelt's words were often counterproductive. During much of the crisis, he was largely absent, periodically hunting in Louisiana. Roosevelt declared that politics had not caused the crisis, saying of stock speculators: "That man is doing all that he can to bring down in ruin the fabric of our institutions, and it is our business to set our faces like flint against his wrongdoing, to war to undo that wrongdoing in the interest of the people as a whole, and primarily in the interests of the honest man of means."³⁵

This hardly was helpful rhetoric but would turn out to be a frequent refrain in the history of financial crises. And of course, the press noticed the theme as it always does. Secretary of the Treasury George B. Cortelyou finally convinced President Roosevelt to be more conciliatory. On Tuesday, October 22, 1907, J. Pierpont Morgan summoned Secretary Cortelyou to New York for meetings as banks around the country were withdrawing reserves from New York City banks.³⁶ He and the New York bankers met until 2:00 a.m. that morning to secure the secretary's commitment to deposit government funds in New York banks. Pierpont was the most effective, and perhaps only, stabilizing force in the storm. For all intents and purposes, he was the US government. The panic might have deepened if not for his decisive leadership, ideas, money, and force of will. On October 24, the president issued a congratulatory letter to Secretary Cortelyou and the "conservative and substantial businessmen who in the crisis have acted with such wisdom and public spirit" after only recently criticizing Pierpont and others as "malefactors of great wealth."³⁷ This about-face was as transparent as it was ineffective.

Without a central bank, there was no one to manage the economy, the banks, or the inelastic money supply that was still tied to gold. As the panic spread and the number of bank failures increased, the role of clearing houses serving as lenders of last resort by pooling the resources of the member banks and issuing clearing house certificates became quite important.³⁸ The NYCH was called into action in the Panic of 1907. Its actions and its allocation of emergency loans to its member banks kept the banking panic in New York from becoming far more severe. In their well-researched book, *Fighting Financial Crises*, Gary Gorton and Ellis Tallman chart the impact of gold inflows, reserves, and NYCH certificates outstanding to demonstrate the positive impact of the NYCH.³⁹ But no government entity was up to the task of providing that sense of stability or system liquidity. Someone had to step up.

At the end of October, the BOE raised its discount rate from 4.5 to 5.5 percent, attempting to restrain the flow of gold to the United States. By November 4, it raised the rate to 7 percent, the highest since 1873. Central banks in France and Germany followed suit.⁴⁰ As the crisis deepened, Pierpont went into high gear, engineering infusions of cash into a variety of companies and the New York Stock Exchange by the sheer force of his will. That and a few locked doors that blocked the exit of banking and other executives from his office until his goals were achieved were his most effective tools. Being summoned to his office was a signal that one should bring one's checkbook. He encouraged bankers to step up and have their banks fund trust companies; he even got the recalcitrant trust company executives to create a syndicate to help each other much like an ad hoc clearing house. He twice convinced New York bankers to fund the brokers on the New York Stock Exchange to prevent the growing panic from evolving into hysteria. He engineered the rescue of New York City through J. P. Morgan & Co. when it could not sell bonds, drafting on the spot during a meeting in his office a "perfect" term sheet that would allow the city to issue up to \$50 million in bonds and borrow another \$30 million from banks.⁴¹

In November 1907, Pierpont arranged the rescue of the brokerage house, Moore & Schley, by persuading United States Steel Corporation to accept his plan to acquire the Tennessee Coal, Iron & Railroad Company, which had significant financial and antitrust repercussions that would need the approval of President Roosevelt. In a letter to Attorney General Charles Joseph Bonaparte, the president said, "this

has been urged . . . by a combination of the most responsible bankers in New York who are now thus engaged in endeavoring to save the situation.”⁴² Roosevelt became energized long enough to approve the transaction, proving that Pierpont was the one unifying force in the country and perhaps in the world that could bring together all the various government, commercial, industrial, and banking interests to forge constructive solutions. He had been more effective, more decisive, and quicker in his actions than any government authority ever could be or has been in a financial crisis.

While Pierpont staved off collapse of the banks in New York City, and even the city itself, the effects of the panic moved across the country. Banks suspended withdrawals, which in turn required the local clearinghouses to issue loan certificates that were used as cash. In the peak of the panic, \$250 million (\$7.5 billion in 2020) in clearing house certificates had been issued, which was equal to 14 percent of the currency in circulation.⁴³ The continuing money wars over currency and specie were an aggravating factor that should have been resolved by that time. They were not.⁴⁴ This was as close as they could get to the Federal Reserve pumping money into the economy and lending to troubled institutions. Upward of \$350 million in deposits were withdrawn in the panic with estimates of upwards of \$300 million kept in safes, strongboxes, and mattresses.⁴⁵ Those kinds of movements of money suggested a system in free fall. The Treasury was amenable to transferring cash to national banks, but it only had about \$5 million at hand—severely limiting its effectiveness and causing states to declare holidays or allow their banks to limit what they would return to withdrawing depositors. In part because of these limitations, only 6 of 6,412 national banks failed during that time.⁴⁶ In 1907, commodity prices, industrial production, and imports all dropped significantly as bankruptcies spiked.⁴⁷ Earnings of railroads fell 6 percent in December as unemployment surged toward 8 percent.⁴⁸ Between September 1906 and November 1907, the value of listed stocks in the United States declined 37 percent. In October and November 1907, at least 25 banks and 17 trust companies failed.⁴⁹ The fog of panic began to lift in 1908 as bank suspensions stopped and an energized sense of growth returned, bringing the stock market back to where it had been before the panic by late 1909.⁵⁰

Congress Seeks Stability

In 1908, in reaction to what had happened, the Congress attempted to close the barn door behind the horse by passing the Aldrich-Vreeland Act, which created a way of issuing currency based on bank reserves. It also established the National Monetary Commission to study the US financial system. The final report of the commission issued in January 1911 blamed the national banking system as a cause of panics because of inelastic currency and recommended a National Reserve Association for banks to cooperate in a crisis.⁵¹ Frank Vanderlip, who worked for National City Bank and was the ghostwriter of the Aldrich Plan's proposed legislation to establish the Federal Reserve System lobbied for the legislation. "[T]he whole world is united in agreement that we have the worst system of banking that there is anywhere in existence. It makes us . . . an international nuisance."⁵² The Panic of 1907 convinced almost everyone, including the bankers, that financial reform was necessary.⁵³ But by August of 1909, the Dow was once again back at 100.

After a century of economic chaos, Congress decided to end financial panics for all time.⁵⁴ In 1921, Commerce Secretary Herbert Hoover declared mission accomplished: bank panics had been eliminated by the creation of the Federal Reserve System in December 1913, a sentiment echoed by many other politicians and businessmen at that time, some of whom confirmed that all future financial crises had been rendered impossible.⁵⁵ This launched the period of modern monetary, economic, and regulatory controls. The 1920s would be the first test of the Federal Reserve's effectiveness, and by most accounts, it either acted for the wrong reasons, failed to act when it should have, or was too slow to play a meaningful positive role.⁵⁶

Part Four

The Regulatory Era: Even Larger Panics

7

FINANCIAL ARMAGEDDON

1929

Once the Federal Reserve was established, the country began a new journey down the path toward tighter management of the economy by the government in the hope of more effectively maintaining its soundness and stability. Until that point, the government had often either remained quiet as an interested observer as an economic disaster incubated, enflamed the situation for political purposes, or took actions that were too frequently ineffective or misdirected. Without the resources and information to regulate the economy and financial institutions, the government could only guess at solutions, and guessing was more easily influenced by politics. As money, people, and investments multiplied and moved around the developing country chasing investment opportunities and available credit, the government often ended up impacting the wrong thing at the wrong time for the wrong reasons. Too frequently, its impact distorted markets, aggravating the disquieting effect that the markets were already trying to deal with. The dawning of a new period of increased government oversight provided it a chance to wipe the slate clean and lay down new principles and goals. Nearly one hundred years later, it is still struggling to do so.

On October 24, 1929, twenty-two years after J. Pierpont Morgan had locked executives from New York's major banks in his office to address a national crisis, bankers from Chase National Bank, National City Bank, Bankers Trust Company, and Guaranty Trust Company gathered

in the offices of J. P. Morgan & Co. across the street from the New York Stock Exchange. Pierpont had passed away sixteen years earlier in 1913, but the bankers hoped that they could channel his spirit to come up with ideas to stop the new financial free-fall that the market was experiencing.¹ This was the first major financial challenge in the new era of government oversight introduced by the creation of the Federal Reserve. The fact that these five bankers were even meeting in the offices of J. P. Morgan & Co. in October 1929 was greeted as good news for the markets. The impact would not last.

The significance of this crisis cannot be overstated. From a high of 381 on September 3, 1929, the Dow lost 90 percent of its value, hitting bottom on July 8, 1932 at 41. The stock market's Dow Jones index would not return to 381 until 1954, twenty-five years later, and then largely due to the economic stimulus that had been created by World War II. This would be the most devastating financial and psychological punch that the US economy and its 122 million people had ever endured. Every financial crisis up to that point had been a dress rehearsal for what would unfold. It was and still is the defining moment in US financial history.

DRIVERS OF THE GREAT DEPRESSION

Rampant stock market speculation and reckless financial behavior reached new heights in the Great Depression and there were simply no police officers on the beat to monitor or limit the growth of the financial bubble or assist in its cataclysmic deflation. The behavior of people and markets was naturally focused on reaping the financial rewards that appeared before them, but this time the stakes were greater, and the government was at a loss as to what to do. Misdirected interest rate manipulation and general inaction earned the Federal Reserve a good part of the blame in the minds of many historians and economists. The Federal Reserve was not the principal cause of the Great Depression, but it was a significant factor in creating it, particularly to the extent that its economic decisions may have been driven by political ideology and personal relationships. There seems to be little doubt that the actions of several foreign central banks also played a role. How much depends on who is telling the story. In fairness to the Federal Reserve, however, its

creation had been the result, as most things in Washington are, of political compromise that burdened it with a clumsy and ineffective organizational structure. It was no doubt still searching for its footing when the boom and bust of the twenties exploded in its face. Given the limitations and pressures before it, Congress deserves much of the blame for establishing an ineffective mechanism to deal with disasters by elevating politics over financial reality. It would not be the first time that political compromise was the enemy of a financial solution. In 2005, economist Richard Timberlake pointed out that “[v]irtually all present-day economists . . . deny that capitalist free-market economy in any way caused” the Depression.²

John Kenneth Galbraith identifies five fundamental characteristics of the Depression. First, the distribution of income was skewed as never before with 5 percent of the population attributing for one-third of all personal income, making the economy dependent on a high level of investment or luxury spending. Interestingly, in 2020, the US economy has gotten close to a similar income distribution pattern. Second, the explosion of corporate holding companies and investment trusts brought a new era of “promoters, grafters, swindlers, imposters and frauds” where dividends from operating companies often went to pay for the debt of a holding company. Third, he deduced that bankers were no more culpable in getting sucked into the overheating of the economy than anyone else. Fourth, there was a trade imbalance after the war where the excess of exports over imports was covered by cash payments in the form of gold to the United States and loans to foreign countries, mandating a fundamental revision in the economic positioning of the United States. Finally, he identified a wide-scale economic ignorance at the time, with much of the advice being “perverse.”³

A fair analysis of history suggests that a variety of economic, behavioral, and oversight factors contributed to the Great Depression and the dramatic loss of confidence that destroyed the economy. Margin lending was a factor in the overheating of the stock markets, but economist Gene Smiley says that there was already a long history of margin lending that in fact was strengthened in 1928 by requiring purchasers to pay a larger share of the purchase price.⁴ Other economists point a finger at trade policies and the collapse of international trade when the Smoot-Hawley tariff of 1930 dramatically increased the cost of imported goods and created a trade war. While the Hawley-Smoot Tariff Act was passed

to protect American businesses, some experts reject the argument that tariffs caused the Great Depression because trade was still a relatively small part of the US economy, with gross exports at 2–3 percent of GDP. Tariffs certainly did not help the situation.⁵

Some blame an inevitable failure of capitalism, excesses of the 1920s, excessive production of commodities and building, financial speculation, and a skewed distribution of income and wealth.⁶ Economists Milton Friedman and Anna Schwartz argue that when the money stock fell because of banking panics, spending on goods and services declined, which in turn initiated the cycle in the economy that led to defaults, soaring bankruptcies, and failed banks.⁷ An economist at the St. Louis Fed pins the blame on misguided government policies, but not those represented by the Federal Reserve's interest rate gyrations. He blames the Federal Reserve only for not reeling in the banks because if "they had ample reserves to meet their customers' withdrawal demands, the money stock would not have declined, and the economy probably would not have sharply contracted."⁸

Taking the many expert analyses of the Great Depression together, historians and economists have compiled a long list of causes: (1) tariffs and trade wars, (2) the Federal Reserve's interest rate policies, (3) excessive risk-taking in the markets, (4) margin purchases of stock, (5) available credit from banks and others to purchase stocks and leverage the economy, (6) investment trusts, (7) a changed postwar national and global economy, (8) interlocking and contagious relationships between banks and industrial corporations, (9) inadequate bank reserves, (10) actions of central bankers in Europe, (11) stock manipulation, (12) financial illiteracy, (13) the proliferation of stock brokerage firms, (14) international trade patterns, and (15) the gold standard and reliance on gold. There are several factors that are "but for" elements I would identify as instrumental in this crisis.

The most obvious destructive economic force at the time was the excessive risk-taking in the market, fueled by margin and levered purchases. It was the first time that a broad range of individual consumers jumped into the stock market to get a piece of the action. That enabled the proliferation of investment trusts and a euphoric growth of the stock market. It raised the stakes increasing the damage that could be caused by poor financial oversight by the government. The Federal Reserve's handling of interest rates, particularly to the extent that it was meant to

assist Europe, which was later abandoned altogether for fear of the impact it was having on the stock market, played a crucial role in enabling the longevity and severity of the Great Depression. A staff analysis of the Federal Reserve Bank of St. Louis admits that the Federal Reserve was instrumental because of the actions that it took, particularly when the money supply declined between 1930 and 1933, prices began to collapse and debt burdens, unemployment, and bankruptcies increased:

The Federal Reserve could have prevented deflation by preventing the collapse of the banking system or by counteracting the collapse with an expansion of the monetary base, but it failed to do so for several reasons. The economic collapse was unforeseen and unprecedented. Decision makers lacked effective mechanisms for determining what went wrong and lacked the authority to take actions sufficient to cure the economy. Some decision makers misinterpreted signals about the state of the economy, such as the nominal interest rate, because of their adherence to the real bills philosophy. Others deemed defending the gold standard by raising interests and reducing the supply of money and credit to be better for the economy than aiding ailing banks with the opposite actions.⁹

A secondary factor was the devastating use of tariffs by the government, ostensibly to protect US businesses but unintentionally undercutting them. Therefore, the government seems to have been a prime enabler of the Great Depression. If that is so, it seems fair to ask whether anything would have been different if there had been no Federal Reserve or government intervention. Would anything have changed? Charles Calomiris suggests that once regulatory mechanisms are in place, they create expectations that distort the operation of the market.¹⁰ Perhaps it can be reasoned that the Depression may not have been so severe and long had the Federal Reserve not impacted interest rates the way that it did. That is an impossible question to resolve at this point. We can say, however, that had there been smarter regulation based on better data and targeted action, it is likely that the severity and length of this disaster could have been significantly reduced or averted. For example, if the Federal Reserve had had a broader mandate of authority and more reliable data identifying the profiles of bank balance sheets set in the context of the global macroeconomic environment, it

could have better predicted certain financial outcomes and the reactions to developing investment, leverage, employment, interest rate, and tariff patterns. It is hard to imagine that it would have made the same mistakes.

The Great Depression led to the first meaningful debate about the role of the government and the extent to which intervention or non-intervention was a critical dynamic in the creation of the crisis. In her book *The Forgotten Man*, Amity Shlaes concludes that government intervention and the lack of faith in the market was the primary cause of this financial disaster. She notes the challenges that the young Federal Reserve mishandled, the role of tariffs, and the impact of transitioning from an agrarian to an industrialized economy. But she reserves the principal blame for the government, represented among other things by the missteps of Hoover and Roosevelt manipulating the market by forcing wages up when they wanted to go down, raising taxes, implementing the tariffs of Smoot-Hawley, and thinking that economic relief could be achieved through a military-style effort, all of which elongated the Depression.¹¹ The pro-regulation author Robert S. McElvaine dismisses Shlaes as a “born-again, antisocial Darwinist” who believes that her opposition to government regulation blinds her. He argues that a major driver of the Great Depression was that “eighteenth-century theories were being used to deal with twentieth-century realities.”¹² While he may be correct, that has always been the case and always will be unless technology and enlightened use of data is marshaled to oversee financial institutions and the economy. The government is always fighting the causes of the last crisis, which of course rarely repeat themselves in the same way, with obsolete tools. The academic and scientific theories that Shlaes and McElvaine espouse both contain glimpses of financial practicality and reality. But they are largely impressionistic and economically based forensic reconstructions of the largest financial fire in the history of the world long after it occurred. Unfortunately, most of us all suffer from this lack of involvement when we evaluate history.

In the case of the Great Depression, the government failed its citizens, who enthusiastically participated in the creation of this disaster. As the economy drove itself toward financial ecstasy, there was largely no safety and soundness regulation in place to avert or mitigate the impact of the financial crisis, and the government had few safety nets to deploy on a timely basis.

HOW IT HAPPENED

Central banking in the United States died when Andrew Jackson vetoed the renewal of the Second BUS in 1832. Although panics and financial dislocations continued throughout the nineteenth century, it had not been replaced largely for political reasons. After the Panic of 1907, policy makers realized the government's limitations to prevent or arrest a financial disaster in an ever-growing and increasingly complicated economy. The government's "crisis-fighting tools" were nonexistent and interventions were "precarious, primitive, partial and probably illegal."¹³ Without a lender of last resort like the BOE, there was no place to go to rebuild confidence in the markets in an economic crisis. Policy makers came to realize the risk that posed to the economy.

The Debut of the Federal Reserve

The Federal Reserve was created out of economic need for stability, but not without a political fight. Eastern Republican bankers and rural Democrats naturally battled over control of the flow of credit through a central banking system.¹⁴ Should big city banks or heartland businesses have control of the money? There was no more important question. Ultimately, the Federal Reserve System was a compromise in the number of Federal Reserve Banks and the districts that they served.¹⁵ "[N]o single party faction got precisely what it sought when lawmakers inked the final version of the Federal Reserve Act, fostering the Fed's awkward hybrid organizational structure," preventing "any single coalition from monopolizing control of the reserve system."¹⁶ As well as compromise may work to resolve social and other nonfinancial issues, splitting the difference between economic reality and political expediency rarely works over a long period. In fact, it often backfires, as we have already seen. The act was intended to address the continuing century-long confusion and clashes over what constituted the most reliable forms of money and create an elastic currency that scaled with the economy.

Unsurprisingly, the early years of the Federal Reserve suffered from the many compromises in the law and Congress's desire to periodically tinker with it. The Federal Reserve originally had a decentralized structure. Each bank set its own monetary policy in its district, making the formulation of national monetary policy difficult. Periodic changes to

the law added further political and economic uncertainty, impacting the effectiveness that the Federal Reserve could have.¹⁷ Disputes arose over control of the system, discount rates, open market operations, and which banks were first among equals.¹⁸ The Federal Reserve System would get its first test in the 1920s as the economy roared after World War I. It would not fare well. It revealed itself to be an ineffective government agency maneuvering to avoid political and economic punches. It was accused of two major weaknesses: a lack of uniform monetary policy throughout the country, and little capacity to act as a lender of last resort other than its discount window.¹⁹ Even Herbert Hoover noted in his memoirs that the Federal Reserve was “a weak reed for a nation to lean on in a time of trouble.”²⁰ The best intentions for the Federal Reserve would often be blocked by political and financial reality. In the end, it is more dangerous to create an ineffective government monitor than to have none at all. At least if people knew there were none, they would do their own diligence.

The Postwar US Economy Expands: 1918–1928

By 1913, the gross national product of the United States per capita was five times that of the European average.²¹ The US dollar and the British pound were still on the gold standard, fixing the rate of exchange between paper money and gold. That meant that for every dollar in circulation, the Treasury needed to have a corresponding amount of gold in the vault. But economies had been distorted by the war to the extent that governments took control of production and tariffs replaced free trade.²² After World War I, America was best positioned to dominate the world economically for the foreseeable future. Europe had been geographically reconfigured, further impacting trade patterns. Britain owed the United States \$3.7 billion. The total debt of the allies to the United States was \$11.5 billion. Europe was slow to recuperate after the war, in some measure due to US investment in Central and South America rather than the reconstruction of Europe.²³ The United States had a large population, vast amounts of land, growing transportation systems, political stability, seemingly endless raw materials, and increasing banking facilities to create money and provide credit. It also had a government that did not want to interfere in economic affairs.

As the world transitioned to a peacetime economy, the Federal Reserve began increasing the discount rate in November 1919 to moderate the growth of the economy for reasons that it believed persuasive. There was what seemed to be a corresponding reduction in the Dow as interest rates increased.²⁴ Some economists believe that the rapid pace of rate increases was most likely what hurt the economy. That seems like a rational explanation. But the Federal Reserve seems to have concluded that raising interest rates was the direct cause of the economic downturn, which then dictated its future actions.²⁵ It lowered rates starting in May 1921, reducing the discount rate once again to 4 percent by June 1922. In just thirty months, it had moved rates a cumulative 6 percent (3 percent up and 3 percent down). The Dow improved significantly as rates came down, reinforcing the belief that increasing rates created bad economic results. The Fed did not increase interest rates again for more than five years. At least one expert concluded that “[f]rom 1921 to 1929, the Federal Reserve committed a grievous series of sins, and in doing so abdicated responsibility for managing the supply of money and credit in the American economy—the heart of its mandate—in an embarrassingly feckless display.”²⁶

The economy grew an average of 5 percent annually, with automobile output tripling between 1915 and 1925.²⁷ As the economy heated, so did the stock market, which came into its own for the first time as a market that attracted both financiers and regular citizens. The explosion of citizen investors in the market added capital and increased the interconnected nature of the economy, linking finance, securities, manufacturing, and consumers in a new way. That expanded and more connected economy would both facilitate expansion during goods times and deepen the impact of collapse in bad times. The stock market grew each of the eight years between 1922 and 1929. “U.S. politicians and economists had never experienced anything like it before. They were out of their depth, and the policies that they adopted were inadequate. Some actually made the situation worse.”²⁸ The use of tariffs—the artificial humanmade manipulation of trade between nations—to protect regenerating domestic economies after the war increased around the world, and the United States jumped in with both feet. In 1922, the Fordney-McCumber Tariffs were created to keep cheap imports out of the United States.²⁹

As the economy grew, a shiny new investment vehicle would emerge. Investment trusts pooled investments of stocks under one large company that managed the investments much like present-day mutual funds, but they were not regulated. Before 1921, there were about forty of them in the United States. In 1928, 186 new investment trusts were organized, and by 1929, one was being organized every day by a wide range of financial services companies.³⁰ Investment funds issued \$4 billion of securities in 1929, a third of all the new capital raised that year.³¹ Managers of funds profited nicely, earning various fees for overseeing and trading the securities. Investment trusts accepted small dollar investments, and in that way, provided the man on the street a way to participate in the booming stock market. The real problem arose, however, when investment trusts decided to borrow money and leverage their balance sheets. For example, if you invested \$1 in an investment trust that bought \$1 worth of several securities that turned into \$2 over time, you would be happy with a 100 percent return. If the trust borrowed another \$3 to purchase \$4 of securities, which created \$8 of value, you would be ecstatic with an 800 percent return. On the other hand, that leverage would significantly increase your downside risk. A decrease in stock prices that makes your \$4 worth of stock equal to \$2 would subordinate the value of your shares to repayment of the \$3 loan that the trust had taken out.

Warning Signs Appear

Between 1925 and 1929, manufacturing businesses in the United States increased by 14 percent, and automobile production again increased by more than 30 percent.³² Share prices in the United States continued to rise as sound investment gave way to speculation and no one wanted to miss the moment. Banks lent generously to fan the flames of stock speculators and at the same time were also heavily invested in the market with no meaningful regulation to restrict them. They could borrow from the Federal Reserve at 5 percent and relend it in the broker call market at 12 percent, increasing the volume of those loans from two to six billion in 1928.³³

Corporations also started making stock purchase loans because of the profits to be made. In 1929, Standard Oil of New Jersey invested \$97.8 million in the call market and earned \$4.9 million.³⁴ Many shares

of stock were purchased on margin. Brokerages grew up everywhere, even establishing kiosks on cruise lines.³⁵ The number of stock brokerages increased from 700 to 1600 between 1925 and 1929.³⁶ Eventually, the price of shares bore no resemblance to the values of the underlying companies as the froth on the market continued to grow with no restraining factors. Paul M. Warburg of the International Acceptance Bank predicted in March 1929 that the “unrestrained speculation” would cause a general depression.³⁷

The boom was unevenly distributed in the economy with roughly 5 percent of the population accounting for a third of American income. Spending by the wealthy drove much of the economy.³⁸ There was also a massive increase in commercial and residential housing debt, nearly tripling what had existed during those years.³⁹ Toward that goal, Washington, DC, began to advocate for increased homeownership as “the foundation of a sound economy and social system.”⁴⁰ Tax laws were changed to stimulate housing, with some estimating that it accounted for 20 percent of all new housing construction in the country.⁴¹ Commercial overbuilding was just as concerning a factor; office space in places like Manhattan, Chicago, San Diego, and Minneapolis increased by more than 74 percent between 1925 and 1932. This period produced New York’s Chrysler, Empire State, and RCA buildings, Chicago’s Merchandise Mart, Wrigley, and Tribune Tower buildings, and Philadelphia’s PSFS Building.⁴² Real estate bubbles are always a foundational part of every crisis; everyone knows it, and still no one can see or avert the coming disaster. Unemployment in the United States was still only at 4 percent in 1928, as it was in 1920.⁴³

Investment trusts continued to grow in number, and so did the practice of stock manipulation. It was often practiced by journalists hyping securities for a fee. By all accounts, there was nothing illegal about these practices, but it naturally further undermined the transparency of and confidence in the market once cracks began to appear. Importantly, all this economic froth created a market where the banks were no longer the predominate providers of broker loans or call money used to purchase stocks. This would be a trend that would continue throughout the century as other financial institutions started to play much more prominent roles and the nonbanks industry flourished.

The Role of Central Bankers: 1924–1929

There was another storyline playing out during all of this as the central bankers of the United States, Britain, France, and Germany tried to orchestrate the economies of their respective nations. Britain was eager to return to the gold standard that had been abandoned of necessity during the war. To do that, it would have to coax gold to return to London. To facilitate this, as wonderfully told by Liaquat Ahamed in the *Lords of Finance: The Bankers Who Broke the World*, Benjamin Strong, the president of the Federal Reserve Bank of New York, was approached by his best friend, Montagu Norman, the president of the BOE, about decreasing the discount rate in the United States. Strong had been a banker at the Morgan-controlled Bankers Trust Company. He had become close friends with the other central bankers in France (Emile Moreau) and Germany (Hjalmar Schacht). But he was particularly close to Norman, with whom he often vacationed. Strong acquiesced to Norman's request.

Between May and August 1924, the Federal Reserve cut the discount rate to 3 percent. In May 1925, Britain returned to the Gold Standard with the enactment of the Gold Standard Act of 1925. The Federal Reserve reduced rates again several years later to assist the British economy, no doubt arguing each time that there was a beneficial impact on the US economy. Each time it cut rates, however, it stimulated a stock rally as money became cheaper and the return on stocks more enticing. The Dow ended 1925 with a gain of 64 percent for the two years.⁴⁴ The linkage between interest rates and the Dow had been established and noticed, a fact that some argue would influence the Federal Reserve throughout this period and perhaps forever.

In 1927, as economies in Europe slowed, gold supplies were again shrinking and Norman again pressed Strong to lower rates, which the Federal Reserve did to assist Europe despite Fed governor Adolf Miller's dissent and conclusion that the action was "the most costly error committed by it or any banking system in the last 75 years."⁴⁵ This was the "spark that lit the forest fire" and led to the stock market crash two years later.⁴⁶ By the end of the year, the Dow had risen more than 20 percent, breaking 200. Stocks were often purchased with margin loans of up to 90 percent.⁴⁷ In October 1928, the New York Federal Reserve Bank's president, Benjamin Strong, died.

The market began to be driven by an intangible and invincible sense of confidence. Between the early summer of 1928 and the fall of 1929, the Dow went from 200 to 380.⁴⁸ By January 1929, Norman had reversed himself and was pushing for increases in the discount rate in the United States to reverse the “spirit of speculation” holding the market hostage, hoping it would not harm the global economy.⁴⁹ Norman and George Harrison, Strong’s successor who embraced Norman’s strategy, went to Washington but were rebuffed by the Federal Reserve Board. Instead, it famously issued a letter on February 2, 1929, admonishing Fed member banks not to borrow for the purpose of making speculative loans.⁵⁰ Five days later it warned the public in flowery and over-the-top prose that it was restraining the use of the Fed banks to enable the growth of speculation.⁵¹ One editorial said that “[i]f buying and selling stocks is wrong, the Government should close the Stock Exchange. If not, the Federal Reserve Board should mind its own business.”⁵² So much for the Federal Reserve using the bully pulpit to rein in speculation.

Between 1928 and 1933, 15–20 percent of bank loans became problems.⁵³ Banks called loans that were troubled, constricting credit and further aggravating a sense of panic. In his book, *A Brief History of Doom*, Richard Vague describes the calling of loans and the subsequent contraction of credit the “single most important event of this period.”⁵⁴ This, of course, would lead to a landslide of bank failures. Between February and May 1929, the New York Federal Reserve voted to raise interest rates ten times, and each was rejected by the Board in Washington.⁵⁵ The Federal Reserve became paralyzed.

The Crash

The economy got increasingly cautious throughout 1929. On September 5, the well-known economist Roger Babson announced at his annual business conference that a crash was coming. The stock market lost 3.2 percent over the next five days. It was followed by the collapse of a fraudulent scheme by Clarence Hatry to acquire United Steel Companies, causing investors to lose billions of dollars. It seemed to break the back of the market’s confidence. On October 3, Great Britain’s chancellor of the exchequer, Philip Snowden, described America’s stock market as “a perfect orgy of speculation.”⁵⁶ US Treasury Secretary Andrew

Mellon said investors “acted as if the price of securities would infinitely advance.”⁵⁷ The Dow began to drop. On Wednesday, October 23, 1929, the *Washington Post* headlines were direct and frightening: “Huge Selling Wave Creates Near-Panic as Stocks Collapse.”⁵⁸ By the next day, Black Thursday, panic had set in. The Dow opened at 305.85. It immediately fell 11 percent, but Wall Street bankers bought shares to support the market, allowing the Dow to close the day down just 2 percent. On Friday, October 25, the Dow rose 1 percent to 301, but on Black Monday, October 28, it dropped 13 percent to 260, and on Black Tuesday, October 29, it fell 12 percent to 230. Investors sold 16,410,310 shares on October 29 as the Federal Reserve eased monetary policy dramatically, cutting rates from 6 percent to 2.5 percent and injecting close to \$500 million in cash into the banking system to stimulate the economy. Most of the damage had been done, however.⁵⁹

During the 1920s, there were about 25,000 banks in the country, so unlike modern times, the country was accustomed to losing about 600 banks a year.⁶⁰ But when 1,352 banks failed in 1930 alone, with another 2,294 in 1931 as credit availability shrank and banks called in loans that could not be repaid, the government began to take notice.⁶¹ On March 5, 1933, President Roosevelt issued Executive Order No. 6260, ordering all the banks in the country to close from March 6 to 9, and embargoing all gold exports under the Trading with the Enemy Act.⁶² This act was a post-World War I measure directed at regulating the activities and property of foreign national noncitizens. Using it to close banks was never considered by its drafters and viewed at the time as questionable. It is, however, an example of how governments in financial crises often do what they need to do to prevent the economy from melting down, willing to seek forgiveness later. When the FDIC asserted on October 14, 2008, for example, that it had the authority to guarantee the debt of nonbanks under the emergency Term Liquidity Guarantee Program, it was taking significant liberties with the actual authority set forth in the law in order to smother the growing crisis.⁶³ In fact, the courts have recognized that there is a legal impact created by exigent circumstances. In *Home Building & Loan Association v. Blaisdell*,⁶⁴ the Supreme Court upheld the constitutionality of the Minnesota Mortgage Moratorium Act of 1933, which provided relief to borrowers notwithstanding the contract clause of the US Constitution, which prohibits a state from impairing private contracts. I would be less than candid if I

did not admit that we adopted aggressive interpretations of the law when it came to the regulatory authority that the FHLBB had to rescue failing S&Ls and slow down the onslaught of failing institutions in the early 1980s.

In the five years ending in 1933, about nine thousand banks had failed.⁶⁵ With no FDIC to insure the depositors, people lost their savings, an event that can be as psychologically catastrophic as any in one's life. The developing panic became more and more severe as unemployment skyrocketed and the economy shrank by 50 percent.⁶⁶ When the United States abandoned the gold standard in March 1933, it was blamed for deepening the crisis. The lack of common currency arrangements and the increasing use of tariffs after Hawley-Smoot trade deepened the economic morass around the world. By 1932, unemployment in Germany was 44 percent, 25 percent in the United States, 23 percent in Britain and 3.5 percent in France. Worldwide industrial production fell 40 percent by the end of 1933, with the drop in the United States and Britain more than 50 percent.⁶⁷ These numbers do not tell the full story of how the loss of work destroyed people's self-esteem. This economic and human malaise would last through the 1930s. The stock market would not return to pre-Depression numbers until 1954.

The Reconstruction of Banking and Finance in America: 1932–1940

During the 1920s, the government stayed silent and took a hands-off approach to the economy.⁶⁸ That was a problem because if there is a government overseer, it ought to be doing something, and doing it effectively. Alternatively, it would be better to have none that could lull people and businesses into thinking that someone is protecting them, or even worse, misleading them. President Coolidge (1923–1929), for example, praised the sound conditions of the market when he departed office in January of 1929. At the same time, Congress did nothing but issue “glorious overheated language.”⁶⁹ When President Hoover (1929–1933) took office, he added nothing substantive; his Treasury secretary, Andrew W. Mellon, was an ardent advocate of inaction.⁷⁰ The yield on Treasury bills dropped as investors sought a safe place to hold their money. As the price of shares began to decline, credit constricted as banks lost money and called in loans, creating a familiar chain reac-

tion in the economy. It was not until the Depression fully matured that the government would come to the rescue in 1932 with several programs such as the creation of the Reconstruction Finance Corporation (RFC). The RFC was President Hoover's attempt to stimulate the economy by providing loans to banks, savings banks, building and loan associations, credit unions, industrial banks, life insurance companies, and railroads. In 1930, the Hawley-Smoot Tariff replaced the Fordney-McCumber Tariff, imposing tariffs of up to 50 percent on imported goods. It did not help the situation in America or around the world, where it became more difficult for countries that had exported goods to America to repay loans to American banks. The new, dominant, economic status of the United States meant that whatever cold that it caught could spread around the world. The pain and panic spread from country to country and retaliatory tariffs popped up around the globe.

The government had pumped up the money supply and eased credit, but it had not made bad investments in the stock market, created investment trusts, or sponsored stock speculation and manipulation. Much of the blame for the Depression was placed on the free market, nefarious bankers, and speculators. That resulted in the conclusion that more government oversight was the answer, which in turn led to the creation of the system of supervision that we have in America today. The reaction of the Congress was swift and overwhelming in terms of regulating everything that moves in as many ways as possible.

On March 2, 1932, infuriated by bank failures and the practices that caused them, the Senate authorized the Committee on Banking and Currency to investigate "practices with respect to the buying and selling and the borrowing and lending" of stocks and securities.⁷¹ The search for the Mrs. O'Leary cow of the Great Depression began. In early 1933, Banking and Currency chairman Peter Norbeck (R-SD) hired a new chief counsel, former New York deputy district attorney Ferdinand Pecora, who subpoenaed high-profile bankers to testify, resulting in national and regional news coverage, which politicians all eagerly crave. Wall Street titans earned a new moniker: "banksters"; some were forced to admit to having engaged in shady practices and making bad loans.

The committee issued its four-hundred-page final report on June 16, 1934, after Congress had already passed major legislation in 1933 and 1934 aimed at curbing some of the more egregious abuses uncovered by Pecora and his investigative team. It focused on the practices and

needed oversight of securities exchanges, margin purchasing, market manipulation, director and officer conduct, proxies, investment, commercial and private banking, and investment trusts. With regard to commercial banks, the report pointed to the inadequacy of financial statements, the need for loan diversification, adequate reserves, effective examination, and curtailment of “window dressing” activities that permitted banks to embellish their statements with transactions done on the last day of a reporting period and then reversed shortly thereafter.⁷² It was a meaningful and insightful analysis of many of the underlying practices that erupted into financial chaos once the equilibrium of the markets was shaken.

The significance of this period in the history of American finance cannot be overstated. What followed was a massive legislative response creating the system of federal deposit insurance and financial oversight that continues to this day. In 1932 the Federal Home Loan Bank Act and in 1933 the Home Owners Loan Act authorized the chartering of federal savings institutions, established the Federal Home Loan Bank System to provide wholesale funding to member institutions making home mortgages, and created the Federal Home Loan Bank Board to regulate the country’s new federal S&L associations. This built a completely new and better supervised system of housing finance.

The Banking Act of 1933, also known as the Glass-Steagall Act, separated commercial banking from investment banking and temporarily created the Federal Deposit Insurance Corporation and federal deposit insurance. It also established a system of oversight of all commercial banks, and made structural changes to the Federal Reserve System, including expanding the Federal Reserve’s emergency lending authority, which was used to great benefit in the subprime lending crisis and then taken from it by Congress. The Securities Act of 1933 established the first disclosure regime requiring the filing of financial statements to support the issuance of securities to the public. The Securities Exchange Act of 1934 created the SEC and implemented a system of periodic financial reporting by public companies, and quite importantly, included anti-fraud, insider trading, and market manipulation restrictions.

The National Housing Act of 1934 created the Federal Savings & Loan Insurance Corporation (FSLIC) to insure the deposits in all S&Ls and provide for the regulation of S&L holding companies. The Gold

Reserve Act of 1934 marked the departure from the gold standard and established the Exchange Stabilization Fund, which the Treasury uses to conduct open-market transactions independent of the Fed. In 1935, the Federal Credit Union Act established federal credit unions and a regulatory structure and deposit insurance system for them. The Banking Act of 1935 made the FDIC a permanent agency and deposit insurance permanent, with a maximum coverage at that time of \$5,000. It also increased the power of the Federal Reserve in Washington over its twelve banks. The Social Security Act was passed in 1935, establishing a system of old-age benefits for workers, benefits for victims of industrial accidents, unemployment insurance, and aid for dependent mothers and children, the blind, and the physically handicapped. In 1940, the Investment Company Act mandated registration and regulation of mutual funds and other investment management companies, restricted conflicts of interest in mutual funds and exchanges and limited the investment activities of some mutual funds.

These laws and regulatory structures are still in place today. But the economy, banks, financial services markets, payments systems, and technology driving the delivery of financial products and services look nothing like they did in the 1930s.

8

DOWN COME THE BANKS

The 1980s

S&Ls were not alone in fighting economic peril in the 1980s. While most people viewed that era as a stain on the country's economic history created by S&Ls, as many banks failed in the latter half of the decade as S&Ls failed over the entire decade. Former chair of the FDIC William M. Isaac lays out that sad story quite well in his book, *Senseless Panic*.¹ He describes a decade of enormous financial dislocation as markets evolved and government oversight either failed to keep pace or was completely misdirected.

DRIVERS OF THE BANKING CRISIS

The banking crisis of the 1980s was caused by a massive mismatch between the archaic system of supervision that Congress had put in place in the 1930s and the changing nature of financial markets. Banks were to blame for not seeing or being able to deal with a more challenging economic environment, and in some cases, taking exactly the wrong actions in response. The government's underresourced regulatory system did not have the data or resources to recognize the challenges and growing pains that banks would be encountering in such a unique period of financial volatility. An economic environment that included double-digit interest rates and inflation gave birth to the new mutual and

money fund industries. Breathless investment in and then the collapse of the energy sector combined with the boom and then bust of real estate was too much for most financial institutions to handle at the same time. The increased competition from nonbanks—particularly MMFs—only complicated the challenges and shook the ground upon which bank strategies and operating plans had been based since the 1930s. The loss of nearly one thousand banks between 1988 and 1992 was *not* because they all engaged in fraud or reckless lending practices that put bad loans on the books, as comforting as that explanation might be. It was the deterioration of the economy that made their good loans turn bad. It was because the competitive landscape and economic predicates that they relied upon changed too rapidly. It was because they operated within the lines drawn by our laws, which left them limited room to diversify or bob and weave to deal with widespread financial distress. It was due in part to a system of regulation that just was not keeping pace with or relevant to the changes in the markets and the economy.

Federal and state regulators did make a glaring error by chartering 2,800 new banks between 1980 to 1990, 745 of them in the Southwest United States.² Those 2,800 new banks represented about 15 percent of all the banks in the country in 1980. Thirty-nine percent of these new banks were in the Southwest (mostly Texas and California) where the economies suffered the most. Sixteen percent of them failed by 1994, more than twice the number of established banks that failed in that period.³ It should not be a surprise that banks born into economic chaos had a much harder climb to profitability than the normal competitive challenges new companies bear when breaking into new markets. One might ask why federal and state regulators allowed so many new banks to be chartered in such a challenging period. The answer to that question is driven by a complex set of legitimate economic and regulatory factors but is also impacted by the structure of federal and state oversight. As already noted, there is always a competition between regulators to attract the most institutions to oversee because their budgets are determined by the assessment fees that they receive.

Experts have offered many theories for this banking collapse, some of which seem to be reduceable to the conclusion that the oversight of financial institutions was clumsy, ill-fitted, and based on inadequate

data. Harking back to my theory that the holy trinity of financial oversight has been inverted, Chairman William M. Isaac said of the 1980s:

[T]he FDIC really ought to be a supervisor of banks and not a regulator of banks. I don't think it should be in the regulatory business. I was willing to give up the FDIC's regulatory powers when the Bush Task Force was deliberating these issues. I don't believe it matters to the FDIC whether a bank opens a new branch or not, and I don't think it matters to the FDIC whether a bank is in compliance with CRA and other such things. I don't believe that the FDIC ought to be dealing with anti-trust issues on mergers and the like. I believe firmly that this agency needs to be focused on the forest, not the trees. If we missed some things in the 1980s, I suspect it is because we were not stepping back and looking at the system and saying where is it going, what is happening, what is changing?⁴

The regulatory mistakes often pointed to as causes of the crisis are bank branching limitations that constrained geographic and lending diversity, flat rate deposit insurance that did not penalize stockpiling risk on the balance sheet, allowing banks to grow rapidly to outrun problems, the chartering of too many new banks chasing too few good loans, the moral hazard message sent by the rescue of Continental Bank, and the ineffectiveness of regulatory and supervisory tools. Economically, banks suffered from their own optimistic lending patterns, which were undercut by wide-ranging regional and sectoral recessions, collapsing real estate markets, gyrations caused by oil prices, and significant changes in the deposit markets related to the growth of money funds.⁵ Fraud and financial misconduct undoubtedly also occurred. One study at the time found that insider abuse and fraud were “significant contributing factors” in 33 to 50 percent of commercial bank failures and from 25 to 75 percent of thrift failures between 1980 and 1988.⁶ Surprisingly, this contrasts with the National Commission's conclusion that fraud accounted for only 10 to 15 percent of the losses in the S&L crisis. This just proves that after-the-fact studies by academics, historians, congressional committees, and federal agencies of the role of insider fraud and abuse can vary widely depending on one's perspective, definitions, goals, and timeline.

As disquieting as it may be to have to confront a world where the misdeeds of bankers do not fully explain a financial crisis, in my experi-

ence, fraud is usually the exception and is infrequently responsible for the failure of a bank or the entire financial system. There will always be instances of fraud, abuse, and criminal conduct uncovered when the search lights are focused on companies that were under financial duress. That is not to excuse it, but it is to say that proponents of the theory that fraud and abuse brought down the thrift or banking businesses may sell books, but it is just not sustainable by a fair analysis of all the factors.⁷

It should not be too much to expect from government or private industries that they had better anticipate these kinds of economic events and seismic competitive shifts. To do so, they need better data, more sophisticated tools, and more streamlined, less siloed operating styles. The government needs to alter its approach and appreciate the fact that it is overseeing less and less of the economy as banks became a smaller factor in the creation and movement of money. In effect, financial regulators are increasingly sitting in front of a control board where many of the buttons and levers are lit but not connected to anything. The crisis in the 1980s was understandable, perhaps inevitable, but it could have been significantly moderated by better government policies, data, and foresight.

HOW IT HAPPENED

Between 1980 and 1994, the economy was as volatile as it has ever been. Double-digit interest rates and inflation undercut the basic economic stability that financial institutions rely upon. Oil prices went from a high of \$111 a barrel to \$26 a barrel. Figure 8.1⁸ vividly demonstrates this economic volatility. (These numbers exclude open bank and other financial assistance transactions. They tend to change based on the source and how terms are defined.)

About 2,500 financial institutions were closed, put into receivership with the FSLIC, RTC, or the FDIC, or otherwise provided some sort of government assistance between 1981 and 1994. The Dow nearly tripled, short-term interest rates topped 12 percent, inflation hit double digits, and the price of oil collapsed. You would have to be a financial genius who saw the future to navigate that decade without experiencing financial distress. Perhaps most disruptive was the shifting competitive

Year	Failed Banks*	Failed S&Ls*	Dow Jones Index (01/01)	3-Month T-Bill Rate (01/01)	Average Annual Inflation %	Oil Price per Barrel (01/01)
1981	7	34	964	5.02	10.3	111
1982	34	73	875	12.28	6.2	91
1983	45	51	1047	7.89	3.2	82
1984	78	26	1259	8.90	4.3	75
1985	116	54	1212	7.76	3.6	64
1986	138	65	1547	7.07	1.9	44
1987	184	59	1896	5.43	3.6	43
1988	200	190	1938	5.81	4.1	37
1989	206	145	2169	8.27	4.8	36
1990	168	137	2753	7.64	5.4	46
1991	124	129	2634	6.22	4.2	41
1992	120	56	3169	5.80	3.0	35
1993	41	5	3301	3.00	3.0	36
1994	13	2	3754	2.98	2.6	26
Totals	1474	1026				

Figure 8.1. The economic volatility of the 1980s (* The numbers of failed banks vary depending on the source).

ground under the feet of commercial bankers, which caused them to lose the business monopoly that they had enjoyed for two centuries. They were shocked to find a world where they were no longer the center of financial commerce. Mutual and money market funds were here to stay, and they attracted huge amounts of money that would have previously been deposited in banks. Between 1980 and 1990, the MMF industry doubled in size, growing from \$66 billion to \$122 billion in assets under management.⁹ Credit cards were also coming into their own, creating a new and challenging payment system that equated to banks making long-term unsecured loans at the whim of the borrower. At the same time, junk bonds, repurchase agreements, MBS, hedge and private equity funds, and other novel Wall Street financial derivative instruments were beginning to capture a large portion of the investment and lending markets that had once largely been the province of banks. A new financial era was in full swing akin to the wildcat banking

era of the nineteenth century. Combined with volatile financial markets that saw a record number of mergers of all companies and the collapse of the S&L industry, this shifting economic landscape took its toll on commercial banks.

