SEVEN CRASHES

The Economic Crises That Shaped Globalization

HAROLD JAMES

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Harold James

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Contents

Acknowledgments vii

Introduction: How Prices Shape Globalization 1

1 The Great Famine and the Great Revolt 26

2 *Krach* at the Margins 52

3 The Great War and the Great Inflation 83

4 The Great Depression 121

5 The Great Inflation: The 1970s 167

6 The Great Recession: 2008 205

7 The Great Lockdown: 2020–2022 257

Conclusion: The Next Great Globalization 307

Notes 317

Index 359

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Acknowledgments

This book is an outgrowth of the Covid-19 pandemic and the dramatic change it wrought in everyone's lives, and in geopolitics. I had been thinking about globalization and its discontents for over thirty years, and became intrigued by the way that there are historical reversals, as in the Great Depression, but also new phases of intense interconnection. The Covid crisis seemed to me to hold analogies with previous moments—the mid-nineteenth-century famines and revolutions, or the supply shocks of the 1970s—when globalization was reimagined and reconfigured.

My initial reflections appeared in the form of articles, one more academic, "Seven Transformative Crises from European Revolution to Corona: Globalization and State Capacity" (*Financial History Review* 27, no. 2 [2020]), and the other for a general audience: "Globalization's Coming Golden Age: Why Crisis Ends in Connection," *Foreign Affairs*, May/June 2021. I should also like to thank the organizers of several seminars and conferences at which I presented parts of the arguments advanced here, including David Bell at the Davis Center for Historical Studies and Markus Brunnermeier at the Bendheim Center for Finance in Princeton; Piroska Nagy and Erik Berglof at the LSE Institute for Global Affairs; Wolfgang Quaisser at the Akademie für Politische Bildung; Piotr Pysz at the Konrad Adenauer Foundation Warsaw; Liz Mohn, Wolfgang Schüssel, and Joerg Habich at the Bertelsmann Stiftung Trilogue; and Raphael Gross and Nike Thum at the Deutsches Historisches Museum, Berlin. Catherine R. Schenk and the Economic History Society honored me with an invitation to deliver the annual Tawney Memorial Lecture in 2022. I also greatly benefited from joint work with Andrew Koger and with Ali Kabiri and John Landon-Lane on the 1919 Peace Conference and on sentiment in the interwar era, respectively. I have also benefited from comments from Michael Bordo and Luís António Vinhas Catão, as well as long conversations with Markus Brunnermeier and Jean-Pierre Landau.

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Introduction: How Prices Shape Globalization

A connected world is breaking apart. Acute food shortages produce famine, infectious diseases spread among an undernourished population, social unrest flares up, political systems are challenged and destroyed. The attention of the world focuses on particular geographic hotspots: some dominate the geopolitical imagination, the eastern Mediterranean, the Dardanelles. The passage between the Black Sea and the Mediterranean assumes a global significance, a thin needle that connects the grain producing areas of autocratically controlled central Eurasia to hungry or starving consumers. Sound familiar? This scenario has replayed regularly over the past two centuries: at the end of the 1840s, in the First World War, and of course in 2022. In the 1970s, the Middle East became the focus of an intense global debate about energy security. The traumas engendered by inadequate food or energy supplies, fears that they are controlled by hostile or malign or simply completely alien powers, the challenges that the coordination of effective domestic and foreign policies pose to governments: these constitute the fundamental drivers that make humans more willing to reimagine how human ingenuity, and new techniques, may be used to solve problems and connect peoples across the world. Crises which at first sight look as if they are purely devastating, bringing death and destruction, prove to be transformative. This book sets out to tell the story of how the transformation proceeds, and also how it is understood—or better, how it revolutionizes thinking and reconfigures the story of globalization.

What drives globalization, the increased economic and political interconnectedness of the world, and what are its vulnerabilities? It is common to think of the globalization phenomenon as an inexorable self-driving process, a peculiar feature of contemporary civilization, fueled by technical change in what is sometimes called, in a term popularized by the economist Simon Kuznets, Modern Economic Growth.[1] In reality, though, interconnectedness is an uneven and erratic development, shaped by collective responses to disruptions and crises. In those moments, prices—or the attempts to suppress them—generate the signals that guide the reactions. Their yoyo movements may confuse and disorientate: they prompt new ways of thinking—sometimes productive, sometimes dangerous.

The disruptions often start with small and initially apparently trivial incidents, such as the appearance of the fungus *phytophthora infestans* in mid-nineteenth-century Ireland, or of a new Covid virus in Wuhan in late 2019, or, for that matter, the assassination of an Austrian archduke in 1914. The economists Ian Goldin and Mike Mariathasan described this problem as globalization's "butterfly defect."[2] The way the subsequent crises escalate out of control should be reminders to pay attention to how small events need to be understood. They also illustrate quite how hard it is to evolve a framework for such understanding.