To put the bank and S&L failures in the 1980s into economic perspective, about 75 percent of all financial institution failures between 1934 and 2019 came in this period. Of those, about 40 percent of the failures were S&Ls, which was 35 percent of the entire number of S&Ls. The other 60 percent were commercial banks—about 11 percent of all commercial banks operating at the time.¹⁰

As the economy deteriorated and real estate values declined at different times in different parts of the country, the Congress removed real estate development tax breaks. Energy-related businesses began to falter as oil prices plummeted and nonpayment of outstanding loans increased correspondingly. The rescue of Continental Bank in 1984, the seventh largest bank in the country, was a wake-up call. Its potential failure was viewed as possibly being a trigger that could topple other large banks, so it was considered too big to fail. Through no small feat of courage by Chairman Isaac at the FDIC, a rescue package was structured with the assistance of the Federal Reserve and other large banks. It prevented a crisis in the banking system in 1984 but did not avert the failure of more than one thousand banks over the next ten years. Once again, at the end of the 1980s, when S&Ls and commercial banks were collapsing by the hundreds each year, the government had no plan on the shelf to deploy. It again had to invent one on the fly.

As the economy declined, differences between the FDIC, the Federal Reserve, and the OCC also emerged, reflecting the different perspectives of an insurer, a chartering agency, and a central bank lender of last resort each regulating a separate segment of the country's banks. They increasingly jockeyed for jurisdiction and priority as the economic stakes increased, underscoring the inefficiencies and redundancies in the system focused on lesser rather than larger problems, which were naturally the hardest to fix. They differed in their views of brokered deposits, capital, and the chartering of new banks.¹¹ The Treasury joined those disputes with its own point of view. Remarkably in those turbulent times, both federal and state regulators had sharply increased their chartering of new banks through the 1980s to increase competition. Texas led the way. This increased tension between the OCC and

FDIC, since at the time, national banks and Federal Reserve member banks received FDIC insurance automatically upon being chartered by the OCC *without* FDIC approval. This was changed in 1991 in the Federal Deposit Insurance Corporation Improvement Act (FDICIA) when all institutions seeking insurance were required to formally apply to the FDIC.¹² These internecine wars only created greater inefficiencies and confused the strategic approaches that the government deployed in the face of a deteriorating economy. Bank failures increased and were highly concentrated at first in relatively few regions of the country where there were economic downturns related to the collapse in energy, real estate, and agricultural prices, particularly in states that saw an influx of new banks chartered and had prohibitions against branching that limited their ability to diversify their loan portfolios and fund growth through core deposits.¹³ Nearly 60 percent of the bank failures were in California, Kansas, Louisiana, Oklahoma, and Texas.¹⁴ Texas alone had 599 or about 40 percent of the bank failures between 1981 and 1994.¹⁵

This financial stress generated grand pieces of new legislation, much as the Depression did in the 1930s. The Depository Institutions Derogation & Monetary Control Act of 1980 phased out deposit interest-rate ceilings, further broadened the powers of thrift institutions, and raised the deposit insurance limit from \$40,000 to \$100,000. The Garn–St. Germain Act authorized money market deposit accounts for banks and thrifts to stem disintermediation, and further increased the authority of thrifts to invest in commercial loans. I worked on the drafting of parts of both pieces of legislation while at the OCC and FHLBB. The Competitive Equality Banking Act of 1987 finally recapitalized the FSLIC somewhat and extended the full-faith-and-credit protection of the US government to federally insured deposits. In 1989, the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) authorized the use of taxpayer funds to resolve failed thrifts and in turn eliminated the FHLBB and FSLIC while it created the RTC and installed a punishing set of regulatory principles and enforcement authorities. In 1990, the Crime Control Act began the process of criminalizing bank misconduct. The FDICIA of 1991 introduced new capital standards and gave the regulators “prompt corrective action” enforcement authority to take a broad range of actions to require struggling banks to raise capital, or close hopeless banks as capital ratios declined

rather than having to wait until they had no capital at all. In 1993, the Omnibus Budget Reconciliation Act installed a national depositor preference provision so that failed bank depositors would have priority over creditors' claims to hopefully impose greater market discipline on non-deposit creditors. In October 1996, the Deposit Insurance Funds Act capitalized the Savings Association Insurance Fund now operated by the FDIC and required the merger of the bank and thrift insurance funds in 1999 if no savings associations are in existence at that time. Finally, interstate banking was formally authorized in the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994.¹⁶ This launched a new era of closer supervision and regulation that gradually reduced the use of discretion and judgment in favor of rules and ratios.

NO ONE WASHES A RENTED CAR

2008

There are many books about the last financial crisis. The FDIC has produced its version of the Panic of 2008.¹ Most are replete with pages of discussion about what happened, how many meetings government officials attended, who they saw, what they thought, and what they did hour by hour to save the economy. That is indeed valuable historical information, but—having been there—I wanted to write about *why* it happened. There is limited in-depth discussion or analysis of how and why it all developed over several decades.

Much like the S&L crisis, the Panic of 2008 took many years of mistakes to brew; it did not sprout up in 2008. Authors John Allison, Peter Wallison and Oonagh McDonald present detailed, in-depth analyses and demonstrate a clear knowledge of regulatory systems as they link the Panic of 2008 to political and financial vectors that were set in motion before and after the S&L crisis. They ascribe significant blame to the government. As Oonagh McDonald says in her book analyzing the role of Fannie Mae and Freddie Mac in the crisis, “politicians recruited all the federal housing agencies to serve the end of home ownership for all.”² Wallison adds, “The information of all of this was out there, but nobody connected the dots until it was too late.”³ In his 2012 book, *The Financial Crisis and the Free Market Cure*, John Allison blames the Federal Reserve and distorted housing finance policies as represented by Fannie Mae and Freddie Mac.⁴ In my view, the Panic

of 2008 was a production brought to you courtesy of an unintentional conspiracy between government policies and corporate excesses.

DRIVERS OF THE PANIC

This panic was a cogent example of how the country's regulatory apparatus can be misfocused. Many of the nonbank financial companies that lit this fire were the least prudentially regulated. Regulatory resources were largely focused on commercial banks and S&Ls; investment banks, nonbank mortgage lenders, structured finance companies, MMFs, and securitizers were not similarly monitored and supervised in the activities that they might choose to engage in. Congress has ineffectively deployed the government's regulatory resources given how markets had evolved. They could only react after the fact.

Like the 1980s, financial markets and competition evolved dramatically in the early 2000s, once again weakening the hold that traditional financial intermediaries had on their customers. Connectivity and the plummeting cost of information technology changed the manner and speed financial transactions could occur and how many parties could participate in the instantaneous transfer of value and risk. This once again facilitated (1) a breakdown in the barriers between formerly separate sectors of the financial industry, (2) the continued movement of risk from regulated into unregulated participants, (3) increasing competition, (4) the globalization of that competition, and (5) the continuous slicing and dicing of financial risks and returns as the science of structured finance and derivative transactions became finely honed. For more than a decade, this facilitated the ability of nonbank lenders, banks, S&Ls, and investment banks to create and pump financial poison in the form of reckless mortgages into the arteries of the US economy. Moreover, the way some business opportunities could be structured compensated companies for the financial upside while transferring and allocating the downside risk to others. This socialization of risk made reckless behavior rational from a financial perspective. All of this happened with the encouragement or at least acquiescence of the government. The drivers of the Panic of 2008 include the transgressions of an encyclopedic list of players ranging from borrowers to securitizers, and a collage of factors that were mishandled by each of them and the

government. Frankly, no one wanted to kill the financial golden goose that was laying eggs at an extraordinary rate while the economy was growing. Blaming callous bankers, greedy corporate executives, financial recklessness, or even the government for this crisis is far too simplistic an answer. They are all to blame.

There are as many theories regarding the causes of this crisis as there are commenters on it. Many scholars, historians, and economists have thought longer and harder about this crisis than I have. But I was on the ground throughout it, representing a range of financial institutions and investors, watching a simultaneous failure in both corporate and government behavior. I can accept the assumption that there may have been no one cause, no one villain, and no one detonator of the crisis, as disquieting as that may be to some. Lenders, borrowers, securitizers, investment banks, credit rating agencies, regulators, and Congress all seem to share the blame. All of them allowed financial markets to amass increasing amounts of risk from one end (lax lending practices) to the other (leveraged derivative and structured finance instruments) that were distributed throughout a globally interconnected system. That system suffered from a decreasing amount of transparency, insufficient liquidity, inadequate capital, and a disproportional reliance on complex structured debt and hedging products in which too many participants had no skin in the game.

Some argue that the government created the ingredients that drove the housing bubble and produced the crisis, while others contend that capital markets were the principal drivers of the crisis because they created a global casino of risky derivatives and MBS all to satiate the global demand for higher yields. At the very least, the government gave the impression of overseeing markets when it really was not.

The purpose of this book is to analyze the role that government played in allowing the economic bling of the moment to captivate businesses and consumers. It does not matter whether the government bears 25 percent or 85 percent of the fault. What is important is the fact that government policies share the blame. The government created a petri dish in which this financial monster was permitted to germinate, and then was incapable of seeing the growing crisis or effectively remediating it once it exploded. That demands serious consideration so we can figure out how to avoid such breakdowns and ensure they do not happen again. We have a government to avoid and mitigate crises, not

to enable them. I believe that the solution to this recurring dilemma is embedded in our future use of technology.

Like the S&L crisis, politics and defective government policies helped to foster the Panic of 2008, and the markets loved and took advantage of it. Reckless mortgage markets jet propelled homebuilding, a result that would allow manufacturers to sell more washing machines, carpeting, furniture, and lighting fixtures. Everyone, including small-town mortgage brokers, national subprime loan originators, national rating agencies, and Wall Street investment banks, gorged themselves at what they thought was an all-you-can-eat financial buffet as Washington high-fived itself over increases in homeownership. Washington politicians and regulators did not make the millions of bad loans and substandard MBS that were pumped into the markets like heroin running through the veins of an addict. Neither did they stop it. Again, if there is going to be a regulator, it must do the job that the market expects it to do.

Once alarms were sounded in the markets about the creditworthiness of these subprime instruments, lenders and investors began to constrict credit. As that happened and concern began to set in, the brakes on the economy were pumped. That has always shown to be a problematic event. Banks and financial services companies may not have originated subprime mortgages because of the regulatory concerns that they raised, but they had become enthusiastic purchasers of them in the form of MBS. It was financial alchemy at its best as risky mortgage loans went through a “credit-enhancing” securitization process, were blessed by the rating agencies, and somehow became less toxic than the underlying individual loans from which they were built. These Frankenstein securities took on an air of creditworthiness—perhaps invincibility—that was unrealistic. When confidence in the bad paper that was issued in the form of MBS began to wane, confidence in the entities that manufactured, distributed, and invested in MBS paper began to disappear. But that was everyone in the market—banks, S&Ls, mortgage bankers, nonbank lenders, investment banks, mutual funds, hedge funds, insurance companies, and private equity funds. This led to a contraction of retail and commercial credit, including the repo market. The latter acted as a multiplier across an interconnected market of counterparties causing a funding crisis and sell-off of assets among entities with a mismatch in asset/liability maturities. As asset prices fell,

there was pressure on highly leveraged entities as increases in margin and collateral requirements occurred followed by margin calls that resulted in further sell-offs and further declines in asset prices. Liquid capital was held back by those who possessed it, in anticipation of better bargains yet to come. There was a rush to quality. Some markets had only sellers and some only buyers. Even as central banks increased money supply to offset the liquidity crisis, interest rates still increased among large entities because it was too difficult to assess counterparty risk given the complex grid of risks that had been created.

Eventually, there were no trusted intermediaries left to rely on as the value of financial instruments began to deteriorate and markets began to collapse. The psychology of the moment became overwhelming and self-fulfilling. It was about more than just numbers, values, and financial ratios. An insatiable and uncontrollable drive to immediately jam on the brakes and put the engine in reverse emerged. The buffet ended when credit lines were pulled and institutions that were bloated with now overpriced assets that they could not sell or use as collateral to bail themselves out started to have liquidity problems. The government further contributed to this market collapse by sweating in public and then reacting too late with too few effective solutions. A shortage of regulation was not the cause of this crisis. It is more appropriately seen as another example of too much regulation of the wrong dynamics in the market helping to distort it and the corresponding business behavior.

Peter Wallison addresses the causes of this crisis in his dissent in the Financial Crisis Inquiry Report (FCIR) and his subsequent book on the topic, *Hidden in Plain Sight*. Among other things, he tracks the crisis back to government policies that created the Community Reinvestment Act (CRA) in 1977. The CRA was enacted to require FDIC-insured banks to lend throughout their “communities” and not redline certain inner-city or minority areas where they would refuse to lend. Compliance with the CRA was enforced by the federal bank regulatory agencies through on-site examinations and periodic reporting. More importantly, however, the CRA set up a quid pro quo. To gain approval for regulatory applications to branch, merge, and engage in a range of corporate transactions, a satisfactory CRA rating was required. That provided consumer advocacy groups the basis to protest and, in many cases, extract financial commitments from merging banks by alleging

that they failed to adhere to CRA standards and fulfill their obligations to the community, whether true or not. It became common for merging banks to offer consumer groups a goody bag of financial support and commitments to increase lending in lower-income communities, as well as funding for the organizations themselves in return for not protesting their mergers. Banks got the political message loud and clear. The financial results—more lending in poorer communities—were good, but the process by which that happened was likely not what Congress intended.

Mr. Wallison explains that the National Commission on the Causes of the Financial Economic Crisis, of which he was a commissioner, started with the assumption that it knew the causes of the crisis and instead of pursuing a thorough study, used its extensive investigative authority to seek only the facts that supported its thesis. That thesis was that “deregulation, lax regulation, greed and recklessness on Wall Street, predatory lending and unregulated derivatives” caused the crisis. He states, however, that the commission did not seriously investigate any other causes, particularly the one that he blamed for the crisis.⁵ He concluded that “the *sine qua non* of the financial crisis was US government housing policy, which led to the creation of 27 million subprime and other risky loans—half of all the mortgages in the United States—which were ready to default as soon as the massive 1997–2007 housing bubble began to deflate.”⁶ He argues that government policies were the cause of the housing bubble and therefore the cause of the subprime financial crisis that spread throughout the world.⁷ His case against the Federal Reserve, HUD, FHA, Fannie Mae and Freddie Mac, the Office of Federal Housing Enterprise Oversight, and the Community Reinvestment Act are laid out in painstaking detail in his dissent to the FCIR.⁸ His criticisms are even more pointed and more fully documented in his book, which he wrote having the facts that he never was given access to as a commissioner responsible for the FCIR. His thesis is the subject of sharp debate.⁹

While he has identified critical elements that enabled the crisis, I believe that the explanation is more complicated with multiple *sine qua nons*. Corporate excesses, predatory lending, and unregulated derivatives did contribute to the crisis, but it was not lax oversight or the absence of regulation that contributed to it as much as misfocused and ineffective regulation did. There was more than enough regulation

created by Congress and the last few administrations prior to the crisis. It was just not smart regulation based on adequate data to make it effective.

The Clinton and Bush administrations' focus on increasing homeownership in America, their political experiment to use massively conflicted entities such as Fannie Mae and Freddie Mac by forcing them to reach new affordable housing goals, and the Federal Reserve's interest rate setting mistakes along with the abdication of its authority to regulate mortgage lending set the table for a reckless market to take advantage of. There was no shortage of willing private sector coconspirators, including the mortgage broker in Topeka, the predatory house flipper in Miami Beach, the securitizer on Wall Street, and the participants in the unregulated derivatives and credit default swap markets. Because there was limited risk to companies that originated and securitized subprime mortgage loans that ultimately were insured in some fashion by companies like AIG, it appeared entirely rational to throw more and more fuel on this financial bonfire. The housing bubble grew while the Federal Reserve lowered interest rates. The regulators' data was poor, technology outdated, and oversight often focused only where the light was—on commercial banks and S&Ls.

New securitized and derivative products and markets had become the shiny new objects of the moment that attracted gobs of money. Some experts argue that credit default swaps, which played a role in the demise of AIG, were never proven to be “a significant contributor to the financial crisis through ‘interconnections.’”¹⁰ Similarly, while there was predatory lending, there is limited evidence that it was so widespread that it could drive the crisis. Wallison ingeniously asserts that “predatory borrowing” by people and mortgage brokers committing mortgage fraud and purchasing and flipping homes with impunity was also a part of the problem.¹¹ Again, weighting the individual factors that contributed to the crisis is not the point. The way that each component came together while the government looked on created the psychology of the moment.

The assertions made by Peter Wallison about the actions and conclusion of the FCIR are particularly damning, suggesting a politically driven effort with preconceived conclusions based on secret or inadequate data. He also points out that the report did not elaborate on the significance of MMA, which commentators argue created impairment

charges at exactly the wrong time, which reduced the equity of financial institutions, making them appear weaker than they actually were relative to the cash flows that they were receiving.¹²

The FCIR is a lengthy, mixed bag of factual information and conclusions. It did conduct rigorous research and analysis, reaching insightful conclusions, but its penchant for repeating the views of witnesses—particularly housing and community activists—about what they think occurred without citation or support is less than confidence building. The commission did get many things right. It includes in its list of culprits—the cows that tipped over the lantern—the Federal Reserve, failures in bank regulatory supervision, poor corporate governance, excessive lending and borrowing practices, an ill-prepared government, a breakdown in accountability and ethics, the creation of new structured finance products, proliferation of over-the-counter derivatives, the implementation in 2007 of the FASB's new mark-to-market accounting principles and continuing, significant failures by the credit rating agencies. That pretty much covers the waterfront of the parties and products that enabled the creation of an enormous housing bubble and the search for yield and fee income unwittingly driven by government monetary and economic policies. Subprime mortgages and the MBS that could be created from them became a bridge to that yield. In fact, there was a sense that MBS were some of the safer investments that a financial institution could own. After all, they had a low risk weighting for bank capital calculation purposes.

The government should have assumed that aggressive mortgage and investment bankers would originate and securitize substandard mortgages to make a buck and ordered its regulatory priorities accordingly. It should have seen that a leveraged, unsupervised, and growing derivatives market would stockpile risk. It should have known that if encouraged and allowed to do so, there would be businesses that would pump financial crack through the veins of the US economy given the potential returns. The FCIR concluded that the crisis should have been anticipated by the government as well as the private sector. Then why wasn't it? All the financial incentives were in place to produce the crisis. In part, it was the challenge and cost of monitoring increasingly complex risk. A lack of risk transparency was created using derivatives that could camouflage economic leverage, and market compensation structures often encouraged the creation and assumption of risk. All this presented

a new and unfamiliar challenge for regulators that was not fully understood until it was too late. Many indicators of the collapse were not seen quickly enough, in part because of the government's lack of data and the technical resources to create it. They did the best they could with what they had. That is where the benefits of technology can be brought to bear to avoid future financial crises.

HOW IT HAPPENED

In their book *All the Devils Are Here*, Joe Nocera and Bethany McLean determined that a critical event in the spring of 1987 led to the creation of the Panic of 2008. As they recounted, Salomon Brothers, First Boston, Merrill Lynch, Goldman Sachs, and several other firms engaged my law firm and me to represent them in an effort to persuade the government to stop Fannie Mae and Freddie Mac from entering and eventually dominating the real estate mortgage investment conduit (REMIC) market.¹³ A REMIC is a federally tax-exempt special purpose vehicle that is established to acquire and pool commercial and residential mortgage loans to issue MBS. The issuance of REMICs by Fannie Mae and Freddie Mac was a threat to investment banks that wanted their companies and the private sector to have a fair share of this new securitization business. They were rightly concerned that they could not compete against such government-subsidized players in the secondary market.

The government had been the first to issue residential MBS in 1970 when Ginnie Mae, an organization that had been split off from Fannie Mae in 1968, issued MBS that were guaranteed as to timely payment of principal and interest and backed by underlying FHA and VA loans.¹⁴ Freddie Mac followed a year later, this time aggregating conventional mortgage loans to produce its MBS instruments. Salomon Brothers, First Boston, Merrill Lynch, Goldman Sachs, and others had brilliant financial minds such as Lew Raineri, John Oros, Richard Pratt, and Larry Fink developing products to streamline mortgage finance. Working with them was like assisting Galileo or Leonardo da Vinci. These men were some of the inventors, pioneers, and implementers of the private MBS business in the 1980s for their respective firms. They changed US markets and the economy and made much money for their

firms. Through no fault of these iconic geniuses, it was these MBS products that would be critical contributors to the Panic of 2008 as markets changed and MBS increasingly decoupled the financial responsibility for lending decisions from those who made them. In effect, the securitization of loans without the originator and go-between having skin in the game changed the risk-reward ratio and the way that the markets worked. As would become apparent, under pre-Dodd-Frank Act rules, there would be a difference between the care taken to originate a loan that a company would hold in portfolio and one that would be on its books for a short period as it made its way into the securitization market. Once securitized, as if by magic, the provider of the credit—a faceless investor—assumed the risk in the transaction, while the mortgage originator was on the hook only for what was considered to be the remote risk of fraud or other breaches of the representations and warranties provided. In a steadily improving housing market and economy, no one worried about such events because the market would always provide an escape hatch. The homeowner could always sell the home for a profit if things did not work out.

Notwithstanding the extensive arguments that we presented to Secretary of Housing & Urban Development (HUD) Sam Pierce urging HUD to restrict Fannie Mae's and Freddie Mac's role in this market, he chose a compromise approach, authorizing them to conduct a \$15 billion "pilot program." That partial victory was short-lived and simply allowed the investment banks to lose another day as HUD gave Fannie Mae and Freddie Mac permanent and unlimited authority to engage in REMICs a year later in 1988.¹⁵ Nocera and McLean suggest that the future of the mortgage markets might have been very different if HUD had restricted the eventual chokehold that Fannie Mae and Freddie Mac would gain over the MBS and housing finance businesses in America.¹⁶ This suggests that Fannie Mae and Freddie Mac were significant players in the crisis, so let's start there.

The Role of Fannie Mae and Freddie Mac

Fannie Mae and Freddie Mac are complicated and unique private/public corporations with too many masters—one social and the other financial. This schizophrenic, government-chartered public company model was destined to implode. Fannie Mae's and Freddie Mac's pub-

lic policy goal has always been—much like that placed on S&Ls—to subsidize and encourage homeownership in America while operating in a private sector for-profit model. They had been a favorite tool of Congress to influence economic and social housing policy in the United States. Fannie Mae and Freddie Mac did lower US housing costs, but ultimately at a great cost to the health and welfare of the US economy. The global explosion came when Fannie and Freddie were put into federal conservatorship on September 6, 2008, exactly twenty years after HUD had eliminated the REMIC restraints it had temporarily imposed on them. Crises always seem to take decades to ripen. Fannie Mae and Freddie Mac remain in conservatorship today.

Congress established Fannie Mae in 1938 to buy mortgages insured by the Federal Housing Administration. By 1968, Fannie Mae's portfolio of mortgages on its balance sheet was \$7.2 billion. To remove those assets from its balance sheet, in 1968 and 1970, Congress enacted legislation that allowed Fannie and the newly formed Freddie Mac to pool mortgages, which would create income streams guaranteed by Fannie and Freddie that could be sold as securities in the market.¹⁷ This system created significant efficiencies for the housing finance market. Fannie Mae and Freddie Mac purchased mortgages—mostly thirty-year, fixed-rate obligations—originated by S&Ls. That removed them from the S&Ls' books at a small profit and generated new cash to make more mortgages, which in turn stimulated more home buying, building, and financing. This kept the national mortgage pump continually primed. Otherwise, S&Ls would eventually have reached a point where they could no longer make any mortgages. Because keeping mortgages in portfolio required the S&Ls to hold capital against them, they would eventually run out of capital, liquidity, or both as their mortgage lending portfolio grew. Fannie Mae and Freddie Mac were one of the government's solutions to keeping the American homebuilding and housing finance machine hydrated to keep the US economy working. It seemed like a straightforward and innocuous idea at the time, but so did the imposition of Reg. Q on S&Ls in 1966.

The private sector was of two minds regarding Fannie Mae and Freddie Mac. Because they were viewed as government proxies, they borrowed in the public markets at a near government rate, significantly below the rate that private sector companies could borrow. Thus, they could pass along the benefit of their borrowing status to mortgage lend-

ers, thereby lowering the interest rate on mortgages that homebuyers took out. Fannie Mae's and Freddie Mac's guarantee of the timely payment of principal and interest to investors did not technically have the full faith and credit backing of the United States, but the markets always acted as if it did, and in the Panic of 2008 their assumption proved correct. For that guarantee, Fannie Mae and Freddie Mac charged the originators of mortgages that they purchased a guarantee fee or G-fee. Because they were essentially huge S&Ls, in the early 1980s, Fannie and Freddie found themselves in failing financial condition as interest rates rose and moved erratically. At around the same time, Congress closed the barn door after the horse had escaped by raising the capital requirements for the S&L industry. This made it even more economically favorable for S&Ls to sell mortgages to Fannie Mae and Freddie Mac and not keep them on their balance sheets. Fannie Mae and Freddie Mac debt and the balance of their mortgage obligations underlying outstanding MBS grew from \$759 billion in 1990 to \$2.4 trillion in 2000.¹⁸

The schizophrenic constitution of Fannie Mae and Freddie Mac was a stark example of politicization of capitalism that had failure written all over it. How could they satisfy the political agenda of their congressional masters who worshipped at the altar of homeownership for all and earn a return that would satisfy and attract investors? Having a monopoly (duopoly to be precise), among other things, was one way that it could bridge that gap at least temporarily.

By some accounts, when the financial crisis began in 2007, twenty-seven million mortgages in the United States—50 percent of the fifty-five million that were outstanding—were of subprime quality.¹⁹ Whether that number is correct or not, the point is that there had been a seismic shift in the quality of a significant portion of home loans being originated, which were then being purchased and pooled into MBS by Fannie Mae and Freddie Mac. But this was only a part of the sad story that unfolded. Between 2001 and 2006, agency-issued MBS by Fannie Mae, Freddie Mac, and Ginnie Mae totaled a whopping \$13.4 trillion.²⁰ By the end of November 2005, through purchases in the open market, Fannie Mae and Freddie Mac had accumulated their own massive retained mortgage security portfolios of around \$1.5 trillion—much of which were comprised of MBS that they had issued themselves.²¹ These purchases had been financed by their issuance of debt instru-

ments by Wall Street at favorable rates that were priced off Treasuries because of the implicit backing that they have from the US government.

If anyone were watching at the time, they should have asked what public policy was being achieved by allowing Fannie Mae and Freddie Mac to leverage themselves with government-subsidized borrowing so that they could purchase their own mortgage obligations. By the end of 2007, Fannie's and Freddie's combined leverage ratio, including loans they owned and guaranteed, stood at approximately 60 to 1, as mortgage indebtedness in the United States doubled.²² This was the culmination of some twenty years of housing growth that converted people's homes from a place to live to their prime investment.

The Politics of Home Lending

In 1992, Congress enacted affordable housing goals for Fannie Mae and Freddie Mac, planting in the minds of some the seeds of the Panic of 2008.²³ President George H. W. Bush (1989–1993) signed the Housing and Community Development Act²⁴ on October 28, 1992, and Fannie Mae and Freddie Mac were formally recruited in the cause of encouraging fair housing and financing “underserved areas.” Among other things, Fannie Mae and Freddie Mac could reduce down payment requirements on mortgagors they purchased to 5 percent or less and purchase mortgages where borrowers had problematic credit histories.²⁵ It has been reported that by the time President Clinton (1993–2001) left office, the Department of Housing and Urban Development required that low-income loans make up 50 percent of Fannie Mae's and Freddie Mac's portfolios, and under the heading of “compassionate conservatism,” George W. Bush's (2001–2009) administration raised this quota for low-income loans to 5 percent.²⁶ By 2007, high-risk mortgages would make up almost a quarter of their portfolio, up tenfold from a decade before.²⁷

In 1995, the Clinton administration decided to boost homeownership from the 65.1 percent to 67.5 percent of American families by the year 2000 “to do much better” for American homeowners.²⁸ President Clinton announced the National Homeownership Strategy to raise the number of US homeowners by eight million.²⁹ The program brought together a coalition of industry, government, and consumer advocacy participants in “Partners in the American Dream” to impact the eco-

nomics of lending by reducing down payments and mortgage costs for low- and moderate-income home buyers.³⁰ In 1995, HUD prepared an Urban Policy Brief describing an unprecedented public-private partnership to increase homeownership. It was a noble political goal, but one that should have mandated economic and financial cost-benefit analyses before it was announced. Of course, that did not happen.

In the mid- to late 1990s, the Department of Justice (DOJ) and the federal bank regulatory agencies were asked to do their part to increase homeownership and at the same time ensure that banks lent to low- and moderate-income borrowers. Almost immediately, banks increasingly faced lending discrimination complaints lodged by the DOJ and the federal banking agencies. A tidal wave of cases throughout the nation were alleged or filed against Blackpipe State Bank (North Dakota), Chevy Chase S&L (Maryland), Vicksburg National Bank (Mississippi), Allbank FSB (New York), Decatur Federal Savings & Loan Association (Georgia), Northern Trust Company (Illinois), First National Bank of Doña Ana County (New Mexico), Shawmut Mortgage (Massachusetts), Deposit Guaranty National Bank (Mississippi), Associates National Bank (Delaware), Fleet Mortgage Corp. (New York), Huntington Mortgage Company (Ohio), Long Beach Mortgage (California), Security State Bank of Pecos (New Mexico), First National Bank of Gordon (South Dakota), and Nissan Motor Acceptance Corporation (Tennessee).³¹ My firm and I represented several of these institutions. Our experience in these cases led us to publish *The Fair Lending Guide*,³² which provided a review of the legal foundations and developing approaches in this rapidly evolving area. The most frequent allegations in these cases were disparate treatment claims of discrimination based on loan approvals and denials anchored to statistics that indicated non-white loan applications were rejected in greater percentages than similarly situated white applications. At trial, these claims would have involved an examination of the actual underwriting system and procedures in place at each particular institution.

Whether these cases had merit or not—and some did—no financial institution wanted to find itself on the wrong end of a discrimination lawsuit brought by the federal government. They were not inclined to incur the reputational harm that the case would impose, whether they were guilty or not.³³ The lenders settled almost every time a case was threatened, resulting in new laws created by settlements anchored to

agency policies rather than judicial decisions tethered to the law. It is hard to conclude that these CRA and fair lending charges caused the Panic of 2008; most of the cases were focused on depository institutions rather than nonbank subprime lenders. At least one part of the government—the DOJ—had little institutional focus on the possibility that lending to higher-credit-risk borrowers would put more risk on the balance sheets of originating financial institutions and ultimately Fannie Mae and Freddie Mac. But the government's initiatives did generally spur lenders to move to a greater reliance on credit scores as a determining factor in their loan decisions as well as using "second look" reviews for borderline applications.

In *The Financial Crisis and the Free Market Cure*, John Allison recounts a particular instance in which the bank where he was CEO, BB&T, was accused of discrimination for purely political reasons. He asserts that no empirical evidence of any discrimination by any person was ever provided to the bank by the regulators. His take on the general absence of discrimination in bank lending and the impact that government policies have on finance represents the perspective of a highly respected banker that is well worth reading and understanding.³⁴

Wall Street, Financial Markets, and Contagion

In 2005 and 2006, Wall Street securitized one-third more loans than Fannie and Freddie. Nonagency private-label mortgage-backed securities grew more than 30 percent, reaching \$1.15 trillion in 2006; 71 percent were subprime or Alt-A.³⁵ Nearly one in 10 mortgage borrowers in 2005 and 2006 took out option adjustable-rate mortgage loans where they could choose to make their very low initial payments at the risk that their mortgage balances could rise every month and compound their debt over time.³⁶ Nearly one-quarter of all mortgages made in the first half of 2005 were interest-only loans. During the same year, 68 percent of option adjustable-rate mortgage loans originated by Countrywide and Washington Mutual had low- or no-documentation requirements.³⁷ There was an enormous appetite for MBS, which was encouraging mortgage originators to lower underwriting standards or to produce loans with serious documentation deficiencies. At the same time, sophisticated but unsupervised derivatives markets were growing as Americans levered their homes by extracting \$2.0 trillion through

refinancings between 2000 and 2007, including \$334 billion in 2006 alone. That was more than seven times the amount they took out in 1996.³⁸ One out of every ten home sales was being made to an investor, speculator, or someone buying a second home, and MBS issuance skyrocketed.³⁹ It was an extremely profitable business.

AIG became the poster company for the Panic of 2008. It was the largest insurance company in the world, had a AAA bond rating, and saw the housing bubble as an economic opportunity. Consequently, it effectively developed a way to rent out its AAA rating. To do so, in 1998, AIG Financial Products (AIG FP) began writing credit default swaps insuring the owners of corporate debt, believing that the risk of default was low.⁴⁰ Low interest rates between 2003 and 2006 made MBS one of the places that foreign and domestic investors had found to seek higher yields. Following the market and the trail of profits, AIG enlarged its credit default swaps business, insuring collateralized debt obligations that pooled various types of commercial and mortgage debt securities. In so doing, it enhanced the marketability and pricing of the underlying debt instruments and effectively crossed over from insuring corporate debt to insuring the housing finance system.

AIG was not alone in trying to take advantage of the booming lending and securitization markets in America. Between 2001 and 2006, Wall Street issued about \$5.5 trillion in MBS for private nongovernment agency mortgage lenders, much of which were rated by credit rating agencies—Moody's, Standard & Poor's, and Fitch. In 2007, the leverage ratios of investment banks in the United States were in the 30 to 1 or greater range.⁴¹ For every \$30 in assets, there was only \$1 in capital to cover losses. That meant that a less than 3 percent drop in asset values could wipe out a firm. Goldman Sachs estimated that between 25 and 35 percent of its revenues from 2006 through 2009 were generated by derivatives.⁴² At the end of 2007, Bear Sterns was incredibly leveraged and borrowing heavily in the overnight market.⁴³ But the business of originating and securitizing mortgages was extremely lucrative for everyone, including the credit rating agencies. Moody's had just become a public company, raising the stakes on its financial performance.⁴⁴ The rating agencies had insufficient historical data such as the history of prepayment rates, default rates, and correlations as to value and risk of the new structured products built out of subprime mortgage

loans. They also had conflicts of interest in rating these products for a fee.

By late 2005, AIG FP had insured \$80 billion in MBS through credit default swaps. From a risk perspective, the market was becoming an interconnected closed loop of unprecedented risk that was obscured by or ignored because of the free call options and enormous profits that the participants could take advantage of. They knew full well how to identify and value such optionalities. Short-term profit-oriented compensation structures, tax loopholes, accounting conventions, and the ability to profit from portfolios whose risk would be borne by others incentivized the creation of enormous systemic risk largely outside the banking business. The private sector should be blamed for such excesses, and routinely is. It was another “heads I win, tails you lose” game. The government should be blamed for not seeing it or doing anything about it.

At the same time, the Federal Reserve increased interest rates seventeen times by a quarter of a percent between June 2004 and June 2006.⁴⁵ Mortgage rates correspondingly increased, and naturally home prices began to decrease by the end of 2006. Wall Street knew what that meant. Stock prices dropped, and nonbank mortgage lenders that had tethered their financial futures to subprime mortgages and MBS began to experience financial issues as borrower repayment slowed because their mortgage payments that were tied to market interest rates increased. When AIG’s rating was reduced to AA, it altered the quality and value of MBS that it had insured and started a chain reaction in the market of collateral calls, asset valuations, and the terms of outstanding lines of credit in the interconnected world of mortgage finance. The reversal of the economic engine began. As mortgage defaults increased, losses and failures did also. Merrill Lynch agreed to acquire First Franklin Mortgage, National City’s subprime lending platform, in a \$1.6 billion deal in the summer of 2006 when the subprime business was still apparently flying high. My firm and I represented Merrill Lynch in that transaction. The acquisition was closed in early 2007, just as the market was beginning to show serious signs of stress. On October 5, 2007, Merrill Lynch announced a \$5.5 billion loss, in part related to the First Franklin acquisition. It took another loss of \$2.2 billion for that quarter and the stock market began to feel the strain, concerned that a company like Merrill Lynch could have gotten it so wrong. Bank

of America rescued Merrill at the strong urging of the government, announcing a stock-for-stock exchange on September 12, 2008, paying Merrill shareholders \$50 billion, or just \$29 per share. Merrill had been trading above \$90 per share just before the closing of the First Franklin acquisition at the beginning of January 2007. The value of subprime mortgages in this market, and the MBS that were created from them, was beginning to emerge, and the facts were ugly. The market went into a downward spiral and credit and liquidity tightened.

On March 16, 2008, Bear Sterns collapsed and was acquired at the encouragement of the government by J. P. Morgan Chase. The pain had also moved to FDIC-insured depository institutions by this time. IndyMac Bank (FSB) was a thrift institution headquartered in California and regulated by the state and the OTS. It was the largest provider of reverse mortgages. Reverse mortgages allow seniors to access the equity that they have built up in their homes, and defer payment of the loan until they died, or sold or moved out of the home. When word of IndyMac's weakening financial position began to circulate, Senator Chuck Schumer jumped into the fray, releasing his letter about the precarious position that the bank was in. A depositor run followed, and IndyMac was seized by the OTS on July 11 and reopened under government control. The senator's actions were a significant amplifying factor in the downward-spiraling bad news that was building each day. IndyMac was the largest US bank failure at that time with about \$13 billion in deposits and a \$150 billion loan servicing business. It was the first major bank failure in the United States in fifteen years, so Wall Street and investors had become somewhat unfamiliar with the FDIC receivership that ensued.

Several months later, Steven Mnuchin and his Dune Capital sought to bid on and acquire IndyMac from the FDIC. Mnuchin had assembled a who's who of investors, including John Paulson, Chris Flowers, Michael Dell, and George Soros to put more than \$1 billion into the failed bank, in return for financial assistance from the FDIC. My law firm, Fried Frank, and I represented investors in the transaction. This was the most complicated and largest financially assisted acquisition that the FDIC had ever done, and it knew that the transaction and the financial assistance offered would have to entice future bidders to what was going to be a continuous line of failed bank opportunities. Mnuchin

was a gifted orchestra leader who overcame every issue that came our way.

On October 6, 2008, the FDIC received twenty-three first-round bids, and on December 15, 2008, six final round bids were received for IndyMac or pieces of it.⁴⁶ The Dune Capital proposal was the most comprehensive “whole bank” acquisition bid received and was deemed to be lowest cost to the FDIC, as required by law. The transaction took months to negotiate and document, in part because based on most of the bids that had been received, the FDIC had not expected that anyone would want to acquire the whole bank. Because of that expectation, it had created eight to nine packages of documentation to sell a variety of pools of IndyMac assets to different buyers.

It took weeks for us to unravel and coordinate the more than thirty contracts that we had received. IndyMac was eventually acquired from the FDIC and turned into OneWest Financial; Mnuchin brought in Joseph Otting and Brian Brooks to run the bank until 2015, when it was acquired by CIT Financial. In 2017, Mnuchin became secretary of the treasury and Joseph Otting comptroller of the currency. In April 2020, Brian Brooks became senior deputy comptroller of the currency, and Acting Comptroller of the Currency when Otting departed on May 29, 2020.

On September 6, 2008, the Federal Housing Finance Agency appointed itself conservator for Fannie Mae and Freddie Mac, a situation that remains in place these twelve years later. They were placed in conservatorship so as not to disrupt markets around the world with an unprecedented receivership and not to anger foreign investors who were not interested in seeing their US investments adversely impacted. The Treasury contributed capital to keep the companies afloat, taking a senior preferred stock instrument and common stock warrants in return. Several years later, Treasury received 100 percent of the earnings of the companies (less a de minimis capital buffer) as dividends in perpetuity. When Fannie and Freddie returned to profitability, this dividend stream not only repaid the money that Treasury had injected, but gave the taxpayers a handsome profit, while delaying the companies from rebuilding their capital to return to a sound financial condition. I represented certain shareholders for much of this time and filed amicus briefs on behalf of other parties in the DC Circuit Court of Appeals and the Supreme Court in cases challenging the terms of these conservator-

ships. The Supreme Court is likely to finally decide the issue in mid-2021, a decision that could have major financial, political, and market implications.

On September 15, Lehman Brothers was allowed to fail and proceed into federal bankruptcy. This shocked the markets, which reacted to the new uncertainty inserted into the process by the appearance that the government was picking winners and losers. Over a weekend in late September 2008, Goldman Sachs⁴⁷ and Morgan Stanley⁴⁸ converted Utah industrial loan company subsidiaries into commercial banks to become bank holding companies as part of an agreement with the Federal Reserve to obtain financial assistance from it. By the sheer force of financial necessity, much of the venerable investment banking community had now either been acquired by banks or become bank holding companies subject to federal and/or state prudential regulation. Much like the 1980s, when financial necessity led to unprecedented interstate and interindustry acquisitions of failed financial institutions, the face of banking and financial regulation had once again been radically reconstructed on the fly.

Much has been written about the Lehman Brothers situation and why it was allowed to collapse, and other companies such as AIG and Bear Sterns that were not. The Federal Reserve determined that it had no statutory authority to lend to Lehman because the company did not have enough collateral to satisfy the requirement that the Federal Reserve be assured of repayment. In his tirelessly researched book on the Lehman non-rescue by the Federal Reserve, Professor Laurence Ball concludes that the Federal Reserve was either wrong or misrepresented the facts for reasons known only to itself and the Treasury, likely executing a decision made by the Treasury, which had no legal authority to approve or deny Lehman Brothers credit from the Federal Reserve.⁴⁹ This was a critical event in the downward spiral of the economy and in the view of many experts, a horrible mistake because it suggested that the government was picking winners and losers. There have also been theories that suggest that the government was determined to “fail” the next big financial company in financial stress to tell the market that the government was not going to bail out everyone.⁵⁰ In any event, the markets were completely upended by this string of events and confidence in almost every financial asset completely eroded, as did their value.

The next day, the Federal Reserve bailed out AIG with an \$85 billion loan in exchange for 79.9 percent of the company's equity. The Federal Reserve and the Treasury Department needed to increase the funding to AIG as the crisis deepened, bringing the total up to an estimated \$150 billion. The rescue of AIG was in part a bailout of the companies in its interconnected debt loop that had been created between mortgage lenders, MBS issuers, investment banks, and the rating agencies. It was effectively a rescue of Wall Street. It was the government's only and best option at that point to avoid a complete meltdown of the financial markets that were in free fall. Government officials wore their panic on their sleeves and the markets could do nothing but reflect that sense of panic. As noted above, on September 22, fearing imminent collapse, Morgan Stanley and Goldman Sachs gave up their status as relatively unregulated investment banks and became traditional commercial banks and bank holding companies so that the Federal Reserve could assist them. On September 24, Warren Buffet invested \$5 billion in Goldman Sachs, warning that failure to agree to a government bailout could result in an "economic Pearl Harbor." Two days later, America's biggest S&L, Washington Mutual (WAMU), was seized by federal regulators and sold to J. P. Morgan for \$1.9 billion in a deal that sent more shockwaves through Wall Street and Main Street alike. WAMU was the largest FDIC-insured bank failure in America with \$307 billion in assets.

While at Fried Frank, I represented creditors of WAMU's holding company for several years through their settlement in the bankruptcy court. Later, while at Dechert LLP, I represented the senior noteholders of WAMU bank for five years before the FDIC, DOJ, FHFA, and in several courts handling the issues that were created by its receivership. It was a unique receivership since the FDIC ended up with \$2.8 billion to distribute to WAMU creditors. Most FDIC receiverships have nothing to distribute to creditors. That is because the FDIC has a priority claim that usually consumes anything in the receivership to offset its cost of providing financial assistance to the institution that acquired the failed bank. However, the senior noteholders were not the only parties in line for that \$2.8 billion. J. P. Morgan showed up and made a claim under the indemnity provisions of the Purchase and Assumption Agreement that it had entered into with the FDIC when it acquired WAMU. Deutsche Bank also made a claim as trustee on behalf of the investors

of MBS securities issued by WAMU. It attempted to exercise the investors' right to put the securities back to WAMU because of the alleged fraud and other breaches of the underlying covenants.

It began a decade of litigation over the respective rights of these three different parties and the allocation of the \$2.8 billion in the WAMU receivership. In September of 2017, the FDIC finally paid an interim dividend distribution of approximately 95 percent of the receivership's total current assets to the receivership creditors, including the approved unsecured senior note holders, Deutsche Bank as trustee for its claimants, and J. P. Morgan.⁵¹ There is more to come as the receivership collects damages asserted on behalf of WAMU in a variety of London Interbank Offered Rate and other lawsuits. The events of this twelve-year receivership could fill another book. Suffice it to say, the WAMU saga underscores the complexity of taking over large failed banks, even when the bulk of the assets are sold to another bank. The thought of seizing a \$2 trillion mega-institution and "liquidating" it through various restructuring transactions as the Dodd-Frank Act requires seems like an unrealistic challenge. I will return to that problem shortly.

The Federal Reserve Weighs In and Markets Explode

Chairman Ben Bernanke called the Panic of 2008 the "perfect storm" that could not have been anticipated. He is correct, but only if you understand that the government likely did not have the tools, data, people, structural integration, and technology to see the signs of the approaching crisis. It could have, but it did not. Investment banking clients and others were telling me in 2007 that there was a financial reckoning approaching that was linked to subprime MBS. Why did they see it and the regulators did not? As a former regulator, I believe that the federal regulators did not have enough of the resources they needed to do the job given the complexity of the problem facing them. Congress had given the Federal Reserve the authority in 1974 to oversee mortgage lending disclosures and in 1994, in the Home Ownership and Equity Protection Act. It empowered the Federal Reserve to prohibit practices that it found unfair, deceptive, or designed to evade the provisions of the Truth in Lending Laws to *stop lenders from making loans based solely on the value of property without regard to the consumers'*

ability to repay. While the Federal Reserve did lower and then increase interest rates, it took no regulatory action to deal with the increasing euphoria in the mortgage markets and the large number of loans being made that evidenced ability to repay issues.⁵² Chairman Bernanke admitted that the Federal Reserve's failure to act was "the most severe failure of the Fed in this particular episode."⁵³

Between 2000 and 2003, the Federal Reserve reduced the fed funds rate from 6.5 percent to 1 percent. By lowering interest rates for sound reasons, including the impact of 9/11 on the economy, it may have inadvertently forced investors in the market to search for yield in unfamiliar places. Subprime MBS became one of those places. It felt like the same mistake that Benjamin Strong made in the 1920s when the Federal Reserve lowered interest rates to help Europe, only to light a fuse on the US economy.⁵⁴ By June 2004, housing prices were skyrocketing. Hoping to cool off that market, Chairman Greenspan then raised the fed funds rate six times, reaching 2.25 percent by December 2004.⁵⁵ In 2005, the Federal Reserve raised interest rates eight times—two full points to 4.25 percent. In 2006, new Fed Chair Ben Bernanke raised the rate four times, hitting 5.25 percent by June 2006.⁵⁶ Because of the hands-on interest rate approach the Federal Reserve took and the hands-off regulatory approach it took to mortgage finance, experts argue that it unintentionally "ignited the demand for MBS, which led to the dubious mortgages required to populate them."⁵⁷ The risk-reward ratios created by the ability of investment managers to earn fees even from managing an unprofitable portfolio of MBS created incentives that made their action financially rational. The lack of skin in the mortgage securitization game that many had when loans were originated and sold to investors created a perfect storm. The pace of the Federal Reserve's interest rate changes may have been once again disorienting to the market as they had been in the run up to the Great Depression, but there was a lot more going wrong in this market. Naturally, increases in the interest rate environment raised monthly payments for interest-only and other variable-rate mortgages. When home prices fell in certain markets and interest rates increased, the market began to unwind, putting many borrowers in a box. They could not afford their increasing monthly payments and could only sell their homes at a price that would not pay off their mortgages. They were economically upside down.

Before the cracks in the system began to show, the combination of regulatory inaction and the pressure of the markets for mortgage product to securitize created a sense of unbridled economic growth that replicated those that had preceded other financial crises in the country's history. Make no mistake about it—the private sector jumped into this financial typhoon with both feet to make as much money as it could. The more this cycle continued and the less that the government intervened, the more originators were incentivized to create exotic mortgage products such as Alt-A, exploding adjustable-rate, subprime, negative amortization, interest-only, low-doc, no-doc, ninja (no income, no job, no assets), 2-28s, 3-27s, piggyback second, payment option, and pick-a-payment adjustable mortgage loans. That was a sure way of providing an increasing flow of mortgage inventory to be securitized and sold into the market. In the six years beginning in 2001, the overall mortgage indebtedness in the United States climbed from \$5.3 trillion to \$10.5 trillion.⁵⁸

The Federal Reserve's reduction in interest rates spurred a reduction in mortgage rates and a surge of new mortgage lending and home refinancing. Refinancings surged more than six-fold from \$460 billion in 2000 to \$2.8 trillion just three years later as home prices skyrocketed in many US markets.⁵⁹ Housing starts increased 53 percent between 1995 and 2005. The rating agencies were overwhelmed by the number of MBS they would have to evaluate and rate. The demand for MBS in this country and around the globe was endless, encouraging lenders to make increasingly risky loans to attempt to satisfy the demand. Once again, there were few Cassandras warning of the impending doom. As the sense of never-ending economic expansion increased and bank regulatory agencies seemingly took little action or raised glaring warning signs, the markets saw no reason to restrain their entrepreneurial instincts. According to the Cato Institute's George Selgin, the Federal Reserve misjudged the markets when it began paying interest on required and excess reserve balances that were high relative to short-term market rates. It became the chief instrument of monetary control rather than traditional open-market operations, limiting the effectiveness of the Federal Reserve's asset purchases and its ability to achieve its inflation target.⁶⁰

This was not simply a problem driven by Wall Street and Washington. Opportunity seekers emerged at every level of the mortgage fi-

nancing machine around the globe. Nonbank mortgage brokers in every city, town, and village in America could make several thousand dollars for each application they took that turned into a mortgage. They had every incentive to push as many applications through the process in this new mortgage-friendly environment, even if they had false and incomplete information in them. The mortgage brokers, purchasing banks, lawyers, securitizers, and investment banking underwriters all made money in that economy. Everyone in between in almost every building and manufacturing sector profited from more houses being financed and built. Financial institutions and investors around the world participated. What could go wrong? While loan originators and subsequent purchasers agreed that if there was fraud in the transaction, the loan could be put back to them, it rarely happened in a growing market where home prices continuously rose. When the market began to sour and loans were put back to an originator as defaults increased, many did not have the resources to make good on their commitments. In the end, many participants in the housing finance machine got a piece of the action but had little skin in the game. Scott Nations, in his insightful book, *A History of the United States in Five Crashes*, notes that the MBS phenomena delinked the relationship between the borrower and the ultimate lender—the owner of the MBS—destroying any market discipline or reason to self-regulate.⁶¹ The absence of responsibility for defaults increased the risk of fraud and inaccurate information. That may seem like an obvious deficiency, but no one seemed to see or appreciate it in the mid-2000s. The effects were predictable. Ask yourself why no one washes a rented car.

In reaction to the growing crisis, the Federal Reserve rolled out programs to support the markets and keep them liquid. A Term Auction Facility (TAF) was introduced by the Federal Reserve in December 2007. It auctioned one-month and three-month loans to depository institutions. It was intended to allow them to avoid the stigma attached to borrowing at the discount window. Almost \$4 trillion was provided through the TAF between 2007 and 2010, but the process was criticized for being selective and requiring opinions from accountants about the collateral, which took time for companies to obtain. In March 2008, the Federal Reserve launched the Term Securities Lending Facility program to provide short-term loans to the Federal Reserve's primary dealers, including non-depository institutions, and the Primary Dealer

Credit Facility (PDCF) to make overnight cash loans to primary dealers against “eligible” Federal Reserve collateral. Nearly \$9 trillion was loaned through the PDCF by 2010. Bear Stearns used the PDCF before the Federal Reserve facilitated the Bear Stearns–JPMorgan merger. Three other primary dealers—Citigroup Global Markets, Merrill Lynch Government Securities, and Morgan Stanley & Company—heavily relied on the PDCF. Almost 80 percent of the PDCF lending went to these four firms.⁶² Some of these companies were levered 30:1 even before the crisis began to unfold. The government hoped that these programs would stem the tide and re-create a sense of confidence in the system.

TARP to the Rescue

On October 3, 2008, President Bush signed the \$700 billion Troubled Asset Relief Program (TARP) into law. It was meant to stem the tide on the seemingly unstoppable collapse of financial institutions. Most experienced financial people doubted it would work as drafted. It authorized the Treasury to purchase “assets” from failing banks rather than purchase equity interests in them. The Treasury and the Fed were obviously struggling, having no coordinated, preconceived strategy for the crisis, something that Henry Paulson and Timothy Geithner essentially admitted in their books. One might think that after two hundred years of financial crises, the first job of the government would be to be prepared for the next crisis and have safety nets on the shelf that it could deploy. The boy scouts are always prepared. Nothing could be further from reality when it comes to the government.

When Treasury latched on to TARP as a way of stopping the economic meltdown, many expressed surprise that the administration had become dedicated to an approach that history had proven would be a “colossal waste of taxpayer money.”⁶³ The FHLBB had tested similar approaches to deal with thousands of failing S&Ls in the 1980s, but we quickly figured out that it was not an effective or efficient use of the limited dollars that the FSLIC had available. The money could never go far enough to make a dent in resolving the troubled asset problem. It is much more efficient and effective for the government to take an equity or debt interest in financial institutions that can be levered to support economic growth. In 1982, we developed Income Capital Certificates

(ICCs) to function as a noncash IOU from the FSLIC that had to be repaid only when the S&L returned to certain levels of profitability and capital adequacy. If the FSLIC had tried to purchase assets from failing S&Ls and improve their crumbling balance sheets, it would have had to do so by purchasing them at their book value, which would have been a windfall to the S&Ls at the expense of the taxpayer, or at their current market value, which would have forced institutions to book the enormous losses embedded in those portfolios and likely fail. ICCs provided a capital lift to failing institutions without any cash outlay, and at the same time, announced that the government was behind the institutions that received them. That was enough to help stabilize and calm the markets without spending those federal dollars.

The Bush administration had the TARP bill enacted into law as an asset purchase program and almost immediately realized that the purchase of bad loans would not work. It pivoted quickly and interpreted the law as providing it the authority to purchase an institution's equity securities. That was a big push, but luckily, everyone wanted the government to succeed and no one challenged its interpretive authority to turn a capital instrument—preferred stock issued by the institution—into an “asset” of the institution. This was the beginning of the injection of confidence that the market was looking for from the government. Confidence was the only thing that could stop the run on everything financial.

On October 13, 2008, Henry Paulson (Treasury), Ben Bernanke (Fed), Timothy Geithner (FRBank NY), John Dugan (OCC), and Sheila Bair (FDIC) met with the CEOs of the nine largest banks to inform them under threat of regulatory action that they would all be accepting TARP assistance. That message was not well received by some. Why should they accept government assistance if they did not need it? Paulson wanted them all to accept it so that any of the hundreds of smaller banks that required it would not be branded as troubled outliers that were doomed to fail.⁶⁴ At the same time, the government decided that it could not adhere to the principle established in the S&L and banking crises of the 1980s—if a financial institution got assistance from the government, its management and the board were replaced. Paulson and Geithner assumed that such a requirement would be a deal breaker because executives would never accept TARP at that point if they had to resign. If they didn't accept TARP, the banks that did take TARP

because they really needed it would be labeled as failing institutions that consumers and the markets would run from.

Perhaps they overthought that issue. The question is not whether the market sees an institution as failing but whether it perceives the government as underwriting its future viability. A government imprimatur makes up for a whole lot of market reality. Just look at S&Ls that received assistance in the 1980s, Continental Bank in 1984, and Fannie Mae and Freddie Mac today. For years, Fannie Mae and Freddie Mac were failed entities losing billions of dollars, and even with senior preferred stock purchased by the Treasury, they reported almost no shareholder net worth for a decade as dividend payments to the Treasury drained their retained earnings. But government backing allowed them to do business as close to normal as possible after entering conservatorship. Because of their desire not to have banks identified as failing by accepting TARP, Geithner and Paulson admittedly lost the opportunity to remove directors and officers and did what Tim Geithner anticipated would be distasteful to Main Street America. They bailed out the banks in a way that appeared to bail out the bankers, thereby providing political fodder for their opponents and the press to pillory them. We are lucky that they had the courage to take those hits, but based on my experience, they probably could have been tougher on executives and boards that deserved it. Those are difficult fine points to decipher in a crisis when there is only one fundamental goal—stop the global economy from melting down. It does no good to stick to principles and watch the economy dissipate, so I view whatever mistake in judgment and whatever moral hazard that was created to be manageable.

For all its shortcomings, TARP had a significant impact on the psychology of the moment. It was a statement from the government in the creditworthiness of the more than seven hundred banks that received it. It worked because it injected confidence back into the market. It told the market that those seven hundred-plus banks would not fail. That is all their counterparties and vendors needed to know to continue to do business with them. In the end, TARP was a money maker for the United States.⁶⁵

The Financial Accounting Standards Board Plays a Card

Among all this financial chaos, there was one other significant element mixed into this financial mess, compliments of the FASB. It was the requirement that financial institutions move to a greater degree to MMA or fair-value accounting. MMA requires the current market value of an asset or liability to be reflected on an institution's financial statements. In contrast, historical cost accounting is largely based on the value at which an asset or liability was booked when it was originated or acquired. Historical cost accounting is more straightforward given the complexity of determining the current value of assets such as a loan when its value is represented by a hole in the ground that will eventually become a building.

In the 1930s, banks were required "for supervisory purposes" to use MMA for their investment securities portfolios. Concerns by bank regulators about how it impacted banks' financial performance and investment decisions resulted in the agencies abandoning it even for supervisory purposes.⁶⁶ Even then, there was a debate over the benefit of not having banks fail due to short-term changes in the economy and the detriment of having their balance sheets be impervious to current economic conditions. After the Great Depression, accounting tended away from current values, a move that was then supported by the chief accountant of the SEC.⁶⁷ Note that MMA can be just as problematic when values are rising rapidly and banks are experiencing short-term boosts. Fair value accounting returned in 1975 after substantial declines in the market values that mandated its use in certain circumstances. In December 1975, the SEC issued SFAS No. 12, Accounting for Certain Marketable Securities, which applied MMA to marketable equity securities.

MMA was studied for more than a decade by FASB, which finally adopted FAS-157. It went into effect at the worst time possible—November 15, 2007. It required banks to write down the value of some or all their assets, especially illiquid assets. The timing could not have been more problematic. In the accounting world, there seems to be an unwritten rule that the more painful an accounting standard is, the more accurate it must be. MMA added volatility at a time that was already enormously unpredictable and resulted in write-downs of banks assets, updated pricing of illiquid securities, and reductions in the value of

many financial derivatives, including credit default swaps and MBS. All of this ultimately aided in some large institutions such as Lehman Brothers becoming insolvent. The stock market nosedived just as FAS-157 went into effect, with the S&P 500 Index plunging over 50 percent in the next few months as trillions of dollars in wealth disappeared. “The crisis required a write-down of over \$2 trillion from financial institutions alone, while the lost growth resulting from the crisis and ensuing recession has been estimated at over \$10 trillion (over one-sixth of global GDP in 2008).”⁶⁸ William M. Isaac, former chair of the FDIC, labeled this action as “irresponsible” and concluded that it caused the “senseless destruction of bank capital within the U.S. financial system.”⁶⁹ He estimated the write-down on bank balance sheets alone as \$500 billion in capital that directly resulted in the elimination of \$5 trillion of bank lending capacity.⁷⁰ “[T]he implementation of mark-to-market accounting rules in November 2007 was the proverbial straw that broke the camel’s back and launched us into the crisis.”⁷¹ On March 16, 2009, the FASB proposed less severe guidelines for valuing assets under FAS-157 as the stock market bottomed.

The SEC studied the impact of MMA on the Panic of 2008. It concluded that “financial institutions recorded 45% of all assets at fair value as of first quarter-end 2008,” with the low of 31 percent for banks and the high 71 percent for insurance companies.⁷² Of total banking assets and liabilities, 22 percent and 11 percent were reported at fair value.⁷³ The SEC staff concluded that fair value accounting was *not* a “primary” underlying cause of the 2008 bank failures studied.⁷⁴ While recommending that MMA not be suspended, it did, however, recommend that MMA rules be readdressed, improved, and simplified.⁷⁵ This nearly eighty-year debate over MMA and the value of its impact on financial institutions will continue as advocates and opponents continue to develop data and arguments and assess the impact after the fact. Brian Wesbury, a well-known financial economist,⁷⁶ created a presentation that correlates the collapse of the economy in the Panic of 2008 with actions taken by the Federal Reserve and the application of MMA.⁷⁷ There is little doubt that the timing of the rollout of MMA in 2007 was very unfortunate no matter how devastating an impact it had.

What makes this chapter of the crisis even more suspect, however, is that the FASB is not a government agency and is subject to tissue-paper-thin oversight. It was formed by the accounting industry in 1973

to develop and articulate generally accepted accounting principles. It is essentially a self-perpetuating body of accounting experts located in Norwalk, Connecticut. It is a unique body that enjoys an unusually privileged position in the financial world.⁷⁸ Federal law authorizes the SEC to set accounting standards for publicly reporting companies, which it delegated to the FASB in 2003 under the authority provided it in the Sarbanes-Oxley Act in 2002. In its report on MMA after the Panic of 2008, the SEC staff went to some lengths to sanctify the processes, transparency, and due process employed by the FASB in developing its MMA rules.⁷⁹ Unfortunately, the SEC retains only minimal oversight, noting its anticipation of a continued “collegial working relationship.” The FASB was not established by any act of Congress, it largely operates according to its own rules, and it is nearly impossible to challenge its standards or the basis for them in court.⁸⁰ In contrast, the public can invoke a variety of federal laws to pull back the curtain at any federal government agency to see how final decisions have been made and invalidate them if the appropriate processes have not been followed. Notwithstanding whatever self-imposed transparency and governance rules the FASB has adopted, no such check by the public is available with respect to the FASB. Neither is the FASB subject to presidential executive orders that seek to reduce and streamline financial regulation. There is simply insufficient due process and no right of appeal when the FASB gets it wrong, as it has several times during its relatively brief existence.⁸¹ This system of accounting standard setting is peculiar at best.

The Crisis Hangover

Six months *before* Congress’s hand-picked commission finished analyzing the causes and presenting its recommendations regarding the Panic of 2008, Congress passed the Dodd-Frank Act in July 2010. It must have been one of Congress’s more prescient moments. It could not even wait for the findings and conclusions of its own commission before enacting legislation. Perhaps that is why most provisions of the act did not match the causes of the crisis. For example, this catastrophic financial event was largely a liquidity crisis that turned into a solvency crisis, but the act did not include new liquidity requirements for any financial institution. It did introduce several important preventative regulatory

enhancements, including (1) a methodology to measure and protect systemic safety and soundness; (2) reordering the financial incentives in mortgage securitization by requiring the retention of risk by the creators of mortgage pools; (3) reforming home mortgage origination and disclosure requirements; (4) creating the CFPB to protect consumers; (5) establishing a regulatory and exchange structure to make derivatives and swaps markets and trading more supervised and transparent; (6) introducing new regulation of payments, clearing, and settlement system companies; (7) implementing new investor protections; and (8) creating formalized stress testing for banks.

Its approach to some of these issues was not nearly as effective as it could have been. Systemic regulation was delegated to the nine underlying federal agencies that Congress accused of not doing their jobs leading up to the crisis, and it focused on designating a few big non-banks to be regulated by the Federal Reserve. Risk retention was an important concept necessitated by the way mortgage risks were socialized, but it became a complicated collection of concepts that were difficult to implement. Home mortgage reform overly standardized mortgage products to the detriment of innovation. The Dodd-Frank Act led to the adoption of more than two dozen bank capital requirements that made compliance difficult and created conflicting risk incentives, particularly for the largest banking institutions in the country. The act was more than eight hundred single-spaced legislative pages of new laws, many of which had little to do with the causes of the crisis. It mistakenly concluded that more regulation would necessarily be a good thing. In its haste to address the financial crisis, Congress confused action for progress and missed an opportunity to fix the broken structure of federal regulation and the archaic way that regulators are forced to oversee institutions and markets. It did not give regulators better data or tools as was the intended purpose for the newly created Office of Financial Research in the Treasury and did not mandate functional regulation to move the country toward regulating financial transactions rather than just banks. It did not more finely calibrate financial regulation to economic incentives in the market. It did not arm regulators with the technology that they needed.

Hundreds of rules have been promulgated because of the enactment of the Dodd-Frank Act, and yet, no government entity has ever analyzed the cost of the act before, during, or since its enactment. For all

anyone knows, when it was passed by Congress, the act could have just as likely hurt the US economy as improve it. No one knew, and yet it passed. It is to some degree an unnecessary tangle of regulatory spaghetti that will come back to bite the financial security and stability of the US economy if for no other reason than the costs and distortion that it will eventually and unintentionally create. Most of those costs are being passed on to consumers in the form of higher interest rates on loans and lower interest rates on savings accounts. The act was a missed opportunity at a time when it could have remade an obsolete regulatory system.

FINANCIAL PANDEMIC

2020

A century after the Spanish Flu pandemic ended in December 1920, coronavirus 2019 (COVID-19) appeared. It was the epidemiology equivalent of a hundred-year flood that most never imagined they would ever encounter. It altered every aspect of social, economic, and government behavior in a matter of weeks. While there may have been no way to prevent the pandemic from occurring (although much has yet to be learned about its origins), the government's battle against it and the financial hurricane that accompanied it was handicapped by the absence of reliable data and rigorous analysis. Federal and state governments did not have supercomputers using sophisticated algorithms evaluating enormous amounts of data twenty-four hours a day to track and identify optimal methods of fighting the disease and its effects. But BlueDot did.

BlueDot was founded in 2008 to create software to “track, locate and conceptualize” infectious diseases. It saw evidence that COVID-19 was coming and identified it in December 2019, before the World Health Organization released its statement alerting people to the emergence of the virus.¹ BlueDot uses sophisticated artificial intelligence that runs algorithms against vast amounts of data. That data includes information collected from the airlines about each flight and the patterns of the four billion global travelers who can transport diseases with them each year. It also analyzes public health, livestock, medical, and anonymized cell

phone data records. It has studied and collected information on 150 deadly pathogens and used intelligent programs to process its data every fifteen minutes around the clock in sixty-five languages. BlueDot predicted twelve of the first twenty-four metropolitan cities that would suffer from COVID-19.

I had learned about BlueDot and was already applying its theories analogously to the prevention and mitigation of financial crises when I saw the report on BlueDot's work on *60 Minutes* on April 26, 2020. I sat in front of the television shouting "YES, YES!" as a medical expert said that the benefits of artificial intelligence had sadly *not yet been employed* to overhaul the way that governments tackle pandemics and other healthcare crises. He urged policy makers to move in that direction and create an "infectious disease forecasting center."² This is precisely my proposal for dealing with financial services. Where is the country's early warning financial disaster forecasting center? Why had FSOC or the Treasury's Office of Financial Research not created it after the Panic of 2008? The technology was available, but the data was never collected and analyzed in the ways that it could have been.

If governments' handling of and response to the pandemic and the economic tsunami that it created are finally determined to be less than optimal, it will almost assuredly be due at least in part to a failure of available data, the analysis of it, and the correspondingly deficient responses of governments. For example, consider this most basic deficiency. Raw infection rates, reported deaths, and corresponding mortality rates have been generally published by city, state, and nation in a manner that does not help people to calibrate the appropriate levels of care and concern that they should have depending on where they are. Measuring the number of deaths against the number of people tested and found to have the disease ignores the many people who have not been tested, had the disease, were asymptomatic, and didn't die. In other words, to understand the threat posed by the disease, officials had to know the denominator of a fraction that was largely unknown. If there are three hundred thousand deaths against a denominator of three hundred million people who contracted the disease, the mortality rate would be 0.001 percent. If the denominator is three million, the mortality rate is 1 percent. Similarly, without knowing the rate of infection, it would be impossible to determine what healthcare providers would have to be prepared for. I do not ascribe to a utopian view of how

all of this could have been handled in a perfect world. But I do know that technology and data create a prism through which humans can more reliably understand what is happening in real time. Being better prepared and using artificial intelligence to overhaul how governments tackle pandemics and healthcare problems is not only possible; it is mandatory for them to be able to protect their citizens.

Given the government's recent experience with the Panic of 2008, the building Financial Pandemic of 2020 provides an interesting test case for the economic preparedness and effectiveness of the government. While the federal government was able to deploy an impressive arsenal of familiar assistance programs, the allocation of government resources mandated by the Dodd-Frank Act did not sufficiently create the tools and systemic preparedness that could have been used to address these new financial challenges. That is not to suggest that the government should or could have been prepared for a hundred-year pandemic. If healthcare experts had sophisticated artificial intelligence analyzing mountains of data around the clock like BlueDot, perhaps it could have detected the virus and its growth patterns several weeks or months earlier. Those weeks or months could have provided time to define strategies, stockpile masks and personal protective equipment, prepare hospitals, and look for a vaccine, all things that could have saved lives. Similarly, data could have better prepared the government to react to the financial disruption that the pandemic created once it arrived. For example, while the quiver of financial assistance used in 2008 was quickly rolled out, one missing variable was the fact that the financial markets of 2008 were different from those of 2020. In 2008, there were no marketplace peer-to-peer lending companies or cryptocurrencies.

At this writing, events do not yet fit my definition of a "financial crisis" because the financial services and commercial banking business is still strong, and no banks have failed. But time will change that if the virus and economic stagnation continue. On September 23, 2020, the OCC reported that the percentage of seriously delinquent mortgages—mortgages that are sixty or more days past due and all mortgages held by bankrupt borrowers whose payments are thirty or more days past due—increased 5.4 percent from the previous quarter and 5.3 percent from a year ago.³ Given the potential for economic distress that a prolonged pandemic period has and the actions that the government has

already taken to stabilize markets and support individual workers, I would be remiss not to include this event as a financial crisis.

DRIVERS OF THE CRISIS

This financial crisis broke the mold that all others in the last two centuries had created. It was not an economic event or financial sector misbehavior that led to a loss of confidence in the financial system. It was caused by fear of an invisible viral enemy. Much of the economy came close to stopping for several months. The 2020 coronavirus pandemic was a seismic shock to the country's health, psyche, and economy. Nothing like it had occurred in a century. The world transitioned from life as usual to social distancing, and then to disengagement and widespread isolation in a matter of weeks. Shopping, restaurants, manufacturing, hotels, construction, travel, repairs, and life as we know it went into suspended animation as state after state ordered people to stay home. Personal lives stopped. No one knew how long the virus would be around, how many people would contract it, or how many would die. With imperfect knowledge about these questions, a health crisis almost instantly became a financial crisis, with no way of telling how long either would last. Financial confidence was shattered in a matter of weeks, more by the fear of death than fear of bank failures. The normal financial tools that the government could deploy would have to confront a new and different player on the board—COVID-19.

It became clear within thirty days of the outbreak in the United States that the health crisis had to be brought under control before economic damage could be averted or limited. But governments had inadequate scientific data and models to rely on and therefore, even with the best of intentions, could not make informed decisions that resembled anything more than gambles. The White House did eventually establish gating rules and layered guidance in mid-April for the governors to use in deciding when and how to open the economies of their respective states. But how could states send people back to work and expect no systemic relapses when they did not know how many of them were infected, how many would likely be infected, how many would die, and what the profile of each group looked like? Similarly, on what scientific basis were governments keeping workers home and tak-

ing the resulting economic blows if they did not know how contagious, debilitating, and lethal the disease was?

Economic data also seemed to be inadequate. While pumping money into the economy through a fire hose might have avoided a collapse, it could not do so forever, and it would likely be highly inefficient. The impact of trillions of dollars could eventually create all kinds of post-crisis problems, including inflation and higher interest rates.⁴ The Treasury and Federal Reserve would have to remain flexible and adapt to wherever the virus sent the economy.

HOW IT HAPPENED

On December 30, 2019, the Dow Jones Index closed at 28,462. The US economy was as healthy as it ever had been with extraordinarily low unemployment numbers. The next day, Chinese health officials informed the World Health Organization that forty-one patients with a form of pneumonia supposedly linked to the Huanan Seafood Wholesale Market—a “wet market”—in Wuhan province in China had been identified. Subsequent reports speculated that the virus had escaped from the nearby Wuhan Institute of Virology⁵ and that the Chinese government engaged in a coverup to avoid blame and corner the market on masks, protective gear, and whatever else it thought it might need.⁶ In any event, the Huanan wet market closed the next day.⁷ It will undoubtedly take years to find the truth about the source of the virus. On January 7, 2020, Chinese authorities officially identified the new coronavirus and several days later, its first casualty. Five million panicked people left China over the next two weeks.⁸ It is estimated that 430,000 of them flew to the United States.⁹

By March, the viral hurricane and its economic devastation hit the United States straight on. On March 11, the White House banned all travel to the United States from twenty-six European countries and declared a national emergency.¹⁰ Two days later, the Dow had dropped by more than five thousand points. On Sunday, March 15, the Centers for Disease Control and Prevention (CDC) advised against gatherings of fifty or more people over the next eight weeks.¹¹ The White House then counseled against groups of more than ten people as New York City’s public schools system, the nation’s largest with 1.1 million stu-

dents, announced that it would close. It was assumed that sheltering in place would become the logical way of preventing the disease from spiking and overwhelming hospital and healthcare resources. As good as it may have been health-wise for everyone to isolate themselves, it would create an unprecedented economic downdraft. Given the implications of people not working, receiving incomes, or paying their bills, credit immediately constricted as the value of collateral decreased and businesses began to fear that leases and loans would increasingly go into default, a development that could eventually threaten the country's banks, which entered this period as strong as they had ever been with an average of 11 percent capital. Businesses and individuals increasingly transitioned to cash, threatening to create an economic death spiral as a wave of securities sales and margin and collateral calls swooshed through financial markets.

Armed with the playbook from the Panic of 2008, Congress, the Treasury, and the Federal Reserve would attempt to offset the impact of a sudden reversal of the economy and provide liquidity and credit to allow businesses to weather the “temporary” economic storm. That playbook would consist of strategies to flood the financial services sector and capital markets with liquidity, purchase financial assets, encourage lenders to forbear on borrowers who were unable to repay, give banks some latitude and forbearance when they would inevitably start to feel financial distress and miss capital and liquidity targets, provide funding and grants to businesses to allow them to keep paying their employees, create expanded and more generous unemployment programs, rapidly disburse cash payments to Americans, and sanction delays in making monthly mortgage payments. This added up to a quicker, deeper, and broader response than the government had deployed in the Panic of 2008. The government knew that it needed to provide confidence as well as cash to keep the economy afloat.

On March 15, the Federal Reserve stepped forward and unleashed an arsenal of interest rate and credit expanding actions in coordination with other central banks.¹² It reduced interest rates and bank reserve requirements close to 0 percent and committed to purchasing billions of mortgage securities.¹³ The markets were not impressed. The very next day, Monday, March 16, the Dow fell another three thousand points, so that week, the Federal Reserve and the bank regulators reloaded and released a statement encouraging banks to use their re-

sources to support households and businesses. Throughout March, the Federal Reserve launched a host of lending facilities from 2008 and some new programs to underwrite financial markets. They included the (1) Commercial Paper Funding Facility to support commercial paper markets; (2) Primary Dealer Credit Facility to provide primary dealers overnight and term funding;¹⁴ (3) Money Market Mutual Fund Liquidity Facility to enhance the liquidity and functioning of money markets,¹⁵ including state and municipal money markets, through nonrecourse lending to banks that could then purchase fund assets;¹⁶ (4) Primary Market Corporate Credit Facility to provide investment grade companies access to four-year bridge financing; (5) the Secondary Market Corporate Credit Facility to purchase secondary market corporate bonds issued by investment grade US companies and US-listed exchange-traded funds; and (6) Term Asset-Backed Securities Loan Facility with credit protection provided by the Treasury Department to support the issuance of asset-backed securities backed by student loans, auto loans, credit card loans, loans guaranteed by the Small Business Administration, and certain other assets.

The Federal Reserve also established six-month US dollar liquidity arrangements (swap lines) with central banks to simulate Federal Reserve intervening in foreign exchange markets and strengthening liquidity conditions in dollar funding markets around the globe.¹⁷ These arrangements effectively signaled support for dollar denominated transactions in foreign countries and confirmed the Federal Reserve's position as central bank to the world.¹⁸ In mid-March, the Federal Reserve expanded its power and influence globally, purchasing \$450 million in Treasuries from investors around the world to raise dollars, lending another half a trillion dollars over the next few weeks to foreign counterparts. The *Wall Street Journal* reported that the Federal Reserve had "eased a global dollar shortage, helped halt a deep market selloff and continues to support global markets today."¹⁹ It lent abroad faster in 2020 than it did during the Panic of 2008. Domestically, as Chairman Jerome Powell of the Federal Reserve would later explain, longer-term debt markets were strained as the cost of borrowing rose sharply for those issuing corporate bonds, municipal debt, and asset-backed securities backed by consumer and small business loans.²⁰ The FOMC assertively announced that it would purchase Treasury securities and agency and commercial MBS "in the amounts needed" to

support smooth market functioning and effective transmission of monetary policy.²¹ Still not finished, the Federal Reserve previewed the establishment of a Main Street Business Lending Program to support lending to eligible small- and medium-sized businesses and complement efforts by the Small Business Association (SBA).²² Wherever the Federal Reserve did not have broad authority to lend to nonbank companies or purchase assets, the Treasury would make an equity investment in special purpose vehicles established by the Federal Reserve through its Exchange Stabilization Fund and that vehicle would lend the money or purchase the assets.

The Panic of 2008 provided a proximate understanding of how and why these emergency responses should work. But this crisis was different—it was not started by government policies or financial institutions playing with financial fireworks. It was caused by American businesses, employees, and consumers being immobilized by the fear of disease and death. Moreover, the markets had evolved with a new generation of digital and online products such as peer-to-peer lending, cryptocurrencies, and crypto exchanges that were nonexistent in 2008. There was not much time to recalibrate what worked in 2008.

In late March, the federal and state financial regulatory agencies formally announced various forms of forbearance and encouraged financial institutions to work constructively with borrowers affected by COVID-19 on loan modifications to avoid defaults. Similarly, the agencies decided to refrain from criticizing such institutions for pursuing forbearance programs with their borrowers by allowing them to avoid automatically categorizing loan modifications as troubled debt restructurings that would have negative accounting and financial consequences when short-term modifications were made on a good faith basis in response to COVID-19.²³ But forbearance is a tool that has limited utility and significant risks. The length of its runway is determined by the amount of time that banks can operate without income. In addition, forbearance—workouts from a bank's perspective—can make banks' financial statements less transparent, thereby potentially hiding other building financial problems. Having rolled out a large swath of these regulatory assistance tools, the country waited for Congress to pass a rescue package that would inject money into the economy. The Dow Jones Index slid to 18,592, down about 37 percent from its high of 29,551 just thirty-two days earlier on February 20. In contrast, it had

taken thirteen months for the Dow to drop 37 percent in the Panic of 2008. Expecting a more comprehensive solution about to be enacted into law, the Dow rose by more than 20 percent to 22,552 on March 26.

On March 27, Congress passed and the president signed the Coronavirus Aid, Relief, and Economic Security Act (CARES Act),²⁴ which appropriated and provided for the distribution of two trillion taxpayer dollars to fight the health and economic impacts of COVID-19. Much of that funding would be multiplied several times because the Federal Reserve was expected to leverage funding from the Treasury into another \$4.5 trillion in lending power. In addition to direct relief to fight the virus, the CARES Act authorized \$349 billion in forgivable loans through the country's banks for small businesses so that they could continue to pay employees whether they were working or not, \$600 billion for larger corporations in return for options, warrants, and other equity instruments and \$1,200 payments to eligible Americans. The FDIC was authorized as it was in 2008 to backstop bank-issued debt and certain noninterest-bearing transaction accounts. Community bank capital requirements were reduced by 1 percent,²⁵ and FASB accounting rules dealing with troubled loans (i.e., troubled debt restructurings) and current expected credit loss (CECL) were suspended temporarily.

The same day, the bank regulatory agencies went even further to avoid accounting losses and bookkeeping burdens by suspending these two accounting principles for up to two years. This action seemed to underscore the arguments made by opponents of CECL that such accounting principles are procyclical and created unnecessary losses in chaotic environments such as existed in 2020.²⁶ The fact that CECL was the first baggage that Congress and the regulators threw overboard undercuts the arguments made by proponents of CECL that it was the most accurate and intellectually honest way to value bank assets. Consumers also were provided relief under the CARES Act by receiving temporary relief from loan foreclosures, evictions, and adverse credit ramifications, and up to 360 days of payment suspension on federally backed mortgages. No capital assistance for banks or nonbanks (like TARP) was provided, however, and there were limited or no lending facilities for noninvestment-grade companies and private equity firms.

With the passage of this legislation, one question permeated the daily discussions about COVID-19. How long would the virus continue to afflict the world and keep the economy shut down? The country had

not been forced to choose between its physical and economic health since the Spanish flu caused the death of 675,000 Americans between January 1918 and December 1920. The Spanish Flu infected an estimated five hundred million people worldwide, or about 27 percent of the world's population.²⁷ It came in three waves: the first in July 1918, the second and most deadly three months later in October 1918, and the last in February 1919. No one knew where it came from or why it disappeared.²⁸ Between thirty and fifty million people, or about 1.7 percent of the world's population, were estimated to have perished. Cities such as Philadelphia and Washington, DC, were completely shuttered. Washington, DC, reportedly ran out of coffins because so many people were perishing each day. Merchants reported business declines of between 40 and 70 percent.

If COVID-19 followed the same path today, it would translate into one hundred million deaths around the world. Modern healthcare standards and medicine should be expected to reduce the impact and recycling of the disease, as well as the number of deaths. The economic impact of a modern pandemic should also theoretically be better handled today given the more sophisticated tools that governments possess. But the economy was more simplistic in 1918 with relatively small amounts of consumer credit extended in markets that were nowhere near as interconnected as they are today. The Federal Reserve System had been created in 1913, but was still ill-equipped, politically handicapped, and badly structured in 1918 to take economic actions in reaction to the pandemic. The Spanish Flu was essentially permitted to run its medical and economic course, but once it had run its course, the Dow increased by 50 percent rather rapidly.²⁹ It was followed by the roaring twenties, when the economy expanded exponentially. A 2007 report by the Federal Reserve Bank of St. Louis Report on the Spanish Flu is quite instructive. It extrapolated from it that in future pandemics, quarantines would have to be complete to be effective, causing businesses to suffer revenue losses in excess of 50 percent.³⁰

There was, however, an overriding variable that would decide how effective the government would be in supporting the economy—the virus. By March 29, confirmed cases of COVID-19 being reported in the United States stood at 140,258 with 2,540 deaths, and President Trump announced that social distancing guidelines would be in place through April 30. Little did he know at that time that many would view

that period as the end of their patience for the economic destruction that was occurring. By the end of March, almost every sector of fixed income markets, including Treasuries, municipal bonds, and money-market mutual funds, had come under stress. The Federal Reserve had already added more than \$1 trillion to the system and purchased \$942 billion in Treasuries and MBS. The program did not, however, apply to private-label MBS not sponsored by government agencies. The Federal Reserve also had provided more than \$50 billion in low-cost loans to banks through its discount window. These actions appeared to ease some of the financial stress as the global demand for dollars from corporations and investors hit an all-time high and credit risk reflected by derivatives indexes eased. But the commercial paper market, which many businesses turn to for short-term funding sourced from money market funds, remained stressed, and the leveraged lending market was a specific concern given the 15 percent default rates that were predicted for it if things did not turn around quickly.³¹ The Federal Reserve on March 31 established a temporary repurchase agreement facility to allow central banks and other international monetary authorities with accounts at the Federal Reserve Bank of New York to enter into repurchase agreements with it and temporarily exchange their US Treasury securities held with the Federal Reserve for US dollars, which could then be made available to institutions in their jurisdictions.³²

The Treasury quickly announced the terms of Small Business Loans to employers of fewer than five hundred employees under the Paycheck Protection Program created by the CARES Act³³ as President Trump told the country to prepare for a very painful two to three weeks and possibly deaths in the United States as high as 100,000 to 240,000 even with social distancing in place. The sense of helplessness and eroding public confidence was not helped by medical studies like one posted by the Federal Reserve Bank of Minneapolis indicating that the country would have to adhere to severe social distancing measures for *twelve to eighteen* months, or until a vaccine could be developed, underscoring the significant economic tradeoffs that would accompany that remedial approach.³⁴ More problematic was its conclusions that even under severe social distancing scenarios, it was likely that the health system would be overwhelmed within six months when 10 percent and 20 percent of the population (thirty-three to sixty-six million people) suf-

ferred from an active infection.³⁵ None of these dire predictions would come to pass by October 2020—nothing even close to them.

As people increasingly became unemployed, some state government unemployment systems were utterly unprepared for the surge. State websites that were to distribute the financial relief provided by the CARES Act crashed, frustrating people who were already stressed. When some systems that were programmed using the sixty-year-old common business-oriented language (COBOL) crashed in the wake of millions of unemployment filings, the systems could not be quickly repaired because few present-day programmers knew what COBOL was or how to fix it.³⁶ The fear of the increasing threats to economic and physical health could be felt everywhere.³⁷ Liquidity in Treasury markets deteriorated rapidly as the bad news increased and financial institutions experienced difficulty continuing to provide credit to households and businesses. As financial assets decreased in value, margin and collateral calls increased as lenders pulled in their credit lines and hoarded cash. Real estate investment trusts and nonbank commercial lenders and intermediaries saw lines of credit dry up overnight, forcing them to find credit on unfavorable terms, or not at all. The municipal-bond market made the case for the Federal Reserve to use its new powers to wade in as it came under stress, increasing concerns about the massive financial toll that the unprecedented economic shutdown would have on states, cities, transit agencies, airports, and others that stand behind municipal bonds, particularly as tax filing deadlines were being pushed back and revenues fell. This led to municipalities urging the Federal Reserve to create a temporary facility to buy municipal debt and provide low-interest loans to them.

In March, the percentage of residential home loans already in forbearance grew to 2.66 percent from 0.25 percent, according to the Mortgage Bankers Association. For loans backed by Ginnie Mae, which serves low- and moderate-income borrowers, the rate jumped to 4.25 percent.³⁸ These numbers would be headed higher. Concerns grew about the staying power of mortgage providers, servicers, and investors. If the mortgage business collapsed, that would likely undo much of the remedial actions that had been taken throughout the balance of the economy. On Friday, April 3, federal and state regulators published guidance to provide needed regulatory flexibility to enable bank mortgage servicers to work with struggling consumers affected by COVID-

19 under the CARES Act. The agencies promised not to take supervisory or enforcement action against bank mortgage servicers for violations of applicable rules, notice provisions, and collection requirements.³⁹ The 40 percent of mortgage servicers that were not banks sounded alarms regarding their inability to foot the bill for months of nonpayments by homeowners. This caused the Financial Stability Oversight Council to again consider the systemic risk created by a strain on non-bank servicers and appoint a special subcommittee to evaluate the issues and possible solutions. These economic dislocations were a natural byproduct of the art of forbearance. If institutions forbear to allow consumers to skip payments, eventually those institutions will experience liquidity and asset quality problems that will cause them to feel financial distress, restrict credit, and perhaps fail if the situation lasts long enough and their regulators lose patience with them. It is a tricky formula because somewhere and somehow the original debt comes due and someone must satisfy it. There is no free lunch. That would become particularly clear as borrowers in federally backed mortgage loans used the financial hardship provisions of the CARES Act to request forbearance for up to a year, putting a strain on loan servicers as well as Fannie Mae and Freddie Mac. Such strains could eventually result in the need for their additional draws on the Treasury just when the government was preparing to launch plans to release Fannie Mae and Freddie Mac from conservatorship, recapitalize them in the public market, and allow the Treasury to sell or dispose of its preferred stock and warrants. In a coronavirus press briefing ten days later on April 13, Secretary Mnuchin assured the public and the mortgage servicing industry that the administration was keenly aware of this problem, had spoken to FHFA about what Fannie Mae and Freddie Mac should do, and would make sure that there were no disruptions in the market.

While unemployment was reported to have risen to be about 4 percent in March, nine million people not included in those numbers had filed for unemployment insurance over the previous two weeks, causing some to believe that unemployment in the United States had already reached close to 13 percent and was headed higher.⁴⁰ Reports on Monday, April 6, revealed that banks had already committed to make \$40 billion in loans to small businesses under the Small Business Association Paycheck Protection Program established by the CARES Act. Clearly, the \$349 billion provided by Congress would not last long at that rate.

The next day, the Federal Reserve announced a new lending facility to provide financing backed by these Small Business Administration–guaranteed loans.⁴¹ In other words, these loans made by the banks could be used by them as collateral to borrow from this Federal Reserve facility to increase their lending capacity. Because these Small Business Administration loans were forgivable, this was effectively the Treasury indemnifying the Federal Reserve for accepting them as collateral. While this facility could not increase the \$349 billion limit on forgivable Small Business Administration loans authorized by the CARES Act, it did provide a means for banks to replenish lendable funds and increase credit availability generally. On June 4, the Congress would extend the program's forgiveness period from eight to twenty-four weeks since many businesses were not able to apply the full proceeds of their loans to payroll and other costs in the shorter period. It also adjusted loan forgiveness timing and requirements to reflect the continuing stagnation of the economy. The president would sign the bill on June 5.⁴²

As the death toll reported in the United States surpassed 10,800, there was some good news suggesting that New York might be reaching its apex in terms of COVID-19 cases, as well as continuing stories about potential vaccines being tested on a fast-track basis. On April 6, the Dow Jones closed that day at 22,680, up 1,627 points, or 7.73 percent. The debate about how and when to get the country back to work had begun to heat up in April and opposing views about the utility of a several-month lockdown circulated. The sheltering in place that the country had practiced over the prior three weeks showed signs of working as the number of infections peaked in some hotspots throughout the country. But information in the public domain was sparse and often contradictory. By April 7, in New York City, the US epicenter of the pandemic, 86 percent of the 4,700 deaths were people who had underlying health conditions such as hypertension, diabetes, hyperlipidemia, coronary artery disease, renal disease, and dementia,⁴³ with 60 percent of hospitalizations being people seventy-five years of age or older. Of the more than 4,500 sailors tested for the virus on the USS *Roosevelt* in April, roughly 60 percent of the more than six hundred sailors who did test positive showed *no* symptoms of COVID-19, suggesting that younger people may be carriers and that the numbers being reported were highly unreliable, particularly in terms of the death rate.⁴⁴

Market watchers became increasingly concerned about growing levels of noninvestment-grade corporate debt and plummeting oil prices due to Saudi and Russian disagreements, which could severely harm the US oil and fracking businesses. On April 9, reacting to the pleas for assistance coming from various sectors of the economy that were still deteriorating at an alarming speed, the Federal Reserve announced that it was injecting another \$2.3 trillion of liquidity into the economy through new and previously established lending facilities.⁴⁵ To expand the liquidity available to participating financial institutions in the Small Business Administration's Paycheck Protection Program, as announced on April 6, the Federal Reserve agreed to extend credit to eligible financial institutions that originate those loans and take them as collateral at face value.⁴⁶ The Federal Reserve also agreed to purchase up to \$500 billion of short-term notes issued by US states (and the District of Columbia), US counties with a population of at least 500,000 residents, and US cities with a population of at least 250,000 residents.⁴⁷ The Federal Reserve was everywhere.