This book will argue that new institutions—market innovations, but also states that are stronger and extend their capacities—generally arise out of responses to a particular kind of disruption: supply crises. The result changes the way people conceive of interactions—or of the economic process. These supply crises are moments when fundamental items such as food or fuel become scarce, prices rise, and new channels of production and distribution are required. A central question for politics is how to respond to the challenge of dramatic price movements. The yoyo moves lead to revolutions in government, as well as in business organization. Some systems are so rigid that they are completely destroyed by the economies of shortage: the brilliant Hungarian economist János Kornai strikingly demonstrated how scarcities, and the hoarding and dysfunctionality that they prompted, undermined and finally destroyed centrally planned (communist) economies.[3]

The response to the Covid-19 crisis exemplifies the conundrum inherent in thinking about the direction or linearity of the globalization dynamic. Initially it looked as if the pandemic fragmented the world, destroying multilateralism, tearing up complex cross-border supply chains, and in this way reversing globalization. The interruption of normal commerce at first depressed prices as supply chains shut down; then as demand for goods replaced demand for services, shortages appeared and prices surged. Prices showed a whiplash or bullwhip effect.[4] Countries became locked in clashes for scarce resources, and some—Russia in particular—tried to exploit their grip over supplies of energy and foods. Then war disrupted production further, and in 2022 the world harvest was reduced, food supplies fell, and major scarcities appeared.

The biggest countries seemed to be beating a retreat. China looked less to export-led growth than to a new model in which domestic consumption would be the driver of the economy. The United States turned in on itself and, even after a new presidency in 2021 which rhetorically embraced multilateralism, left the Trump-era tariffs substantially in place. Russia turned aggressively to confront not just Ukraine but the whole international economic and political order. Smaller countries, by contrast, continued to depend on trade for essential goods: food, but also complex engineering and electronic products, as well as medical and pharmaceutical supplies.

The experience of history, however, is that some sorts of globalization crisis lead to more, rather than less, globalization: they produce a new energy for communication and innovation. There is thus a major uncertainty hanging over today's politics: what will Covid do to globalization? Ever since the 2007–2008 Global Financial Crisis, indications have proliferated that globalization might be reversing, or moving into stasis or slow-motion "slobalization." Globalization was often supposed to act principally on wages and prices—producing constant deflation by bringing large numbers of new workers into a global workforce and devaluing the activities of traditional blue-collar manufacturing workers in the rich countries. There followed a populist backlash against migration and trade, and countries tried to limit financial flows. Countries of immigration worried about effects on wages and labor markets, while countries of emigration lamented a brain drain that would deprive their societies and their tax systems of expensively educated individuals. In economies with widespread job losses, trade appeared to many people as a zero-sum game, with imports destroying livelihoods. Capital movements were condemned as being potentially wild and destabilizing, and the policy-making community responded with plans to manage them. Twelve years later, the coronavirus, a global threat, magnified the challenge to globalization. Many populist or antiglobalist politicians immediately concluded that globalization was to blame.

Recognizing that pandemics or climate change are global threats should produce coordinated global responses. Crises appear to emphasize how globalization must be guided or managed. Skeptics will quickly point out that reality is often more complex. Covid often prompts people to think first in terms of a national self-interest: America First. But policy-makers will also look over their shoulders and see and compare what other countries are doing, and perhaps what they need to learn. Countries immediately embarked on a race to be first with a vaccine in order to secure a longer-term scientific and technical ascendancy: vaccine nationalism then drove the United States, the United Kingdom, Russia, and China to clash more nakedly, but also generated bitter conflicts within the European Union. The turn to trade protectionism and heightened competition between powers set the scene first for the aggressive use of energy supply as an instrument of blackmail, and then for Russia's attack on Ukraine in 2022. Other global challenges, too, initially provoke a new nationalism and protectionism. Even climate change, like Covid-19, might be used to build new strategic advantages: in particular, northern countries—Russia especially, but also Canada and Norway—may be beneficiaries of warmer temperatures and easy navigation through the Arctic. In consequence, geopolitics appeared to be omnipresent in the wake of the pandemic, in the response to the war in Ukraine. A geopolitical mindset limits the capacity to produce coordinated responses; and globalization in consequence appears to be on the defensive, on the retreat.

Is it? How far will the pushback continue? Coordination, the cooperative interaction of governments, certainly becomes harder. There is thus a need to rely on other, privately produced dynamics that may hold the world together. But will those new initiatives be sufficient to solve major supply constraints?

Modern Economic Growth

Globalization in an economic sense involves the flow of goods, labor, capital, and also ideas across national frontiers. Such flows respond primarily to knowledge about scarcity, classically expressed in terms of price signals. The world before modernity was regularly disrupted by severe supply shortages, most frequently and dangerously of food, in response to vagaries of the weather, other natural events, but also the devastation caused by human conflict. The future was uncertain, and guarding against the shortages required intelligence or supranatural assistance: as when Joseph responds to the pharaoh's dream of seven healthy cows eaten by seven ill-favored and lean-fleshed cattle by arguing that storage needed to be built up in the years of plenty to cope with the coming seven years of adversity. Or when Moses leads his people from the fleshpots of Egypt, when they need nutrition and the prophet tells them that God will rain bread from heaven.

The phenomenon of population movement is old—there is some archaeological evidence from classical antiquity of links between the eastern and western parts of the Eurasian landmass.[5] But in a modern sense it developed, with quantitatively much more substantial movements, from the middle of the nineteenth century. It plays a vital role in the models used to describe Modern Economic Growth, or MEG. It is quite striking that the term "economic growth," let alone MEG, was hardly used before the 1940s, when it became popularized in part as a social science counterpart to a "cybernetic-system view," which in the natural sciences was best exemplified by the engineering of a nuclear chain reaction. The world then became a "series of objects or systems that could be modelled, predicted, and manipulated."[6] There were consistent interactions and feedback loops—and they moved across the boundaries that demarcated states and empires.