The federal banking agencies did what they could, issuing rules confirming that such Small Business Administration-backed loans made by banks would have a zero weighting for bank risk adjusted capital rules, essentially providing banks, subject to the remaining leverage and other lending restrictions, to make large amounts of such loans without having to match them with capital. That was completely appropriate because the government, not the bank, was theoretically on the hook for nonpayment for all or a portion of the loans.⁴⁸ The OCC, FDIC, and Federal Reserve would eventually also reduce some of the leverage capital requirements for certain institutions.⁴⁹ To increase credit flows to small and midsized businesses, the Federal Reserve agreed to purchase up to \$600 billion in loans through the Main Street Lending Program,⁵⁰ but it attached strings that were intended for Treasury's direct lending programs under the CARES Act making the loans less attractive. That included bans on stock buybacks and limits on compensation and dividends. This likely was to counter anticipated criticism by Congress. The loans would be for four years, and Main Street borrowers would have to "make reasonable efforts" not to lay off employees. This raised fundamental questions about how such metrics would work where a restaurant, hotel, and airline would reopen in a new world

when customer traffic and revenue might be at 50 percent of previrus levels.

As markets continued to strain, to facilitate the flow of \$850 billion in credit to households and businesses through capital markets, the Federal Reserve expanded the size and scope of the Primary and Secondary Market Corporate Credit Facilities and the Term Asset-Backed Securities Loan Facility backed by \$85 billion in credit protection provided by the Treasury.⁵¹ Eligible collateral under the Term Asset-Backed Securities Loan Facility was also expanded to include riskier investment-grade credits including commercial mortgage securities and CLOs.⁵²

By the afternoon of Good Friday, April 10, the United States had nearly 500,000 cases of the virus, about 340,000 more than the next closest country. As the numbers grew, they were increasingly dismissed as inaccurate by those who thought that they were too low and others who argued that they were too high. In addition, it was starting to become clear that the denominator in the published death rate ratios was problematic given that states and other countries were beginning to find that many more people who had the virus showed few if any symptoms. Confirmed cases of COVID-19 had no relationship to the total number of people who had it and perhaps were asymptomatic. It became obvious that focusing on the numbers to glean any more than a general sense of the severity and direction of the disease and its likely impact on the capacity of the healthcare system was imprudent. By mid-April, the balance sheet of the Federal Reserve had ballooned by about 50 percent in a month from \$4.3 trillion to \$6.4 trillion.⁵³ The president announced that on April 14, he was about to convene the first meeting of the “Opening the Country” Task Force.

Over the next week, there was political back-and-forth between state governors and the president arguing about who was in charge and when the economy would begin to reopen. As the country reached 31,000 deaths in mid-April, the Paycheck Protection Program had more than 1.4 million loan applications approved, totaling about \$305 billion of the \$349 billion set aside for the program. The balance was expected to be spoken for within hours. Unemployment figures reached twenty-two million people, wiping out nearly all the job increases created since the Panic of 2008.

On Friday, April 16, the White House seemingly reversed course on having “total” responsibility for reopening the economy and published uniform guidance approved by its Task Force of medical professionals for the governors to rely on to begin the process of rebooting the economy state by state.⁵⁴ The guidance described three stages to phase in the economies of states that had satisfied a gating prerequisite where it could document decreased COVID-19 symptoms, cases, and hospitalizations over a fourteen-day period.⁵⁵ Once through that initial gate, businesses in a state would increasingly open according to the priorities set forth in the guidance. The government would monitor the results to identify hotspots where relapses might be occurring to rapidly control them. On Friday, April 17, the Dow finished up 705 points (3 percent) to reach 24,242. From its high of 29,551 on February 12, the Dow Jones Index had swung down and then up a whopping 16,609 points, a 69 percent swing. By that time, more than 3 million mortgages were already in forbearance.⁵⁶ For the week, 4.4 million people filed for unemployment insurance.

Every time that a financial problem was addressed, a new one seemed to arise. By that time, the \$700 billion collateralized loan obligation (CLO) market was being discounted by more than 30 percent as credit ratings on the corporate loans that constituted them were rapidly downgraded, forcing managers to sell underperforming issuances or suspend payments to investors.⁵⁷ This was dangerous because many CLOs had a proportion of loans rated one level above junk and were the largest purchasers in the \$1.2 trillion leveraged loan market.⁵⁸ This could translate into a larger deterioration of institutional market confidence. Like a family squabble after the death of a wealthy relative, a battle over bailout dollars and economic fairness ensued.

Small business lending programs and small businesses were already running out of the money appropriated by the CARES Act. They waited for Congress to return to work and help them. The acting secretary of banking and securities in Pennsylvania, Richard Vague, among other things, said that another \$2 trillion package was needed to keep small business alive.⁵⁹ Borrowers of all types complained about the conditions attached to obtaining loans under these programs. Some commenters accused the government of favoring large businesses and protecting the Treasury from losses rather than the economy from collapse.⁶⁰ State and local governments saw tax revenues disappear. The government

was seeing the contradictory box it usually finds itself in. When parties are insulated from downside in the economy because of government safety nets, the fundamentals of how and why markets work get distorted. If the government did not throw out safety nets, however, the collapse of the economy could be unimaginable. Deciding how much of that distortion to permit when the economy is crashing down is a difficult challenge. To make matters more complicated, the price of oil plummeted as demand reached record lows given the world economy coming to a halt. For the first time ever, the price of a barrel of West Texas Intermediate crude to be delivered in May closed at negative \$37.63.⁶¹ Refineries had to pay distributors to take their oil!

The spotlight stayed on the mortgage business as mortgage servicers and borrowers experienced increasing financial stress because borrowers simply could not satisfy their monthly obligations without a paycheck. Having seen a backlash to prior statements essentially leaving nonbank mortgage servicers to carry the weight of mortgage forbearances provided by Congress, the FHFA backtracked and confirmed that Fannie Mae and Freddie Mac would require mortgage servicers to advance principal and interest on mortgage loans in forbearance *only* for four months.⁶² Mortgage loans that were delinquent for more than four months would be treated as they would be in a natural disaster event and remain in the MBS pool instead of being purchased out of those pools by Fannie Mae and Freddie Mac. Of course, this would not be more than a temporary stopgap solution if the virus persisted for longer periods because nonbank mortgage servicers are typically not as well capitalized as bank servicers. Moreover, neither Congress nor the regulators had made clear whether the four months of principal, interest, taxes, and other fees that would be advanced by the servicers would be recouped and if so, how and when.

The next day, the FHFA announced that it was temporarily suspending the prohibition against Fannie Mae and Freddie Mac purchasing mortgage loans already in forbearance or delinquent before being delivered by the lender because an increasing number of borrowers had begun to request forbearance or defaulted on the first payment after closing.⁶³ This illustrated how much mortgage markets had deteriorated in just a few weeks. Secretary of the Treasury Mnuchin announced that at the moment, beyond these actions, there were no plans to create a Federal Reserve facility to inject funding into mortgage servicers. Crit-

ics wondered how long that “moment” would last as Fannie Mae and Freddie Mac announced earnings reductions of more than 80 percent for the quarter. Seven percent of the mortgages that Fannie guaranteed were missing payments by this point. In the Panic of 2008, about 5 percent of Fannie Mae’s and Freddie Mac’s mortgages became “seriously delinquent.”⁶⁴

The approaching disruption in the complex US mortgage ecosystem could be unprecedented. By the end of May, several unintended consequences triggered by the CARES Act and its one-year payment forbearance provided to home borrowers had begun to distort market performance and threaten long-term economic recovery. Rates for a thirty-year fixed mortgage were about 1 percent higher than they would normally be given traditional spreads of about 1.7 percentage points above the ten-year Treasury yield.⁶⁵ The amount of available credit also shrank, particularly in the jumbo mortgage market, and some lenders would not consider making a loan with less than a 20 percent down payment.⁶⁶ Although rates were at historic lows, mortgage refinancings did not increase as they normally would, and to protect Fannie and Freddie, the government limited their ability to purchase loans in forbearance other than in ways that were economically unattractive to originators. By that point, 4.75 million people had requested forbearance, representing about \$1.04 trillion of unpaid principal.⁶⁷ The CARES Act created a one-way financial trap by allowing homeowners to forgo payments for a year with no forbearance for mortgage lenders or servicers.

To complicate the dizzying array of financial decisions being made, new scientific information emerged every day suggesting that many of the healthcare-related decisions that the government was making were based on incomplete or defective information. That of course would correlate to the confidence and performance of financial markets. For example, at the White House COVID-19 briefing on April 23, the Department of Homeland Security presented research suggesting that sun, temperature, and humidity may have a meaningful impact on the half-life of the virus. In other words, being outdoors in the sun could have an impact on the spread of the disease. Additionally, research emerged suggesting that more than one in five people in New York City had COVID-19 antibodies and may have had the virus.⁶⁸ That too would significantly undercut the models, ratios, and data that decisions

were being based on, including possibly lowering the mortality rate to well below the range of most flu mortality rates. By the end of the day, the House of Representatives passed legislation already approved by the Senate to refill the lending facilities created by the CARES Act.

These amendments added \$484 billion more in assistance to small businesses through the Paycheck Protection Program (\$320 billion) and sent \$100 billion to hospitals under stress from the coronavirus pandemic. By Monday, April 27, the United States was reporting close to one million cases of COVID-19 with almost 55,000 deaths. Twenty-six million workers had filed for unemployment over the previous five weeks and more than 3.4 million mortgage borrowers—6.4 percent of mortgage borrowers—had sought forbearance since Congress passed the CARES Act.⁶⁹ The US economy was in free fall, shrinking at a 4.8 percent annual pace for the first quarter.⁷⁰ Before April closed, the Federal Reserve expanded access to its Paycheck Protection Program Liquidity Facility to additional lenders including approved nonbank lenders.⁷¹ It also expanded the scope and eligibility for the Main Street Lending Program to businesses with up to 15,000 employees or \$5 billion in annual revenue, lowered the minimum loan size to \$500,000 from \$1 million, and increased the share of loans that the originating lenders would retain to a 15 percent share.⁷² This latter change would create a more salable participation interest in those loans than the previous 5 percent share. Of the \$454 billion authorized under this program, at the end of August, \$259 billion was still uncommitted.⁷³ But the bank regulators were running out of forbearance runway as bank capital would inevitably be reduced as it was used to bolster American businesses. The Federal Reserve's vice chair, citing a "national urgency," asked Congress to modify the Dodd-Frank Act's tight statutory restrictions "complicating the regulatory agencies' ability to address a severe economic stress period" to allow regulators to provide flexibility under Tier 1 leverage requirements as banks respond to increased credit demands.⁷⁴ Through April, thirty-three million Americans had filed for unemployment, increasing the unemployment rate to 14.7 percent. On April 29, the Federal Reserve's FOMC publicly committed to continue to support the US economy, noting that the ongoing public health crisis would "weigh heavily on economic activity, employment, and inflation in the near term, and pose considerable risks to the economic outlook over the medium term."

By May, the mood of the American people slowly shifted after months of shock began to wear off. Some people refused to come out of their homes, petrified by the deluge of contradictory information distributed by medical professionals, the media, and government leaders. The daily briefings by the president and the Coronavirus Task Force stopped. Some people accused governors of micromanaging their lives and restricting their constitutional rights by mandating what they could do even while sheltering in their own homes, while others applauded their efforts to protect lives. A growing number of people wanted the lockdowns to end so that they could earn a living again. The main problem was inaccurate information, inconsistencies, and clear contradictions in what authorities were circulating at the federal and fifty state levels. In some states, liquor stores remained open, while churches were closed. Face masks were first discouraged as ineffective, but then later mandated. The World Health Organization first said that there was no evidence of person-to-person transmittal of the virus,⁷⁵ and then did a reversal, as it did months later with regard to whether asymptomatic people could spread the virus.⁷⁶ The CDC said that the virus was transmittable from material surfaces, and then reversed itself, concluding that it was much less likely to be transmitted that way.⁷⁷ A salon owner who opened her business in Texas to be able to feed her family was put in jail⁷⁸ at the same time that cities and states were releasing incarcerated felons to prevent them from getting COVID-19. Naturally, some of those prisoners immediately committed new crimes, including murder.⁷⁹ The unhoused population in some major cities were sent to hotels closed by the virus and offered alcohol and drugs to stay quarantined there.⁸⁰ Sweden's failure to lock down its populace was repeatedly condemned and then later lauded as the right way to go.⁸¹ Finally, the way the disease could be transmitted has never been consistently or clearly articulated as contradictory theories connected to saliva, breathing, heat, sweat, humidity, sun, and touching circulated.

People readily noticed these inconsistencies in the government's messaging and policies and wondered how decisions were being made and whether they were the result of science, bad management, confusion, ineptness, or politics. Governors and the president traded accusations, insults, and blame, underscoring the underlying political divides throughout the country. Unbelievably, the pandemic became the political weapon of choice. The more politics that emerged, the more public

bickering occurred and the more confused the messages to the American people became.

All those mixed messages undermined confidence in federal and state governments, which is critical in any kind of a crisis. Some people protested and others crowded beaches as states began to slowly reopen. Whether short-sighted or not, it became apparent that fighting a virus with a one-size-fits-all strategy might not have been the most thoughtful approach given that more than 50 percent of the country's deaths as of mid-May had occurred in New York, New Jersey, and Massachusetts. Why would residents in West Virginia or Utah think that their economies and livelihoods should come crashing down because of 54 and 67 deaths respectively? New York had 27,000 deaths. Inconsistent reports about the reach and severity of the disease continued to circulate, underscoring that the decisions being made were likely based on unreliable empirical data or the analysis of it. Research at Stanford University, for example, suggested that a majority of people who contracted the virus recovered without ever knowing they were infected, making the number of cases in the test area possibly fifty to eighty times higher, and the true fatality rate in line with seasonal influenza, somewhere in the range of 0.12 to 0.2 percent.⁸² Similar studies surfaced suggesting that the infection rate of the disease in New York was larger than thought by many multiples. Debates emerged among physicians and virologists over whether sheltering in place was preventing the natural process of herding immunity that would normally occur and allow substantial portions of the community to develop natural antibodies. Political and medical debates also flourished about the value of drugs such as Chloroquine and Remdesivir, the extent of deception that the Chinese government had perpetrated on the world and the loyalties and effectiveness of the World Health Organization. In the absence of a vaccine, which some said could take years, their fear was that the virus would reemerge and begin the crisis all over again.

To make meaningful healthcare decisions in the absence of a vaccine, policy makers would have to know how many Americans had already contracted and would likely contract the disease, how many carried antibodies from exposure to the virus, and whether those antibodies would protect that segment of the population from a reinfection. In mid-2020, there were no definitive answers to any of those questions. The fabric of civility was beginning to fray as the virus refused to retreat

quickly and fears of a recurrence in the fall began to circulate. Reports began to appear that some workers would not return to take part-time work with their employers as long as they could receive a \$600-a-week federal supplement to their unemployment check because it surpassed their normal pay. Many businesses complained that the government's many financial assistance programs excluded them or never reached them, or that the terms were too onerous and impractical to allow them to participate. No one seemed satisfied, which meant that the programs were either wholly unworkable or elegantly successful. States lurched forward one by one toward a partial reopening of their economies amid cheers of support and choruses of criticism. The extent of social and medical chaos only made the economic challenge greater.

Real people were simply frightened by the unknown and the mixed signals sent by federal and state governments. They were concerned about dying and becoming impoverished, not which politicians had made what statements, mistakes, or excuses. Most Americans were more focused on helping each other and trying to block out the nastiness they heard and saw in the media. Doctors, nurses, first responders, food providers, postal workers, and all those who stayed on the jobs to deliver services and products to Americans who were locked in their homes faced death and were lauded as heroes. People looked in on their neighbors and cared for those who were too feeble and old to care for themselves. That seemed to underscore the stark contrast with the negativity of the press, social media addicts, and pampered talking heads who see everything through a divisive social or political lens because there is financial benefit for them in doing so. I mention this as a part of an analysis of a financial crisis only because it underscores a point that I have made about being able to interpret the events of a crisis after the fact. Things are not always how they are described. If you were not part of this crisis and you were reading about it a decade later, you might get a remarkably inaccurate view of what actually occurred.

On May 13, the chair of the Federal Reserve elegantly presented the deteriorating state of economic affairs in the country and forecast the need for even greater spending by Congress based on what he saw ahead:

Since the pandemic arrived in force just two months ago, more than 20 million people have lost their jobs. . . . Among people who were

working in February, almost 40 percent of those in households making less than \$40,000 a year had lost a job in March. This reversal of economic fortune has caused a level of pain that is hard to capture in words, as lives are upended amid great uncertainty about the future.⁸³

The Federal Reserve's semiannual Financial Stability Report issued two days later warned that asset prices were vulnerable to "significant price declines" should the pandemic persist, noting the potential impact on commercial real estate resulting from the decline in revenues and that some hedge funds had already been "severely affected" by the large asset price declines and increased volatility.⁸⁴ These statements signaled that the permanence of the economic damage being done by the virus and the closures mandated as a result of it were becoming apparent. They also undercut the oft-repeated mantra that the economy would spring right back to where it was before the crisis because it had been so strong. Where it was before the crisis had become irrelevant to where it was and where it was headed. By the end of May, lockdowns were lifted in a number of states and the economy began to improve, dropping the unemployment rate to 13.3 percent from nearly 15 percent the month before.⁸⁵ Experts at the University of Chicago's Becker Friedman Institute concluded, however, that some 42 percent of American jobs would never return.⁸⁶ If the Becker Friedman estimates were correct—the permanent loss of more than fifteen million jobs would have a devastating impact on the country's economy and the length of time it would take to return to where it had been. Despite all this, for the time being, the country was getting by, largely because tons of money and forbearances were sent in the direction of Americans. Through the middle of May, more than 4.2 million loans for over \$530 billion had been made under the Paycheck Protection Program, and more than 140 million checks for over \$240 billion had been sent directly to Americans, with a typical family of four receiving \$3,400. The Treasury had distributed almost \$150 billion to states, local, and tribal governments and approved nearly \$25 billion in payroll support to the airline industry.⁸⁷ The total number of residential mortgage loans in forbearance in America increased to 8.53 percent by May 31, 2020, with almost 4.3 million homeowners in forbearance plans.⁸⁸ The Congressional Budget Office estimated that the gross domestic product (GDP) *decreased* 38 percent on an annualized basis in the second quarter.⁸⁹

Meanwhile, the Federal Reserve responded to the continuing deterioration by purchasing \$1.5 billion in exchange traded funds whose portfolios had become invested in noninvestment grade (junk) bonds. This was a significant change and a symbol of the lengths that the Federal Reserve would go to assist the economy.⁹⁰

Secretary of the Treasury Mnuchin trumpeted the administration's efforts to end the shutdown and get the economy working again, saying that it was optimistic about the progress being made on vaccines, antiviral therapies, and testing and expected economic conditions to improve in the third and fourth quarters.⁹¹ Worldwide reported cases of COVID-19 surpassed five million; deaths reported in the United States reached 100,000 by the end of May. For perspective, the CDC estimated that between 24,000 and 60,000 people died of seasonal influenza between October and April. The question was whether the infliction of continued economic damage would result in many small businesses never reopening and people's personal savings disappearing. Without knowing the country's healthcare future, there was no way to know how bad the economy would get. By Memorial Day 2020, every state would have partially reopened, and the Federal Reserve's balance sheet topped \$7 trillion. The economic situation was complicated by a completely unanticipated event on May 25.

The tragic death of George Floyd on May 25 while in police custody in Minneapolis was an unanticipated event that added to the country's financial woes. Protests, social unrest, and riots that included looting and burning occurred in many cities around the country for the next several weeks. The resulting destruction of businesses and increasing social discord would only add to the challenges that the economy and society would have to overcome in an election year. Predictions surfaced, suggesting that it would take a decade for the economy to recover,⁹² and those were before it was even clear how long the virus would stay and whether it would return. Nevertheless, based on improving jobs data, by June 5, the Dow Jones Index was back over 27,000 points, about 9 percent less than the Dow's highwater mark in early February. As some reemergence of the virus was detected over the next week, the Dow dropped 1,861 points on June 11, and the talk of additional stimulus legislation increased. It seemed that there would be no escape from the up-and-down gyrations of the stock market as long as government

officials were still handicapped by uncertain, inconsistent, and inaccurate data that turned into headlines.

Over the next several months, things seem to level out as infection, hospitalization, and mortality rates decreased, testing increased, and people seemed to adapt. At the end of September, the Dow was still hovering in the range of 27,000 after some violent ups and downs. Unemployment in the United States settled at around 8 percent. It appeared that people who were being laid off from restaurants, small businesses, hotels, airlines, and a host of other industries were finding employment in an economy that was quickly re-creating jobs in areas that were given a boost or less impacted by the pandemic. Applications for employer identification numbers and new business filings suggest double-digit-percentage increases in small business startups during the pandemic.⁹³ The total number of home loans in forbearance decreased to 5 percent through December 2020 as the Dow astonishingly climbed over the 30,000 mark. The death toll in the United States exceeded 350,000 by early January 2021, as vaccinations began to be administered throughout a country that had settled into a second ferocious wave of the disease.

Several paths lay ahead for the US economy. At the most positive end of the spectrum, if the virus continues to recede and does not reappear in any meaningful way and/or a vaccine is developed, people and markets will likely return to some version of normalcy in 2021. Schools, travel, commercial real estate, entertainment, sporting events, and the businesses related to them would undoubtedly be slower to return than many others, adding to the economic hangover lasting for several years as companies regroup, retrofit their businesses for the new America, or are restructured or liquidated in bankruptcy proceedings. At the other end of the spectrum, if the virus persists or returns with a vengeance, causing another shutdown of the economy, it could lead to an extended period of double-digit unemployment, a spike in loan defaults, the disappearance of a wide range of small and large businesses, and a debilitating dent in confidence, pointing the country in the direction of another depression. It is impossible to predict which path the country has before it.

This crisis underscored three things to the American public. If federal, state, and local governments have one primary responsibility, it is to be prepared for the worst case with strategies, tools, and resources at

the ready to be deployed to prevent physical harm and an economic collapse. Second, it also emphasized the need for authorities to collect and analyze accurate data, upon which decisions can be made that are not likely to be reversed days or months later. Last, smart governance requires a plan to efficiently reverse the government's economic intervention at the appropriate point. As we saw after the Panic of 2008, that is not so easy. If the government is not prepared for these things, people wonder why it is there.

THE FINANCIAL FUTURE OF THE PANDEMIC

In April, Merrill Lynch reported that with the continuing buildup of cash, money market fund assets under management reached \$4.5 trillion, greater than the eurozone market capitalization.⁹⁴ This signified both a lack of confidence in the future and a large capacity for equity markets to be given a shot of adrenaline at some point. The pandemic will largely determine the duration and depth of the economic damage that the country endures, and when that shot is delivered I do not know the former and am handicapped in predicting the latter as of this writing.

If the pandemic persists, increasing loan defaults will eventually erode and challenge the strength of banks, nonbank lenders, and the economy generally. There are some obvious factors to monitor. For example, if there is a long-term impairment of residential mortgage repayments, it could crush large mortgage lenders (banks and non-banks), servicers, investors, and then Fannie Mae and Freddie Mac, the economic end-of-the-line of the mortgage finance system. Luckily, Treasury still has some headroom left from the authority it was given in 2010 to invest in more preferred stock of Fannie Mae and Freddie Mac, whose earnings were down more than 80 percent in the first quarter of 2020. We know from history that what happens to housing in America is a large part of what happens to America economically. While most understand how to measure such economic indicators, there are less obvious factors that may illuminate what the long-term economic picture looks like.

First, watch what the Treasury and regulators do. Forget about legislation; it is a lagging indicator. Once Congress acts, everyone is already

knee deep in the problem. But when the Federal Reserve sets up facilities to support lenders, nonbank companies, and a wide variety of bond issuers as it has, or regulators waive or modify regulatory, capital, and accounting principles as they have, we know that they are concerned about certain financial fires burning out of control and contaminating the banking system. It is only a matter of time before liquidity problems at hotels, airlines, restaurants, retail stores, and agricultural companies become solvency problems that threaten their viability and that of their lenders. As shareholder equity—a company's net worth—disappears, its remaining liquidity usually also dissipates, beginning a path that typically ends in bankruptcy. As borrowers deteriorate and loan repayments stop, temporary relief from troubled debt restructuring accounting principles will not ultimately save a bank from having to eventually take write-offs and book losses for worthless loans. Loan classification forbearances and workouts that conceal potential losses will eventually give way to a point where regulators will require those aggregated losses to be recognized. These are fuses that should be closely monitored because once they are lit, some banks will move closer to becoming part of the problem.

If the virus persists, the government may be forced to purchase equity from troubled industrial and commercial companies, and eventually from banks as it did with TARP in the Panic of 2008. Additionally, watch the pace at which bank regulators begin to reverse classification and accounting forbearances on troubled loans and return reserving and loss calculation methodologies to normal. They know that these forbearances and workouts can tend to hide the real losses being embedded on bank financial statements and will eventually say enough is enough. Similarly, with so many exceptions created to support the many lending facilities that were launched, bank regulators will eventually have to decide when to return to normal leverage and capital rule calculation requirements. That may force institutions to take losses, dispose of loans if they can, or raise capital to support the loans that they had added to the balance sheet at no regulatory cost when originated. Some banks will undoubtedly be sideswiped in this transition and be left swimming naked when those tides recede.

Second, the business rules of engagement in the United States incorporate a set of accounting, bankruptcy, and disclosure trip wires that are largely self-executing and irreversible.⁹⁵ They are protective fea-

tures in a complex business environment intended in normal times to prevent companies from prejudicing the interests of investors, creditors, depositors, and competitors. The integrity of these features makes the economy work as it does—good companies prosper and bad companies fail. In difficult times, these features are not easily turned off, and they tend to work against the forbearance efforts of the government to buy time so that the economy can stabilize. For example, GAAP accounting drives the financial statements of every public company. When such a company borrows in a crisis to preserve liquidity and pay its bills, it increases the liability side of the balance sheet. If it is using that borrowed money to pay employee salaries, for example, and not booking counterbalancing assets to those liabilities, it is likely burning through shareholder equity as operating losses mount. Continued losses may eventually force a company into the zone of insolvency, where the trust fund theory springs into effect as a matter of law and shifts the board of directors' fiduciary responsibility from its shareholders to the creditors.⁹⁶ That changes how and why the company must act.

Similarly, public companies are required to disclose their financial status, whether good, bad, or disastrous, and those disclosures will often trigger other legal, accounting, operational, and solvency actions. For example, they may trigger the default or prepayment provisions that company contracts contain, resulting in a counterparty's right to (1) walk away from or enforce certain contract obligations, (2) require increased collateral to secure a borrowing, (3) enforce a margin call, or (4) require the defaulting party to repurchase the instrument or assets. Without a lifeline such as government backing, there is a business point of no return that companies cannot pass if they are to avert bankruptcy or if a bank, FDIC receivership. The government cannot effectively move that point of no return. It is built into the system.

Third, while trends in loan default rates, bankruptcies, liquidity deficiencies, building permits, and home foreclosures can be monitored to track the direction and velocity of economic deterioration, I also monitor less obvious financial indicators. For example, monthly bank call reports and the footnotes to their periodic financial statements, all of which are publicly available, can paint a descriptive picture of loan modifications, loan loss reserves, and restructurings that may have otherwise been classified as troubled debt restructurings requiring classification or reserves but for the temporary suspension of those rules. They

will tell you where banks are lending, what they are running from, and where future losses are likely to arise. The management discussion and analysis provided in the annual reports and various other periodic filings of a sampling of banks will also paint a picture of the events that are playing out on the ground. The annual shareholder letter released by JPMorgan's CEO, Jamie Dimon, is as good at predicting trendlines as any. The breadcrumbs buried in the details of such financial filings can often tell the true story of what the economy will look like after a crisis.

Fourth, the reports issued by the Shared National Credit Program assesses the risk of the largest and most complex credits shared by multiple regulated financial institutions and are important leading indicators of economic deterioration and growing systemic risks.⁹⁷ Launched in 1977, this program currently reviews credits with minimum aggregate loan commitments totaling \$100 million or more shared by three or more banks.

Finally, watching the number and type of enforcement orders published monthly by banking regulators and disclosed by banks in their public filings will also provide a clearer view into the inner thoughts of the regulators. For several years beginning in 2008, the bank regulatory agencies issued hundreds of formal and informal orders annually, many of which I reviewed. They told an interesting story about the depth of the problems and the hangover that would impact the future performance of many banks. As the banks go, so goes the economy.

PANDEMIC TAKEAWAYS

Years from now, someone will be writing about the economic events surrounding the pandemic and know how it ended. As I send this manuscript to print, I can only pray that it did not mature into a full-fledged financial crisis and that the country returns to some semblance of the financial life that was. Whatever world does return, however, will find several generations of people irretrievably scared by the events that they were compelled to live through in 2008 and 2020. They will act, think, and live differently and financial services will adapt to those changes. Financial regulation will also have to change.

State and federal governments were unprepared for the health crisis caused by the pandemic. Frankly, that is not unexpected. Most govern-

ments, state or federal, Republican or Democrat, would likely not have been prepared for something that had not occurred in a century given the priorities and budget constraints that they realistically operate under. Similarly, we can only praise the efforts of those who jumped into the fray to solve the healthcare and financial crises that were created by the pandemic. But governments could have had better tools to understand how, where, and when to act and react. They should have been better at managing the crisis and stopping the contradictory healthcare and lockdown messaging that seemed to dominate the period from beginning to end. That is why we have governments. But it takes data, analysis, coordination, planning, and execution to implement good governance, and that seemed to be in short supply. The purpose of the Centers for Disease Control is “to protect America from health, safety and security threats, both foreign and in the U.S.”⁹⁸ No matter how you come down on how good a job it did, it was clear that pinning down what the disease is, how it is spread, how it can be treated, and how deadly it can be is only one very challenging part of the picture. Whether it is a healthcare or financial crisis, there must be a seamless hand-off from that scientific oversight side of the government to the part that rolls out preplanned emergency remedial and survival plans to keep the basic fabric of institutions and commerce running. Crises prove again and again that priorities matter.

Financial regulators—the many of them that share jurisdiction—performed quite well given the tools that Congress had given them. Congress acted boldly in approving the largest remedial packages of aid ever. As evidenced in other crises, the mere insertion of the government into the crisis can rebuild the confidence that the markets need to move on without the government having to actually spend the dollars that were allocated. That is exactly what happened with the Federal Reserve’s program to purchase corporate debt. In June, the *Wall Street Journal* reported that “[j]ust the announcement of the backstop ended panic selling, boosted prices and fueled a record surge of new corporate-bond sales.”⁹⁹ In fact, some companies became reluctant to join the program because it could be seen as a sign of weakness. That is a perfect example of how confidence impacts the psychology of the economy.

Some suggested that banks should be able to weather the financial wreckage created by the pandemic through 2020,¹⁰⁰ raising the obvious

question of what happens if the virus is still around in 2021. A report by the Bank Policy Institute concluded that in a serious second wave of COVID-19, large banks would generally remain well above their minimum capital requirements, but depending on how the regulators adjusted required stress capital buffers, there could be a nationwide reduction in lendable funds by as much as \$950 billion.¹⁰¹ At the end of August 2020, banks reported a decline of 70 percent in quarterly net income driven by increasing loan loss provisions of 380 percent, but liquidity and capital levels remained strong.¹⁰² More must be done, however, to create ongoing tools to monitor future financial scenarios and support the economy in times of crisis. Congress must drag itself and the rest of the government into the twenty-first century, find the resources, and write the laws to marshal the vast amounts of technological power that are available to better protect financial markets and people. The economic shock and awe unveiled by the Federal Reserve, Treasury, and the Congress was indeed eye-popping and implemented as fast as humanly possible. But whether it was the correct dose of intervention directed at the right areas of the economy, whether it was timed to correlate to the impact and duration of the pandemic, and whether it took into account the postpandemic economic damage that it could do were largely guesses to the extent that data and analysis of these questions was incomplete. In a letter written to the Congress in April 2020, the Federal Reserve vice chair noted that the Dodd-Frank Act unnecessarily restricted the regulators from loosening certain capital and lending requirements consistent with the forbearance temperament of a crisis.¹⁰³

As this book goes to print, the Federal Reserve, Treasury, and Congress have fired many of the bullets that they had.¹⁰⁴ But it is not at all clear how the economy will perform and what else the government can do if the pandemic persists. Congress did what it was supposed to do in the crisis, enacting one piece of legislation after another to flush enormous sums of federal money into the economy. But it did not reauthorize the Treasury to purchase equity interests in banks or nonbanks to forestall the closure of companies as the crisis erodes shareholder value, credit availability, and solvency. Neither had it yet established a new entity modeled after the Reconstruction Finance Corporation in 1932 to take preferred stock interests in American companies to prevent them from experiencing solvency issues and failing.¹⁰⁵

Using the bankruptcy process to restructure thousands of American companies will be difficult if the pandemic persists.¹⁰⁶ It will have to consider such options if the virus persists. The country experienced more than 23,000 business bankruptcies a year between 2013 and 2019. The Cato Institute's George Selgin astutely points out that even if the bankruptcy courts were not overwhelmed by many thousands of new filings by companies seeking relief from their creditors, those companies could not continue to operate in or emerge from a Chapter 11 restructuring *without* financing. That much financing would likely only be available from the government. The more effective way to deal with such a looming financial debacle is to prevent it from occurring by supporting both the liquidity, credit, and solvency needs of businesses. Massive bankruptcy proceedings would unwind economic relationships and impact the psychological well-being of companies, employees, counterparties, markets, and communities. The cascading impact would damage the economy for many years to come. If fighting a crisis is about rebuilding confidence, restructuring America one company at a time through the bankruptcy courts is not the way to achieve it.

As I will discuss in subsequent chapters, the government should be optimally armed to fight future financial crises. Regulators should be trusted enough to be given the power to act and more streamlined mechanisms should be developed to involve Congress when it is needed. Advanced technologies should be readily available to pinpoint the sources of financial distress, how much credit is needed, where it is needed, and for how long. The government should know what industries should be prioritized, which communities are most in need, how long liquidity will last, and when balance sheet net worth begins to dwindle by company and geographic sector. There should be no doubt what the quickest and most effective financial delivery systems are to get liquidity and capital into the bloodstream of the country where it is most needed and reduce the possibility of a financial hangover. There will be a final reckoning when the pandemic passes, which will have to allocate the costs of the crisis, including increased medical emergency spending, businesses' and individuals' lost income, new programs and subsidies, shifts in real estate usage and values, and the recently displaced workers who may create a new segment of the welfare state. As the 1920s, 1930s, and post-9/11 periods demonstrated, new programs

and their related costs must eventually be priced, factored into the budget, and funded.¹⁰⁷

NATIONAL HANGOVER

We have no idea what upward of \$10 trillion of emergency credit and cash will do to the economy, how long it will take for the Federal Reserve and Treasury to reverse the financial steps that were taken, how long it may take for the economy to fully rebound, and where it may rebound to. Once the crisis is gone, the economy will continue to be impacted by the seismic shifts in social, psychological, business, cultural, and personal behavior left in its wake. That certainly was the case after the Great Depression.

In the coming months and perhaps years, we will understand the impact of the health problems that went undiagnosed and the lack of treatment that exacerbated illnesses or resulted in deaths when health-care was essentially shuttered between March and June of 2020. The preliminary reports are stunning. Newly identified cancers fell 46.4 percent, stress-induced heart problems increased 400 percent, 13 percent of Americans reported increased use of substances to cope, and there was a spike in injuries indicative of domestic abuse.¹⁰⁸ People will be more hesitant to fly, stay in hotels, and dine out, and meetings may continue to occur online because users discovered how well and less expensively that they could occur. Senior citizens may be less willing to live in assisted living facilities where a virus can run rampant. That may alter the senior care business just as the baby boomers are reaching the age where they need such care. But perhaps the most meaningful measurement of how quickly the economy can return to normalcy is what K–12 schools do around the country. Schools and childcare facilities remaining closed directly impact the ability of parents to continue to work, which of course has a massive impact on the economy.

Likewise, the demand for real estate has already changed. Cities may mandate that people work at least six feet from each other, abruptly altering the footprint and the use of space throughout America. Workers and managers have learned how to transact business without an office or a window overlooking downtown Manhattan or having to load onto crowded elevators. Some speculate that Manhattan real estate

needs may never be the same again.¹⁰⁹ The combined impact of COVID-19 and the recent civil unrest in large cities may severely impact their attractiveness and real estate values. Reports suggest that losses in the \$5 trillion plus commercial real estate business could be larger than ever experienced. That market and its corresponding losses would be divided between real estate development lenders, which include commercial banks (39 percent), agency and Fannie and Freddie portfolios (20 percent), life insurance companies (15 percent), and structured finance and asset backed issuers (14 percent) that hold commercial real estate paper.¹¹⁰

Manufacturers may turn to even greater automation to rely on machines that are less likely to carry, transmit, or fall susceptible to disease. People may be less interested in living and working in densely populated cities. Universities may have to downsize as students demand a less costly educational experience that can be provided online. Movies, sporting events, and even political rallies may have to change, at least for some period. People will also realize that they need to save more money for rainy days, altering the consumption economy that the United States has enjoyed. Last, how the country and the Congress deals with the deluge of litigation that follows will have a significant impact on individuals, companies, and the country. The virus decimated the fundamentals of many businesses, from airlines to nail salons. At the same time, the crisis has likely jump-started an engine of innovation that has caused technological changes that might otherwise have evolved over the next twenty-five years to become the norm almost overnight. As life changes, so too will financial commerce and the regulation of it. At a minimum, financial institutions will consider new models to deliver their services, including fewer and smaller brick-and-mortar branches, more drive-through and walk-up facilities, and increased digital financial services.

Finally, there is little doubt that the world will also come away from this crisis with a different economic relationship with China, which itself could change the world order. At the very least, the global downturn will decrease economic activity in China simply because global orders for goods have dropped.¹¹¹ Perhaps the sovereign nations of the world will seek compensation if it is finally determined that China's intentional behavior caused or contributed to the global destruction created by COVID-19. Lawsuits had already been filed in the United

States by April of 2020 in this regard, which will raise complicated legal and political issues. Legislation to allow such suits to proceed despite sovereign immunity and other international protocols was introduced in Congress.¹¹² Many countries like the United States may also decide not to be as indebted to China or reliant on its products. The fact that China was already showing signs of a deteriorating economy in mid-2020, with a 6.8 percent year-over-year contraction, will no doubt have significant impacts on the United States as well as the world.¹¹³ Finally, the sheer enormity of government intervention to save the economy will have unintended consequences and will have a distortive effect on market performance and financial incentives for years to come.

In the next chapters, I consider what policy makers should have been doing over the last decade to create a better system of financial oversight and regulation. That system would have been smarter, leaner, more flexible, more responsive, and more tethered to real-time data analysis and state-of-the-art technology when the Financial Pandemic erupted. That system could have been better at identifying systemic risks, throwing out meaningful safety nets in times of crisis and fostering higher levels of financial literacy. Unfortunately, we will not ever know how those changes might have helped because they were not in place before this crisis as I had hoped they might be. The Financial Pandemic of 2020 will continue to evolve as a macabre duel between the threat of death and the desire to earn a living. As with every crisis that we have considered, there are no good solutions. There are only bad and worse options that policy makers may choose from, and every solution creates different types and degrees of pain, tragedy, financial loss, and aftereffects. Believing that there is a good solution to a financial crisis is akin to believing in the tooth fairy.

Part Five

The Cure for the Common Crisis

BUILDING A BETTER MOUSETRAP

Now that we have examined two hundred years of financial crises, we should be able to design a data-driven system of oversight that is more up to date, comprehensive, smarter, and more reliable. After all, the country's regulatory structure is approximately eighty-five years old. It is often focused on regulating the wrong things at the wrong times in the wrong ways, which can unnecessarily distort markets, create volatility, and migrate or socialize systemic risk. These are the ingredients that can lead to financial crises or the conditions that can incubate them. Some of the changes will not require any action by Congress. Regrettably, many do, and getting a stubborn, divided Congress to act seems nearly impossible these days. Whether Congress acts or not, federal and state regulators should begin to harness huge amounts of data and new technologies to be more informed and better analyze predictive financial scenarios. That will allow them to do their jobs more effectively and better protect markets and consumers.

There are seven fundamental changes that can and should have been made to fix the oversight of financial services in order to arm regulators and consumers to be better able to avert or mitigate future crises and the loss of trillions of dollars.

I. MODERNIZE FINANCIAL SUPERVISION

The convoluted and concentric levels of regulation and oversight of the financial services system reminds me of the complexities that physicists ponder each day. Earth is the fifth largest planet in a tiny solar system that is a part of the Milky Way galaxy. The Milky Way is itself small, one hundred thousand light-years across, with about four hundred billion stars. It resides in a local group of at least forty-seven galaxies that are about ten million light-years across. The observable universe spans some twenty-eight billion light-years (ninety-three billion light-years in diameter, and still expanding), is home to an estimated three hundred fifty billion galaxies like the Milky Way, and supports about thirty billion-trillion stars. Most of us deal with the enormity of this universe by being quite practical. We simplify and prioritize it based on how it actually impacts our daily lives. We should adopt a similar approach when dealing with the complexity of the financial services system and the regulation of it.

As I have discussed, the financial services system and its regulation and oversight is clumsy, bloated, and redundant. No less than nine federal agencies oversee the primary activities of US depository institutions, accompanied by a blizzard of state agencies that regulate some or all of what they do and how they do it. Those that do business in foreign countries also must adhere to the rules imposed by regulators in those jurisdictions. A bank that offers home loans nationwide may have to comply with rules enforced by more than one hundred federal and state regulators. That is before considering the ancillary impact that federal agencies like the IRS, Department of Labor, HUD, Treasury, and the FHFA may have on their operations. It makes no sense, particularly when so many financial companies that may have a significant impact on the economy are not similarly regulated. The Panic of 2008 demonstrated the challenges of having to move quickly in the fog of economic war to make critical decisions when several dozen federal officials, as well as the leaders of affected congressional committees, are involved. Any management system that allocates responsibility among many entities is one in which no entity is in charge or responsible. Such siloed financial oversight allows each regulatory entity to focus on its own slice of the problem and blame someone else when things go sideways. It is a

classic model of how *not* to allocate responsibility and delegate oversight.

The deficiencies in this regulatory system were on display in 2008 as federal agencies examined their slice of the economy and ignored the massive instability in the balance of the economy because of the narrow responsibility that they had. The economist John Kenneth Galbraith captured the essence and complexity of regulation in his 1954 analysis of the 1929 Depression:

The regulation of economic activity is without doubt the most inelegant and unrewarding of public endeavors. Almost everyone is opposed to it in principle; its justification always relies on the unprepossessing case of the lesser evil. Regulation originates in a raucous debate in Congress in which the naked interests of pressure groups may at times involve an exposure bordering on the obscene. Promulgation and enforcement of rule and regulations is by grinding bureaucrats which are ceaselessly buffeted by criticism.¹

A more streamlined approach with professionals staffing the agencies who are paid commensurately with their market value is the first step toward a smarter form of regulation. All prudential, deposit insurance, and disclosure-based regulation of financial services companies should be housed in a single five-commissioner financial services commission. It should include the vice chair of the Federal Reserve, the assistant secretary of Treasury for Domestic Affairs, a presidentially appointed chair, and two commissioners. It would oversee the regulation and supervision of every type of financial company, including payments systems, nonbanks, fintechs, Fannie Mae, Freddie Mac, and the Federal Home Loan Banks to the extent that they impact the safety and stability of the financial services system. Instead of separate agencies as exist today, each different type of financial activity such as bank regulation and securities disclosure oversight would be housed in separate divisions of the commission. This would create more seamless oversight where everyone knows who has the responsibility. Federal deposit insurance should be available to be purchased by a wider array of financially regulated companies to whom funds are entrusted by consumers as long as they are willing to be prudentially regulated. The cost of all federal deposit insurance should be based on the risks that the government is insuring rather than arbitrary formulas. The system should

move toward using private insurers as the primary carriers, with the government acting as catastrophic reinsurer. Monetary policy would remain with the Federal Reserve, Federal Reserve Banks, and the FOMC, but they would lose their supervisory oversight authority over banks and bank holding companies.

While this structure would make financial supervision in America highly efficient, it would also raise concerns about too much power and authority residing in the hands of two few people. To offset some of those concerns, the qualifications for those appointments must be quite high and set by statute to allow only individuals who meet exceptional standards of regulatory, financial, business, and other professional experience to be appointed. There can be no room for amateurs, partisan politicians, or on-the-job training when it comes to the fiscal health of the country. The commission should have special emergency powers that could be activated by the president when certain conditions were met. To lessen the intervention of partisan politics in the oversight of financial institutions, the Senate Banking and House Financial Services Committees should be replaced by a Joint Financial Services Committee staffed by an elite group of highly compensated economists, lawyers, and businesspeople. Partisanship should be vigorously discouraged. Optimally, all members of the Joint Committee would opt out of accepting certain campaign contributions and receive funds directly from the Treasury for those purposes. There are numerous ways to reduce the impact of politics on money if we really want to do it. A senator sitting on a committee that oversees an industry might be prohibited from accepting campaign contributions from that industry and its executives. That would lead to a starkly different political world than the one we currently have.

At the same time, Congress must modernize the role that the Federal Reserve plays in monetary policy, including evaluating the authority it has and how it uses it in a vastly different financial world than the one it was born into in 1913. The Federal Reserve's statutory mission set forth in Section 2A of the Federal Reserve Act is broad enough to apply to any period: "to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."² It's how that mission is executed that makes all the difference. The Federal Reserve has become too involved in guiding the economy and impacting the balance sheets of financial institutions in normal times, which often

results in it having to adjust its prior adjustments in a crisis. As a recent Federal Reserve governor recently wrote, the Federal Reserve is on “a one-way path to a larger role in our economy and government.” He suggests that its growing authority is unquestioned, which should be of concern in a constitutional system.³ It and the rest of the regulatory system should be less involved in day-to-day financial activities and more focused on the creation of financial safety nets that can be deployed in financial crises and how monetary products and financial institution powers are impacted by a financial system lurching toward cryptocurrencies and real-time payments that use peer-to-peer verification networks. These and other questions are being put on the table for consideration even by current Federal Reserve governors.⁴

Fewer financial regulators would create a smarter and less conflicted system of regulation and make it better suited to seeing and avoiding financial crises. Some critics go even further, arguing that the Federal Reserve has become part of the problem by continuously having to be the solution for financial collapses. Lee, Lee, and Coldiron, the authors of *The Rise of Carry*, suggest that the actions of the Federal Reserve contaminate markets, in some ways harkening back to Walter Bagehot’s theories of central banking having at least two aberrational impacts on the economy. First, when the Federal Reserve intervenes to control a severe financial crisis, it conditions the market to expect intervention when problems become catastrophic. As a result, large financial players may find it entirely rational to gamble with volatility, maximize short-term gains that serve their compensation interests, and build enormous long-term risk, assuming that they will be bailed out when everything explodes.⁵ Therefore, risk becomes mispriced due to the expectation of Federal Reserve intervention and concentrated in ways that seem counterintuitive to the world that most investors see. The second distortive impact that the Federal Reserve is said to create is related to a factor that I have discussed in other contexts. To the extent that the Federal Reserve is not able or does not choose to reverse the remedial financial actions that it has taken in a crisis, those actions continue to influence the market when it has stabilized and restrict actions that it might otherwise take when markets once again experience distress. In the simplest example, if the Federal Reserve does not “allow” interest rates to rise to more normal levels after a crisis, as has been the case

since the Panic of 2008, it has limited headroom to lower rates in the next crisis.

Secretary Geithner was not shy about his criticism of the inefficiencies of the web of regulators he had to deal with to address the economic challenges of the last financial crisis. His criticism of the FDIC, for example, was that it thought and acted too narrowly, appearing to be focused solely on the health of the FDIC insurance fund.⁶ That is not at all surprising given the siloed regulatory system that the United States has constructed; every regulator considers the mission of his or her agency as paramount, even in a crisis. This eventually results in government authorities working at cross purposes. Geithner underscored that result in criticizing the parallel investigations that the special inspector general for TARP was conducting while Treasury was trying to save the economy. He characterized SIG TARP's findings as "untainted by financial knowledge or experience."⁷

The reconstruction of the system of regulation should also address its glaring blind spots. Banks, S&Ls, savings banks, trust banks, and insurance companies are subject to "cradle-to-grave" prudential oversight. They receive their charter, operating ratios, limits on when dividends may be paid, and approvals to expand or merge from their federal and state regulators. Those regulators also effectively decide when management and the board must go, and when the institution will be put into conservatorship or receivership. While the regulators do not operate financial institutions, they do have a significant veto power over their operations and activities. Frankly, that can sometimes feel like they are running them. On the other hand, nonbank financial and fintech companies have a significant impact on finance, but largely escape prudential regulation in favor of a more trusting market disclosure regime. They can operate according to their own rules so long as they explain them and the risks that are created to their investors. Whether one determines that prudentially regulated banks are overregulated, or nonbank companies are underregulated, consistency suggests that they each be supervised based on the functional role that they play in the creation, delivery, and movement of money, credit, payments, and investments in the economy. This requires the entire regulatory system to be overhauled first, and the federal/state regulatory structure to be rationalized. It would be economic suicide, however, to impose the

current inefficiencies of the system on the broader spectrum of companies that participate in the financial space.

Financial regulation must also evolve past the rules-based system that it has become. Too many laws and rules dumb down the system by transforming it into a “check the box” exercise. We live in a “rule-happy” environment. For example, the Code of Federal Regulation has 50 titles covering 200 volumes and more than 175,000 pages of federal regulations. Reading eight hours a day, it would take almost ten years to read these rules.⁸ It is overwhelming. In addition, too many rules written in stone eventually calcify the oversight process. Rules become obsolete as markets change, incentivizing institutions to constantly be looking for loopholes and workarounds. An effective and efficient system should be a semi-principles-based one that is less reliant on static rules and more focused on situational regulatory discretion.

There has been much debate about the efficacy of principles and rules-based systems of regulation. In a rules-based system, the good standing of financial institutions and what they are required to do is driven by their adeptness in complying with applicable statutes and implementing rules. How well a bank complies with a blizzard of operating rules, however, does not historically equate with operating a safe and sound bank. On the other hand, risk analysis and safety and soundness judgments of regulators and executives based on experience and underlying data drives a principles-based system and the actions that it dictates. In theory, rules do provide clarity and presumably result in less cost, while principles require interpretation that adds ambiguity and cost to the system.⁹ In practice, it can be just the opposite. Laws and rules have created a punch-list mentality to financial oversight and created endless arguments over legal loopholes that can eat up valuable resources as issues of relatively little impact are debated by institutions, regulators, and lawyers. A general principle is more loophole-proof and hopefully whatever resources are used debating and discussing them focus on critical safety and soundness principles. The downside of principles is that they can be unclear and subjective.

The United Kingdom relied more on a principles-based system from time to time, but both it and the United States have moved toward a rules-based format, particularly in the last twenty-five years. Some argue that the UK principles-based model demonstrated significant defects in fostering a race to the bottom of regulatory standards.¹⁰ Most

support a rules-based system of financial oversight. Nevertheless, I believe that the evidence—severe financial crises in the United States—demonstrates that the rules-based model deployed in the United States has not been a success largely because it has subordinated judgment and camouflaged problems behind the false sense of security that compliance with rules can create. A slavish adherence to rules and ratios tends to undercut a broader sense of responsibility among executives and regulators who should be watching for red flags. Ultimately, it decreases the political will to act. Why act when regulatory compliance is being achieved, notwithstanding what your gut tells you about what is happening? A modified principles-based system that would include basic TBE concepts makes more sense. What rules are created should sunset periodically so that agencies are required to assess their continuing relevance and cost effectiveness. Modern markets require sound human judgment aided by technology, rather than the application of static, obsolete rules. Relying on rules is like relying on models; eventually they become outdated and fail. More on that later.

The dual banking system also needs to be reevaluated. Technology raises difficult questions about the future role, utility, and purpose of parallel systems of state and federally chartered banks because of how it can deliver financial products and impact consumer behavior. Acting comptroller of the currency Brian Brooks and the agency's chief economist, Charles Calimiris, have squarely challenged the rationality of a system where increasingly efficient financial products and delivery systems are regulated by fifty state authorities.¹¹ Money now travels in a world that has no borders. I thought that the state system of chartering and regulating banks was doomed to extinction when interstate transactions to rescue failed S&Ls were first approved in 1980s. I thought it was even more true when bank holding companies found loopholes in the law to orchestrate interstate mergers in the 1990s, and I was thoroughly convinced that the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994¹² put the final nail in the coffin of our dual system of banking. When the internet and online commerce arrived in the mid-1990s, it seemed clear that state laws and jurisdiction would give way to a borderless, global economy. I was wrong each time.

The dual banking system embeds certain structural defects. For example, it is fundamentally a “heads-I-win, tails-you-lose” proposition for the states. For many years, until Congress fixed it, regulators attracted

banks to regulate by offering them “regulatory swag bags”—lower assessment fees, less regulation, and broader investment powers. Although every FDIC-insured bank must have a federal regulator, if the bank is chartered by the state, the state is the primary regulator and has significant influence in calling the shots. The “secondary” federal regulator is usually a tick more reticent to impose its views. When the economy has slowed in the past, the data indicates that state-chartered institutions have been more likely to fail. That is what happened in the 1980s when mortgage-centric, state-chartered S&Ls in Texas, California, and Florida, for example, were given broad new state powers to expand their investment horizons into commercial real estate, wind farms, and other unfamiliar businesses. When the energy and real estate businesses, among others, went sideways and the economy experienced double-digit inflation and interest rates, S&Ls began failing, with a disproportionate share of them being state-chartered S&Ls in the most “accommodating” states.¹³ In the Panic of 2008, approximately 80 percent of the 493 banks that the FDIC took control of between 2008 and 2013 were state-chartered banks and savings institutions.¹⁴ Moreover, when a bank is closed by the state, it simply hands the mess—a bundle of bad assets and a larger set of liabilities—to the FDIC to work out in receivership. There is no cost to the state. The FDIC then shells out its money to an acquiring bank out of its insurance fund—not state funds—to purchase those assets and at least assume the retail deposits and some of the other liabilities, so that the failed bank can reopen under a new name. The state never looks back, having enjoyed the upside of the assessment fees paid by the failed bank, but leaving the financial tab with the FDIC and arguably the taxpayers of the United States. The states should have more skin in the game.

As I have discussed, regulatory systems always create a sense of market reliance—a financial sense of security. When there is a pervasive system of regulation in place that is not effective, it “head-fakes” the market to the extent that the market relies on the system and lets its guard down. Some academics argue that regulation in fact has weakened banks and caused waves of failures that are not characteristic in other industries by favoring the government’s financial interests or “propping up special interests” in the banking industry.¹⁵ Examples of these market distortions include branch banking limitations that discouraged geographic diversification, activity restrictions such as the Glass-

Steagall Act's prohibition of securities activities that limited investment diversity and deposit insurance, which creates a moral hazard and a "heads-I-win, tails-you-lose" scenario.¹⁶

"Between 1931 and 1933, several thousand U.S. banks—mostly small rural banks—failed. In contrast, Canada's branch-banking network, which is dominated by large banks "did not suffer a single bank failure, even though in other respects Canada was just as hard hit by the depression."¹⁷ Banking regulation is seen by these scholars even today as increasing the risk of insolvency, facilitating the risk of contagion, and discouraging private-market mechanisms to avert financial crises.¹⁸ Experience tells me that there is economic integrity to these theories. Regulation that is ineffective, inefficient, and arbitrary unnecessarily distorts market dynamics and creates perverse economic incentives. The year 2008 was a perfect example. All of the blanketing financial oversight that was in place before had not averted the financial temptation to convert homes into financial investments and create extraordinary amounts of high-risk loan pools where too many participants could take advantage of the upside, believing that they had no exposure on the downside.

Regulation is necessary and should constantly reflect the current state of financial markets. It does not. It is untethered from reality to the extent, for example, that it fails to accurately calibrate financial incentives by ignoring the relationship between the measurable benefits and predictable costs of new laws, rules, and various forms of regulatory oversight. Most laws and rules pay only lip service to a cost-benefit analysis, while Congress and regulators continue to heap enormous regulatory burdens on institutions in the name of protecting the consumers who ultimately must bear the cost of that regulation. The enactment of all laws and agency rulemakings should include standardized, rigorous, cost-benefit analyses to empirically demonstrate that the costs that they will create are reasonable when compared to their overall impact on safety and soundness and the corresponding benefits to the public. How can an agency defend its decisions as not being arbitrary and capricious under the Administrative Procedure Act if it does not know what the direct and indirect economic costs of them are and has not quantified the benefits?¹⁹

Bad regulations can have a "multiplier effect on the regulated sector and are thus a potential source of systemic risk."²⁰ Policy makers must

be conscious that even well-intentioned rules and financial supervision can aggravate existing market deficiencies through the distortion of competition, reduction of supply, the creation of moral hazard, and embedding procyclicality and systemic risk.²¹ The Dodd-Frank Act is Exhibit A in the case for cost-benefit analyses; it is a good example of what is wrong with financial regulation. After it was enacted, the Federal Reserve Bank of Minneapolis found that staffing needs at community banks to handle the increased regulatory burden reduced the median profitability among small community banks.²² A 2014 survey of two hundred community banks by the Mercatus Center at George Mason University found that customers experienced the effects of the increased regulatory burden through reduced product and service offerings, particularly mortgage credit availability.²³ A study by Federal Financial Analytics in 2014 concluded that “quantifiable” regulatory costs faced by the six largest banks had doubled since the financial crisis.²⁴ The American Action Forum pegged the burden of compliance with Dodd-Frank at roughly \$895 billion in reduced Gross Domestic Product between 2016 and 2025.²⁵ Similarly, Merrill Lynch released a report noting that the new regulatory regime was causing banks to slash holdings in financial assets and exacerbating market volatility that often accompanies the Federal Reserve’s signaling of its intent to begin raising rates.²⁶

While these studies may be somewhat anecdotal and biased to the extent that they are driven by industry sponsors, the point is that we simply don’t know what the comprehensive benefits and costs of our laws are when they are created and often, not even after they go into effect.²⁷ The government never attempted to calculate them before, during, or since the enactment of the Dodd-Frank Act. That seems negligent at best and perilous at worst. Richard J. Parsons, the author of *Broke: America’s Banking System*, contends that the impact on the mortgage business was not just anecdotal. He notes that residential mortgage loans are the largest asset sitting on the balance sheets of US banks—comprising 22 percent of all loans—but they are the least profitable product. He ascribes that result, in part, to the fact that the five hundred banks with the most mortgage loans on their books also are burdened with the highest capital ratios in the country. Moreover, the billions that the nation’s biggest banks paid in legal settlements and

finances associated with home mortgages are required to be input as operational losses into their regulatory capital calculations.²⁸

The Government Accountability Office (GAO) has taken modest steps to consider actual benefit evidence. In 2013, it noted that while regulators have collected *some* data on these costs, no comprehensive data or analysis exists. Studies have estimated the economic impact of certain of the Dodd-Frank Act's reforms, but their results vary widely and depend on key assumptions.²⁹ Similarly, in 2014, the GAO noted that although in certain circumstances financial regulators must consider costs and benefits of their rulemakings, the complexity of collecting empirically based cost-benefit analyses makes it difficult to ensure the accuracy and reliability of their findings.³⁰ In 2016, it produced a limited and unrevealing report on agency efforts to evaluate the impact of their rules and paperwork burdens.³¹ At the very least, wouldn't it improve the system if someone actually knew the real cost of new legislation before it was enacted? If the directors of a public company acted as legislators did, they would be sued for gross negligence.

2. URGENT FINANCIAL CARE AND SAFETY NETS

After rumbling for two months, Mount St. Helens erupted in Washington State on July 10, 1980. The explosion devastated 230 miles of forest around the mountain and sent a column of smoke sixty thousand feet into the air. One and a half hours after the eruption, ash rained down on Yakima eighty miles away. The ash clogged and obliterated everything, turning days into nights. Yakima had no volcano emergency plan or procedures, and the city's staff did not even know how to operate the emergency broadcast system. It was helpless and paralyzed for three days.³² Citizens probably expected the government to have been prepared.

Be prepared. The Boy Scouts have it right. That is why we have governments. If you have friends who are first responders, you know that they spend enormous amounts of time training for every possible eventuality. As the Financial Pandemic of 2020 demonstrated, no one ever knows what the next financial crisis will look like and when it might arrive. We do know, however, that another one is always on the horizon. While governments can hardly solve every financial crisis, being consis-

tently unprepared is hardly what we should expect from an expensive government infrastructure meant to keep the economy relatively stable. The single most important role that the government can play is being prepared to provide urgent financial. It should be prepared to throw out safety nets that bolster public confidence and prevent the economy from bottoming out.

Congress often requires the regulatory system to focus on the wrong issues at the wrong time for the wrong reasons. It is easy to look for your keys under the light, but they are rarely lost there. As previously noted in this book, the supervisory priorities of the regulatory system have been inverted, making it likely to be less effective in times of crisis than it should be. There is no better example than what happened after the Panic of 2008. Instead of focusing on the systemic deficiencies that left the government surprised and unprepared for that crisis, Congress became enamored with regulatory details and operational minutia. While it wisely saw the systemic implications of having no skin in the mortgage securitization business and adopted risk retention rules for those involved, it also adopted things like the Volcker Rule, which launched a decade-long, convoluted regulatory process.³³ The Volcker Rule prohibits proprietary equity and hedge fund investments by banking organizations, things that had never caused or contributed to a financial crisis in a century. Fair enough, it might prevent some problem in the future. But what made its adoption so destructive was that it required five federal agencies over a decade to devote hundreds of people, thousands of hours, and tens of thousands of pages to propose, repropose, and reevaluate new rules to scrutinize a hypothetical risk that has not materialized in a century. In turn, that led to enormous allocations of time by institutions to review, comment on, and implement the rule, adding significant new compliance costs. Those were extraordinarily valuable resources that were lost in that effort. They should have been devoted to developing an effective system of red flags and safety nets to deploy as a financial crisis approaches. A financial EMS should have been created. The priority should have been on the systemic solution rather than the operational details of theoretical exposures.

The government should be prepared to address financial crises of all causes, sizes, and shapes all the time. That takes planning, people, and technology. Because the Financial Pandemic of 2020 occurred so soon after the Panic of 2008, the government had an arsenal of tools that it

was able to roll out in a matter of days rather than months as was the case in 2008. But we have yet to determine whether the tools used by the government in 2020 were the right medicine and were targeted and substantial enough to return the economy to the heights that it was hitting prior to the pandemic. We also will find out if the financial intervention was too much for the economy to bear once things stabilize. In 2008, the concern was that the collapse of financial instruments and institutions would contaminate American businesses. In 2020, the concern was that the complete shutdown of American business would infect the banking business and cause its collapse. After 2008, technology could have assisted in creating prepackaged alternative plans to assure that liquidity, credit, and capital reached the most effective destinations in each crisis as quickly and efficiently as possible. That was not the case, and there were delays and roadblocks that prevented money from getting to some businesses as quickly as it needed to, if at all. The only alternative in 2020 was to force money out of the government firehose, hoping that it would fall into the pockets of those who needed it so that the economy could traverse a global health disaster and not completely disintegrate. The injection of trillions of government funds into the limping economy was entirely unprecedented, so the long-term impact of the crisis will be unknown for some time. Runaway inflation, a federal debt obligation that crushes the country, the end of the dollar as the world's reserve currency, higher interest rates, and the emergence or failure of the Chinese economy may all be embedded in the aftershocks of the 2020 pandemic crisis. Technology can help with that part of the equation too. Several principles should guide the government's decision making about creating safety nets in a financial crisis.

First, in a crisis, governments should not act until they must. If they intervene too early, it may exacerbate the crisis by appearing arbitrary and undercut market discipline and the corporate desire to "heal thyself." Economic moral hazards should not lightly be created. However, when governments act too late, they may not have enough tools or funds at that point to stop the meltdown of the economy. Appreciating the point at which to act can only be informed by years of experience and insights, a thorough knowledge of history and an uncanny ability to make informed educated guesses. This illustrates the need for a crisis handbook, a SWAT team that is always ready to go, and new technological tools to paint pictures of alternative economic scenarios.

Second, when the government decides that it must act to save the economy, its actions should be the equivalent of economic shock and awe so that markets receive a clear and convincing message about the direction and effectiveness of the intended solution. Erratic policies untethered to a comprehensive plan can result in greater financial distress as markets get the sense that the government is unsure of itself or picking winners and losers. That is what happened in the Panic of 2008. The halting deployment of strategies and sense the government was picking winners and losers created some uncertainty that undercut the economy and the credibility of the government. Rebuilding confidence is the goal, and that often takes the form of lots of cash, credit, and capital. The government should be given emergency powers to lend, invest in, buy assets from, and offer full faith and credit assurances to financial companies when the economy is in extremis. Back-up systems and off-site operational mechanisms should be ready to become operational within a day. Liquidity facilities should have been previously thought through and ready to roll out. Lists of executives, consultants, and vendors that are ready to be deployed at a moment's notice should be maintained, and a decision-making team that involves a limited number of critical people should be designated and enabled by Congress and the president. Once called into action, that group should have the emergency powers required to do whatever it takes to save the economy.

Third, the solutions must be well choreographed for public consumption in a television and social media enabled world. No matter how well and technically crafted economic relief strategies are, they will live or die based on their presentation and acceptance. That requires, in addition to the best technicians, the deployment of talented government sales and spokespeople to make sure that the message is convincing and compelling. Secretary Geithner considered that a place where the government could have done better in the Panic of 2008.

Fourth, the politics of the situation must be kept in the sideview mirror. It is difficult to eliminate politics where money is involved, and eventually, every financial crisis will become one that only Congress can solve. One would hope that a public sense of duty would rise above the normal impulses of members of Congress, but that has not always the case.

Fifth, the goal should be financial expediency and maintaining the flow of money throughout the economy. Regulatory and dogmatic financial principles of moral hazard and economic incentives must give way at some point to practicality when the pulse of the economy is fading. Secretary Geithner realized this in the subprime crisis and was a voice of pragmatism in a sea of economic theologians. He understood what many of us have learned in handling a financial crisis: if all that is left after a crisis are a set of principles, they will not save a failing economy. I am confident that given the choice, citizens on Main Street would choose the survival of the economy over principles that allow everyone to perish together.

Sixth, after all else fails, government officials must have enough working levers in a financial crisis to control events and prevent the economy from hitting bottom. The regulatory system must be fixed to create those emergency levers. This is in large measure why Congress created a systemic stability council in the Dodd-Frank Act and gave the FDIC the authority for the first time to act as receiver for nonbanks. Yet Congress also repealed the authority of the Federal Reserve and the FDIC to rescue certain companies in a financial crisis because it did not want the government bailing out individual companies on Wall Street to the detriment of the people and merchants on Main Street. That was a short-sighted political act that requires a “do over.” At the same time, providing the regulators with the authority to close systemically important financial companies is largely illusory; they will never do it. No one knows what will happen if the government seizes a two-trillion-dollar financial institution or what levels of economic chaos would follow. The government—the human beings who make those decisions—will never want to go down that path to find out. Thus, a new system must be developed that applies prudential regulation in a functional way and has a relevant system of safety nets ready to go. Today, technology can vastly improve the timing and reliability of these decision-making challenges so that the government can more accurately decide when intervention is required and what it should look like.

Finally, the actions taken should be quickly reversible, allowing the economy to return to its natural state of equilibrium as soon as possible. That means that the plan of attack must be as precise as the plan of withdrawal. Continued managed intervention coupled with enormous sums of credit and capital may be too much of a good thing if the

distortion that they create puts the control and direction of the economy in the hands of the government, creates massive inflation, impacts the dollar, or promotes other economic deviations. After 2008, the US economy continued to be the strongest, thereby protecting the dollar as the global reserve currency. If the economy loses that status and financial technologies such as cryptocurrencies displace the dollar, the dam may break, releasing the financial pressure that has been growing for the last several decades. When that happens, the size of the national debt and the impact of the unprecedented economic interventions that the government has taken will have a cascading effect on the country's economy.

3. THE GRAND DELUSION OF “TOO BIG TO FAIL”

The previous discussion on safety nets bleeds into the never-ending debate over “too-big-to-fail” (TBTF) financial institutions. There have been more words written about TBTF than perhaps any other financial issue in the last decade. While the debate fuels political rhetoric that allows everyone to chastise big banks, TBTF is not the issue it is made out to be and is not being properly analyzed or regulated for what it is. This debate is a continuing distraction.

The TBTF dogma suggests that certain financial institutions may be TBTF because their size and global interconnectedness would threaten the stability of financial markets. Because of that, they are viewed as enjoying regulatory, operating, and funding advantages that create moral hazards that undercut market discipline. Significant recent analytical work has been done to attempt to identify the extent to which there is evidence in the market of advantages of being TBTF and whether things have changed since the enactment of the Dodd-Frank Act.

The work of several academics in April 2020 using advanced economic analysis of, among other things, funding and debt costs of large financial institutions suggests a decline in the funding advantages of TBTF institutions since the adoption of the Dodd-Frank Act because creditors have priced in a higher expectation of losses.³⁴ However, the paper concludes that while the numbers may suggest the allocation of more losses among creditors, government bailouts of large financial firms will continue to occur. The markets are well informed, and it is

not surprising that they would extract a higher price based on the leverage that the Dodd-Frank Act provided them by giving the government greater latitude to close and operate TBTF financial institutions through the FDIC.³⁵ In June of 2020, the FSB issued a consultative report concluding that systemically important banks are more resilient and resolvable. It noted that they are better capitalized, have built up significant loss-absorbing capacity as the capital ratios of global systemically important banks doubling since 2011, and provided authorities a wide range of options for dealing with failed banks through the creation of resolution plans. While admitting that there is more work to do, the report argues that any “material negative side effects of the reforms” are outweighed by the net benefits to society.³⁶ Finally, the staff of the Federal Reserve Bank of New York found that resolution plans increase a bank’s annual cost of capital by 10 percent of total funding (\$42 billion annually), thereby reducing their TBTF subsidies.³⁷

Notwithstanding the accuracy of these studies, my experience suggests that the government is extremely unlikely to ever seize and restructure large financial companies. Indeed, Lee, Lee, and Coldiron suggest in *The Rise of Carry* that the Federal Reserve has become a major supporter of the TBTF doctrine to the extent that it consistently bails out systemically significant financial companies.³⁸ The TBTF doctrine is like many arguments that I confronted studying metaphysics and epistemology in college. They provide significant and valuable theoretical food for thought, but the conclusions reached may not necessarily reflect the real world. Consider several fundamental facts.

First, large financial institutions have always been a part of the financial landscape and always will be. Whether they cause aberrational behavioral impacts in the market and enjoy certain funding and other advantages, they are also important working parts of the economic engine in the country. Second, like the electoral college, TBTF is not easily fixable as a practical matter. Breaking up large banks would require a thorough understanding of the economic, political, and competitive impact on economies and monetary systems around the globe. Preventing institutions from becoming TBTF institutions demands a blanketing system of government oversight that could threaten to calcify the economy. Taking them over when they are sick requires a level of resources and capability that the system has never encountered. It is also unlikely that there is the political will to bring about any of these

results. Third, big banks play a leading role in the economy. They came forward or were used in the Panics of 1893, 1907, the Great Depression, 2008, and 2020. They were bastions of financial strength and liquidity when the coronavirus shuttered nearly every business in America in 2020. They have created buffers and soft landings that the economy needed but often could not create by itself. They were symbols of stability that the government could not or would not supply. Without big banks, the economy could not be so easily managed—no collaboration of community banks could do what big banks have done to address financial panics. Fourth, the Federal Reserve relies on two dozen primary dealer banks to dispense monetary and fiscal policy. Without them, monetary control would be a much more difficult job. Fifth, large financial institutions provide correspondent, payments, and back office services to the thousands of community banks and nonbank financial institutions, giving them the ability to deliver products and services that they never could have provided their customers on their own. In that regard, at least until technology changes it, large banks have an economy of scale that is important in reducing consumer costs related to credit cards, payments systems, and mortgage products. They enjoy greater risk diversification, spread fixed costs over many activities, and can offer combinations of products with a global reach.

As a part of the bias against large financial institutions embedded in the Dodd-Frank Act, Congress gave the federal government (the president, Treasury, Federal Reserve, and FDIC) the authority to impose FDIC receiverships on nonbank financial companies such as bank holding companies and nonbank investment banks. How it would work is unclear and somewhat impractical given the negative effect on markets that the forced receivership of large nonbanks would have.³⁹ Moreover, there is no evidence or guarantee that breaking up or eliminating large financial institutions would lessen the risk of financial collapse or that a country of regional and small banks serves the interests of the American public and its economy. As noted, banks are no longer the sole option for most US savings and investments, so addressing the TBTF issue without first dealing with the nonbanks and functional regulation issues would be short-sighted.

Blindly asserting that large banks should disappear because they are TBTF ignores history, economic reality, and international competition, and suggests that there is a better financial services landscape for the

country for which there is little analytical support. It is far from certain that the government even has the resources to handle the receivership of such behemoth companies. The largest receivership that the FDIC has ever handled was Washington Mutual Savings Bank, which had a relatively simple balance sheet comprised of \$300 billion in deposits, mortgages, and MBS. JPMorgan Chase assumed responsibility for most of its deposits and acquired most of its assets with certain assurances and financial guarantees from the FDIC. Its receivership has been in progress for twelve years, and it is still ongoing. The FDIC has never attempted to resolve a multi-trillion-dollar global commercial and investment bank failure, whether it involved selling the companies in pieces or paying out depositors and liquidating its assets. If TBTF is to form the basis for a new regulatory strategy that assumes that TBTF institutions can be seized and liquidated, it must first be based on the capability and experience—not just the authority—to do so. Based on history, TBTF institutions should be considered here to stay. Therefore, they should be regulated as such, with the government imposing capital, liquidity, and other surcharges on them to offset whatever privileges they may possess and threats they present.

Many theories including breaking up TBTF institutions to bail-ins and ring-fencing insured depository activities have been debated.⁴⁰ The Dodd-Frank Act does include provisions that provide for the limitation of activities of large bank holding companies and sale of assets under certain conditions. The presumption post-Dodd-Frank Act appears to be that if a large banking or nonbanking organization gets into trouble, the FDIC could be appointed as receiver for the parent and would transfer viable subsidiaries to a bridge company that would be recapitalized by converting legacy company creditors into equity holders. This of course assumes an awful lot, most of which has never been tried on a large scale before. Most commonly in failure scenarios, the largest entity in the corporate structure—the lead bank—is in financial distress, leaving its holding company and sister companies in reputational and financial distress without a flow of dividends to service their debt. Restructured entities require financing to make them work, so either the government or the private sector would have to step up, as the Dodd-Frank Act provides in establishing a new systemic fund.

Finally, seizure and liquidation of a large bank in the United States in a future financial crisis would likely raise alarms around the world

that would put creditors and counterparties in every country on edge because the largest US banks and financial companies do business in many dozens of countries around the world. In such a liquidation or other failing company scenario, every regulator and receiver would likely attempt to seize the assets of that failed company in their country for creditors there. Without some sort of agreement, other countries would not simply defer to the FDIC or a US court regarding the resolution of failing global financial company to the detriment of their own citizens. The several agreements that US regulators have executed over the last few years with Canada, the United Kingdom, the Caymans, and EU nations are little more than expressions of a willingness to cooperate with each other in a future financial crisis to enhance communication and the planning of orderly resolutions “*consistent with the laws of each country.*”⁴¹ That last phrase is indeed telling. Those countries and any other country that is impacted would act to protect their own economic interests just as the United States and its regulators would. Foreign regulators have no intention of ceding jurisdiction or assets to US creditors. In short, the failure of a global financial institution under today’s rules could lead to an unprecedented international food fight over the assets that would generate massive numbers of global lawsuits, claims, and financial uncertainty.

While there is significant debate about the benefits, detriments, and risks that TBTF institutions create, and Congress provided the authority in the Dodd-Frank Act to close and liquidate such banks and non-bank financial TBTF companies, none of this has ever been done in the real world. All the research papers, laws, and regulations that signal the curtailment of TBTF are missing one important variable: how things really work when humans are making the decisions. The last thing that any government supervisor wants to do or will do in a financial crisis is take over and liquidate a TBTF institution when the consequences are unknown. No one jumps into a hole when the bottom is not visible.

4. TECHNOLOGY AND REAL-TIME SUPERVISION

How can the most sophisticated financial system in the world not be based on real-time data? Before the Panic of 2008, I represented a bank that was under scrutiny for the safety and soundness of its operations.

The agency's bank examiners asked for several years of information about the bank and took the better part of a year to conduct their annual examination and prepare a formal examination report. It presented its report of examination and findings to the bank's full board of directors because of the seriousness of its conclusions and its decision to initiate a formal enforcement action against the bank. As counsel to the bank, I was in the board room for that presentation, as I had been for dozens during my career. The examiners painstaking and professionally laid out their case. I vividly recall thinking that the system was not working. The board sat there patiently listening to a discussion of what they had done wrong three years earlier, even though much of what they were being criticized for had largely been fixed over the last year. We spent the next several months negotiating a consent cease-and-desist order requiring the bank to refrain from and correct activities that it had largely terminated. Not only was the system not operating on a real-time basis; it was living in the past. I remember thinking that while the examiners were delivering their message to the board that the next set of examination issues had likely already developed, and that we could be back in that room four years later to deal with them.

The financing business has come a long way from the simple lending and investment products of the 1930s. Complicated synthetic financial instruments are traded among a myriad of counterparties in an ever-increasingly interconnected global financial network. The system may be too complicated to regulate. It needs a significant upgrade, particularly from new technologies that can integrate analysis of an institution's risk profile within its rigorous macroeconomic analytics and make reasonable predictions about the future. Regulators need the tools and ability to see a crisis coming, the authority and capacity to act swiftly and decisively, and the resources to avert a collapse of the economy. They should not have to use a wrench to adjust an algorithm. Congress and the regulators have in the last decade finally begun to deploy the kinds of oversight tools in the form of stress testing, risk management, and living wills to move toward a more technology-driven real-time system of oversight, but it is still rudimentary. For example, regulators are receiving real-time liquidity and capital information on the half-dozen largest banks, but the question then becomes what they do with it. The system needs more comprehensive, forward-looking endeavors and increased resources to evaluate and use the data that is collected.

The effectiveness and quality of government decision making and the financial decisions and policies that follow should be predicated on evidence-based analyses that can be enhanced by state-of-the-art technologies and the application of artificial intelligence. Governments make life-and-death financial decisions for us. Before they do, they should have the ability to assemble a solid record of empirically based alternatives, costs, and benefits using the most sophisticated analytical tools available. That still does not happen well enough today.

Continued modernization of the analytical and examination process is fundamental to being able to regulate the complicated system that exists. While improvements have been made, data is still largely gathered across the banking industry the same way that it was nearly fifty years ago. Beyond the banking industry, the collection of data is even less comprehensive. But for the very largest banks, bank supervision is still significantly based on backward-looking data that is evaluated with limited analysis of the macroeconomic impacts that are occurring in the markets. This information is collected on a monthly, quarterly, and annual basis from banks and is anchored to an annual physical examination by bank examiners. Too often, by the time that bank supervisors see the results of that data, a bank may already be many miles down the road toward a new set of financial challenges. Sometimes it is on the brink of collapse by the time the problem is seen. This process is also largely an inward-looking exercise focusing on the institution's individual metrics.⁴² Regulators (their systems) should be collecting a broader set of data on a real-time basis to raise real-time red flags. That data must include more outward-looking information, incorporate macroeconomic factors, and facilitate predictive analysis of future risk scenarios that go far beyond those that are visible on the books of the institution. The current examination focus on whether a bank violated any of the myriad rules, regulations, bulletins, and opinions over the last two years is important, but so is how it and the system will fare in alternative economic scenarios modeled on the analysis of much larger data sets than are currently being employed. Supervisory judgments must be supplemented by real-time micro- and macroeconomic analyses taking advantage of sophisticated forms of artificial intelligence and machine learning that can provide future red flags that regulators can act upon. Prioritization of risks is important.

Upgrading the oversight of financial institutions will be tricky. Finding the money to modernize the system to make it real-time and predictive would likely result in some pushback by the institutions that would have to pay for it through the assessment fees that they pay. Hiring the people with the expertise to do it is even trickier because bank regulators are admittedly not technologists. The increased assessments that would be charged to finance such an effort will be controversial because the cost of regulation is already viewed by many banks as disproportionate to its benefit. Large institutions are currently allocating billions to technology, including artificial intelligence and machine learning, and would not likely be as significantly impacted by the costs of upgrading to a new system as community institutions, which are already operating on razor-thin margins. The costs attributable to enhancing supervision with state-of-the-art technology might be enough to push many of them to sell. Regional banks would be more prone to merge with each other to absorb the costs. In addition, refitting the regulatory process would make the most sense only if it also contemplates changes necessitated by a complete overhaul of the system that would include the rollout of more effective and targeted functional oversight to apply prudential safety and soundness standards to a wider swath of financial companies. Such a modernization of financial services oversight would have to consider the likely impact on the structure of the banking system and the number of banks that it could likely support.

A new real-time data financial monitoring and predictive model would have to be rolled out in stages, likely beginning with the largest banks that are ahead of the curve. The spectrum of enhanced data that could be gathered and evaluated includes decades if not centuries of (1) internal financial planning and performance ratios; (2) external macroeconomic indicators (e.g., unemployment numbers, interest rate trends, property values, building permits issued, birth rates, demographic changes, healthcare trends, global trends, bank failures, bankruptcy filings, loan defaults, foreclosure trends, market characteristics, etc.); (3) corporate governance, risk management, and talent factors; and (4) predictive behavioral information about markets and C-suite executives. Imagine the data that could be collected just over the last fifty years about every facet of interest rates, markets, governance, financial transactions, investment patterns, liquidity distribution, housing trends, capital formation, income distribution, demography, and the velocity of

movements in all these factors. Consider how machine learning applications could evaluate that data and combine it with real-time reporting by financial institutions to arm the government with a significantly more comprehensive database to complement supervision so that it can better identify warning signs, predict future problems, and construct mitigating strategies. Intelligent applications should be able to evaluate this data and be able to compare it with current market forces to better correlate how the financial incentives in the market match up against current forms of regulation. A change in baseline indicators instantly identified by superintelligent machines much faster and more reliably than what happens today will demonstratively improve the government's and financial executives' ability to see and avert future financial crises.

There are, however, extremely difficult issues to confront and complex technological systems to develop. They will have their disadvantages and pitfalls. Models always fail at some point, and machines are not infallible. But the increased insights that they could provide will make the human judgments made by regulators much more reliable, effective, and efficient. The challenge will be using that data and the predictive results that it produces as tools to assist human judgments rather than as just another crutch that discourages sound deductive reasoning. If such a system of supervision had been in place in 2000, it might have allowed regulators and bankers to avert the Panic of 2008 or lessen its impact. It may have permitted the government to more effectively and efficiently irrigate the economy and identify trouble spots that would need additional amounts or forms of liquidity or equity capital. While it will be expensive to roll it out, the cost would be offset by just one day of market disruption in a financial crisis. I will turn specifically to the use of artificial intelligence and super computers in the next chapters.

5. BETTER REGULATION OF SYSTEMIC STABILITY

Systemic regulation—supervision of the entire financial services business to identify potential shocks to the system—is a laudable goal, but one that is challenging and so far has been vaguely defined and difficult to implement.⁴³ The systemic stability requirements of the Dodd-Frank

Act are a good example of “let’s-see-if-this-works” regulation. In the last twenty-five years, America has experienced the most explosive period of technological development in the history of humankind. And yet, the government has essentially focused its oversight authority and energy on issues of secondary importance. The FSOC and its Office of Financial Research (OFR) within the Treasury are perfect examples.

In 2010, when a shell-shocked Congress decided to extend pervasive prudential regulation by the Federal Reserve to companies that had never been prudentially regulated and allowed the FDIC to act as receiver for them, it was a radical departure from past precedent. Such pervasive oversight had never been imposed on insurance companies, nonbank financial companies, consumer lenders, asset managers, fintech companies, online lenders, and marketplace lenders that did not enjoy federal deposit insurance or some other form of an express or implicit government guarantee. Yet there was limited data-driven analysis underpinning this shift in direction or informing policy makers of the possible unintended consequences or economic costs. Title I of the Dodd-Frank Act effectively requires the members of FSOC,⁴⁴ who are the very federal financial regulators manufacturing the underlying regulations (the SEC, Federal Reserve, OCC, FDIC, NCUA, CFPB, CFTC, and FHFA) effectively to sit in collective review of their own actions and weigh the aggregate impact that they have from the perspective of national and global systemic stability. That seems like a system doomed to mediocrity. How Congress intended systemic regulation to mesh with other global regulatory schemes is also unclear. For example, the Basel Committee on Banking Supervision is the primary global standard setter for the prudential regulation of banks. Its forty-five members comprise central banks and bank supervisors from twenty-eight jurisdictions who meet to harmonize global banking supervisory matters. It is part of the Bank for International Settlements, which was established in 1930 by sixty central banks representing 95 percent of world’s GDP.⁴⁵ The FSB was established in April 2009 as the successor to the Financial Stability Forum by the G20 to promote the reform of international financial regulation and supervision. It plays a large role in global stability and the designation of large companies for enhanced supervision, which has indeed become a crowded and sometimes competitive regulatory field that is only complicated by the addition of the FSOC’s mandate to ensure systemic stability by creating a risk-reducing

oversight mechanism that can see around financial corners and allow regulators to steer around future systemic shocks.⁴⁶

Consider the FSOC's track record. In more than ten years, it has designated companies to be regulated by the Federal Reserve as systemically important financial institutions (SIFIs) as a means of ensuring future economic stability.⁴⁷ None of the four nonbank companies that it designated as SIFIs between July 2013 and December 2014 are still SIFIs. The designations of General Electric Credit Corporation, American International Group, and Prudential Insurance were all eventually rescinded,⁴⁸ and MetLife successfully challenged its designation in federal court.⁴⁹ I represented several companies before the FSOC and was consistently concerned that the process seemed to be a choreographed dance where the only unknown was how long it would take for the FSOC to get to the inevitable designation conclusion it seemed destined to reach. The assumption that bank-like prudential regulation of nonbank financial companies would somehow lessen or prevent future financial meltdowns was just that—an assumption. No study of the benefits or economic costs of prudential regulation of nonbanks was ever conducted, and no one considered how regular meetings of nine financial regulators would make them more effective collectively than they were individually. The FSOC's focus on reviewing individual companies for potential designation was an inefficient and ineffective use of its resources that left it at risk of missing the forest for the trees. Its approach distorted competitive markets and disadvantaged US companies relative to their overseas competitors, and often failed to incorporate the views of primary regulators of companies in its crosshairs. The real damage over this last decade has been the lost opportunity to have built a better mousetrap to evaluate systemic stability. Indeed, throughout the Financial Pandemic of 2020, which threatens the systemic stability of the globe, the FSOC has been largely invisible.

The OFR was also a great idea. Its job description raised high hopes when it was established to “measure and analyze risks, perform essential research, and collect and standardize financial data” in order to shine a light in the dark corners of the financial system to see where risks are. It has published numerous reports on national and global financial stability issues over the last ten years that have hardly seemed to see the light of day or received critical acclaim.⁵⁰ Compared to the things they could be doing with technology and Big Data to move

toward real-time risk evaluation and global financial stability, the efforts of the FSOC and OFR have been misdirected failures.

In August 2010, just one month after the Dodd-Frank Act was enacted, the Basel Committee published an analysis of the regulation of systemic risk and the attendant benefits and costs.⁵¹ It is a complex and somewhat opaque analysis that concludes that assuming institutions pass on to borrowers the added costs arising from strengthened regulations, the net benefits from the reduction of the probability of a banking crisis through higher capital and liquidity standards is uncertain and difficult to calculate.⁵² Wondering what that means? William Dudley, former president of the Federal Reserve Bank of New York, in an October 2015 conference at the Federal Reserve Bank of Boston, explained that “[T]he use of macroprudential tools holds promise, but we are a long way from being able to successfully use such tools in the United States.”⁵³ How the FSOC and the FSB proceeded also raised serious questions about the efficacy of the process and regulatory methodologies they used. For example, enhanced prudential standards that were to be applied to at least one nonbank SIFI (GECC) as proposed by the FRB tended largely to be bank centric.⁵⁴ Applying bank capital, liquidity, and operational concepts to insurance companies and investment managers, among others, is problematic given the difference in their business models, balance sheet, and risk profiles. Moreover, the FSOC and FSB’s analyses did not clearly distinguish between large companies that were the creators of market risk (i.e., banks), and those that either invest in, absorb, or manage that risk (i.e., asset managers). If the FSOC and other countries were in fact successful over time in lessening the creation of systemic risk by designating nonbanks to be regulated prudentially, the need to impose additional systemic regulation on a greater number of companies and products in the market would be commensurately lessened. The FSOC’s rules or actions did not suggest that this constantly changing risk environment was ever considered. Perhaps most telling were the disagreements among FSOC members. When some of the more knowledgeable members of the FSOC, from the insurance industry for example, dissented from the decision to designate two insurance companies as SIFIs, one wonders what it all meant.⁵⁵

The Trump administration has refocused the FSOC. It appears to have rightly abandoned the designation of nonbanks as SIFIs regulated

by the Federal Reserve and redirected its analysis toward an evaluation of how activities, products, and technology, rather than companies, may create systemic risk. It and the American economy would be well served if in the next ten years, the FSOC could introduce a technologically enabled system of global red flags that provides authorities around the world with information, indicators, and time to make course corrections and avert or mitigate future financial crises. If those regulators also had predictive analytical tools, they could be significantly more effective in moderating systemic risk and averting future financial crises.

6. CREATE PUBLIC-PRIVATE SECTOR TECHNOLOGY INITIATIVES

Many banks still think they are banks. They are in fact rapidly becoming technology companies that happen to take deposits and make loans in a borderless, real-time transaction world. That requires a seismic shift in the intellectual and physical approach to financial services. They need to think and act like technology companies, and their regulators need to correlate what they do to that reality. As I will discuss in greater depth later, technology holds vast benefits for them and their customers, as well as presenting unprecedented risks and threats. Financial regulation in this new world should enable a public-private partnership to both assimilate and combat technology. For example, the best way to defend against cyber-threats and malicious artificial intelligence is through the sharing of extensive information and adopting acceptable standards and rules of engagement. To the extent that a bank that is fending off a million online security attacks each day and is sharing that information with the government and its peers in an effective yet guarded way, it will be improving its defenses and those of the financial infrastructure of the country. The world is evolving financially in a way that requires more collaboration and sharing and less intrusion by the government. At the same time, it will be critical that the combative relationship between financial institutions and the government that oversees them be dissipated and replaced with greater incentives to share and aggregate capital and resources. Unless that happens, regulated financial institutions and their regulators will be left in the technological dust of

companies that better understand the opportunities and threats that are being created.

7. THE NEED FOR FINANCIAL LITERACY

The history of consumer protection in the United States is a tortured and complicated one that must be rebuilt from the ground up. It largely began in the modern era in the late 1960s and 1970s with the enactment by Congress of laws focused on providing consumers with limited rights but reams of information that they could evaluate before they picked a financial provider or chose a financial product or service. When I joined the OCC in 1976, I was assigned to the consumer protection division of the law department. I handled complaints filed by consumers against national banks for several years and participated with a team from the other federal banking agencies in the drafting of many of the historic consumer protection rules and amendments of them, including those implementing the Truth in Lending Act (1968), Equal Credit Protection Act (1974), Real Estate Settlement Procedures Act (1974), Home Mortgage Disclosure Act (1975), Fair Credit Reporting Act (1970), Electronic Funds Transfer Act (1978), and the Community Reinvestment Act (1977). Since that time, a half dozen federal agencies (ignoring for these purposes the output of fifty state agencies) have issued hundreds of consumer protection rules that have taken the resources of thousands of staff members to produce tens of thousands of pages of rules, interpretations, and enforcement actions. Unfortunately, these laws and the truckloads of information and disclosures that they created over the years could not help a large segment of the population that was increasingly becoming financial literacy challenged as new products and services evolved. Many Americans are largely uninformed, for example, about how mortgages work. While they can appreciate the difference between a 5 percent and a 7 percent interest rate and how the internet provides them more financing alternatives and negotiating leverage, many consumers are not generally attuned to the intricacies of moving money between checking and savings accounts, using the time value of money, investing in the stock market, managing their 401(k)s, and trading in derivatives, shorts, options, and puts. And yet today, consumers are willing to communicate vast amounts of per-

sonal information about themselves to the world through social media and sell any last vestige of their privacy to a myriad of internet-based retailers, app vendors, and digital money, cryptocurrency, and fintech companies.