The key point of the new vision of the economy was that capital and labor can be substituted for each other in the standard form of the growth model, in which output is driven by a function that combines proportions of capital and labor with a coefficient expressing technology improvements. In the 1950s, Moses Abramovitz and Robert Solow elaborated growth models that would be corroborated by the work of John Kendrick: these analysts found a remarkable surge in productivity in the twentieth century, which they attributed to technology improvement.[7] These growth models were then extended, especially by Paul Romer, to suggest ways in which technology was endogenous to the growth process, rather than an external deus ex machina that explained mankind's transformation. Technology was applied and adapted through "intentional actions taken by people who respond to market incentives." The number of interacting people was crucial to the process, and a larger stock of human capital would thus produce more growth. Consequently a widening of that stock, by free international trade, pushed the growth process.[8]

In the nineteenth century, the fundamental push was generated by the comparison of returns on mobile factors (labor and capital), but also on the immobile factor, land. Characteristically in the globalization of the second half of the nineteenth century, people (the labor force) moved to where labor was scarce and wages correspondingly high and land cheap, in areas of settlements: with the largest flows to the United States, Canada, Argentina, and Australia. By contrast, Europe had expensive land and lower wages, especially outside Britain. An aristocracy, with massive political influence, wanted to keep things that way. The movements of people drove higher output, but also eventually raised wages in the countries of emigration, and the cost of living fell. And then emigration occurred from poorer countries. The lands of settlement or immigration also experienced a shortage of capital, with higher returns to capital, and capital also flowed in large quantities in order to expand production at the frontier of cultivation through investment in infrastructure, construction, equipment, and so on. The preponderant share of British capital exports went to the Americas, Australasia, and Russia.[9] The result of this globalization was a convergence, limited in the nineteenth century because it basically operated only in temperate parts of the world suitable for European-style farming. Technology appeared limited in its applicability, and in particular could not be transported easily to parts of the world with high populations, low wages, and low educational attainment as measured by western standards. In this set up, capital and labor regularly flowed together as a combination that powered development, but not everywhere in the world.

That early age of globalization is thus quite distinct from a more modern pattern, in which products are manufactured in complex supply chains that span the world, and information technology allows easy transfers.[10] Higher education levels now meant that technology could permeate more easily. Hence in the late twentieth century the globalization process was more geographically generalized as capital often moved to areas with low labor costs and a potential for a large productivity catch-up. But even here there was an often-noted paradox, in that capital did not always flow to poor countries, and in some cases rich countries (especially the United States and the UK) became major capital importers.[11]

A central feature of the growth model is the assumption of a general rate of technical change. But it might be objected that discovery is a random process, though with more scientists and experimenters there are likely to be more innovations, and on a broader front, over a long time frame. The critical difficulty lies in the application of technology. In practice, there was often a long gap between a potentially transformative innovation and its wider useful diffusion. Matthew Boulton and James Watt produced a better steam engine in 1776, but the first railroad in Britain, the short Stockton-to-Darlington line, opened only in 1825 to connect collieries to the North Sea, and the first steamship, the paddle-driven *SS Great Western* of Isambard Kingdom Brunel, crossed the Atlantic in 1838. So it was only in the middle of the nineteenth century that railroads opened up interior spaces all over the world, and steamships carried goods globally. Orville and Wilbur Wright flew a powered heavier-than-air machine in North Carolina in 1903, but it was only really in the 1960s that the jet aircraft opened the way to large-scale transportation. Aniline was isolated in 1826 by Otto Unverdorben, but only in 1854 did the reduction method developed by Antoine Béchamp allow the large-scale production of dyestuffs. Medical or pharmaceutical uses took longer, with a derivative synthesized in 1908, sulfanilamide, having extensive antibacterial uses. Some other medical discoveries required even more time to be extended across the world: Edward Jenner developed the practice of vaccination against smallpox in 1796, but it was 1977 before smallpox was completely eradicated. And Jenner's son, sisters, and wife all died of tuberculosis, a disease for which a vaccine (Bacillus Calmette—Guérin, BCG) was first used in 1921.

The long durations in which new innovations are developed and applied might be changed by new political constellations. One revolutionary driver, for instance, the container ship, was developed in the 1950s, but only had a significant impact on shipping costs and practice in the 1970s because of changes in the regulation of carriers and their interactions with shippers. Big disruptions, notably wars, limit trade, but also drive an intense search for quick solutions—such as the synthesization of nitrate production for both explosives and crop fertilizer in the First World War, and the development of penicillin in the Second. It is thus wrong to simply assume that the dissemination of technology is a steady, even-paced process. It is distinctly shaped by government priorities: choices as to why certain products matter: railroads, steamships, aircraft, vaccines, and so on.

What is true for technical development also applies to financial innovation. Thinking about new approaches, new financial instruments or forms of organization, often develops slowly over long periods of time; but then suddenly price signals indicate the possibility of extraordinary profits, and the necessity of new thinking and radical innovation.

The problem might be considered more generally. Globalization and Modern Economic Growth constituted a nexus, with limits to global interchange regularly slowing down and hindering development. Growth came with a promise of abundance. The beginning of Henry James's late masterpiece *The Golden Bowl* evokes the history of empire and its material products, placing the United States in a continuity with the imperial power projection of nineteenth-century Britain and ancient Rome. A Roman prince is introduced to us, shopping in London: "The Prince had always liked his London, when it had come to him; he was one of the modern Romans who find by the Thames a more convincing image of the truth of the ancient state than any they have left by the Tiber. Brought up on the legend of the City to which the world paid tribute, he recognised in the present London much more than in contemporary Rome the real dimensions of such a case." James's prince stopped now and then "before a window in which objects massive and lumpish, in silver and gold, in the forms to which precious stones contribute, or in leather, steel, brass, applied to a hundred uses and abuses, were as tumbled together as if, in the insolence of the Empire, they had been the loot of far-off victories." But the violence of connectedness is not just about carrying products over distances. People are producing, becoming more productive in globalization. Jeff Bezos told his shareholders in his final letter as Amazon's CEO: "If you want to be successful in business (in life, actually), you have to create more than you consume. Your goal should be to create value for everyone you interact with. Any business that doesn't create value for those it touches, even if it appears successful on the surface, isn't long for this world. It's on the way out."[12] If everyone would create more than they consume, there would be permanent surpluses.