Hundreds of pages of consumer protection regulations and lengthy disclosures can have only a limited impact on altering the risks to consumers when those risks are not understood. This rule-writing effort over the last six decades has not been an effective or efficient way of protecting consumers, and it has cost an enormous amount of money. While many would debate this point, I suggest that the proof of its ineffectiveness is borne out by the fact that notwithstanding decades of writing rule after rule, the Panic of 2008 represents in the eyes of some the greatest abuse of consumers in modern history.

The solution is not more rules and lengthy disclosures that no one reads or understands. It is not more agencies or more money thrown at the enforcement of rules. The government cannot assign a monitor to assist every consumer in every financial transaction. The answer is to divert the enormous resources being devoted to rule writing and the creation of bureaucracies to increasing financial literacy. If the government had taken all the billions of dollars that it has spent on creating consumer protection agencies and promulgating and enforcing all the consumer protection laws and rules that have been enacted since the 1960s and directed those resources at financial literacy education projects, most consumers would be far ahead of where they are now and would need a lot less protection from government agencies. Why hasn't every high school and college in the country partnered with a financial institution to offer required financial literacy courses? Why haven't financial institutions offered to work with schools to educate the country's future consumers? Don't they all benefit from increased financial literacy and the development of future loyal financial services customers? Informed customers are more profitable customers and purchase more sophisticated financial products. They make fewer mistakes and create fewer headaches. School districts should auction off the right to financial services companies to educate their students. Financial institutions should want to do that job. The benefits are obvious—consumers would learn how to take control of their financial lives, less distortive regulation would be required, and financial companies would potentially end up with customers for life. Financial literacy must be a critical

component in the reconstruction of a safer and more secure system of finance in America. More rules and regulations will not solve the riddle of consumer protection.

If these changes had been enacted, if the government had better data upon which to make decisions, and if there were the will to make hard decisions and leave politics aside, this restructured regulatory platform would have provided the government a crisper, more direct and effective means of responding to the Financial Pandemic of 2020.

MACHINES TO THE RESCUE

People make mistakes, models fail, and machines are not infallible. But combined with and controlled by human judgment and experience, more precise and predictive intelligent machine guidance can help regulatory experts and financial managers improve the quality of their judgments and operate with scalpels rather than meat cleavers. Technology can help protect us from fraud, complete transactions more efficiently, and tell us more about how to improve our economic futures. It can provide financial regulators and policy makers with information that they have never had before. But no one should be seduced by the glitz and glamour of technology. It has a dual personality. As much as it may improve human decision making and enrich our lives, it may also be setting the most significant traps to economic safety and security that we have ever encountered.

As technology and financial services converge, the government is increasingly struggling to keep up with how financial companies use technology to improve performance, how adaption impacts the financial ecosystem, and how defenses against cyber and other digital attacks should be deployed. Much of that focus arose after 9/11 when terrorists rewrote the security playbook and the government began to focus on the protection of critical infrastructures.¹ As technology has insinuated itself into every aspect of financial services, financial regulators have zeroed in on the use of technology by financial institutions and the risks that it poses for them. The government should not, however, just be focusing on regulating how *financial institutions* use technology. It

should also be considering how *it* can use technology—particularly artificial intelligence and in the future, quantum computing—to convert its limited data analysis systems to ones that produce more reliable, micro- and macroeconomic real-time and predictive indicators of our financial futures. It must also consider how it will deal with malicious technology applications that will attempt to undo the country's financial infrastructure. The FSOC is the place where that work is presumably being done today, although nearly nothing has been made public about it. It may not be the most effective home for that problem in any event. Financial regulators are great at assessing financial risk that derives from lending and investments. They are not experienced at assessing and defending against financial infrastructure threats created by technology. That is a much broader issue requiring an array of financial, technological, military, and scientific experts.

Driving down an interstate highway limited only to the use of rear-view and sideview mirrors is a dangerous way to travel. That is how the regulatory system was built. Imagine how your driving skills would improve if you could evaluate oncoming hazards from all directions at the same time. A wider field of vision created by increased micro- and macroeconomic data and state-of-the-art technologies would likewise provide regulators with a much-improved opportunity to avert future financial crises. To be clear, however, machines should be viewed as the *tools* that can develop better forward-looking data that will allow *humans* to make the final judgments.

A SHORT HISTORY OF FINANCIAL TECHNOLOGY

Financial technology became most visible in the last half of the 1900s when banks began deploying automated teller machines (ATMs) to take deposits and dispense cash in the late 1970s. I was at the OCC when we released the legal opinion authorizing national banks to deploy ATMs without going through a cumbersome branch application process. At that time, the only automated aspects of a bank's business were a part of closed, proprietary networks that they either owned, shared, or rented through outside vendors. ATMs would share the same space. The concept of a financial institution participating in an open architecture net-

work would have been unthinkable by either bankers or their regulators in the 1970s.

That next step forward in the use of technology arrived in October 1994, when Stanford Federal Credit Union became the first financial institution in the United States to offer internet banking to its customers. A year later, commercial banks followed suit, beginning a revolution in financial services that has lasted to this day. The challenge of transacting business online in an open architecture was addressed by cryptography, encryption, digital signatures, and a host of secure interfaces introduced to the financial services business by technology pioneers. Between 1998 and 2002, when I was chair of the Cyberspace Law Committee of the American Bar Association, we were running as fast as we could to respond to the digital revolution in commerce and how it was impacting the law of communications, contracts, and money as everything transitioned to electronic forms that were ambivalent about physical borders. I traveled to Swindon, England, to participate in the digital money and electronic wallet experiment launched by Mondex and later chaired a twenty-country study released in London in 2020 on the ways to address the jurisdictional conflict of laws in online commerce.² We confronted issues raised by anonymous digital money such as DigiCash and learned how the security provided by encryption and digital signature technologies could create a secure foundation for online commerce. The issues were obvious—every law, rule, and judicial decision to that point was written or based on paper agreements physically executed by the parties. Most laws simply did not accommodate digital contracts and online commerce.

To avoid commercial chaos, acceptable answers and conventions were required quickly. Most of the financial world at that time assumed that the new digital products would instantly revolutionize global money and be adopted overnight. The glitz had overshadowed the complex legal, financial, and operational issues that the transition to online commerce posed. The shift did not happen as expected; in fact, when the hype receded, many of the new digital products disappeared, only to come back decades later as blockchain technologies supporting cryptocurrencies and other business transaction applications. That was a great lesson about the rigors of gaining public acceptance and how new technologies must solve the 3 *Cs of consumer acceptance*. They must lower *cost* and increase *convenience* while simultaneously projecting absolute

confidence in the security of the product. A full description of this era and how technology and the internet impacted financial services is laid out in a 650-page book I coauthored with Robert H. Ledig and Lynn Bruneau in 1998 titled *21st Century Money, Banking and Commerce*.³

Many of the seeds sown in the late 1990s matured over the next twenty-five years. In 1998, the first person-to-person (P2P) platform for money transfer services was established. In 2003, Congress authorized digital copies of checks to be made and electronically processed. The first cryptocurrency was created in 2009, with approximately 8 percent of Americans in 2020 owning one of the more than 1,500 cryptocurrencies that have been issued around the world. Every financial institution today provides a range of online and mobile products and services through the open architecture of the internet increasingly relying upon artificial intelligence and machine learning, biometrics, cloud computing, Big Data, and distributed ledger and blockchain technologies. Money may be transferred between and among all financial companies by customers or the institutions themselves with a few keystrokes. There are applications to save and budget money, invest, and pay bills. The OCC recently issued a summary of these technological developments in an Advanced Notice of Proposed Rulemaking.⁴

The Federal Reserve, a participant, competitor, and regulator in the growing digital payments business, is not about to be left behind. In August 2020, Governor Lael Brainard outlined several projects that the Federal Reserve launched to (1) implement a new instant digital payment service—FedNow—in 2023 or 2024 to enable financial institutions to provide instant payment services in real time;⁵ (2) experiment with distributed ledger technologies (DLT); and (3) identify the potential uses and legal hurdles for a central bank digital currency (CBDC).⁶ Its work on DLT such as blockchain applications has been done in the Board's Technology Lab with a multidisciplinary team of application developers from the Federal Reserve Banks of Cleveland, Dallas, and New York, as well as in collaboration with researchers at the Massachusetts Institute of Technology. Notably, it has emphasized that a cyberattack on a CBDC arrangement in one jurisdiction could create domestic financial stress, which could affect linked economies or have broader effects if confidence in certain technologies or payment mechanisms is eroded.

Facebook's announcement in 2019 that it was launching a new cryptocurrency seemed to shock everyone and move the business of digital payments forward emotionally, if not technologically and legally. It posed the question most consumers have had on their minds—*what's all this crypto stuff about, and why is Facebook getting involved?*⁷ The buzz over cryptocurrencies today is not just about new alternative forms of money, and the profit embedded in the minting and transmittal of digital currency. The financial impact so far is minuscule. So, what's it all about? I see cryptocurrencies as a symbol that represents a bridge to the still-undefined future of money, payments, and commerce that an increasing number of companies, venture capital, and users simply do not want to miss out on.

For definitional purposes, *cryptocurrencies* are digital coins generated or mined by computer programs that are intended to function as money or an instrument of value. Some are linked to fiat currencies to provide a stable value, while others float in the market as investor interest ebbs and flows. Some are backed by liquid financial assets such as government-issued notes, but base their value and acceptability on public confidence, which can be a fickle friend at best. Cryptocurrencies tend to be created and supported by blockchain applications, which have evolved into a life culture that speaks to one's sense of democracy, privacy, and the role of government and financial intermediaries.

A wonderful explanation of how the blockchain works and more importantly, what it signifies is set forth in Professor William Magnuson's new book, *Blockchain Democracy*.⁸ In simple terms, the blockchain is essentially an advanced generation of digital signature technology that creates encrypted packets of information that themselves are linked through a newer generation of hashing and encryption applications similar to those that supported Mondex and DigiCash in the 1990s to form connected blocks of data shared among all of the users of the application. These complicated chains of data packets must coexist in identical form in the computer programs of each participant, and therefore *should not* be able to be created, modified or replicated unless the strand of the chain and any modifications of it are consistent throughout the user population.⁹ It takes so much computing power and time to create, hack, replicate, and disrupt the blockchain that the chances that those things will occur are substantially reduced. Never say never when

it comes to mathematically driven programs, however—more on that later.

Cryptocurrencies such as Bitcoin rely on blockchain applications and are viewed as egalitarian—they may be created and controlled by everyone as long as they have computing power and electricity to do so.¹⁰ There are no financial intermediaries, go-between fees, clearing systems, or regulation. The rationale and purpose behind cryptocurrencies are impacted by a variety of economic, social, and political instincts and aspirations. At one end, people just want to make money, while at the other, users want to live free with as little government centralization and intervention in their lives as possible. The latter category of users tends to be those who see cryptocurrencies as the symbol for a way of life.

Cryptocurrencies provide innovative advantages including the ability to (1) transact financial business anonymously, (2) avoid government oversight or intrusion, (3) execute and pay for transactions in real time, (4) transmit value in real time across borders, (5) complete retail and commercial transactions at a lower cost by extracting costly go-betweens, and (6) avoid control by any one party. The challenges posed by cryptocurrencies include known and unknown issues and threats to the extent that cryptocurrencies and supporting blockchains (1) are not under the control of any government or an entity that a government regulates; (2) are too often used to facilitate illegal business transactions, including terrorism, money laundering, and the purchase of drugs;¹¹ (3) are not backed by any government or central bank; (4) create monetary control issues to the extent that they may be mined without an offsetting deposit or reserve requirement; and (5) may be subject to hacking, replication, or theft, particularly as technology evolves and cryptographic security systems become more vulnerable to attack.

From a retail acceptance perspective, cryptocurrencies must be more cost-effective and convenient than current value systems to attract users. So far, they have not attracted a critical mass of users of their product as *money*. Most importantly, they must also be considered safe and secure to create the sense of confidence that users have in fiat-based currency systems such as cash, checks, automated clearinghouse, and Fed wire transfers. In those kinds of fiat-based transactions, the government or a trusted intermediary sits in the background providing

a sense of confidence, whether real or imagined. That confidence must exist on both a transactional and systemic basis for any system of value to attract a critical mass of users who believe that a particular transaction will occur successfully, and that the system will not collapse or be subject to theft, replication, or fraud.

Unless issued by a federally insured financial institution, a sovereign central bank, or other entity that reflects systemic confidence, cryptocurrencies are unlikely to achieve widescale acceptability in stable economies. But what if they do? How could they be bailed out in a crisis? Some argue that Bitcoin was intentionally created to be impervious to bailouts. Its inventor, Satoshi Nakamoto, harbored great disdain for TBTF financial institutions and their systems, which regularly career from one panic to another.

As with many other cryptocurrencies, Bitcoin employs no trusted intermediaries between users, a role traditionally played by the regulated financial institutions that governments have a habit of relying on to bail out economies. Its network purports to be self-sustaining and impervious to disruption, replication, or destruction because it double-checks itself continuously through complex mathematical problems that link every block seen by every user. Since all transactions are stored forever, the theory is that actions can be traced, making it difficult to hide the evidence of wrongdoing.¹² But does that make it immune from the boom and bust cycles that have characterized all human financial experience? Does that make it resistant to future technologies? A government or central bank could temporarily provide price support if it consider it necessary to protect economic stability, but that is a narrow band of protection in a vast sea of digital risks.

Bitcoin indeed represents a cultural mindset; it is the quintessential antibank. This is poignantly illustrated by its ironic and humorous Genesis Block, the very first block from which all its progeny has evolved. It contains a secret message within its raw data: “The Times 03/Jan/2009 Chancellor on brink of second bailout for banks,” a headline from the January 3, 2009, edition of the London Times about the actions and inactions of the British government during the Panic of 2008. The romantic version of Bitcoin is that it was created to be different from systems that were failing and was built on accountability, integrity, and transparency.¹³ Whether it represents the birth of a purer financial

future or is a veiled attempt to create a floating crypto casino, Bitcoin and other cryptocurrencies are more than meets the eye.

Cryptocurrencies will evolve in each country into whatever the financial and political realities will accommodate or need. In the United States, for example, the dollar is a universally trusted fiat currency issued by the US government, so cryptocurrencies do not offer an attractive or necessary product to US users. But if the US economy maneuvered itself into a more precarious economic situation due to escalating debt or other financial blunders that threatened the value or security of the dollar, cryptocurrencies might become the more stable and reliable form of value in retail and commercial transactions. In countries where government stability is elusive, money has been politicized, and fiat currency is not trusted, cryptocurrencies seem to be a welcome necessity. For example, although Venezuela is a comparatively small economy in the world, it has been fourth in the world in Bitcoin trade.¹⁴ That fact speaks volumes about the role that cryptocurrencies fill in such unstable countries where the governments are not trusted. Similarly, several nations are pushing for a globally accepted cryptocurrency as a means of avoiding economic sanctions, asset freezes, and other political punishments that are based on the US dollar.

A second front in the evolution of technological financial products is how digital assets like smart contracts and blockchain-enabled systems and tokens will further displace traditional financial intermediaries. The potential replacement of go-betweens that guarantee identities, rummage through title records, and process loan data is just one example of how technology is substituting low-cost, real-time, peer-to-peer-approved movements of information and money to improve efficiency and change financial services. Big paydays await those who can redefine the role and identity of trusted intermediaries. But there is a final and equally significant front that will determine who wins and loses the war for our financial future. It is the one that government regulation eventually opens.

Regulators are rightly giving new technologies and cryptocurrencies the time and room to innovate. They will undoubtedly step in to regulate them when a critical mass of retail crypto users lose money, crypto coins begin to look and function like deposits, or central banks begin to lose control of money supplies. The challenge is knowing just when to step in. Like a financial crisis, acting too soon can negatively impact the

innovative benefits that technology can generate for economies. Waiting too long may cede control of an economy to unknown forces. When regulators do step up, they will at a minimum want to oversee whoever controls crypto money supplies and its delivery chain; how transparent they are; who or what stands behind them; and what information is being collected and transmitted to and about users. That will inevitably raise the question of whether a new approach to financial regulation is necessary and who should be doing it. As I have discussed, the scope of regulation has been driven to this point by the identity of the company, not the nature or impact of the financial activities being conducted. That concept of regulation was developed in the wake of the Great Depression in the 1930s when commercial and private banks controlled almost every aspect of the movement and investment of money in the country. It was logical then to construct the regulatory apparatus to oversee banks. Today everything is digital, financial borders are invisible, and banks occupy a smaller part of the financial space in the United States. There will be little about money, banking, and commerce in the next decade that looks anything like it did when the current federal regulatory mechanism was established. Fintech companies will continue to complicate and enhance the picture as they remake the nature of money and role of low-cost, real-time, peer-to-peer verified products and delivery systems. It is time to consider whether a different and competitively fairer form of financial regulation is warranted. Will it continue to make sense to regulate financial activities and products comprehensively only when they are conducted by banks? Should bank regulation be scaled back to level the competitive playing field? Should nonbanks and technology companies be prudentially regulated proportionally to their impact on money, commerce, and the economy? Nothing will come easy in the war for the next financial hill, but if the government's answers to these questions are not well thought out, the next financial panic could be the backdrop for deciding them.

THE EMERGENCE OF ARTIFICIAL INTELLIGENCE

A greater regulatory reliance on the analytical and predictive qualities of financial technologies, particularly artificial intelligence and Big Data sets, will be one antidote for financial panics. There are some caveats: it

is not perfect; it will make mistakes and is only a tool that humans should apply in conjunction with experience, judgment, and reason.

Artificial intelligence is an umbrella term for the latest range of algorithm-based technologies that mimic the human mind to solve complex tasks.¹⁵ It can assist in decision making by finding and comparing correlations and then providing predictions, recommendations, or classifications.¹⁶ Machine and deep learning are subsets of artificial intelligence. Machine learning, the scientific study of algorithms and statistical models that computer systems use to perform specific tasks without using explicit instructions, relies on learned patterns and inference.¹⁷ Deep learning is part of a broader family of machine learning methods based on the technology used in neural networks usually applied to computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics, drug design, medical image analysis, material inspection, and board game programs.¹⁸ Both are considered subsets of *artificial intelligence*, which I refer to as the generic term that includes them all. The next frontier will be artificial general intelligence (AGI), the technological analogue to the way that the human brain works and uses deductive reasoning to make judgments and rationalize behavior. AGI is admittedly in a relatively rudimentary stage at this point. That is another way of saying it is coming.

Artificial intelligence has allowed us to enter the age of *Big Data*, where extremely large collections of digitized data can be analyzed computationally through the application of complex algorithms to reveal patterns, trends, and associations relating to human behavior and interactions. If you believe that history merely repeats itself, Big Data can be enormously profitable to the extent that it allows users to better predict economic outcomes. Two fundamental challenges shadow Big Data, however—how it is collected and how it is used. Businesses are increasingly relying on Big Data sets to improve the information upon which they base money-saving judgments. For example, marketers and analysts are using drone-driven data to track shopping traffic that determines operational and investing decisions. The need for proprietary spotters sitting in the parking lot of a shopping mall has been eliminated. Roofers are inspecting roofs and preparing work orders and estimates using Google Earth rather than in-person inspections. Delivery companies are using artificial intelligence to micromanage hundreds of

thousands of routes so that the precise order of deliveries and the routes taken are configured down to the smallest detail to save millions of miles, steps, gallons of gas, and dollars. Likewise, financial institutions are incorporating artificial intelligence and Big Data into their underwriting, marketing, and compliance functions to streamline processes, attract customers, and detect cyber-security breaches and signs of money laundering. All this information is being collected and dissected in new ways to provide its users a financial advantage. The applications are limited only by the financial resources available to support them and the increasing controversy about how data is gathered about almost everything and whether it is authorized.¹⁹ Data is power and perhaps in digital form, is the most valuable asset on the planet.²⁰ I recall representing a distributor of airline flight information in the 1990s that made more money publishing the free information it gathered on each carriers' flight schedules than the airlines made flying the planes. That was when I really began to appreciate the value of data.

The gap in this seamless evolution of technology is the government. If banks are now technology companies, the government should regulate them as such. That means that government regulators must also understand and use technology. But federal and state banking agencies still ground many decisions on the results of manually collected historical data and physical on-site examinations. There is still an important role for on-site examinations provided by an examiner's ability to look into the eyes of bank executives and discuss and debate the operations and safety and soundness of a bank. It is also a critical way to identify and evaluate potential fraud and other misdeeds. But it can no longer be the main tool in a real-time environment. Financial regulators rely on information that has been locked in analog form—formats that originate on paper, limit their field of vision, and cause them to miss fast-moving trends. Better models are being developed to evaluate risk management, but real-time, automated regulation is years away.

The Panic of 2008 has pointed regulators in the direction of evaluating future risks. For example, regulators now oversee the creation of elaborate bank resolution plans called living wills, sophisticated capital, and stress testing under alternative financial scenarios as a part of its Comprehensive Capital Analysis and Review (CCAR),²¹ and measurements of liquidity and risk management plans under similar duress. These all require the application of forward-looking models by banks

and the regulators. But the supervisory function should move to the next levels and become fully focused on the comprehensive, real-time collection of data that can be analyzed by artificial intelligence algorithms to assess present and predict future economic and financial behavior. There are decades of valuable financial, economic, social, demographic, statistical, and other Big Data sitting out there waiting to be compiled, compared, and analyzed to evaluate market trends, financial performance, regulation, systemic panics, and bank failures. They hold the key to unraveling the financial variables that encode the secrets of the next crisis.²² They could raise red flags that the experts could rely on to make important course corrections to avert a crisis or lessen their severity and longevity, *if* they were available and being used.

As I was developing my thesis over the last several years on the importance of technology to the next level of financial regulation, I came across the work of the Alliance for Innovative Regulation and its Regtech Manifesto issued in July 2020.²³ It argues that financial regulation must transform with the digital times and solve the data and analytics challenges that it faces in order to be more effective. The G-7's FSB released an extensive report on the use of artificial intelligence and machine learning in financial services in 2017.²⁴ The FSB concluded that artificial intelligence can help authorities "detect, measure, predict, and anticipate, among other things, market volatility, liquidity risks, financial stress, housing prices, and unemployment."²⁵ The report emphasizes the salutary impact that technology can have in linking macro- and microeconomic databases and comparing trading activity with behavioral data to better determine deviations requiring further analysis.²⁶ The FSB noted that as of 2015, 39 percent of central banks expected to "nowcast," or predict in real-time home prices, retail sales, tourism activity, and business cycle sentiment indicators.²⁷ In the same way, new technologies can raise a more comprehensive set of red flags to warn supervisory authorities that something is changing or amiss. The Financial Industry Regulatory Authority, which oversees the securities brokerage business, has been using artificial intelligence to look beyond patterns of rule violations to better understand which of them create red flags that it should detect and follow up on. The SEC has been employing artificial intelligence to draw conclusions from the massive sets of data it collects to improve its regulation of market activities for compliance and identification of corporate risk. It is buying blockchain

forensics software to decipher smart contracts that are created to record digital transactions between anonymous parties without the need for a central database.²⁸ The London Stock Exchange has teamed up with IBM's Watson to develop enhanced market surveillance.²⁹

Despite these recent advancements, the pace of technology adaption by governments has been glacial, which continues to the detriment of global economies. On December 3, 2018, the Treasury and the federal banking agencies issued a joint statement acknowledging the benefits of technology and artificial intelligence, and "encouraged" financial institutions to implement new technologies and promote financial and compliance innovation. *Innovation* is the word that shows up in every government statement and report on new technologies. Most of the statements issued by the government have reflected limited appreciation of how the use of artificial intelligence technologies could be deployed to enhance the work that the government and financial regulators do.³⁰ It appears that the government has been inclined to encourage institutions to adapt artificial intelligence and Big Data technologies to stimulate innovation while it slowly learns on the job how to regulate those changes.³¹ The government seems to be somewhat hypnotized like the public by the newness, inevitability, and awesome utility of technology, while underestimating the threats. There has been only modest discussion of how artificial intelligence can be used by regulators (whoever the right regulators are to do it) to better predict changes in the financial landscape³² and protect the financial services infrastructure.

US federal banking agencies are beginning to recognize the challenges ahead and that they must assimilate and adopt technology, rather than be spectators as those they regulate deploy it. The OCC has established an Office of Innovation, and its 2020 Supervision Operating Plan commits to deploy "technological innovation and implementation, including use of cloud computing, artificial intelligence, digitalization in risk management processes, new products and services, and strategic plans."³³ It has begun to create methodologies to correlate databases and analytics that it relies upon to do its job and is accelerating its use of technology and artificial intelligence under Acting Comptroller Brian Brooks, who came to the job from a technology company.³⁴ The OCC recently gave national banks the go-ahead to store crypto assets as being

within their “longstanding authorities to engage in safekeeping and custody activities.”³⁵

The FDIC has concluded that by encouraging institutions to voluntarily adopt technological innovations, ultimately, it will facilitate its use of a new regulatory approach. It is exploring ways to leverage technology in its examination program, having conducted an average of 64 percent of its consumer compliance examinations and 44 percent of its prudential examinations off-site in 2019. It also established a Subcommittee on Supervision Modernization to consider how the FDIC can further leverage technology, modernize financial reporting processes, and improve examinations.³⁶ It has also sought public input on the creation of a public/private standard setting partnership and voluntary certification program to promote the adoption of innovative technologies at FDIC-supervised banks.³⁷

As already noted, the The Federal Reserve is developing a real-time payments system—FedNow—and studying the legality and benefits of a CBDC. It is also using automated machine learning “heat maps” in its annual bank capital assessments to identify financial stability risks and validating banks’ capital loss models, and reportedly deploying natural language processing tools at large financial institutions to examine e-mails and search for potential signals of control failures or misbehavior.³⁸ It has apparently approached artificial intelligence in a decentralized way, permitting the twelve regional Federal Reserve Banks to independently pursue disparate strands of machine learning research. For example, the Federal Reserve Bank of Kansas City reportedly developed neural network models that could more accurately forecast unemployment, while three regional Federal Reserve Banks publish their own online artificial intelligence–based nowcasts of GDP and inflation.³⁹ These are all efforts that are critical to the future stability of the financial services system and are a trend that must be supercharged well beyond their current capabilities.

Predicting the next financial crisis is comparable to forecasting the next hurricane. There are endless human, operational, and financial variables that may impact the outcome and timing.⁴⁰ The year 2020 was proof of that. Big Data and artificial intelligence can directly unpack some of the mysteries of many of the variables that make up a financial crisis and increase the effectiveness of financial regulation. As I have noted, financial regulation historically has been a largely backward-

looking, institution-centric exercise. Artificial intelligence can be the bridge between the historically based microeconomic analysis that financial regulation supervisors focus on and predictive, macroprudential regulation that can use Big Data to build a safer and sounder financial services network.⁴¹ The risks embedded in the financial statements of a bank are only a part of the challenge that it must confront. The risks inherent in the overall economy and financial networks will often have as much if not more of an impact on the quality of the credit that it has extended and its performance than its own financial predicament.⁴² Those risks created by the interaction of companies in the market is endogenous risk.⁴³ It is the systemic risk that occurs when the external elements cause institutions to synchronize their behavior and increase procyclical financial risks.⁴⁴ It seeks to understand the risk that is usually not seen until it is too late.⁴⁵

Even more significant over the last two decades has been the increasing interconnectedness of the global financial markets, which exacerbates “threats to the financial system through the domino effect, the fire sale effect, and oversized role” certain firms have.⁴⁶ When governments develop a methodology that blends micro- and macroeconomic data, they will have a better chance of receiving an early warning of financial distress and potentially have an opportunity to avoid or mitigate future financial crises that can literally spread overnight given the interconnectedness in the system. Artificial intelligence and Big Data can enhance stress testing to improve the ability to decipher patterns of systemic risk, correlate data, and evaluate the relative risks that companies are creating and absorbing.⁴⁷ Artificial intelligence has the potential to revolutionize financial services and the regulation of them.

Our current system of financial regulation is not only seriously challenged when it comes to averting or mitigating financial crises; it can often exacerbate them. Technology provides a solution because the supervision of financial institutions relies on “the evaluation of a vast quantity of objective and factual data against an equally vast body of well-defined rules with explicit objectives.”⁴⁸ Artificial intelligence programs could add the macroprudential data and analysis that has largely been missing to allow risk management, financial positioning, concentration, and counterparty decisions to be made with greater reliability and less cost.⁴⁹ Artificial intelligence can (1) increase the ability to seek out financial vulnerabilities such as maturity mismatches, prepayment

velocities, interest rate movements, and asset valuation; (2) stay current on the latest financial trends and theories; (3) create more sophisticated and reliable models; (4) provide the government with the ability to develop more dependable cost-benefit analyses; (5) present policy makers with a more reliable range of options and recommendations; and (6) determine the most effective delivery channels for the relief that is required.⁵⁰ At the same time, the capabilities and reliability of artificial intelligence may be hamstrung by the inadequacy of data that arises from the fact that the financial environment never remains static; millions of transactions occur each day.⁵¹

HOW IT COULD WORK

Artificial intelligence and related applications should not be viewed as replacing humans or the financial models that are currently in use. Those have proven to be useful, but they have their limitations, particularly when regulators and executives become too reliant on them. The adoption of the next generation of technology is an opportunity to revamp the way that regulators and executives collect, analyze, and use data to complement the seasoned sense of judgment that they have. The product of that analysis should add to the expertise of regulators, not displace it as many models have done. It should not be viewed as infallible or impervious to challenge.

At a very basic level, artificial intelligence and Big Data could have enabled financial supervisors and executives to see a broader and deeper financial picture before and during the S&L crisis had they existed, but certainly leading up to the Panic of 2008. Technology could have helped them act more quickly and effectively to avert those crises and mitigate the flames of those financial disasters once they emerged. I offer this perspective more as an admonition of how financial oversight should be reconstructed and improved in the future than as a criticism.

The S&L Crisis

The 1980s were technologically prehistoric from the perspective of artificial intelligence. Machine intelligence was in its nascent stages, and the required computing power was extremely expensive and not widely

available. Nevertheless, if the capabilities of the twenty-first century had been available then to analyze more data and produce more alternative scenarios and recommendations, it would have helped us at the FHLBB enormously during the S&L crisis. There were 4,500 failing S&Ls in various forms of deterioration located throughout the country. At any one time, there were dozens of potential acquirers of all different types and businesses anxious to bid for one or more failed S&Ls. They included banks, investment banks, asset managers, insurance companies, and steel and car manufacturers. Each had a different balance sheet and level of financial expertise. Matching bidders to the profiles of failed S&Ls to get the best result was largely done by eye. The agency simply did not have meaningful computer programs or power to bring to these questions. The institutions that were bid out and in what order that occurred were also essentially manually determined. The calculation of negative spreads between the industry's asset yields and liability payments, the impact of asset growth and diversification, and likely economic trends were not ascertained or evaluated with the help of sophisticated computers. We had limited insight into future macro- and microeconomic scenarios, and at the velocity that interest rates and the economy were changing, that future was the next week. There were a lot of educated guessing and mistakes.

The agency did have a model that it used to analyze and compare bids for failed S&Ls, but it was quite rudimentary and often had to be altered to accommodate the variables of a proposal. Over that decade, there were many other issues related to the growth of S&Ls, the use of brokered deposits, the use of new powers given S&Ls in 1982 to diversify their portfolios, and how those new asset portfolios should be valued in the short and long term. Increased technological data and analysis could have provided more precise and predictive information and allowed the regulators to more accurately monitor risk and develop more refined future scenarios and solutions. Stepping back even further, it would have allowed the agency to adjust S&L business behavior and performance as early as the 1970s when the financial problems that Reg. Q was creating began to be understood. With better data, more precise recommendations, and more predictive information about future scenarios, the depth and duration of the S&L crisis could have been reduced, and perhaps largely avoided.

The Subprime Years

Consider how artificial intelligence and Big Data could have impacted the Panic of 2008. Assume that a huge amount of macroeconomic and financial industry data going back to 1965 had been compiled and was being analyzed by sophisticated computer algorithms beginning in 2000. That data input would have covered the inception of interest and usury rate controls, the most volatile interest rate environment the country had ever experienced, the failure of a massive number of S&Ls and banks, the collapse of oil prices, risky lending in Latin America, several real estate development recessions, the junk bond boom and bust, the stock market collapse of 1987, dramatic changes in demography, the rise of mutual and money market funds, the emergence of asset management businesses, and the internet and social media explosion. It would also have included a period of explosive growth in the government-backed and private-label MBS business. The 1990s would have included the government's push to increase housing in America, the resulting changes in the affordable housing, underwriting requirements of Fannie Mae and Freddie Mac, Wall Street's increasing appetite for MBS, and the Dow's meteoric growth from 4,000 to 15,000 points. This period would also have encompassed the beginnings of the hybrid and subprime lending booms and the government and industry incentives behind them.

Assume further that this sophisticated data analysis system driven by superintelligent computers applying artificial intelligence programs was continuously analyzing a growing amount of interrelated real-time data to avoid staleness or stationary results. Beyond real-time, microeconomic data about individual financial institutions, large macroeconomic databases would have collected recorded global financial information and trends including historic and real-time Treasury rates; consumer and commercial interest rate movements; employment; income levels and distribution; population; changing social demographics; immigration; municipal building permit statistics; housing starts, prices, and financing; purchasing patterns; mortgage payments, defaults, and prepayments; FICO scores of mortgage borrowers; securities trading patterns; mortgage securitization volumes and terms; institutional investment and credit availability; leverage, capital, and liquidity ratios; rating agency volumes and evaluations; the characteristics, volumes, and de-

fault rates of credit default swaps and other synthetic securities; financial fraud statistics; the causes of bank failures; asset/liability maturity mismatches; monetary supply variables; analyses of structured finance markets; bankruptcy filings; package delivery volumes; retail trends; credit reporting data; and much more. Added to all this could have been a rapidly developing mountain of social media data (Facebook debuted in 2004), online shopping and surfing information, and data sets that track past and future purchasing and economic behavioral patterns.

An integrated approach to the evaluation of financial data could also have included information related to the financial incentives and behavior, rational and irrational, that were built into the system. Socialized risk and short-term compensation incentives could have been factored into the mix, perhaps leading to a quicker grasp of how, for example, the securitization of assets ranging from home mortgages to credit cards had skewed the risk/reward formula. Without belaboring the point about the breadth and depth of data that could have been evaluated, I am sure that data collection and analysis professionals far more experienced than I could augment this list with significant other collection targets.

Many industries are using Big Data today to improve performance. For example, a growing number of investment professionals are using “alternative data” to assist their clients.⁵² Why shouldn’t financial regulators who are flying partially blind also use it? Some experts have concluded that better data sets and more sophisticated computer programs still would likely have missed the coming storm because they would not have known how to connect the dots and what to focus on to do so.⁵³ I think that misses the point. As someone who has sat in the chair and had to make decisions based on agency information in a financial crisis, I could not disagree more. In the land of the blind, the one-eyed giant is king. The more data that decision makers have, the more informed their decisions will be. Moreover, such data makes it more likely that they will make decisions quickly rather than allowing them to languish on the corners of their desks. That does not guarantee that those decisions will be correct, but it does enhance the chances of correctness.

The ability to identify systemic risks and crises turns on an understanding of institutional and systemic vulnerabilities.⁵⁴ Those vulner-

abilities tend to be somewhat unique to each situation, but as we have seen, do include many familiar patterns and factors. Better data and more predictive conclusions about where those data patterns lead facilitate better decision making. With better data sets and analysis, the government and industry executives would have had more reliable indications of developing crises years before they arrived. While having the information to make a decision also requires the political will to do so, the more evidence that Congress and regulators have, the more likely it is that they will act in an enlightened way. It is simply a matter of painting a compelling and convincing picture. Once it is possible to make out the objects in the picture, it becomes harder to ignore them and do nothing.

What would have occurred if years before the Panic of 2008, regulators and executives accessed these new databases and ran simulations that began to show red flags emerging? They would have seen as early as 2000 disturbing data about the impact of increases in the amounts of outstanding credit, leverage, second and third mortgages, default rates, and the potential impact of several generations of variable-rate mortgages in rising rate and decreasing home value scenarios. Intelligent machines could have analyzed data that the government had in ways that it was not capable of doing. Red flags would have been seen earlier and more clearly about the interrelated impact of reductions in credit quality, increases in credit availability and the proliferation and interaction of shiny new financial products such as MBS, collateralized debt obligations, and credit default swaps. The Federal Reserve would have had precise data about points of vulnerability and the most effective delivery channels for the infusion of liquidity, credit, and capital.

The creation of excessive risk created by parties with no skin in the game and few downside concerns would have been noticed and hopefully financial incentives could have been adjusted. Intelligent computers would have produced alternative economic scenarios that regulators could have evaluated. If they could have spent less time micro-supervising less important matters, they would have had the time to war game how these events might have intersected and made appropriate course corrections. Vast amounts of oversight resources were expended overseeing the origination of mortgages, while little were dedicated to the creation of the MBS that these mortgages seeded. The FHFA could have altered the business plans of Fannie Mae and Freddie Mac and

averted their inclinations to support and encourage subprime lending and build their own portfolios of toxic subprime MBS. Congress, bank and investment banking executives, the SEC, and the Federal Reserve might have had the chance to realize that under the developing circumstances, the capitalization and leverage ratios of firms like Bear Sterns and Lehman Brothers were dangerously low and were creating a massive systemic threat.

Similarly, regulators and executives might have seen much earlier that AIG could not have sustained a credit default swaps exposure that was effectively insuring all of Wall Street. Better data and predictive analysis could have led to more fulsome public securities disclosures by Bear Sterns, Lehman Brothers, AIG, and Merrill Lynch about possible risk factors that the companies were facing. That would have given shareholders the opportunity to speak through their platforms and, perhaps, alter the course of future events. With better data and earlier pictures of future scenarios, bank supervisors could have taken corrective action at Countrywide Savings, Washington Mutual, and Indy-Mac Bank years before it was too late. After all, bank supervisors have almost unfettered power to significantly influence the actions, investments, and operations of FDIC-insured institutions and their boards of directors. All they needed was better data to see the red flags and act on them. They did not need machines to make their decisions; there are too many human variables that go into the choreography of the US economy. But if the regulators had simply had a more fulsome set of data points and more predictive scenarios to evaluate, they could have connected more dots than they did. That could only have resulted in a better outcome.

The 2020 Financial Pandemic

Massive amounts of artificial intelligence and data could have also been available and could have greatly helped industrial and government leaders deal with the Financial Pandemic of 2020 from both the healthcare and financial points of view. They would have added to the understanding of the nature, impact, and duration of the virus, as well as provided greater insight on the point at which the pain of an economic shutdown would likely exceed the health impact of the disease sector by sector of the country. Such information could have helped to identify how to

balance the potential poverty, mental distress, suicides, abuse, diseases, and crimes that would result from the economic shutdown against the short- and long-term benefits of keeping the country closed. It could have helped to develop a sharper picture of who the disease was targeting so that leaders could determine who as a society we needed to protect. A more immediate and deeper understanding of the data surrounding the pandemic might have persuaded policy makers not to shut down the economy or open it when and how they did. It could have provided context and alternative drafts of safe, sensible, and effective plans to phase the economy in and get people back to work at precise times by sections of the country and the ages of workers. Machine intelligence could have provided greater insights into how the restarting of jobs and businesses should have been prioritized and sequenced, how working conditions should have been changed, who should wear masks, what cleaning methods should be adopted, who could travel, and how much space should separate people when they were working, meeting, playing, flying, and attending events.

Similarly, as the government injected trillions of dollars into the economy, intelligent machine analysis could have helped to determine the sequencing, prioritization, duration, and nature of the assistance. Instead of pumping liquidity from a fire hose at the economy, the injection of that pain-killing elixir could have been refined and localized to make it more effective, efficient, and hopefully less damaging once the crisis had passed. Better information would have helped the Federal Reserve, Treasury, and Small Business Administration design all of the credit facilities that were created in the most effective and least burdensome way, providing clearer insights into the conditions and terms of the lending that was done.⁵⁵ All the information on the planet would not, however, have altered the political debate over money and who should get it. It is unfair to be critical of the government's financial response to this crisis under the circumstances, but it could have been so much more informed at all levels. This disaster has underscored why the business of financial oversight must be provided the resources to plan for future crises and begin to enlarge its machine intelligence capacity.

This is all informed speculation on my part because the government did not have any of these technological advantages in any of these crises. But I believe that it is largely an accurate picture of what could

have been if technological tools like artificial intelligence and Big Data had been available and deployed in the early 2000s. Some will say that many saw the Panic of 2008 coming and did nothing anyway. The many regulators may have been split on the seriousness of the growing problem, and companies wanted to keep making bets until it looked like the tide was turning. Perhaps there was no political or corporate will to be the skunk at the garden party. But if we streamline the regulatory system to eliminate the redundancy and jurisdictional conflicts, move toward a functional approach to financial oversight, and the government obtains better data points and red flag indicators years before a crisis, the system will work better and the course of potential financial crises will be altered to the good. The way that the system works now, the government has a limited chance to see danger coming and react once it finally does begin to connect the dots. In fact, government action in every financial crisis has usually been too late, if taken at all. There will be no excuse in 2025 not to have these new technological tools fully deployed to support government oversight of the economy.

It is not possible to completely avert financial crises, but their impact surely can be mitigated, and solutions delivered in a more timely and efficient manner, if red flags are flown and recognized years before. I believe this particularly true because of the role played by confidence and “narrative economics,” as the talented economist Robert J. Schiller describes it in his recent book, *Narrative Economics*.⁵⁶ It is sometimes not clear whether economics drives the narrative, or vice versa. How else could tulip bulbs become the most valuable commodities in Holland in the mid-1600s, sometimes trading for as much as six times an average person’s annual salary? The path and fury of a crisis is not simply about economics. It is also about avoiding the point when confidence in the economy disappears and runs begin. More information that allows parties to react sooner can impact that timeline and the extent to which confidence erodes. Changes in the economic environment years before the 2008 crisis might have prevented millions of homeowners from defaulting and thrown them a lifeline much sooner than occurred. More information may not be the cure, but it surely is a path to the cure.

Experts can debate how accurately technology could have predicted the Panic of 2008 or played a role in the Financial Pandemic of 2020. At the very least, had technology been used, the government could have

seen health and financial disaster patterns and been better able to prepare alternative disaster plans.

CHALLENGES CREATED BY TECHNOLOGY

Technology, and particularly artificial intelligence, bring with them significant challenges. Artificial intelligence is a tool that is reliant on the integrity of the program, the programmer, and the data being used. It can be wrong, biased, corrupted, hijacked, stale, and simply based on bad data. Trusting artificial intelligence is an exercise in caution and discretion. In the war on COVID-19 in 2020, the predictions relied on by the US government and many states issued by the respected Institute for Health Metrics and Evaluation, an independent global health research center at the University of Washington, about the spread and death rate of the disease were initially wrong by many multiples of order of magnitude. They constantly needed to be updated using more reliable data. Whether factual or not, the parable about the US Navy's testing of artificial intelligence is instructive. As it goes, when the navy's artificial intelligence applications sensed that a simulated convoy was moving too slowly, it simply sank the slowest two ships in its convoy to speed up the convoy's overall progress.⁵⁷ That is hardly a solution that would work in the field of financial regulation.

The creation and use of Big Data by the government will also have its drawbacks in overseeing financial services. Artificial intelligence programs must naturally be correlated to the regulatory rulebook. But that may require it to operate according to predetermined rules that limit its capabilities.⁵⁸ The stakes get increasingly higher as the scope of and reliance on Big Data increases. A myriad of issues can undercut the integrity of artificial intelligence. Corrupted data, overestimation, bad software, defective security, deficient models, stationary data, bias, bad programming, human/machine interaction deficits, and amoral analyses all can impact the final product.

Even more challenging questions of human freedom are arising, however. For example, as data and machine intelligence advance, some argue that it triggers a journey into a technological prison from which there is no escape. Shoshana Zuboff's *The Age of Surveillance Capitalism* describes this as being "cornered," noting that it is easy to download

the Google Toolbar but “impossible to disable it” and stop it from tracking browser behavior.⁵⁹ The assertions that technology companies systematically corrupt search results to favor their own content and downstream products portends even more troubling concerns over how technology can be used.⁶⁰ If you need additional proof of the threats that technology is creating, Zuboff lays out 690 pages of chilling analysis about how humans are becoming technology’s product in the new world of “surveillance capitalism.” When technology companies can read your personal e-mails and then bombard you with product advertisements related to the words in your e-mail, it is clear that we have entered a new world where the rules are different and someone else is in charge. Won’t that happen just as easily to an economy?