Human interactions also awaken needs and desires that globalization promises to fulfill, thus ending the cycle of scarcity. That is the promise that Henry James's fittingly named Prince Amerigo is meditating. If everyone wants to satisfy their needs or desires, there are shortages: and shortages prompt a new push for more globalization to supply the unmet needs.

Ideas about Connections

One of the most persistent debates in the analysis of globalization is the extent to which it is shaped by ideas. In a simple version, many people assume that the mid-nineteenth-century surge of globalization was driven by powerful, rhetorically gifted men who took the message of the great original thinkers Adam Smith and David Ricardo on comparative advantage and popularized and familiarized it. This was, after all, still the age of Napoleon, in which a "Great Man" theory of history, propagated by prophets such as Thomas Carlyle, flourished. Richard Cobden and John Bright's Anti–Corn Law League looked like the model for a political mobilization behind a distinct economic model—free trade and laissez faire. In the late twentieth century, Milton Friedman and Friedrich Hayek were supposed to be the drivers of a new neoliberal globalization. However, economists are generally quite skeptical of these claims for the intellectual influence of economists and prefer interest-driven explanations.[13] Historians also push back against the Great Men theories: they point out that the reforming nineteenth-century British prime minister Robert Peel was operating in a predemocratic system, but still needed to respond to quite straightforward economic interests and deal with a clash between landowners and agrarians who depended on the tariff to maintain their income, and employers and workers who saw the tariffs imposing costs.[14]

Reflections on the limits on intellectual influence led the economist George Stigler to complain, "Why, when the economist gives advice to his society, is he so often and so coolly ignored? He never ceases to preach free trade—although the sermons are getting less frequent—and protectionism is growing in the United States." And he went on to conjecture: "I believe, on the contrary, that if Cobden had spoken only Yiddish, and with a stammer, and Peel had been a narrow, stupid man, England would have moved toward free trade in grain as its agricultural classes declined and its manufacturing and commercial classes grew. . . . The repeal of the Corn Laws was the appropriate social response to a shift of political and economic power."[15] Indeed, Stigler went on to argue that the fact that economists are not so numerous, or so expensively equipped with research facilities, as cancer researchers indicated a quite correct social estimation of their usefulness: "I must also concede that if economists are being used efficiently, their impact on policy will be small. Remember my estimate that our research bill in economics is perhaps one-quarter of a billion dollars, and considerable parts of this are spent in support of economists with conflicting views. Those who believe that economists are more important than this meagre standard by an order of magnitude, must believe that society is seriously underinvesting in economics."[16] Stigler wrote that in 1976: at a moment when economists had become more influential in giving policy advice because of the Keynesian revolution, but before the popularization of financial services and the increase in financialization drove large numbers of private-sector firms to employ economists (and economists consequently became better remunerated).

A good way of thinking about the dynamic of influence is to contemplate when and how long-term trends arise and how they may be interrupted. There may be great historic movements: Modern Economic Growth, or the related phenomenon of a centuries-long ("suprasecular") downward tendency of real interest rates (r) to fall.[17] These megatrends suggest obvious "laws" that can be formulated in terms of just two variables: in this case the upward movement of growth and the downward movement of interest rates. Globalization pushes up growth rates (g), while at the same time political modernization, institutional reforms, and the growth of representative governments with property-owning legislatures make for a greater stock of safe assets, and consequently a lower rate of return (r). The English financial revolution of the late seventeenth century created a model that could be imitated, and lower secure rates then also reduced the costs of other types of capital, though that might be subject to quite varying risk premia.[18]

Influential theories of stagnation or capitalist catastrophe, from Karl Marx to John Maynard Keynes, included arguments about the falling marginal return on capital as more capital accumulated. Keynes described a decline in the marginal efficiency of capital. And Marx had picked up this thinking from an even older and more influential tradition, Adam Smith's and David Ricardo's reflections on the stationary state.

The nature of the long-run dynamic is rightly a key element of any assessment of future prospects, but it has always been elusive and problematical. Marx famously failed to elucidate his law of the falling rate of profit, in his words "the most important law from a historical standpoint," and "a law which, despite its simplicity, has never before been grasped and, even less, consciously articulated."[19] Marx started to rethink the question of falling profits, and in 1868 wrote to Engels: "If we consider the enormous development of the productive forces of social labor in the last thirty years alone as compared with all previous periods . . . then the difficulty which has hitherto troubled the economist, namely to explain the falling rate of profit, gives place to its opposite, namely to explain why this fall is not greater and more rapid."[20] Shocks suddenly arise and force a reevaluation of previous conclusions about the long term. Would-be interpreters of the big trends are thus always compelled to shift the focus of their attention.

One particular problem concerns what indicator we think we should measure as r: the inflation-adjusted (real) return on safe assets such as government bonds of strong industrial countries? The marginal cost of capital? Or average returns on capital that have already been sunk into investments? Analyzing the long-term trends of average return has led to an influential formulation about the rate of return on capital, pointing to higher and higher levels of accumulation ("producing infinite accumulation"): that became the subject of a famous analysis by Thomas Piketty.[21] Piketty's average rate is consistently higher than marginal rates, especially in eras of decline or stagnation: perhaps because in fact it is largely concerned with returns on land or real estate that might properly be thought of as the rents for scarce locations: the middle of Paris or New York or Silicon Valley or Shanghai.[22] The phenomenon was the major driver of inequality in the nineteenth century, and again at the end of the twentieth century: Piketty sees the rise of inequality proceeding at an even faster rate in the twenty-first century.[23] His version of $r > g$ may simply be a reflection of a globalization that pushes up land values, especially in globally connected centers (and indeed, his measures of inequality fall during the deglobalization phase of the mid-twentieth century). Thus he insists that even technical progress, which might be thought of as the triumph of human ingenuity or human capital over the cold types of dead capital that constitute his definition (land, buildings, or financial capital), will drive a need for more buildings, agglomerations, patents that will drive up the returns on capital. In this view, humanity will not be rescued by the "caprices of technology."[24]

It is worth thinking about these caprices of technology more closely. The long term does not always prevail. The relationship between interest rates and growth shifts radically in periods of crisis and uncertainty. The real return on capital becomes unstable in moments of very large price movements. Considering developments *sub specie aeternitatis* is a luxury of philosophers, but the large-scale vision of the major trends is not always helpful in telling individuals or entrepreneurs what technologies they should take up. Especially at moments of crisis, we are uncertain about the future, its meaning and direction. Bankruptcy is decided not by the long-run viability of an idea or business concept, but by an ability to meet immediate financial requirements, or by the way assets and liabilities in a balance sheet are interpreted. It is precisely at the moments of doubt and hesitation that individuals, governments, and markets are open to influence by persuaders: powerful analysts, interpreters, and rhetoricians who can provide some light, and who claim to know the future. The responses then help to shape the way the future develops: at such a moment there are multiple possibilities or trajectories. If we consider these in static terms, we will think of multiple equilibria. Keynes wrote of how "the uncontrollable and disobedient psychology of the business world" determined the marginal efficiency of capital.[25]

Over the past centuries, the course of globalization has thus been shaped by the way countries respond to crises, economic shocks that are often accompanied by the appearance of financial crisis. In these dramatic shocks, every expectation about normalcy, or about the smooth continuation of existing trends, is stood on its head. The most obvious historical break in the upward trajectory of every intensified globalization was the painful deflation of the interwar Great Depression, which intensified belligerent nationalism and zero-sum thinking. It is immediately tempting to see in many contemporary developments echoes of the 1930s. But it is not just the interwar slump that led to a rethinking of what globalization is about, whom it hurts, and whom it benefits.

Demand and Supply

Not every crisis destroys or reverses globalization. On the contrary, some dramatic watershed events led to more rather than less globalization. In the 1970s, the oil shocks altered the policy paradigm. Initially more protectionism appeared as a response to big trade deficits in industrial countries, and as a remedy to exposure to global risk. The Cambridge Department of Applied Economics under Wynne Godley became a base for advocates of a siege economy. But instead of limiting trade, the policy community shifted to deregulation, disinflation, and more openness, with center-left governments leading the way: Jimmy Carter in the United States, James Callaghan in the UK, Helmut Schmidt in Germany.

Crisis and interruptions and shocks come in quite different forms. As a result, analysts who think that they are all alike, or are all variants of the same phenomenon, are likely to fall into a trap of false equivalences. Many historical accounts of crisis thus warn against the tendency of economists, like generals, mistakenly to fight the last war, with necessarily inappropriate instruments.[26]

To see how some crises stimulate further integration, it is helpful to go back to the beginning of the modern era of globalization. The surge of interconnectedness in the nineteenth century started as a response to a shock: the harvest failures, famines, and then financial and business collapse of the mid-1840s. Europe then experienced a continental wave of revolution in 1848. Marx had given a powerful analysis of how global integration was driving the world and producing vulnerability and exposure. But the economic shock of the 1840s did not reverse the course of integration. Instead prices rose, trade expanded, governments reduced tariff barriers, capital surged, and people moved across continents in response to the experience of misery but also to the promise of new prosperity.

Why do some shocks foster globalization, while others seem to reverse globalization? Some people will describe the trajectory in terms of intellectual fashions—the victory of the free-trade economics of David Ricardo and John Stuart Mill in the mid-nineteenth century, or of the so-called neoliberalism of Milton Friedman and Friedrich Hayek in the 1970s. But the question about the influence of theoreticians only leads to another question: why policy is open to particular influences at certain moments.

The more plausible explanation for thinking about the aftereffects of traumas lies in the character of the shock. Not all crises are the same. In particular, we should distinguish between supply and demand shocks. Economists analyze the influences on key indicators—output and prices—by differentiating between influences that affect aggregate supply and factors that shape demand.

A supply shock changes the ability of producers to make goods that add to overall output, and directly affects prices or quantity inputs or production technology. A negative shock reduces inputs and increases prices. A positive shock increases inputs and lowers prices. The supply shocks thus move the equilibrium price level and equilibrium output in opposite directions.