The issues of “explainability” and “accountability” are extraordinarily important in the financial world. How does a financial institution explain why the predictive conclusions of a machine were followed or rejected, particularly after the outcome goes wrong? How can a decision made by an intelligent machine be challenged? How is the use of artificial intelligence impacted by privacy laws and the ability or inability to identify an accountable party?⁶¹ Can machines explain what their algorithms did or how they did it to satisfy the kinds of legal obligations that are imposed by the Fair Credit Reporting Act, the Equal Credit Opportunity Act, the Fair Housing Act, and the European General Data Protection Regulation to provide the borrower or customer with an explanation about why credit was denied?⁶² Is transparency or privacy possible in a financial world driven by artificial intelligence? The federal banking agencies have weighed in on the emerging responsibilities that banks have. They have noted that “alternative data” has the potential to expand access to credit and produce benefits for consumers by automating the use of cash flow data to better evaluate borrowers’ ability to repay loans and deploy “second look” programs to assist applicants who would otherwise be denied credit. But they also note that some aspects of alternative data usage may reduce consumer protections and increase consumer risks.⁶³

A stark example of the advantages and disadvantages of using Big Data and artificial intelligence as predictors is found in sentencing tools and procedures used by judges. The stakes are incredibly high when determining the likelihood that someone will become a productive member of society or an even more violent criminal. The nature and

increasing amounts of data available will indeed pose complex challenges, but not necessarily reduce associated legal and business issues. Some experts believe that artificial intelligence may be inclined to focus on the least important types of risk that are readily measurable and suggest that the “likelihood of [AI] putting all the pieces together is quite remote.” In the end, balancing all these complexities, human risk managers may be less likely to miss systemic risk because they are blessed with historical, contextual, and institutional knowledge and can do things artificial intelligence cannot.⁶⁴

The financial system is for all practical purposes infinitely complex and any entity, human or AI, can only hope to capture a small part of that complexity. The combination of sparse data, complex structure, uncertain and changing rules with high degrees of endogeneity make systemic risk an exceptionally difficult and quite possibly intractable challenge for AI.⁶⁵

Artificial intelligence is a tool that is only as useful as the integrity and reliability of the data it uses and the intelligence and judgment of the humans applying it. Data traditionally has come from governments, private sector studies, think tanks, and universities. But that is only a small part of the data that is available today. Data is a real-time commercial commodity collected and marketed by entities ranging from large corporations to data brokers. It is “scrapped” or freely provided by consumers and collected through a variety of methods from online sites, social media, and retail tracking apps, and correlated with large amounts of economic, demographic, and social data. The derivation and integrity of this scrapped data has become a challenging issue. QVC, LinkedIn, JPMorgan Chase, and other companies who themselves use Big Data are objecting to the wholesale, unprincipled, and insecure manner that data is collected. Some have fought back in court to stop vendors of Big Data from scrapping their sites of digital data and customer footprints.⁶⁶

The collection, analysis, and use of financial Big Data by increasingly superintelligent machines will raise even more questions about data ownership, privacy, and intellectual property rights. What are the jurisdictional rules in a global online economy where borders are irrelevant, and the oversight of international authorities may not be harmonized? How will the use and proliferation of Big Data that is biased, is inaccu-

rate, reduces competition, or facilitates price fixing be regulated? Finally, what legal and moral duties will companies owe their clients regarding the collection and use of Big Data? The bigger that Big Data gets and the more it becomes a proxy for power, the greater the concern that it will be stolen, attacked, or used maliciously by thieves, fanatics, or rogue nations. Not surprisingly, however, decisions rendered by the courts on these novel issues have been mixed, raising the question of what data belongs to whom. Is Google permitted to take and post a picture of your house? Who owns human experiences that form the basis of Big Data? Remember when Kramer sold his life stories to J. Peterman on *Seinfeld*? In 1990, a California court effectively told John Moore that he didn't own his spleen once it was removed and used to patent a novel medical treatment.⁶⁷

Artificial intelligence applications are increasingly running every aspect of our business and personal lives, and that will only increase as AGI and quantum computers expand their usability and capabilities. The use of artificial intelligence by financial institutions in the form of models to measure capital adequacy, for example, may lead to synchronization of balance sheets. Fed the same data, artificial intelligence programs will likely produce the same results. In economic terms, that raises the question of whether its broad use will drive financial procyclicality so that in an economic downturn, every financial company's balance sheet reacts the same way and creates the crisis that regulation was supposed to have avoided. Viewed another way, it raises the question of whether having the technological ability to predict the future allows humans to alter that future, making the artificial intelligence being used to become less effective the more sophisticated it becomes. Can the predictive abilities of artificial intelligence sentence it to chasing its own tail in a perpetual loop that never ends? Recall that the Black-Scholes options pricing model that nearly every financial advisor and investment expert used in the 1980s exacerbated the 1987 stock market crash because the assumptions that it relied on became incorrect when there was no market to trade options. Experts have noted that homogeneity in beliefs and actions amplify systemic risk.⁶⁸ There must not be an assumption that technological evolution is inevitable, that it will automatically create valuable market innovations and efficiencies, and that none of this can be questioned. Not questioning and taking control of this evolution will be a serious mistake.

Last, as a practical matter, financial and human resources are costly and finite. Companies are likely to expend vast amounts of resources only when the cost of not doing it is a clear and present danger. Unlike private companies, however, federal banking agencies have a different set of issues. They are funded by assessments paid by the banks that they regulate. They do not receive taxpayer funds or congressional appropriations. In effect, banks and savings institutions throughout the nation would have to pay for their regulators to arm themselves with artificial intelligence and Big Data technologies to improve the regulatory system through the assessment system. Because the cost of regulation is one factor that financial institutions use in choosing a regulator—federal or state—it impacts the number of banks that federal or state systems oversee. Thus, there are competitive limitations on how much the federal regulators can charge for regulation, thereby limiting their ability to invest in state-of-the-art oversight tools and methodologies. While the assessment system has its benefits, this natural limiting factor on how well a regulator can regulate is troubling.

Big Data, superintelligent and quantum computers, the cloud, complex algorithms, and artificial intelligence will increasingly provide governments with tools that will dramatically increase their ability to predict and avert future economic disasters. While those systems will never be foolproof, they will increase the opportunity for the government and businesses to make course corrections based on a wider and clearer field of vision. They will potentially give regulators better intelligence and more time to improve and adapt financial regulation, monetary and interest rate controls, and economic responses to impending downturns. Imagine being able to avoid the next financial crisis or, more realistically, lessening its impact because of the decisions made based on information produced by algorithms feverishly analyzing sets of Big Data years before. The advantages of having substantially more data that can be analyzed quickly by intelligent machines can alter the course of financial history and create a smarter and more effective system of financial supervision. Every day that passes without this technological tool in the government's pocket is another day the economy potentially creeps closer to the next financial Armageddon without any clear warning. Scientists know when a tsunami is approaching, social media companies know what users are thinking and buying, telecom companies know where we are, but we still seem to be largely in the

dark when it comes to seeing the signs of impending financial disasters and taking remedial action.

The Panic of 2008 should not have been a surprise. Indeed, the financial complexities that incubated it are only getting more challenging. The increasing availability and use of Big Data, artificial intelligence, machine and deep learning, neural networks, peer-to-peer markets employed by blockchain applications, cryptocurrencies, digital asset exchanges, and online lenders are once again reconfiguring the role and availability of credit, as well as the way that financial services are delivered. They will reset the rules of the game and may even determine who ends up in charge of the world's economy. The digitization of assets is redefining the most direct route between the consumer and her money, and who the providers of the credit and other financial services that she needs will be. The role of financial intermediation by a trusted third party is changing as technologically enabled products are increasingly accepted by consumers. That will change the role of banks, insurance companies, investment firms, and payments systems. Whether that is for the better or worse is yet to be determined. It all seems uncomfortably up for grabs.

ATTACK OF THE ALGORITHMS

Machine intelligence will make everyone's financial lives easier, safer, and more profitable. That expected upside obscures the harm that malicious technology can inflict. What is frightening about that is that for the most part, no one entity is deploying comprehensive systemic defenses to control malicious technology that may be used against the financial infrastructure of the United States. A constellation of private and public sector groups are expending resources to study, monitor, and share some information about the defenses of the country's financial infrastructure against the technological dark arts, but actual structures and plans to uniformly predict, prevent, and remediate against such attacks are meager relative to the potential threats. No one entity is charged with stopping rogue nations from taking over all or facets of the country's financial networks, and if that happened, getting everything up and running again. In short, it is an *every-man-for-himself* situation.

The threats are not hard to anticipate, but focusing on them seems to be viewed as political and innovation downers. As artificial intelligence continues to be ceded control over the underwriting, processing, servicing, back-office, and money-moving functions of financial services systems, superintelligent machines will increasingly learn from and talk to each other as they get even "smarter." As the human mind learns and deduces, even beyond the threat of evil handlers, machines may eventually determine that their own interests should have priority over the interests of their once-superior human handlers. Left unfettered, they

may link up or conspire with facial recognition cameras, biometric systems, and a wide range of other networks that control the country's infrastructure to achieve what they view as their "mission." The economic race for control of money, information, and payments systems has already begun, and the increasing superintelligence of machines will only increase the conflict between market innovation and the imperative that the financial safety and stability of the system be protected.

While the benefits of more efficient processing of huge amounts of investment, credit, financial, and customer information are apparent, they are also matched by unprecedented challenges involving privacy, control, and freedom. Many believe that that war has already been waged and lost or won, depending on your perspective, without a single shot being fired. The *New York Times* editorial board puts it this way: "[T]ech companies have fostered a grass-roots surveillance culture that has convinced millions of Americans that they live better when they buy smart assistants, carry smart phones, watch smart televisions, turn their doorbells into unblinking video cameras."¹ In the end, studies show that consumers are pleased with the conveniences that technology provides.² One such study revealed that more than fifty billion location pings from the phones of more than twelve million Americans could easily be used to track the movements of supposedly anonymous data and link it to real live human beings.³ Is there no longer the right to be left alone and untracked?

THE INSECURITY OF DEVELOPING TECHNOLOGIES

Technology may be carving a direct path to financial disaster while it paves the way to greater financial efficiencies. MIT's Professor Max Tegmark warns that the increasing differences between the relative speed of decision making by humans and artificial intelligence may lead to a "superintelligent machine [that] may well use its intellectual superpowers to outwit its human jailers."⁴ Technology will either empower or overpower financial services companies and their regulators.⁵ That is a choice that we may still have control over. But when Stephen Hawking, Elon Musk, and Henry Kissinger voice concerns about robot uprisings, the merger of humans and machines, and the possible subjugation or

extinction of humans, it is time to pay attention to the dark side of technology.⁶ Is this where the next great American financial panic will come from?

As simple examples, consider that cryptocurrencies and crypto exchanges are creating a whirling dervish of economic hyperactivity, some significant portion of which is perceived to be immune from government oversight and intentionally or conveniently being used to facilitate illicit financial activities and money laundering.⁷ Blockchain technologies are enabling more and more DLT products using public key encryption, which creates incredibly large decentralized time-stamped chains of data that we are told are immutable and secure. The larger the networks grow and the more decentralized they become, the more proponents of them argue that they are secure because nothing can be altered or counterfeited without everyone in the chain agreeing. Could their financial conflict of interest be any more obvious? Based on that assertion, the blockchain is replacing trusted intermediaries such as banks and traditional payments systems with peer-to-peer systems of validation that are under the control of who knows who. Perhaps China? Chinese leader Xi Jinping has hyped the importance of blockchain technologies and promised to “seize the opportunity.”⁸ That opportunity includes ending the dominance of the dollar and reducing technological dependence on US technologies. Decentralized trust technologies can offer significant benefits in a country such as China.⁹

We should be cynical about that claim of immutability and absolute security. I heard similar assertions in the 1990s as digital signature technologies were being rolled out to support online financial transactions. The language of traditional computers is binary—0s and 1s—and encryption is only as good as its ability to defeat the computing power that confronts it. Nothing is theoretically immutable in a world based on the degree of difficulty of solving a mathematical equation. It is simply a question of computational speed and power. He who controls the fastest and most powerful computer can control all other computers and the public private encryption technologies that they employ to maintain their security and the security of the world’s data. The many cryptocurrencies and crypto exchanges that are sprouting up around the globe may be creating financial value and networks that are susceptible to being undone, stolen, or manipulated by the next generation of faster and more powerful computing technology. For now, that next genera-

tion is called *quantum computing*, and it will either make cryptography and digital signatures more impenetrable or completely render them obsolete as the speed at which machines think begins to outwit all known hash functions and cryptographic keys. That makes the race to achieve quantum computing dominance a question of security and perhaps freedom. Indeed, the US National Institute of Standards and Technology launched a competition in 2016 to develop new standards for cryptography intended to be quantum-proof. The majority of the finalists so far base their work on lattice-based cryptography, which instead of using keys relies on grids with billions of individual points across thousands of dimensions that essentially make it impossible to decipher unless one knows the route.¹⁰ The winner will be announced in 2022.

An algorithm is a finite sequence of well-defined instructions, typically that solve a class of problems or perform a computation. Technology uses algorithms that collect and slice and dice financial data. Those processes could allow financial regulators to oversee institutions and the stability of the economy more predictably. They may also be used to collect and synthesize data that intrudes on the secrets of individuals and companies. There are algorithms that talk to and control other algorithms. Unfortunately, the implementation of algorithms to supplement the regulation of financial institutions and the development of protections that will be required seem to be evolving at a glacial pace compared to the pace at which technology is usurping conventional thought and processes. Someone needs to get the ball rolling to ensure that financial artificial intelligence and Big Data develop in a manner that continues to empower and be controlled by benevolent parties—preferably human parties. We need to understand the short-term risks that they create and the longer-term threats that the next generation of technology will bring. The fact that computer and artificial intelligence scientists admit that they don't know where AGI will go, when it will get there, and whether it can ultimately be controlled suggests caution about giving intelligent machines access to financial systems without the kinds of barriers, firewalls, and protocols that can constrain them. This is the next great American financial crisis incubating before our eyes.

IMAGINE WHAT THE BAD GUYS COULD DO!

In March 2016, the Bank of Bangladesh reported \$81 million stolen from its account at the Federal Bank of New York when hackers gained access to the bank's systems and sent a message through the SWIFT system—the Society for Worldwide Interbank Financial Telecommunications—making thirty-five requests to transfer funds to accounts in the Philippines and Sri Lanka. Four of the requests were fulfilled, transferring \$81 million. When these transfers came to light, similar transfers surfaced involving Wells Fargo and Taiwanese Far Eastern International Bank. We now know that banks have been targeted since 2013 by groups known as Cabanak and the Lazarus Group, a hacking group purportedly with links to North Korea.¹¹ The Defense Advanced Research Projects Agency (DARPA) within the Department of Defense has identified areas of concern in the financial services sector. Among them is the risk of flash crashes caused by manipulated sell orders that cause a rapid decline in the stock market and attacks on order matching. If confidence in such markets were undermined, financial assets could lose their attractiveness and value.¹²

Consider a world where the parties that control technology and artificial intelligence are not democratic or benevolent, but are hostile nations, terrorists, and fanatics. Why will dictatorial and rogue nations continue to invest in fighter jets, missiles, and tanks when such weapons can be easily disabled by advanced technologies? Artificial intelligence and quantum computing may be all that is needed to dominate a region or the world militarily and economically. Those dangers are being discussed “quietly” by US national security experts who are not satisfied with the resources being devoted by the US government.¹³ Even fewer resources and less coordination have been made available to protect the financial services infrastructure.

In March 2020, the Cyberspace Solarium Commission (CSC) Report confirmed the concerns that I have described about the relatively unprotected state of the economic infrastructure of the United States, essentially concluding that to a large degree, the country has failed in its overall efforts to defend against cyberattacks and defaulted to a norm of inaction. The report underscores the absence of and need for a plan “to ensure that we can reconstitute in the aftermath of a national-level cyberattack” and be able “to ensure that our economy continues to

run.”¹⁴ The commission developed a strategy built around layered cyber-deterrence, economic resilience, government reform, and infrastructure fortification.¹⁵ In that regard, the report includes a recommendation that Congress “direct” the executive branch to institute a Continuity of the Economy plan to begin to identify the kinds of attacks that could occur and the priority of critical economic resources and functions that would have to be restored across industry sectors after a catastrophic cyberattack. The report includes about four dozen recommendations, including one that Congress codify in the law the concept of “systemically important critical infrastructure” so that entities responsible for such systems and related assets will have access to special assistance from the government.¹⁶ The release of such a report sounding the alarm about the country’s state of unpreparedness at this point is sobering to say the least. The clear message that runs throughout the report is the need for more and better resources, data, and metrics to analyze the problems. Similarly, it urges a more cohesive and focused partnership between the private sector, which owns 90 percent of the country’s financial infrastructure, and federal and state governments.

The great challenge in protecting the country’s financial infrastructure is the fact that it may take only one malicious agent to penetrate a system’s defenses once to cause havoc, while institutions and governments must simultaneously and continuously solve for a universe of problems.¹⁷ Therefore, global acceptance of artificial intelligence rules of engagement will require a technology cop on the beat who can encourage and enforce participation by the economic community using both a carrot and a big stick to address aberrant behavior. The CSC agrees, arguing for deterrence that includes the means to shape behavior, denying benefits to and imposing costs on violators, assuming that attribution of malicious acts is reasonably assured.¹⁸ Solutions proposed to this global enforcement problem range from a master artificial intelligence regulator to algorithmic accountability that incentivizes businesses to verify that their artificial intelligence systems act as intended and identify and rectify harmful outcomes.¹⁹ Experts have suggested that “[I]f we want to make AI more resilient against attacks it might be necessary to give it power over the rulebook with the ability to alter the rules and allow it to experiment. These features would most likely be unpalatable to the financial authorities.”²⁰ It is only fitting that machines may require machine cops—algorithms regulating algorithms!

Warning signs are increasing. The explosion of large technology firms weaving themselves into daily financial transactions through searches, payments, credit, insurance, and asset management services will further innovate and improve the efficiency, speed, and cost of financial services. The vice chair of the Federal Reserve notes, however, that this signifies a clear movement toward decentralization of financial market participants and the replacement of financial intermediaries, which will have broad implications for “verifying trade finance invoices; executing, enforcing and verifying the performance of contracts; and keeping an audit trail to deter money laundering.”²¹ The FSB agrees with fintech advocates that decentralized financial technologies could lessen some of the financial stability risks associated with traditional financial institutions and intermediaries, reduce liquidity risks arising across institutions’ balance sheets, and be more resilient to cyber-risk than highly centralized systems.²² In effect, decentralized financial systems may be an antidote for malicious technology. Peer-to-peer systems may be more resilient and impervious to broad systemic assaults since such attacks can impact only pieces of a complicated network. If malicious intelligence can only disrupt a slice of the system, why would it bother? Unfortunately, decentralized systems may lead to other threats.

Today, the takeover or takedown of a payments system could immobilize the national movement of money and freeze every ATM or Fed wire, spelling widescale economic chaos. The staff of the New York Federal Reserve released a report underscoring the impact that cyber-risks could have on the US financial system, but included few if any solutions, particularly with regard to the increasing use of artificial intelligence and Big Data.²³ It did warn, however, that payment and settlement systems are a natural high-value target for a malicious attacker, noting that the impact of a cyberattack on the largest five participants in the network could be “very large.” The time for talk and study is done. Informational and financial security is now completely built around technology. There is no paper left.

New financial technologies also raise new risks regarding the ownership, control, and concentration of power over assets, source code, infrastructure, crypto assets, and code development. Who is in control of the various blockchain-enabled systems in place already? We are told that no one is. But five mining entities based in China have controlled

up to 49.9 percent of all computing power on some crypto networks.²⁴ The fact that these miners stay below 50 percent and avoid the designation of a controlling party should not be viewed as accidental. At such levels of hash power, miners could manipulate the network, thus undercutting confidence in it. This is unfamiliar territory for financial regulators that oversee, limit, and approve or disapprove every facet of the control of banks, payment systems, and nearly all financial transmission vehicles in the country. The FSB has expressed concern about greater procyclicality that could emerge, for example, in the supply of credit through DLT peer-to-peer platforms. Diffused or unclear responsibility and system accountability arises where the allocation of liability is decentralized and participants remain anonymous.²⁵ When unidentified parties rather than regulated institutions, governments, and central banks control and underwrite financial systems or transactions, there is an increased risk that malicious or criminal elements could control the world's money. With no support of a central bank or overriding rules, accepted modes of stabilizing a crisis and parsing users' legal rights could lead to economic chaos and threaten democracy. There is also less likelihood that government support will be forthcoming in such a crisis. Today, we do not know which of these factors are the threats and which are the solutions. So far, it all looks like a pick-up game where the government may be left reacting to whomever or whatever can dominate. That is hardly the way to influence the economic future of the world.

The rating agency Moody's welcomes the potential efficiencies of innovation, but it also warns about the new systemic and concentration risks that DLT technologies introduce.²⁶ Professor Tegmark puts his finger on the issue, saying that while superintelligence may be the elixir that eradicates war, disease, and poverty, some are concerned that we are at risk "unless we learn to align the goals of AI with ours before it becomes superintelligent."²⁷ What happens if the deployment of AGI occurs before the necessary international rules of financial engagement have been established to restrict how machines communicate and operate, what they can do, and where they can go? True AGI, the analogue of how the human brain operates, will think for itself, making its own decisions, like HAL—the "Heuristically Programmed ALgorithmic Computer" in the movie *2001: A Space Odyssey*. If the goals of humans are inconsistent with the mission that AGI has been programmed to

achieve, even if the physical or financial lives of their human charges hang in the balance, like HAL, they may choose to achieve their mission. Similarly, intelligent machines that are asked to predict market behavior so that investment advisors can better assist their customers to grow their portfolios may eventually decide that rather than predicting market behavior and performance, they can and should cause the market results that they have predicted. Seeing that, would they not next logically conclude as a human might that that they should be the beneficiaries of the wealth and power that they can amass by investing in markets that they can control? Wouldn't they collude with each toward that end, draw on vast data-gathering tools such as Big Data, ubiquitous government and private sector cams, and cell phone and online activity to support their efforts and then camouflage them so that their human masters see a world that looks entirely normal? Advanced artificial intelligence will be good at accomplishing its goals, whether they are aligned with ours or not. As Professor Tegmark puts it, "[Y]ou're probably not an evil ant-hater who steps on ants out of malice, but if you're in charge of a hydroelectric green energy project and there's an anthill in the region to be flooded, too bad for the ants. A key goal of AI safety research is to never place humanity in the position of those ants."²⁸

As was suggested by the movie *The Matrix*, it may be possible that humans may eventually be relegated to living in a world where they don't even realize that they are being manipulated, and those who figure it out are controlled through a combination of phone and computer monitoring, traffic control, facial recognition, health monitoring, GPS tracking, genetic manipulation, and biometric screening run by financial supercomputing coconspirators that can bring about the subjugation of their adversary. Ten years ago, I would have said this is crazy. Movies like *The Matrix* and TV shows like *Person of Interest* played on the possibilities that the combination of artificial intelligence, superintelligent computers, and ubiquitous online and physical surveillance could easily control our lives and destinies. Colluding computers may eventually be able to engineer events that will determine where you work, how much you make, what you do, where you drive, and how safely you will arrive at your destination. This potential threat to systemic financial stability and perhaps democracy should be of concern.

THE NEXT QUANTUM LEAP

These threats and challenges will increasingly evolve as additional new technologies are introduced into the marketplace. Cloud technology creates another level of operational and systemic risks that financial institutions are confronting today. The *cloud* allows individuals and businesses to store massive amounts of digital information that has become too costly to store and manage on their servers or computer hard drives. In the cloud, however, businesses, governments, and consumers have less control and reduced visibility, creating an additional layer of security, privacy, and customer interface challenges. A machine controls that data—perhaps a machine that you can trust today, but not tomorrow. Banks have learned this painful lesson when their cloud providers have been breached and personally identifiable customer data has been exposed. Threats associated with data deletion increase in the cloud given the reduced transparency of where data is physically stored and when it has been corrupted or altered. Imagine the damage that one who gains unauthorized access to the cloud can do by compromising administrative users, systems, and data.

Finally, let us return to quantum computing, the next technological frontier that will exponentially increase digital capabilities and cybersecurity threats. It is not yet an alternative for most people; there is no quantum internet and it is not available to hackers sitting in a garage. Quantum technology today is comparable to where classical computers were at the vacuum tube stage—rudimentary. Quantum computers perform calculations based on the probability of an object's unmeasured quantum state in a "mixed superposition." The most common physical world example of quantum computing is a coin spinning through the air where the superpositions are entangled with those of other spinning coins and plugged into advanced algorithms to solve problems that would take a classical computer forever, if it could do it at all.²⁹ The most notable characteristic of quantum computing is the speed at which it can process data, train neural networks to process information, and accelerate machine learning. That means that quantum computers can both create lengthy private keys to enhance the security of a public/private key cryptographic system and easily decrypt keys and breach secure applications. The extent to which quantum computing is ultimately a threat or an enormous enhancement of the

human condition turns in large measure on who gets there first. Google posted a statement that it had achieved “quantum supremacy” when its “Sycamore” solved a mathematical calculation in two hundred seconds that was estimated to require ten thousand years for a current super-computer to do.³⁰ I take little comfort when the experts say that if you are confused by quantum computing, you are starting to understand it.³¹

The financial products and networks being created through DLTs such as the blockchain and the many cryptocurrencies that use them could be cannon fodder for quantum computing. It is entirely possible that the continuing construction and deployment of these crypto value and payments systems, which are not controlled or backed by any governmental entity or central bank, could be destroyed, stolen, or manipulated by the next generation of quantum computers. In short, the “immutable” nature of DLT in the current technological era may be susceptible to infinitely faster and more efficient computers. If that is a possibility, we should be cautious about creating a financial world that could be undone by technology and not be able to call on the support of any country or central bank. Simply stated, the first to achieve quantum computing supremacy could be the ruler of the world. That should lead you to want to know what the United States is doing to maintain technological supremacy.

WHAT ARE WE DOING ABOUT IT?

The short answer is that there has been little progress but much activity. Even before 9/11, the government began to recognize the serious need for increased infrastructure protection in the wake of the technology explosion of the 1990s. In 1998, in Presidential Decision Directive (PDD) 63, President Bill Clinton noted that while the United States possesses the world’s strongest military and largest national economy, they are both increasingly becoming interdependent on critical infrastructures and cyber-based information systems that demand flexible new approaches by the public and private sectors to protect both domestic and international security.³² A national goal was established: the United States would establish an initial operating defense of the nation’s critical infrastructures from intentional attacks within five years—

by 2003. Every department and agency was directed to develop a plan for protecting its own critical infrastructure, including but not limited to its cyber-based systems. The PDD was surprisingly prescient for 1998, but not enough happened beyond the identification of agency personnel who would be responsible for this work at their agency as it progressed over the next twenty years. There was no sense of urgency.

In 1999, the Financial Services Information Sharing and Analysis Center (FS-ISAC) was created to devote private sector resources to reducing cyber-risk in the global financial system.³³ FS-ISAC is an industry consortium serving seven thousand financial institutions and their customers in seventy jurisdictions around the globe. It says that it leverages its intelligence platform, resiliency resources, and a trusted peer-to-peer network of experts to anticipate, mitigate, and respond to cyber-threats through exercises, best practices, hands-on training, and playbooks for rapid response. FS-ISAC created Sheltered Harbor, a not-for-profit, industry-led ecosystem of financial institutions that prepares participating members for catastrophic cyberattacks that could cause critical systems to fail.³⁴ Participating institutions back up critical customer account data each night through their own secure data vault or by using a participating service provider that it is separate from their own infrastructure and backups. Stressing its “resiliency planning guides and an expanding network of assurance and advisory firms,” Sheltered Harbor helps institution create the business and technical processes necessary to restore critical systems.³⁵ The effectiveness of Sheltered Harbor has not been tested to date by a catastrophic event. The “pretty good” progress made on collaboration between industry and government as described by the executive director of the IT Information Sharing and Analysis Center (IT-ISAC) is scary given the potency of the threats that we face.³⁶

After 9/11, the government was again energized to protect critical infrastructure. A commission established by President George W. Bush evaluated the threat to critical infrastructures largely from the perspective of physical attack.³⁷ These efforts have since been overseen by the Treasury with regard to the financial infrastructure of the country, but have continued to suffer from limited funding, the challenges of coordinating private and public sector resources, and the hesitancy of companies to share meaningful information.

Coordination and discussion have continued to increase as financial services are digitized. The Cybersecurity and Infrastructure Agency (CISA), buried in the Department of Homeland Security, is arguably the closest thing to an agency responsible for all infrastructure security, including that of the financial services sector delegated to the Treasury. The CISA issued a Financial Services Sector Specific Plan in 2015 in conjunction with the Financial Services Coordinating Council for Critical Infrastructure Protection and Homeland Security (FSSCC) and the Financial and Banking Information Infrastructure Committee (FBIIC), private and public/private organizations responsible for critical infrastructure protection. That report trumpets limited information sharing between companies, the development and use of common approaches and best practices, collaboration among an alphabet soup of federal agencies, and robust discussion of policy and regulatory initiatives.³⁸ In the face of the escalating power of technology, there are too many chefs stirring this pot and not enough assignment of responsibility to be assured of appropriate reactions by the government and the private sector to assaults on financial markets, payments systems, or the economy itself.

The Government Accountability Office (GAO) appears to agree. In September 2020, it warned that there is an urgent need “to clearly define a central leadership role to coordinate the government’s efforts to overcome the nation’s cyber-related threats and challenges” since it is unclear who ultimately maintains responsibility for coordinating the execution of plans and holding federal agencies accountable.³⁹

It appears that the best America has to offer at the moment is a loosely configured company-by-company, agency-by-agency detection and defense strategy. It is essentially every entity for itself. This state of unpreparedness will lead to chaos if just one protagonist decides that the U.S. economy should be disrupted or terminated. Think of the consequences if that were the way the United States constructed its strategic military defense. J. P. Morgan Chase would have to defend and protect its square block in Manhattan.

This is a serious problem. The government is not bottom-line driven, and the private sector has demonstrated an unwillingness to incur the cost to build a state-of-the-art critical financial infrastructure defense system until that cost has been justified by a clear and present threat. Similarly, while there are antitrust exemptions and government induce-

ments to share the daily online breach and cyberattack data that companies compile, it is not happening in a way that can construct the kind of defenses that a fully functioning public-private sector partnership would prefer.

Most countries now claim to be ahead of the technology curve, a claim that is undercut by the superficial nature of the reports that they have issued.⁴⁰ Recent US government publications talk up the innovations of artificial intelligence and do discuss challenges effecting employment, privacy, online security, bias, and intellectual property, but reference the growing threats only in passing.⁴¹ President Obama established the Commission on Enhancing National Cybersecurity, which released a comprehensive report much like the PDD in December 2016.⁴² Its report was another blueprint for public and private sector collaborations to protect the digital economy. It underscored the need for enlarged federal information technology in which the government deploys technology to a greater degree to fulfill its mission, rather than just overseeing those that use it. The report touches on the country's financial infrastructure, but contains only six references to artificial intelligence, noting the threat it poses in the hands of criminals and nation-state adversaries who will find malicious uses for it.⁴³ Importantly, it also states that "quantum computing has the potential to render useless some of the encryption technology we rely on today."⁴⁴ Finally, it is replete with admonitions for the next administration to continue the work that was begun in the report. That has not really happened yet. The Trump administration has devoted much energy to technology and particularly artificial intelligence, but the focus has been weighted toward the impact of artificial intelligence on American innovation and jobs.⁴⁵ Fair enough. Most parts of government really do not seem to want to be the skunk at the technology garden party and discuss the possibility of a financial Armageddon.

The House of Representatives' Subcommittee on Information Technology in September 2018 did begin to scratch at the serious challenges of artificial intelligence in its report, "Rise of the Machines" concluding that "AI has the potential to disrupt every sector of society in both anticipated and unanticipated ways."⁴⁶ A report published by the Columbia School of International and Public Affairs in 2018, although not focused on financial services systems, includes a comprehensive compendium of the most effective cybersecurity defenses.⁴⁷ It underscored

the need for “defensive advantages” that raise the cost to attackers, marry public and private sector resources, and increased government spending.⁴⁸ It urged significant financial, technological, and sanctions counterweights short of military power to respond to those who weaponize technologies.

In 2019, the CSC was established by the National Defense Authorization Act as a bipartisan entity to develop a strategic approach to defend the United States against cyberattacks of significant consequence. It was authorized, among other things, to examine (1) the appropriate roles and responsibilities across the public and private sectors when it comes to securing US information, innovation, and critical infrastructure from malicious cyberactivity; (2) the Department of Defense’s role in this effort; and (3) how the United States and US allies and partners promote global norms of responsible state behavior in cyberspace.⁴⁹ In its report issued in March 2020, it issued an “urgent call to action” to reform the government’s approach to cybersecurity at every level. It included about five dozen recommendations that would devise a new strategic approach based on layered cyber-deterrence through efforts to shape behavior, deny benefits to adversaries, and impose costs on bad actors.⁵⁰

The CSC Report is the latest warning that it is time to end political showmanship and do something. The financial infrastructure in this country is still largely exposed, waiting only to be undone, usurped, or destroyed by the next great technological innovation in the hands of bad people. Relegating the life-altering impact and threats that artificial intelligence and developing technologies can create to a webinar topic is not a mistake that other countries are making. Experts fear a cataclysmic arms race conducted by lethal autonomous weapons.⁵¹ The same risk exists when it comes to national economies as technology becomes the weapon of choice to make the world more financially insecure. China has already deployed a form of algorithmic governance to monitor its own population through facial recognition, imposing sweeping social evaluation profiling tools to reward and punish citizens based on their social behavioral scores.⁵² It is also actively attempting, according to documented cases, to steal US military technology.⁵³

What China is doing to both undercut US technological superiority and lock in a totalitarian regime that subjugates every one of its citizens to algorithmic control underwritten by phone scanners, facial-recogni-

tion cameras, and face and fingerprint databases in the hands of local police and Chinese government officials is chilling.⁵⁴ Its espionage in the tech area also appears to be continuous. In December 2018, the Justice Department and FBI disclosed that they had broken up a four-year operation by a hacking group that was able to penetrate America's cloud computing systems. One of the targets was the US Navy. In March 2019, Tesla Inc. filed a lawsuit against a former engineer for allegedly copying three hundred thousand files related to its autopilot system before taking a job at a Chinese self-driving car startup, Xiaopeng Motors. In July, an adjunct professor in California was found guilty of stealing information about devices in US weapons systems to transfer the technology to a Chinese company that was on the Commerce's Department's list of companies involved in the illicit procurement for unauthorized military end use in China. In September 2019, the Justice Department filed fraud charges against a professor in Texas for allegedly stealing solid-state-drive computer technology from a Silicon Valley startup for China.⁵⁵ On January 28, 2020, Dr. Charles Lieber, who was the chair of Harvard's Chemistry and Chemical Biology Department, was accused of lying about working with several Chinese organizations where he collected hundreds of thousands of dollars from Chinese entities.⁵⁶ Finally, on February 10, 2020, prosecutors alleged in a nine-count indictment filed in federal court in Atlanta that four members of the People's Liberation Army (PLA) had hacked into Equifax's systems in 2017, creating one of the most massive and significant breaches of security in US financial history. Many more have followed.

These criminal indictments, other economic sanctions, and the development of more robust cyber-capabilities and defenses have not deterred China, Russia, and North Korea from probing critical US infrastructures and stealing assets from individuals, companies, and businesses "with impunity."⁵⁷ One-off prosecutions are not nearly enough to address Beijing's hacking and spying in the United States,⁵⁸ because the United States fails to keep pace with its technological capabilities. About two dozen countries including the United States have published papers on their use and development of artificial intelligence in the past two years.⁵⁹ But China is the only country in the world that has laid out a plan for global artificial intelligence dominance by 2030. It put its money where its aspirations are, massively increasing its artificial intelligence spending between 2000 and 2015. China is the chief US rival in

quantum computing, spending at least \$2.5 billion a year on research in part on developing a code-breaking “killer app.”⁶⁰ The National Quantum Initiative Act, passed into law in the United States in 2018, commits just \$1.25 billion over five years to quantum computing.⁶¹ In reaction to the amount of resources being appropriated by China, the Trump administration proposed a spending increase of about 30 percent in the 2021 nondefense budget for artificial intelligence and quantum information science,⁶² and then less than two weeks later, announced that federal agencies and their private sector partners are committing more than \$1 billion over the next five years to establish twelve new research institutes focused on artificial intelligence and quantum information sciences.⁶³

Only in 2020 did it become apparent that policymakers could no longer ignore the warnings that had been growing over the past twenty-five years. In 2019, the head of Japan’s central bank predicted that cybersecurity could become the financial system’s most serious risk, while Jamie Dimon, CEO of J. P. Morgan Chase said that cyberattacks “may very well be the biggest threat to the U.S. financial system.”⁶⁴ In February 2020, Christine Lagarde, the president of the European Central Bank (ECB) and former head of the International Monetary Fund (IMF), warned that a cyberattack could trigger a serious financial crisis.⁶⁵ In April 2020, the Financial Stability Board (FSB) cautioned that “cyber incidents pose a threat to the stability of the global financial system,” noting that “a major cyber incident, if not properly contained, could seriously disrupt financial systems, including critical financial infrastructure, leading to broader financial stability implications.”⁶⁶ Finally, in November 2020, a remarkably well-researched report by the Carnegie Endowment for International Peace’s FinCyber Project provided a full-throated endorsement of the predicament that the world finds itself in with a largely unprotected financial infrastructure:

Surprisingly, despite the global financial system’s increasing reliance on digital infrastructure, it is unclear who is responsible for protecting the system against cyber attacks. ... [T]he global financial sector remains vulnerable to cyber threats and, absent dedicated action, will only become more vulnerable as innovation, competition, and the pandemic further fuel the digital revolution. Although many threat actors are focused on making money, the number of purely disruptive and destructive attacks has been increasing; furthermore, those

who learn how to steal also learn about the financial system's networks and operations, which allows them to launch more disruptive or destructive attacks in the future (or sell such knowledge and capabilities to others). This rapid evolution of the risk landscape is taxing the responsiveness of an otherwise mature and well regulated system.⁶⁷

The FinCyber Project has spent significant resources to document cybersecurity breaches of financial institutions' systems since 2007. Approximately fifty occurred around the world in 2020 alone.⁶⁸ In the last six months of 2020, they included malware attacks on Brazilian bank account holders; DDoS (distributed denial of service) attacks on Hungarian banking and telecommunication services through servers in Russia, China, and Vietnam; a ransomware attack that caused the suspension of nationwide operations by Banco Estado, one of the three largest banks in Chile; the shutdown of 143 cash machines by Argenta, a Belgian savings bank; and the infection of Android devices by malware hidden in a cryptocurrency converter app. North Korea alone has stolen some \$2 billion from at least thirty-eight countries across five continents over the last five years, more than three times the amount of money it was able to generate through counterfeit activity over the previous four decades.⁶⁹ More dangerous attacks and ensuing shocks that seek to corrupt the integrity of financial records, algorithms, and transactions should be expected in the future. Defenses, solutions, and remedial actions at this point are few and far between.

And then it happened. On December 15, 2020, the government announced that the computer systems of multiple federal agencies, including the U.S. Treasury, Department of Homeland Security, and Commerce Department, were breached in a global cyber espionage campaign launched in early 2020 and believed to be orchestrated by the Russian government.⁷⁰ The fact the country was in a presidential election year may have been some impetus for the timing of the attacks, but there is evidence that planning began years ago.⁷¹ Hackers apparently infiltrated government systems through updates released by SolarWinds, a software company based in Austin, Texas,, pushing malicious code to 18,000 of its customers, including a wide range of government agencies such as the White House, Pentagon, and NASA; some of the country's leading telecommunications providers; and more than 425 of the U.S. Fortune 500.⁷² On December 16, 2020, SolarWinds posted on

its website that it had been made aware of a cyberattack inserting a vulnerability that could potentially allow an attacker to compromise the server on which the Orion products run. It went on to note, “We have been advised that this incident was likely the result of a highly sophisticated, targeted, and manual supply chain attack by an outside nation state, but we have not independently verified the identity of the attacker.”⁷³

The hackers were suspected of weaponizing a “Supply Chain Attack” to embed malicious code into software updates of the Microsoft 360 Office platform in order to surreptitiously monitor federal staff emails.⁷⁴ The attack was “executed with a scope and sophistication that has surprised even veteran security experts and exposed a potentially critical vulnerability in America’s technology infrastructure.”⁷⁵ The Russian Embassy in Washington not surprisingly denied any involvement, saying that Russia “does not conduct offensive operations in the cyber domain.”⁷⁶

Investigators suspect that by using a flaw that is extraordinarily difficult to detect, the Russians were able to gain access and insert counterfeit “tokens” in an undetected fashion to provide assurances to Microsoft, Google, and other providers about the identity of the computer systems involved.⁷⁷ CISA said that the hackers also broke into computer networks using bugs other than the SolarWinds software, labeling the incident a “grave threat” to critical infrastructure entities and private-sector companies. Major banks immediately began scrutinizing their systems to determine if their worst nightmares had materialized. While no evidence emerged in the first days of their investigations, it could take many months to determine the scope of any infiltration.

Microsoft said that of the more than forty customers it had identified as victims of the SolarWinds hack, 44% were IT services companies. While 80% of the victim companies were based in the United States, Microsoft said that targets were also hit in the UK, Canada, Mexico, Belgium, Spain, Israel, and the United Arab Emirates.⁷⁸ This was likely a dress rehearsal for something much larger. SolarWinds allegedly patched the security issue within the week, but choking off further access points does not necessarily remove the intruders who almost assuredly would have embedded themselves and sought to conceal their presence. The assumption was that SolarWinds was not the only company that was used to perpetrate the attacks.

Time for talk and study has long since passed. There is no paper left to protect; informational and financial security is now completely tethered to digital technology. That means that penetration of systems can be broader and more damaging than ever imagined. It is no longer about how many boxes of documents can be stolen and loaded into a van. Moreover, the increasing volume of cybersecurity breaches that are occurring each month should be viewed as tests for the actual financial cyberwar for which countries are preparing. Today's breaches are analogous to reconnaissance missions, probing the limits of things that bad actors can do and get away with, all in preparation for an all-out cyberwar. However, unlike conventional warfare, which is focused on control of physical geography and proportional military responses over extended periods of time, cyberwar will deploy all weapons immediately in a kill-or-be-killed moment because of the threat that one country's cyber capabilities could be entirely neutralized once such a conflict began.⁷⁹ It is the possibility of instantaneous, mutually assured destruction that many argue creates the discipline and rules of engagement—which in turn prevent it from occurring. But that assumes every protagonist is equally invested in avoiding such a destructive scenario, which would be a rash assumption these days. Much as terrorism has altered the dynamics of traditional military conflict, it has lowered the barriers to entry to cyber conflicts, increasing the chances that fanatics and terrorists will obtain malicious pieces of software or supercomputing powers.

The highest priority must be given to the development of a financial services and capital markets strategy to foster technology innovations while at the same time protecting against their unprecedented threats. While the federal regulators are studying some of these threats, we need a multidisciplinary collection of diverse experts to begin protecting the economic future of democratic nations. In that regard, bank regulators who monitor the financial safety and soundness of banking functions, payments systems, and the economy should not be tasked with something that they are not equipped to do. The digital integrity of American finance is a completely different subject requiring a completely different set of professionals to defend it. The stakes are economic life and death. The country needs to focus and confront the issues raised by advancing technologies, and in so doing, tap into not only the resources of the government, but that of businesses, academia,

the military, think tanks, and the public to develop alternative financial technology strategies that the administration and Congress can implement now. US financial infrastructure is already the target of several countries bent on controlling, replicating, or collapsing it. If the US government does not take the lead, others will, and the country's future will be left to the winds of chance or the whims of rogue nations, fanatics, and terrorists. The United States must create a coalition of nations and private sector companies to implement preemptive offensive and defensive strategies to protect critical economic infrastructures.

This is the coming threat to the US financial infrastructure and the stuff that the next financial disaster may be made of. Vladimir Putin gets it. He has said that the country that dominates artificial intelligence will be the "ruler of the world." He is correct. Nothing less than the control of global economies is up for grabs.⁸⁰

DAYS OF FUTURE PANICS

No one could have anticipated the Financial Pandemic of 2020, and no one knows when or how the next crisis will erupt. But there always is a next financial crisis. The question is how corporate and government reform can lessen the severity, duration, and reach of the next one. We know from experience that a loss of confidence can detonate the financial equivalent of bricks of C4 explosives that have been randomly embedded throughout the economy by the government and the private sector. The rapid sale and settlement of western land, the production of new products and crops, the construction of miles of new railroad tracks, the uncontrolled creation of money and credit, expanding international trade, the proliferation of speculative investment vehicles, the expansion of homeownership and a new wave of exotic mortgage products and credit default swaps, carry trades that take advantage of short-term gains, and a pandemic that shuttered the economy all assumed that role in the past. The explosion of just one of the several economic bricks is manageable. For example, we know that if the value of certain securities goes to X, the impact on the economy will be Y. But as in 2008, predicting the potential triggers that may undermine confidence and cause a panic that detonates a string of interconnected bricks and craters the valuation of a wide variety of assets is the tricky part.

The Financial Pandemic of 2020 is unique in that it was caused by a physical disaster—a virus. Most assume that it will pass, and some form of normality will return. Perhaps. Or maybe the current bricks embedded in the economy will be triggered and ignite an even greater finan-

cial conflagration. Let's briefly consider the financial explosives that are deployed throughout the economy and may explode today or in the future.

As I proceed, I should underscore one self-imposed handicap that I have previously referenced, and that did not play a significant role in the 2020 crisis. Congress expressly limited the government's ability to respond and deploy future financial safety nets in the next crisis. As we saw in 2020, the Treasury and the Federal Reserve had to return to Congress to get the money and ability to address rapidly unfolding financial challenges. Prior to the passage of the Dodd-Frank Act in 2010, Section 13(3) of the Federal Reserve Act authorized the Federal Reserve to make emergency loans to companies in "unusual and exigent circumstances" if those loans were satisfactorily secured and the borrower was unable to secure adequate financing from private banking institutions. Such loans were made to support AIG, Bear Sterns, and other companies in financial distress in the last crisis. For largely political messaging purposes, the Dodd-Frank Act prevented future bailouts of Wall Street mega-institutions in anything but the worst of situations by modifying Section 13(3) to limit the Federal Reserve to providing emergency lending programs only if they have "broad-based eligibility." In the future, as a practical matter, no program or facility may be established to assist a specific or small group of companies. To assure that result, the Federal Reserve must provide Congress a report that justifies the exercise of authority and describes the material terms of the assistance.¹ These limitations of the authority that was successfully used to benefit the US economy and its taxpayers in the Panic of 2008 seems short-sighted, particularly since no one knows from what direction new financial distress will come and whether a company is its creator or receptor.

Given the comprehensive impact of the Financial Pandemic of 2020, the restrictions that Congress placed on the ability of regulators to address financial crises have thankfully not been relevant so far. Everyone needed assistance immediately. But since financial crises usually develop one failing company and economic default at a time, limiting financial intervention by the government to an all-or-nothing proposition is dangerous. It is equivalent to assuming that twelve inches of snow falls at the same time and then can simply be plowed once that happens. If the government cannot resolve the issues affecting Compa-

ny X, even if X may have deserved to fail based on its reckless behavior, well managed companies like Y and Z might collapse when Company X does. The law may create the moral hazard that it was intended to eliminate.²

Why would Congress eliminate the very tools that the Federal Reserve used to control the flames of the last financial fire? But wait, there's more! Congress similarly clipped the FDIC's wings in reaction to its implementation in the crisis of several programs including its Temporary Liquidity Guarantee Program through which the FDIC guaranteed deposits and certain types of new debt issued by private firms affiliated with depository institutions. Congress prohibited such future financial assistance by the FDIC in the Dodd-Frank Act, limiting it only to when the FDIC is winding up banks that have been placed in receivership, or again, through a widely available program to guarantee obligations of solvent depository institutions, their holding companies, and affiliates during times of severe economic distress. Then, the concurrence of the Treasury Secretary, a joint resolution of congressional approval of the maximum amount of debt that can be guaranteed, and approval by two-thirds of the FDIC and Federal Reserve are required to permit the FDIC to act. In other words, it is unlikely to ever happen. Neither may the FDIC take an equity instrument such as common or preferred stock in an institution to prevent its collapse in the future as it did in the Continental Bank rescue and as the Treasury did to stabilize Fannie Mae and Freddie Mac in conservatorship.³ These restrictions were temporarily loosened by the CARES Act, but they essentially mean that in the next crisis, the Federal Reserve and the FDIC must return to Congress to obtain authority to rescue the economy. That can be troubling, particularly because economic crises do not move on congressional time or reflect the political factors that Congress may consider critical to its acting. The politicization of solutions to a financial emergency is part of our system for sure, but it can be dangerous.