By contrast, a demand shock affects spending by buyers, whether individuals, businesses, or governments. It might be expected to affect output and production: a positive shock leads to more economic activity, a negative one diminishes activity. But in this case, equilibrium prices and output move in the same direction: up when the demand shock is positive, down when it is negative. Financial crises, when they emerge out of a malfunctioning or ill-constructed or badly regulated financial system, are simply negative demand shocks, destroying the ability of individuals and businesses to buy products, and pushing down both prices and production. The course of globalization was interrupted by two serious, very negative, demand crises, in each case brought about and amplified by financial turbulence: the Great Depression of 1929 to 1933, and the Great Recession after the 2007–2008 financial crisis.

Conversely, moments of radical innovation in financial services produce a sugar or adrenaline rush: prices and production move up. Sometimes financial crises may also result from negative and positive supply shocks, both of which generate excitement on the part of innovative entrepreneurs (and frequently also fraudsters—and it is difficult to tell the difference except after the event). Then the picture gets blurred as elements of both the supply shock and the demand shock are present, and our ability to draw simple lessons from price movements and behavior is reduced.

Negative supply shocks may just be temporary, in which case we may expect a short surge in inflation, then a deflationary interlude, and a relative return to normalcy or the preshock pattern of price behavior. They may be persistent, with expectations that the price of the scarce good will be permanently high: modeling of that scenario suggests that the long-term effect, after an initial spike, on underlying or core inflation would be a small augmentation. Finally, the shock may be the beginning of a long-term continued upward movement in the price of the scarce good, and in this case the modeling would suggest that the core rates of inflation continue to rise.[27] All modeling efforts of this sort assume that there is a clearly discernible pattern: however, the big historical shocks that shifted the course of globalization were quite different. They were not normal or predictable events. They brought substantial dislocations. Their outcomes were uncertain. They caused profound political trauma.

In these circumstances, the responses by intelligent people trying hard to see what the future might hold actually transformed the structure of production and distribution. The radical character of the shock spurred a search for alternatives: new products, but also new mechanisms to move goods. In the two major episodes covered in these pages, the 1840s and the 1970s, supply problems prompted a transportation revolution. It was not that the transformative technologies, the railroad and the container ship, were completely novel. The uncertainty and the political disruption pushed, or eliminated barriers to, a much wider implementation that would transform the supply problem by radically reducing transport costs.

The character of the shocks impacts the way they change attitudes about integration, or globalization. Modern globalization began in response to a very abrupt negative supply shock, in particular the response to the traditional problem of premodern economies, harvest failures and crop disease leading to mass hunger. Food prices, along with prices of other necessities, shot up, consumption fell back. The negative shocks also radically transform distribution networks: small intermediaries are eliminated, often with a substantial initial cost to general well-being. In many crises of this kind, it is the same sort of suppliers who are vulnerable: shopkeepers in the famines of the 1840s, or in the First World War, small shops and restaurants in the pandemic that erupted in 2020. They are often blamed for the problem, and at the same time their business model collapses and they fail.

The negative supply shocks of the mid-nineteenth century and then in the 1970s produced the most obvious globalization surges, as measured by the metric of the relationship between international trade and production (see Figure I.1). But the shock of the First World War also constituted a restriction of supply: there were food shortages in belligerent European states previously dependent on transatlantic shipping routes that were now restricted by economic warfare, but also a lack of rubber, of nitrates, of non-ferrous metals. That shock too pushed a brief restoration of world trade in the 1920s.

In the twentieth century, the Great Depression, which led to a deglobalization push, was primarily a demand shock. People interpreted the catastrophe as poverty in the midst of plenty: there was an oversupply of grain (and other commodities) that drove down prices. The policy answer was demand management. Governments needed to generate more demand and push up prices. The intellectual response was that capitalism and the market had failed. The curse of underconsumption might be remedied if governments could somehow engineer a rise in consumption.[28]

The case of the 1970s, when a new wave of globalization and innovation in international governance began, is more complex. It can be considered as a negative supply shock, but one which originated as a result of roaring global demand. Supply and demand shocks can be linked: in this case, a large positive demand shock in the 1960s, fueled in part by

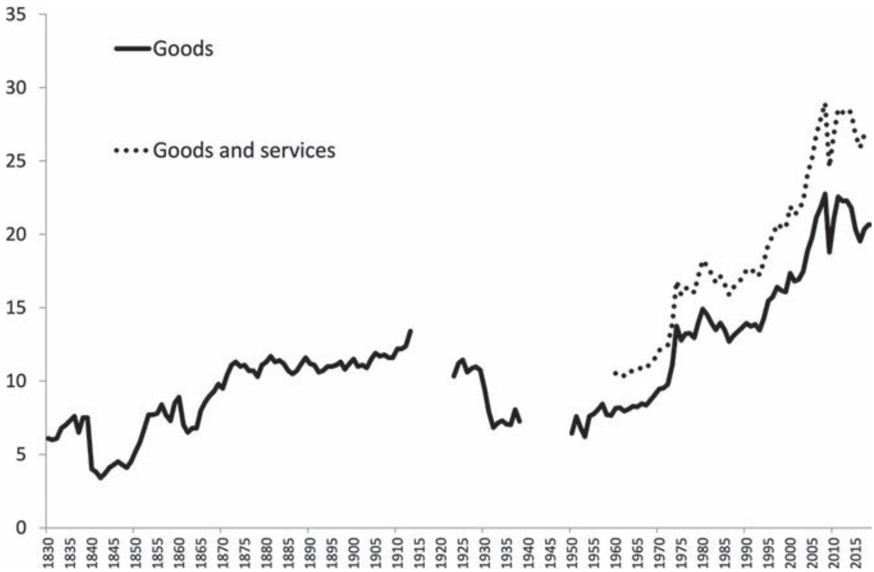

Figure I.1. Ratio of global exports to GDP (percent) (Source: Luis Catão and Maurice Obstfeld, Introduction to Catão and Obstfeld, eds., *Meeting Globalization's Challenges: Policies to Make Trade Work for All* [Princeton: Princeton University Press, 2019])