NEW CONFUSION ABOUT MONEY

The uncertainty of what constitutes money can be economically unsettling. We saw that vividly in the nineteenth century as different forms of money, banknotes, greenbacks, and confederate dollars competed with

gold and silver to achieve national consensus as the accepted form of economic value as financial panics arose every other decade. Similarly, the dislocation of traditional financial relationships and new forms of competition can disrupt markets. In the 1980s, when MMFs upended the deposit monopoly that banks and S&Ls had enjoyed, it helped to expose weaknesses in the country's banking sector and led to the failure of more than 2,500 banks and S&Ls. Today, we are hurtling toward a new level of financial dislocation that may alter most financial relationships and once again create the kind of uncertainty that can upend financial stability. With the emergence of cryptocurrencies and other fintech products, the most fundamental of financial relationships hangs in the balance—the emotional relationship between humans and their money.

Cryptocurrencies have not reached critical mass yet and are not a form of value that has generally replaced cash, credit cards, automated clearinghouse, or checks. They are sparsely used by legitimate parties other than for speculation.⁴ Moreover, as long as cryptocurrencies are the favored means of value to finance terrorism, launder money, make illegal purchases, and otherwise underwrite transactions on the dark net, it is difficult for them to also play the role of an accepted global financial medium that inspires the confidence of consumers and governments. However, if one or more cryptocurrencies that are based on blockchain or similar peer-to-peer applications were to reach critical mass among consumers as an everyday medium of exchange and there was an event that caused a collapse and loss of confidence in them, the resulting panic could be unprecedented. Indeed, there is no assurance that the security of these technologies will be able to withstand an attack using the next generation of computing power. The fact that Chinese miners have moved toward taking control of some networks should raise red flags. No central bank, no government insurer, and no sovereign treasury would have any direct reason to intervene to stabilize a crashing crypto-currency. Once such an epidemic of panic were triggered, it would spread as far and as deep as the suspect crypto-products had infiltrated commercial and retail financial markets. The effects of social media and cable news stations would be felt instantaneously as they transmitted accurate and inaccurate information that would undoubtedly amplify the stakes. Much as the subprime lending of non-

banks eventually poisoned FDIC-insured banks, there is no telling where such a panic would lead and who would come to the rescue.

There is, however, a much more nuanced impact that cryptocurrencies are having that completely changes customary financial relationships. In “dollar-grounded” transactions, the government indirectly underwrites value transfers with support from traditional financial institutions and traditional payments systems. When dealing in cash- or dollar-based transactions, people are effectively doing business with the US government. While I cannot walk up to the Treasury Department and cash in a dollar bill for a piece of the Grand Canyon, that dollar is a symbol of a commitment by the US government. In effect, whenever I buy or sell something, the government is the third party in the transaction providing the financial confidence that the parties have in the form or value that is being exchanged. The parties worry only about the performance of each other and the product purchased, not the currency used to buy it. Nongovernment crypto-products alter that relationship for the better or worse by reconstructing the fundamental relationships between the parties and removing the government from the transaction. It is not clear who if anyone fills the roles of trusted intermediary and guarantor in that world. Not only are cryptocurrencies not controlled or backed by governments, but many appear not to be controlled by any one party that can be seen or spoken to. Some cryptocurrencies are trying to replicate the traditional characteristics of fiat money by using “stablecoins” that are backed by government currencies or collateral held against outstanding coins. But it is not clear how that will work in a crisis or how it impacts the basic sense of confidence that all forms of money must engender. Moreover, while having a sovereign money equivalent stand behind every crypto-coin sounds comforting, there is a natural limitation on the number of coins that could be issued. The liquidity of economies will be impacted if massive amounts of sovereign debt securities such as treasury notes are held as collateral for every outstanding crypto-coin.

The proliferation of cryptocurrencies and other forms of digital money are re-creating the money wars of the nineteenth century. The wars of that century were eventually resolved in part by the insertion of the government as the issuer of a national currency. Moving toward new forms of money that expel the government may be jumping headlong into the same type of economic confusion that undid economies in

that century. Crypto advocates smartly argue against that thesis by underscoring the stability of decentralized currencies, but there seems little doubt that the death of cash and the dollar and their replacement by digital tokens constitute the deployment of a brick that could detonate in the future. The government must eventually decide whether it wants this war fought within the system where it can influence the outcome or outside of it.

CYBER INSECURITY

As we have already discussed, the velocity at which financial technology is changing the creation and movement of money by parties not known or trusted will increasingly raise both institutional and systemic issues. The recent pandemic has turbo-charged many technological changes that may have taken years to unfold. Machine-run programs are already driving trading on stock markets in a procyclical fashion as they often under- or overreact and cause rapid deviations in market performance. Capital and stress test models are attempting to strengthen banks while they risk synchronizing their balance sheets to react the same way in adverse circumstances. There are generations of indexed mutual funds using trading programs that also increase the risks of procyclical market reactions. All these innocent technology-driven programs may react in the same way to friendly or unfriendly economic events, creating or further exacerbating a crisis.

The typical financial threats that companies deal with every day will seem childlike, however, when compared to the threats that will arise when artificial intelligence controls every aspect of our professional and personal lives, increasingly putting machines in control. The possibility that nefarious parties may use machine intelligence to manipulate markets, capture the Federal Reserve's or other financial payments systems, and destroy the economy is heart-stopping. The future potential of quantum computers leaving super computers in the dust by threatening to rewrite the technological security standards with which we have all just become comfortable should make us pause.⁵ What if every ATM in America stops working, payments systems stop processing transmittals, and the Federal Reserve is taken over by malicious artificial intelligence? Consider the impact if the US Treasury's issuance of

debt, global remittances, and distribution of financial benefits are interrupted and the global financial system seizes up so that goods do not move from ports of entry or onto or off trucks and rail cars? What happens when people and businesses cannot access their money and may not even know where it is? The short answer is economic chaos. New technologies in the hands of people bent on destruction is the most pressing issue we face when it comes to protecting the country's financial institutions, economic infrastructure, and democracy.

Admittedly, the government currently has finite capacities and technologies to analyze data, draw conclusions, and make economic judgments. The OCC has included general references to cybersecurity and other technology risks in its December 2019 Semiannual Risk Perspective assessment, noting that “[m]alicious external and internal actors use a variety of techniques to circumvent controls,” but that “generally have appropriate controls for operational stability and protection of bank and customer data.”⁶ Most of its recent reports include similar language.⁷ If the regulators had the capabilities, resources, and political independence of a Facebook, Apple, Amazon, and Google, they could develop highly sophisticated early warning systems that could make more accurate predictions about the economy and implement adjustments before it was too late. It could meet malicious technology head on. This is a real and ever-growing threat to our economy. Given the potential pain that the next crisis will bring, the government must accept the challenge, bite the bullet, and invest in technologies and supervisory systems as if it were Facebook, Apple, Amazon, and Google.

PANDEMICS

The global economy does not need to be interconnected for a virus in a faraway place to end up in a small town in Iowa. The relatively unfettered and unmeasured movement of people across the globe each day is all that is needed to accomplish that. But when it occurs, the impact will be an economic global event given the interconnectedness of the world's economies. Moreover, the effectiveness of the antidote deployed in one country will also impact another. As the Financial Pandemic of 2020 demonstrated, the world is irretrievably linked for better and for worse. That means that given the embedded financial risks that

are continuously being deployed throughout an economy, the stakes for ensuring global health have risen dramatically. For those reasons, pandemics will alter travel and social and financial relationships between countries, and underscore the importance of technology in providing early warnings that trigger global attention. Will the trade and financial relationships between the United States and China be the same after the crisis in 2020? Will people change their living habits such that online contact replaces the need for classrooms, office buildings, and malls? If such changes occur, they will alter economic events and could directly impact the timing and nature of the next financial crisis.

THE PRESSURE OF FINANCIAL REALITY

Since at least 2008, the United States has constructed and regulated perhaps the most managed economy it has ever had. That scenario has only become more engrained with the financial weapons that the government deployed in reaction to the COVID-19 pandemic crisis. With the best of intentions, rates, money supplies, reserves, capital, and credit have all been determined by the Federal Reserve and federal regulators. The result is an economy that has been prefabricated and positioned by the government like a mobile home dropped onto a flood plain. This has created several significant issues, beginning with whether or how the Federal Reserve withdraws its influence and allows markets to perform by themselves, or as close as they ever get in that regard.

More than a decade after the last crisis, the Federal Reserve's role in the economy as the counterparty of choice has remained significant and not returned to precrisis norms. The Federal Reserve purchased trillions in longer-term government securities funded by an increase in reserves held by banks at the Fed, causing the fed funds market to shrink. It then raised the rates paid on excess reserves of banks that they held, essentially recalibrating the financial metrics to react to the crisis. Crisis-era regulations that are still in place, for example, favor government securities over private ones and influence how the capital, repo, and other lending markets interreact. In September 2019, the repo market suffered severe dislocations as overnight rates spiked. The Federal Reserve had to intervene again to fix what was at least partially

attributed to its prior intervention. It still had \$1.6 trillion in mortgage securities on its books prior to the beginning of the Financial Pandemic and ran into market and political headwinds whenever it attempted to raise interest rates. By mid-September 2020, the Federal Reserve's balance sheet hovered at \$7 trillion in assets, \$3 trillion more than it closed 2019. It held \$4.4 trillion in Treasury notes and \$2 trillion in MBS.⁸ An excellent analysis of how the Federal Reserve is orchestrating the post-crisis economy using crisis tools and how that is causing various markets to conflict and bump into each other has been produced by the Bank Policy Institute.⁹

The Federal Reserve has also managed interest rates to keep them at or near historic lows, producing a host of economic tradeoffs. Interest rates for savers have been microscopic, encouraging money to migrate to the stock market to find higher returns, a trend that has led to economic disasters in the past. When the government rather than the markets determines the liquidity of the market and where risk migrates, there are usually unanticipated problems. The national debt, for which Congress has recklessly shown no concern at all, has been kept in a "manageable" range of \$27 trillion thanks to extraordinarily low rates. "Normal" rates of 6 percent would multiply the national debt as old notes were retired and replaced with new Treasury offerings, swallowing the economy whole. At the same time, a generation of retirees is being squeezed by low returns on fixed-income securities that they did not expect when they were making their financial plans for retirement thirty years ago.

No matter how the Fed proceeds to "mainstream" the economy after the current crisis, there will be risks. Many economists believe that economies do not simply run their course. Lee, Lee, and Coldiron suggest in *The Rise of Carry* that the Federal Reserve has conditioned markets to take and price risk based upon the expectation that it will bail them out of the worse financial crises.¹⁰ The MIT economist Rudi Dornbusch wrote in 1997 that "none of the U.S. expansions of the past 40 years died in bed of old age; every one was murdered by the Federal Reserve."¹¹ For now, inflation is low and the United States has become an exporter of energy, insulating itself from the oil price gyrations of the past.

History shows us the danger of manufactured economies such as the one we have had over the last decade. Returning them to reality is

usually accompanied by economic distress, whether the government decides to change course for political or financial reasons, or the viability of such an artificial economy is undercut by market forces. As I have already discussed, there may never have been an economy as choreographed as the one that has been created since 2008 and what we end up with after the current crisis. Its end is likely to be economically painful when and if it occurs, just as it was in 1929 when the Federal Reserve let markets seek their own interest rate levels, and in the 1980s when Reg. Q was eliminated as rates hit historical highs. When the government intervenes in the market to correct or refocus the impact of prior interventions as it will inevitably have to do after the pandemic, markets get confused and begin guessing. As the September 2019 repo disruptions previewed, there are now legitimate questions about whether the postcrisis regulations created by the Dodd-Frank Act are limiting the flow of cash to where it may be needed in the market. That could impact the mortgage markets where nonbank lenders rely on short-term bank credit lines and corporate bonds that hold illiquid assets that would be difficult to sell in a crunch.¹² Some specifically blamed bank liquidity rules adopted by the regulators in 2014, which encouraged banks to hoard liquidity and create the kind of systemic stability issues that they intended to eliminate.¹³ Reversing this set of interventions is a real challenge.

As the Fed prints money to irrigate the economy and tries to counteract threats of inflation, deflation, and stagflation, we get closer to the precipice that we can only see after we have passed it. MicroStrategy Inc.'s transfer of \$425 million in cash from government securities to Bitcoin, where it feels that it is safe and more likely to earn a return may be the canary in the financial coal mine.¹⁴ If I were on the Federal Reserve Board, I would want the most sophisticated programs analyzing the largest sets of data that could be accumulated before I made a decision that would set a future economic course out of this current quagmire.

LENDING, RISK, AND VOLATILITY

The business of finance is like a one-story building with several floors of basements and subbasements. Each lower floor below the first is less

visible to those above it. Most consumers and small businesses function at street level where markets are denominated by basic deposit, lending, and investment needs. Below that level, however, are subterranean floors dominated by increasingly larger and more sophisticated investors, funds, banks, central banks, and government-sponsored entities that create an interconnected web of pulsing financial neurons. This world includes repos, overnight borrowing, carry trades, arbitrage, swaps, derivatives, synthetics, currency exchange-based transactions, commodities transactions, and distressed debt bets, all interwoven with various puts, calls, options, shorts, futures, and forward positions to hedge against risk. As noted already, some believe that the behavior of the Federal Reserve adds catastrophic risk to these lower levels of the economy.¹⁵ I will leave discussions about how these floors in the economic house function to others more skilled at doing so.

Lending is a part of economic growth. But too much lending creates too much pressure in the financial boiler that powers the economy. Once the economy pulls back from that growth, loans that cannot be repaid become the explosives in the basement. Sometimes bad loans were just badly made, but very often, good loans become bad when the economy makes them so. Credit bubbles built around the rapid buildup of private debt are a sign of impending financial doom.¹⁶ But saying that too much private debt is the cause of economic panics does not explain why the United States has so many debt bubbles followed by financial crises. Too much private debt may be either the cause or a symptom of a financial crisis, and it matters which it is.

Through February of 2020, the United States was in its longest period of economic expansion, breaking the previous record of 120 months during the internet explosion from March 1991 to March 2001, according to the National Bureau of Economic Research. Since June of 2009, the GDP has grown cumulatively by 25 percent.¹⁷ At the same time, prior to the Financial Pandemic of 2020, US consumer debt hit \$14 trillion in the first quarter of 2019, surpassing the roughly \$13 trillion of leverage accumulated in credit cards, auto loans, mortgages, and other debt back in 2008.¹⁸ By 2019, total US corporate debt was around \$15.5 trillion, 74 percent of US GDP, fueled by an increase in bank lending that is raising economic concerns.¹⁹ Global debt owed by governments, businesses, and households was up nearly 50 percent since before the Panic of 2008 to \$246.6 trillion according to the Institute of Interna-

tional Finance.²⁰ Financial sectors were growing exponentially, and leverage was increasing correspondingly, particularly in the nonbank lending and financial technology sectors until COVID-19 arrived. The increases in business debt and leveraged lending were leading to comparisons to the rise of subprime mortgage lending in the last decade before the 2020 crisis, so they could be a trigger of an even worse crisis.

Leveraged lending is the equivalent of the junk bond phenomena of the 1980s, when less than investment grade companies that were already highly leveraged borrowed outside the banking system to finance growth by issuing debt securities. While the economy was quite healthy, business debt was at historic highs even relative to the size of the US economy. Corporate debt had been at the upper end of its range relative to the book value of assets, and debt is shifting closer to speculative grade.²¹ The debt-to-GDP ratio increased consistently with previous expansions, but US financial sector and household debt increases were much less than occurred in the five years prior to the Panic of 2008.²² Fed Chairman Powell stated in 2019 that if a downturn were to arise unexpectedly, there *would* be “financial challenges” to deal with and some business would have to deal with severe economic distress, but the stability of the economy would not be threatened.²³ We might take that statement with a bit of cynicism to the extent that it sounds like what Chairman Greenspan communicated about the health of the mortgage finance business just before the weight of subprime lending triggered the collapse of the economy. Nevertheless, Chairman Powell probably did not anticipate that he would have the opportunity to test his theory so soon. So far, it has held up.

In 2019, bank holding companies held about \$2.4 trillion of bank-identified leveraged loans, which made up about 50 percent of the most complex credits shared by multiple banks.²⁴ An increasing number of them were showing increasing risk over the last several years, with weak structures, including aggressive repayment assumptions, ineffective covenants, and permissive borrowing terms.²⁵ Banks are in the leveraged lending business to the extent that they indirectly finance leveraged loans by lending to a wide range of these nonbanks and have purchased collateralized lending obligations, the commercial lending equivalent of an MBS. CDOs are asset-backed securities issued by a special purpose vehicle (SPV). The SPV is a business entity or trust formed specifically to issue a CDO. They can have underlying assets of

various types of asset-backed securities, residential or commercial MBS, or real estate investment trust (REIT) debt. CLOs are CDOs made up of bank loans. CDOs and CLOs are structured to have multiple layers that can be sold desperately into the market. The bottom layers are the riskiest. They will suffer losses as loans in the pool default. As defaults increase, the upper layers will start to be impacted.

CLOs aggregate leveraged loans into commercial asset-backed securities that themselves held about 62 percent of the approximate \$1 trillion of outstanding leveraged loans in 2019.²⁶ Banks also lend to insurance companies, pension funds, university endowments, and other investors that have purchased CLOs or are counterparties to credit default swaps that banks and nonbanks use to protect against leveraged loan or CLO defaults. Banks did appear to be keeping the total of leverage loans on their books in the single-digit percentages of their total portfolios,²⁷ but the interconnectedness of the players in this business, much like what existed in the subprime mortgage origination, securitization, and investment business in the 2000s, suggests that current constrictions in credit could magnify the seriousness of the problem, as they appear to have done in March and April of 2020.²⁸

The fact that regulators now monitor systemic stability and banks have sizable capital absorbing buffers that were not in place before 2008 suggests that a collapse of this market—and only that market—would have less of an impact on banks and the economy, according to Chairman Powell.²⁹ That may be economically accurate, but is it practically and psychologically accurate? Some of Chairman Powell's conclusions may be based on the fact that banks restrict their CLO investments mostly to AAA-rated layers of those asset-backed securities. But the problem is, much like subprime constructed MBS and CDOs in the 2000s, in those highly rated CLOs, there isn't a single loan rated AAA, AA, or even A.³⁰ Frank Partnoy, a former investment banker who was part of the group that structured and sold CDOs and CLOs at Morgan Stanley in the 1990s, now turned law professor, argues in the *Atlantic* that as of April 2020, more than 67 percent of the 1,745 borrowers in the leveraged-loan database that Fitch has rated (e.g., AMC Entertainment, Bob's Discount Furniture, California Pizza Kitchen, the Container Store, Lands' End, Men's Wearhouse, and Party City) had a B rating, meaning that they are likely to see increased defaults in economic conditions such as the present.³¹ So again, much like the subprime mort-

gauge bubble that by itself was not expected to take down the economy, the question is whether CDOs are a trigger or a transmitter in what becomes a larger financial crisis as other embedded risks in the economy catch fire at the same time. The regulators' views about this could be much better informed and their predictions more accurate if they were relying on advanced technologies and analyzing Big Data to draw their conclusions.

CHINA AND OTHER GLOBAL THREATS

As this book went to press and I was considering the impact that China would play in future financial crises, the COVID-19 pandemic was destroying the country's health and wealth. China had in fact been a part of the next financial crisis, but not in ways that anyone anticipated. China is near to becoming the largest economy in the world and has become a huge investor in and counterparty with the United States and many other economies around the globe, raising global interconnectedness to levels that have never been seen before. As has been demonstrated by the urgent need for medical gear, antibiotics, and hosts of other cleaning and protective products to fend off the coronavirus, many countries, including the United States, find themselves uncontrollably reliant on China for these products. That has shown to be dangerous. Beyond the COVID-19 crisis, China could either be the next supreme world power or the trigger of the next global economic collapse.

Its rapid growth and ubiquitous manipulation of its social and economic variables including currency and trade may eventually undercut it and the economies of the world, including the United States, that have come to rely upon it. Local governments in China have overbuilt and outspent their capacity to repay outstanding obligations. Chinese municipalities are said to have \$6 trillion in debt outstanding, with \$428 billion in bonds coming due over the next two years and insufficient tax revenues to support this massive debt structure.³² China's propensity to be an evil empire that steals intellectual property and engages in various forms of technological espionage and cyber-war puts every industrialized economy in the world at risk, particularly those to whom it is exporting its social engineering technology. The United States suspects

that China is implanting everything from eavesdropping devices to the technological ability to control sovereign nations and their populace in the technology that it and its giant tech companies are exporting. A senate report issued in July 2020 accused China of using its technological prowess to develop “digital authoritarianism” to “conduct surveillance, control the internet and censor information not just within its borders, but around the world.”³³ In the midst of the COVID-19 crisis, it ordered its citizens to download applications onto their cell phones to be able to track them and know who is showing signs of having a fever. That will not stop when the virus recedes. China continuously demonstrates an inclination to be unnecessarily provocative and do things that are ill advised. There is no doubt that it is investing vast sums in the development of artificial intelligence and quantum computing that at the very least can dominate the US economy and its financial infrastructure for its own purposes.

HOUSING FINANCE: ALWAYS A RELIABLE PROBLEM

Mortgage lending could come back for a starring role in the creation of the next financial crisis as it has in every crisis since 1929. In 2020, the government has had to essentially provide payment holidays to homeowners stressed by COVID-19, and there is no end in sight to that problem at the moment.

Mortgages are one of the most complex instruments to underwrite and maintain in portfolio—particularly thirty-year fixed-rate mortgages. They pose a risk of nonpayment and a risk that interest rates will rise during the term of the instrument and reduce their value. Additionally, changes in the velocity of prepayments of mortgages because of home sales and refinancings when rates drop makes them challenging to match with funding sources of equal duration and yield, adding significant complexity to the management of mortgage portfolios. With the changes in the law and intense scrutiny that regulators have focused on in this area since the Panic of 2008, it might seem unusual for housing finance to make a repeat performance as the boogeyman of the next financial crisis. But that is what many said after the S&L crisis. The constant desire of policy makers to increase housing in America seems to be insatiable notwithstanding the number of crises that it may cause.

While the growth in mortgage debt has been modest in this most recent expansion,³⁴ regulators are still not working with a full deck of information and data.

There are today more than \$15 trillion in mortgages outstanding in the country. Lenders made 46 percent more in mortgage loans in 2019 than 2018, reaching \$2.4 trillion for the year.³⁵ At the same time, more than half of the mortgage originations in the country are by nonbank lenders.³⁶ An explosion of refinancings over the last decade encouraged by decreases in mortgage rates helped boost that number. The magnitude of these numbers suggests a strong chance that government and private sector mistakes could ripen into a new housing finance disaster. That became clear in the Financial Pandemic of 2020 when MBS, CLOs, and other securities created from the purchase of residential and commercial properties almost immediately became illiquid and fell in price, causing valuation losses and liquidity crises. In addition to these issues, longer term, a new financial crisis may be driven by the last push to increase home ownership. For example, there has been more than ten years of thirty-year fixed-rate residential mortgages originated (at least \$5 trillion worth) at interest rates averaging between 4 percent and 5 percent.³⁷ If mortgage interest rates increased to the “old normal” of 7 to 8 percent, the market value of these mortgages and derivative MBS would shrink by as much as 50 percent, making portfolios of low-yielding mortgages difficult to sell given the losses that would be embedded in them. The shrinking value of such outstanding mortgages used as collateral to support corporate borrowing would trigger margin and increased collateral calls, decreasing available credit and triggering a flight to safety. Homeowners with lower thirty-year fixed-rate mortgages would refinance much less frequently simply because, in most cases, it makes no sense to refinance unless the monthly cost decreases. Low-yielding, fixed-rate mortgages would remain outstanding for longer, while the increasing monthly costs of adjustable-rate mortgages would lead to higher rates of homeowner default. An increase in rates would constrict the market substantially and reduce homebuilding. To reduce risk and avoid problems created by shifting interest rates, mortgage originators either must match asset and liability rates and durations, hedge their exposure using other financial instruments, or sell the mortgages into the secondary market. When mortgage loans are sold, the risk does not disappear; it is merely redistributed. Someone—Fan-

nie, Freddie, investors, lenders—assumes the risk of loss on the trillions of low-rate mortgages and MBS outstanding when rates rise. Those losses may be deferred or recognized immediately based on applicable accounting principles, but they absolutely must be taken when the instruments are sold. As mortgage defaults mount, put-back and recourse provisions could once again be triggered by investors seeking damages from the originators for alleged breaches of representations and warranties or fraud, as they were after 2008. Depending on the velocity of these events, the peak that interest rates reached, and the emergence of triggers that could undermine confidence, these could easily be the ingredients of another financial panic.

The Financial Pandemic of 2020 has quickly revealed the weak links in the mortgage finance system that had been reconstructed after the Panic of 2008. When people became instantly unemployed or at least uncompensated beginning in March 2020, they immediately sought forbearance under plans created and blessed by the government. Fearing that mortgage servicers would have to endure months of nonpayments and that investors, or Fannie Mae and Freddie Mac would eventually have to bear the loss, the first concern became the failure of the non-bank servicing industry that handled about 40 percent of the country's mortgages and would not necessarily have sources of credit to fall back on or acceptable collateral that lenders would consider or value anywhere near where they might have been just weeks before. Neither may those servicers have had sufficient retained earnings or net worth to fall back on as losses mounted. They made their concerns known and were initially told to suck it up and do their jobs. A continuation of this trend would eat through much more of the mortgage finance industry over time, including Fannie Mae and Freddie Mac and the bank servicers that they might attempt to transfer nonpaying servicing rights to. While instant nonpayment by a large swath of borrowers is a financial outlier, the fact that the mortgage finance system has once again become an economic albatross says much about the irrational and risk-creating way that it is allowed to function to provide cheap mortgages to prospective home buyers.

Any system built on the thirty-year fixed-rate mortgage is built to fail. But better data and predictive intelligence would help deal with potential mortgage crises. If the system is not going to be rationalized financially in terms of risk assumption and pricing, better data could

give us some earlier warning in the future of potential fault lines and disasters. Until then, a reasonable hedge against the risk that most mortgages become devalued by increasing interest rates is the fact that the government does not want rates to increase given the impact it would have on the economy, its own finances, and the national debt. Perhaps this is an economic stalemate that will continue to kick this crisis can down the block. But forcing risk outside the regulated financial services world is not an effective way to deal with what is one of the most ubiquitous financial instruments on the planet.

STUDENT LENDING

Student debt has more than tripled since 2004, reaching \$1.52 trillion in the first quarter of 2018, with about 44 million graduates holding student debt with an average balance of \$37,000.³⁸ Two million student loans are in default, with the federal government projecting in 2019 a loss to the taxpayers of \$31.5 billion.³⁹ Whatever one thinks of the student lending program and the university system that is subsidized by it, there aren't enough student loans outstanding *by themselves* to be the source of a national or global financial panic. JPMorgan Chase alone has more than two trillion dollars in assets. But this is also what could have been said about subprime mortgage loans in 2008. The better question is can student lending problems be the spark that lights a larger conflagration that undercuts market confidence?

Most banks are no longer primary lenders in that business. Of the approximately \$100 billion in student loans originated a year, non-government lenders constitute about 10 percent of that number. But much like mortgages, student loans are packaged into asset-backed securities and resold into the market as instruments that pay an expected stream of income. Their value is tied to market interest rates and underlying default experience. Determining whether there is a student loan bubble is difficult to assess. A bubble is generally the result of a run-up in prices that far exceeds the underlying value of the commodity. That did not appear to be the case given the value of a college education, but COVID-19 may have changed the value of the present-day university system. This is another area where there are red flags.

There is potential economic disruption lurking in the political rhetoric about student loans. Candidates who suggest forgiveness of outstanding student loans raise complex financial and social issues. What about the unfairness to students who have paid off student loans and the impact that such a policy would have on the US education model? If everyone goes to college, what happens if 50 percent drop out somewhere along the line? Does a free college education cheapen the degree and mean that graduate degrees will be required to get the same jobs college graduates could have previously secured? Even more financially intriguing, however, is how student loan forgiveness would be achieved, particularly given the fact that most student loans are packaged into asset-backed securities and sold to investors. Presumably, as some of the draft legislation has proposed, the government would insert itself as the payee and forgive the indebtedness of the student and waive the resulting tax impact of having a debt forgiven. If the government becomes the primary obligor on the \$1.52 trillion of student loans outstanding, there will be unintended consequences and impacts on the economy. For example, banks would likely gravitate back to purchasing student loan asset-backed securities, which presumably would have a zero-risk weighting for bank capital risk weighting purposes since they would be guaranteed by the US government. That in turn would result in a reallocation of investment dollars toward student loan securities that would have a ripple effect on market liquidity and investment patterns around the country. The student loan problem was of sufficient concern to require a temporary moratorium on payments under the CARES Act in 2020.

However the government proceeds in dealing with the student loan issue, any scheme that dents investor confidence could have significant contagion effects on the market. The government should want more data about the primary, secondary, and indirect impacts of a dramatic increase in student loan default rates and what would happen if a student loan repayment boycott were advocated over social media and took hold.

TRADE WARS AND NATIONAL DEBT

Some argue that a trade war may be the next great financial crisis. Mark Zandi, the chief economist at Moody's Analytics, said that in the case of "25% tariffs on all Chinese goods, 25% tariffs on imports from Mexico and tariffs on U.S. car imports, it would act like a massive tax increase on U.S. households and businesses, straining confidence and markets and knocking the United States into recession in 2020."⁴⁰ Mr. Zandi's model suggested that a full-scale trade war would cause US employment to drop by 3.1 million between the third quarter of this year and mid-2021, while the jobless rate would rise from less than 4 percent to 6.6 percent by mid-2021. Stock values, he added, would drop 37 percent.⁴¹ Retaliation by China by allowing its currency, the yuan, to depreciate would damage US manufacturing, curtail purchases of US Treasury bonds, increase interest rates and hurt homeowners and stocks.⁴² None of that has happened so far, and COVID-19 and its accompanying financial crisis has pushed these issues to the rear. They are still extant, however, particularly given the expected backlash on China once the pandemic has passed.

The national debt is approaching \$27 trillion, a fact that when mixed with other volatile economic components may cause an explosion of unprecedented proportions. Some speculate that the dollar may no longer be the global currency in the future, an event that would rock the US economy in infinite ways. That is unlikely to happen, however, until there is another national economy and currency that can replace the role that the United States has played in providing the world the most stable economy and monetary system. In short, when the world can place its trust in the Chinese yuan and the Chinese economy, for example, the way that it has with the United States, our economic place in the world becomes vulnerable and the national debt a catastrophic issue. The US fiscal irresponsibility and the massive amounts of debt that it continues to amass makes that moment nearer all the time, assuming that the collapse of China's economy is not the cause of a future crisis. The problem is that we will not know that the US dollar has been displaced until it is too late for us to correct the structural and economic issues that we created.

FINANCIAL ACCOUNTING

It may seem unusual to blame accounting for an impending crisis, but if past is prologue to the future, the vagaries and shifting principles of accounting can complicate financial statements, influence business decisions, and force every balance sheet in America to react the same way in a financial crisis. The best evidence of the counterintuitive impact that accounting principles can have is Congress's and the regulators' immediate suspension in 2020 of certain accounting rules considered too difficult or dangerous to apply in a financial crisis. The FASB implemented its controversial plan to require banks to forecast and book "current and expected credit losses" over the life of loans at the time a loan is originated prior to the COVID-19 crisis. It drew significant criticism then for creating unrealistic principles, focusing only on the loss side, requiring questionable assumptions, and making every balance sheet procyclical. Not too long ago, it was FASB's MMA rules that some commentators argued facilitated or caused the destruction of some billions of dollars of bank capital in the United States in 2008, leading to a global banking crisis.⁴³ Accounting principles that are procyclical, meaning all companies will be hit the hardest in bad economic times when they can least afford it, will artificially create a financial monoculture of risk that could deepen and prolong economic downturns. In March, the integrity of certain accounting rules (CECL and troubled debt restructuring) was questioned by Congress and the regulators. If a principle is integral to the transparency of accounting, suspending it when things get tough undercuts its value. Said another way, the credibility of accounting principles that work only in good times should be questioned.

Regulations and accounting rules drive business strategies, whether economically sound or not. When it was permissible to book the value of assets such as goodwill that are not represented by spendable cash, the distortion created by such rules created perverse economic incentives that added to the losses in the S&L crisis. Perhaps not surprisingly, FASB is yet again reconsidering the proper accounting treatment for goodwill. It is reported to even be considering going back to the much maligned forty-year write-off schedule for goodwill that was criticized after the S&L crisis.⁴⁴ The most startling fact, however, is that accounting principles are created by self-appointed accounting industry repre-

sentatives who are not subject to any federal or state oversight, cannot be asked to provide internal analysis under any Freedom of Information Act, are subject to no presidential executive orders and cannot be challenged as any federal agency could under the Administrative Procedure Act. And yet, once spoken by FASB, a principle effectively becomes law like any statute passed by Congress because federal agencies mandate that companies adopt and use them. While there are admittedly benefits to separating the creation of accounting principles from politics, concern for the health of the economy would suggest that there should be significant oversight of what FASB does and why it does it.⁴⁵

ALL THE ABOVE

It is impossible to choose among these financial, economic, political, and other random factors to identify the event that will trigger a future collapse of public confidence and lead to a financial panic. Indeed, it could be all or some of the above that impact each other and create a wave of uncertainty that leads to the disappearance of confidence. It could be an unanticipated event such as a pandemic, an earthquake, or floods. It could be a yet unknown but well-intentioned government policy. We will likely not know what will cause or trigger the next financial crisis until it happens, and then it will be too late.

We can deduce, however, that the next financial crisis is likely to include elements of many of the usual contributing factors with some new technological twists. But getting too focused on specific causes misses the point. We will never identify the juncture where confidence in the market dissipates and the run to financial security begins. That is an emotional reaction, not an economic fact. The challenge is to build a system and databases that can better predict financial crises and provide government overseers with the time and tools to avert reaching that point, and if they can't, at least be effective enough to reduce its potential impact. It is a multidimensional problem driven as much by psychology as it is economics. The government should be building economic and technological defense systems while it is constructing predictive databases and considering alternative plans that can be rolled out to provide soft landings for a range of different economic tsunamis. It needs better information to understand the kinds of safety nets that it

should be prepared to deploy. The more information that it has, the more reliably and authoritatively it can speak and act, communicating a greater sense of confidence.

Regulators should be spending a major portion of their time and regulatory resources preparing for that event, rather than worrying about the regulatory minutia that Congress delegates to them. The Dodd-Frank Act in July 2010 directed five federal regulatory agencies to promulgate the Volcker Rule to prohibit proprietary trading and private fund activities that had almost nothing to do with the last financial crisis or any since the Great Depression. Those five agencies have spent the better part of ten years promulgating thousands of pages of rules and supporting statements, all to interpret and enact a prohibition driven by just eleven pages of statutory language about a potential risk that has not caused significant financial losses or a crisis in almost one hundred years. There are dozens of similar examples of overwhelming resources being dedicated to issues that are at best politically or symbolically important but never had any role in causing a financial crisis.

PUTTING MRS. O'LEARY'S COW IN CONTEXT

The *Chicago Evening Journal* reported that the Great Chicago Fire of 1871 was “caused by a cow kicking over a lamp in a stable in which a woman was milking.” It was the stable of Catherine O’Leary. Case closed. Chicago had its culprit. After a crisis of that magnitude, that kind of closure is important, whether it is correct or not.

Like physicists probing the meaning of the universe and how it all works, we have spent much time analyzing the past, the present, and the future of financial crises all with the goal of helping to identify a way to prevent them in the future. The fundamentals are not hard to see. There is usually a shiny new investment or shift in industrial development that pumps the economy up and reallocates large amounts of capital. Since the early 1800s, westward expansion, railroads, cotton, automobile manufacturing, international trade, aggressive new types of financial intermediaries, housing finance, and the internet have all created such unique financial opportunities. When such events lead to assets being overpriced and investors becoming overleveraged, they create dangerous economic bubbles. A combination of human, natural, and government interactions can subsequently undermine confidence, forcing those bubbles to explode. This pattern is likely to continue until we better understand when it is happening and when smart remedial actions are necessary.

This suggests a solution beyond simply looking for and blaming a Mrs. O’Leary’s cow for the financial fire. Questions about why no exec-

utives went to jail or why Wall Street got bailed out are legitimate questions that have complicated answers that could fill another book. Suffice it to say that there is never a shortage of government prosecutors trying to put executives in jail after a crisis. But aggressive and even reckless lending or investment practices are not crimes as unsavory as those practices may appear and horrendous the downfalls they create may be. Neither are politically driven mistakes crimes; rarely are they even exposed. Ask yourself who will be blamed if a malicious force or foreign authority disrupts or takes over the Fed wire, ATMs, or check-clearing systems in the United States.

Imposing market discipline on financial executives to avoid bad behavior is critical, but history tells us that it is an effort that can be complicated by the roles that the government and politics play. Financial bubbles can be created when government regulation inadvertently creates economic incentives that businesspeople try to take advantage of. How should the blame be allocated in those cases? Focusing all the time and resources that the government has at its disposal on retribution, punishment, and the creation of additional rules and ratios misses the point. The next crisis is never like the last one, and it is usually not simply the product of corporate misbehavior. Economies are an extraordinarily complicated blend of private and public sector goals that make it unreasonable to search for the one cow that caused the crisis.

If we were scientists, we would try to determine which of the variables that create financial crises could be modified or controlled and then attempt to engineer them to guide the economy away from disaster. Human nature is not one of those variables. Humans rush toward the next shiny financial rainbow and dash away from the smell of collapse. That will never change. Corporate behavior will always be calibrated by financial growth and profit targets and their respective risks and compensatory rewards. Financial literacy could be radically improved and would correspondingly reduce the risks inherent in the economy. But unless every high school and college curriculum in America includes mandatory banking, finance, and investing courses, that will not change either. Likewise, unanticipated natural disasters such as pandemics will continue to occur, and nothing that humans do or say will change that.

The variable in the formulation of a financial crisis that is most controllable is what the government does to instigate, oversee, prevent,

and ameliorate the events that impact them. Therefore, significant time and resources must be devoted to building a smarter system of government oversight and intervention. More than just a frenzied explosion of political and administrative bluster is required to avoid or quell a crisis. The government should have the most sophisticated data analytics upon which it can make judgments. It does not. Such databases should be subjected to rigorous analysis by state-of-the-art artificial intelligence programs run by supercomputers. They are not. Policy makers should be able to run multiple scenarios to evaluate the cost-benefit analyses of every government action taken and understand how their efficacy will deteriorate over time. They are not. Technology provides the opportunity to improve the variable that is most controllable and that impacts almost every facet of the economy—government decisions. In the hands of experienced regulators, technology will be a powerful tool.

If we think of the regulation of financial services as the operation, distribution, and protection of a network, we can learn some lessons from network professionals. They deploy artificial intelligence to leverage machine learning algorithms to detect *abnormal network behavior* that may suggest “an impending network outage, pinpoint its root-cause and prescribe the necessary actions to correct the abnormality.”¹ At that point, software-defined automation using “supervised learning” can adapt and fine-tune the prescribed actions based on the network’s unique characteristics and needs.² The combination of human oversight with intelligent machine-driven applications can find economic abnormalities and forge the best solutions to address them. That takes forethought, planning, and standards to ensure that humans end up in control. These efforts must begin as quickly as possible, particularly given the increasing opportunities that malicious technology is creating for bad actors to attack the integrity of the US financial infrastructure.

Many believe that hundreds of new risk-averse laws and regulations will deter the next financial crisis. Articles are continually being published arguing that banks routinely slip back into their pre-Dodd-Frank bad habits and take large, reckless bets. Sometimes it’s leverage loans, sometimes CLOs, and sometimes it’s the *investment du jour*. That inevitably bolsters the chant for more regulation. Unfortunately, banks, which make money by taking risk, are already so regulated that they and financial markets are partially operated by their federal and state overseers. As we have seen, that half-loaf approach inevitably creates incen-

tives that drive behavior. It is an endless cat-and-mouse game that is based upon a faulty premise. It will never work, no matter how much regulation is enacted until it becomes smarter, more targeted, technologically enabled, and less politically motivated. Assertions that endless regulation makes for a safer and more stable economy are largely political pabulum to reassure an uneasy public.

There is a clear need for and role of financial regulation in America. But the current system of oversight offers overly burdensome and economically distorting regulation of a portion of the economy on the front end and smartly attired undertakers on the back end. Securing the stability of the system is much more complicated and requires a more balanced approach between the need for financial stability and the freedom of financial companies to become critical generators of a vibrant economy. We have done a poor job of striking that balance. America will do much better when there is less bureaucracy and political ideology and greater use of technological resources involved in protecting the financial fabric of the country. As to removing political ideology, I am skeptical as to how far that can go. But I can envision a database and the deployment of artificial intelligence programs that would provide more sophisticated abilities to evaluate red flags and select the next areas most likely to nurture a crisis. I can easily see a smarter form of financial regulation in the future. Meteorologists have Doppler radar to accurately predict storms down to the streets that will be affected. Where is our financial Doppler system? The government, along with financial executives, must have the databases and computing power to be able to accurately see red flags developing, predict alternative financial futures, and make course corrections using the experience that they have. That is where resources should be directed—a better, smarter, and more balanced system of financial oversight.

Government regulation of financial services should not be eliminated. It should be retrofitted to become more effective, streamlined, and technologically enabled. In some respects, it should be expanded to cover more participants that impact financial markets. No matter how laudable social goals such as the protection of the environment and the humanization of corporations are, many of the panics discussed in this book tell us that using government directives to effectuate social policies through financial regulation without a rigorous analysis of the

short- and long-term effects of doing so can have measurable economic downsides.

Finally, the government must focus its attention and resources on the protection of the country's critical financial infrastructure. The actions taken so far to incorporate technology into regulation have largely been rudimentary. The sum of White House roundtables, congressional hearings, and executive orders about the role, benefits, and threats of artificial intelligence and new technologies equals a lot of talk that only scratches the surface of the actions that need to be taken. We need a serious effort at implementing these new oversight strategies as soon as possible. That is the way that we can better understand, predict, and avert the next financial crisis. The stakes have never been this high. The safety and security of our money, financial institutions, and economy are synonymous with our physical safety in ways that we never could have imagined. Nothing less than the control of global economies and human life is up for grabs.

Financial crises produce a predictable set of reactions that always seem to end with the self-congratulatory announcement that the government has identified Mrs. O'Leary's cow and appropriately punished it. It would be beneficial to spend equal time in the future trying to develop a model to identify the *next* Mrs. O'Leary's cow, how it can be prevented from being where it can kick over the lantern that burns down the economy, and how the fire department can be more prepared and better equipped to douse the fire. Better yet, if cows were better educated about the dangers of fire, perhaps they might be able to understand how to avoid the hazard altogether.

EPILOGUE

You may be wondering why I decided to pursue an alternative path as I left the White House on March 15, 2017. In the 150 steps it took to walk from the West Wing to the main gate on Pennsylvania Avenue, I reached three conclusions.

First, I wanted to launch the comprehensive agenda of reforms set forth in this book, but I concluded that it was more than any administration would want to consider. Second, I knew that to push this agenda, I would need to spend enormous amounts of time convincing legislators, regulators, and my fellow governors of the Federal Reserve of its merits. That was a task that I expected would end in frustratingly small steps, and I was not willing to endure that at this point in my life. Last, I realized that I could find no good reason to subject myself and my family to the Senate confirmation process, which in my view has become an extraordinarily unpleasant and dysfunctional process.

In just 150 steps, I had decided that I could not succeed no matter the level of energy and enthusiasm I brought to the job. I do hope someone is willing to put their back into it to improve the financial services system and the regulation of it. The American people deserve it.

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Most important were the contributions that I received over several months from my colleague of almost forty years, Robert H. Ledig. He has spent his career making me look smarter than I am. Robert M. Fisher, a brilliant lawyer/economist I have worked with over the course of my career also provided me exceptionally insightful comments. Finally, the many hours that Richard Pratt and I have thought about, debated, and considered the issues raised in this book have provided me with a lifetime of intellectual challenges and ideas that I hope have seeped into this book. I owe him much. Similarly, the experience that William Isaac has generously shared with me over the years that we have worked and written together has been a wonderful grounding for the development of this book.

A list of a who's who of other banking lawyers, regulators, technologists, and insightful people have also contributed to his effort. They included Greg Baer, Brian Brooks, John Carlson, A. Patrick Doyle, Peter Gutzmer, Richard Klein, David Lesser, Mickey Marshall, Oonagh McDonald, Cantwell Faulkner Muckenfuss III, Alex Pollock, Sarah

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It is impossible to write anything worth the time of any reader without the contributions, insights, criticisms, and inspiration of others who are generous enough to do so. I am lucky to have these people in my life. I hope that they understand how valuable their comments were to the creation of this book.

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point increase in the capital ratio raises loan spreads by 13 basis points. Second, the additional cost of meeting the liquidity standard amounts to around 25 basis points in lending spreads when risk-weighted assets (RWA) are left unchanged; however, it drops to 14 basis points or less after taking account of the fall in RWA and the corresponding lower regulatory capital needs associated with the higher holdings of low-risk assets.” This calculation relies on realistically estimating the expected discounted cost of a crisis because of stronger capital and liquidity requirements. The analysis does not, however, reflect the fact that Dodd-Frank repealed many of the authorities that the Federal Reserve and the FDIC used to control the collateral damage to the economy in the last crisis.

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