monetary measures in the United States, triggered shortages of commodities, and then action by commodity producers to restrict supply in order to raise prices through monopsonistic action. Some of the supply constraint came from old-fashioned causes, with bad weather reducing crop yields or inducing harvest failure. The most striking case of a control of supply, which then served as an attractive model for other commodity exporters to emulate, was the oil cartel OPEC. Large oil price hikes in 1973–1974, and then again after the overthrow of the shah and the 1979 Iranian Revolution, combined with supply restrictions to produce scarcities: the problems of the 1840s made a comeback. There were all-round shortages—of food, of oil—followed by competition for resources. At the time, it was sometimes thought that the supply constraints were once-only effects, that the harvest failure would not be repeated, and that the oil cartel (and other attempted producers' cartels) would weaken. But then governments in rich countries tried to postpone the needed adjustment to a new structure of relative prices by pushing expansion further, and in this way generated persisting rather than temporary inflation.

In today's post-2020 version of a supply shock, shortages of food but also of some key elements of supply chains (from glass vials for storing and delivering vaccines to laptops and computer chips) are returning. The problems posed by a collapsed Covid-19 economy are not a consequence of inadequate demand, but rather follow directly from governments across the world shutting down economies in order to protect their medical infrastructure from being overburdened.

In these modern negative supply shocks, the shortages are limited to particular sectors of the economy, in a range of intermediate goods needed for production. At the center of the First World War shortages were supplies of munitions, specifically shells, as well as food. In the 1970s it was petroleum, with a surge in demand for fuel-efficient cars and improved household heating systems. In the post-2020 scenario, first medical equipment, some pharmaceutical products and vaccines, then electronic components, notably chips (producing "chipaggedon"). Shortages then have a way of escalating, as supply constraints induce more production problems, and interconnected networks are strained and disintegrate. The scarcities trigger competitions, bidding wars, between different countries for the scarce products. The discussion on how to adapt to scarcity quickly becomes a debate about how allocation is best managed: through experts or technocrats, or through popular and democratic mechanisms. A demand for more popular control emerges. In the First World War, discontent turned into a revolutionary wave that surged from Russia and eastern and central Europe westwards; in the 1970s it brought a crisis of ungovernability; today it drives a debate about government competence and the failure of technocrats. There are often short-lived controversies, about issues such as the supply of maize to Ireland in the 1840s famine, or the supply of steel for shells in the First World War, or petroleum in the 1970s, or vaccines and semiconductors today. The specific problems may well be solved, but the powerful sentiments that they evoke remain as a long-standing feature of the political imagination.

The persistence of anxieties and beliefs about shortages is a response to the overwhelming character of the shock. In the midst of despair, only wild, utopian solutions look as if they stand any chance of success.

Entrepreneurs are wrong-footed in the supply shocks. Financiers, who dream of new combinations for adjusting to the future, come into their own. The uncertainty invites bold spirits to take bets; and in order to do that, they need to conjure up a narrative, a vision of future reality. They hype their products, ideas about a new ordering of world politics and economics, in order to convince. Very often, when that turns out not to correspond to subsequent developments, the visions look not just false but fraudulent. The heroes then turn into fragile humans whose bluff has been called. The following pages pay attention to these apparently magic figures, who end in disgrace and shame: Bethel Henry Strousberg in the middle of the nineteenth century, Ivar Kreuger in the twentieth, and Lex Greensill in the twenty-first.

In supply shocks, governments face the same problem as entrepreneurs: the need to project a vision without knowing what will be the reality of the future. The consequence is that the competence of governments is also frequently questioned. The 1840s and the 1970s led to major crises of legitimacy. In the 1840s, autocratic reactionary governments were blamed. In the 1970s, there was a widespread notion that democracy had failed or (according to a celebrated book by Jean-François Revel) was dying, that industrial societies had become ungovernable, and that autocracies would soon have the upper hand.[29] All that doubt about democracy has returned since 2020—because of another negative supply shock, which the Chinese government initially appeared to handle more effectively than its western competitors.

For some observers of the Covid-19 pandemic, it is populist governments (or "illiberal democracies")—those led by Donald Trump, Boris Johnson, Vladimir Putin, Jair Bolsonaro, Narendra Modi, Rodrigo Duterte—that have profoundly mismanaged the crisis. They took a populist stance on the benefits of lockdowns as an immediate containment measure, and rejected expert or "technocratic" advice. Even in rich countries where the crisis looks as if it has been well handled—in Germany or Japan—there is a surge of protest. Before the storming of the U.S. Capitol on January 6, 2021, the German Reichstag had been attacked, in August 2020. Large numbers of people are desperately looking for new leadership and new visions.

As political leaders are looking for ways out, money offers an easy path. Inflation is an obvious immediate answer to supply shocks. More money in more pockets generates the impression that resources are available to deal with scarcity. In the bidding wars, more resources might follow from more money. That result is of course in part an illusion, as the outcome drives up prices. There are also sequencing effects, with the first winners being able to establish a hold on a particular resource. Those gains then evoke new demands, and new allocations. Initial policy actions may lead to an inflationary spiral, especially if there are powerful groups that demand that governments provide yet more relief. The twentieth-century adaptation to negative supply shocks was thus much more inflationary than the nineteenth-century response. After the 1840s, there was both an expansion of metallic money (after the California Gold Rush of 1849 and the Australian equivalent in 1851) and a growth in bank money as many new credit institutions were created. The First World War was also a supply shock, as governments shut down civilian manufactures in order to concentrate on military production. Widespread inflation was the result. The 1970s, after the supply shock, was the decade of the Great Inflation. Inflation made it apparently easier to respond to the supply shock, and greased the wheels for investment and innovation.

Such inflations superficially stabilize societies, but also increasingly appear as a threat in themselves. They push interest groups to mobilize and organize more, and to lobby in the hope of getting a greater share of monetary and fiscal resources. The extent of that mobilization threatens to pull society apart, and the end result is to destabilize rather than stabilize. Indeed, it might be argued that it was the beginning of an international inflation in the 1960s that pushed the oil producers to organize themselves so effectively. Higher levels of inflation thus eventually generate a pushback against the inflationary consensus. The monetary experiments and the globalization they promoted as a consequence may generate a new ordering framework. After the growth surge of the 1850s and the 1860s, the world turned to internationalize the gold standard as adopted in Britain. After the inflation and liberalization of the 1970s, policy-makers groped for a new solution to monetary disorder and found it domestically in inflation targeting and internationally in a new pattern of institutionalized cooperation, through bodies such as the G-5, then the G-7, the G-20, and so on. The experience of crisis molds the course of globalization for a long time, dictating its fundamental rules and processes.

There is a pattern to the systematic response of a globally connected world: a greater challenge to existing authority, more currency instability, more inflation—but also more globalization. The response will eventually require a complete rethinking of global rules. States face tasks that are increasingly complex and multifaceted, and their bureaucratic capacity is strained. How do economic shocks affect the mental map, the imagination of how the world works? How do expectations and then behaviors change?

Prospects

The following pages examine seven critical moments, but also look at the way they were imagined and interpreted by figures who shaped the response and behavior of subsequent generations. The negative supply shock of the 1840s generated the material for Karl Marx to develop a theory of how capitalism would collapse. Then there was the positive supply shock of the 1870s, following from the transformation of transportation through the steamship and railroad bringing lower grain prices. The crisis theories of a generation earlier were succeeded by a new vision, the acceptance of the views of a trio of subsequently influential writers in Britain and the French- and the German-speaking world. William Stanley Jevons in Manchester and London, Léon Walras in Lausanne, and Carl Menger in Austria, simultaneously but quite independently of each other, developed a new theory of value and an individualistic approach to economic decision-making. None of these nineteenth-century figures made policy or directly influenced decisions—both the theorist of collapse and the exponents of the marginal revolution were marginal men. But they shaped the imagination of the future.

The twentieth- and twenty-first-century figures examined in this book by contrast were all academic economists, but they also played a significant part in public life, and many of them were also policy-makers. Karl Helfferich was a prominent German economist who produced the major textbook on money (translated into English and several other languages) defending the gold standard against what he regarded as crankish critics, and then became a politically well-connected banker. In the First World War, he became Secretary of the Treasury (that is, finance minister), and planned a system of war financing that he believed followed from his monetary theory. He would avoid costs to Germans by—as he put it in a memorable phrase—hanging the lead weight of the billions around the necks of the defeated powers. After the lost war, he misunderstood completely the character of the gathering German inflation and hyperinflation, engaged in savage polemics against the leading politicians of the early Weimar Republic, and contributed a stabilization plan that aimed at ending inflation. He never understood the extent to which the First World War was a supply shock. His name is synonymous with what is now called "fiscal dominance."

John Maynard Keynes became famous as a critic of reparations after the First World War, then as a critic of orthodox fiscal and monetary policy during the great demand shock of the Great Depression, and finally played a major role in rebuilding a viable international economic order after the Second World War. A crucial and foundational role in his thinking was played by the experience of the First World War, which he also applied to the Second: his internationalism in the 1940s looks like a dramatic contrast with his stance in the 1930s but is in fact consistent; he thought demand management in wartime was essential in order to avoid the inflationary collapses that plagued and poisoned Central Europe.

The 1970s constituted a major supply shock, in which dependence on petroleum was briefly used by a cartel of oil producers to attempt to remake the world, and other commodity producers attempted to imitate the Middle Eastern producers. Eventually the world moved to greater global integration in order to secure more and more robust sources of supply. One way of absorbing the supply shock was to accommodate greater inflation, but it soon became apparent that high levels of inflation undermined the social coherence of the major industrial countries and set one organized group against another. The answers generated by Milton Friedman and Friedrich Hayek to that inflation as well as to the wider social malaise set an agenda for a new wave of globalization.

The 2007–2008 Global Financial Crisis generated a negative demand shock comparable only to the Great Depression in the major economies of the North Atlantic, while largely sparing the powerful new emerging market economies. The answers generated by central banks, and notably the Federal Reserve under Ben Bernanke, were remarkably successful in avoiding a general collapse, or a repetition of the Great Depression. But they also created an apparently impossible exit problem: how could the policy measures be unwound? Each attempt at unwinding produced new shocks, such as the "taper tantrum" of 2013, when the Federal Reserve debated reducing its security purchasing program and interest rates began to rise. Consequently the policy community became hooked on what had been intended as a short-term remedy.

The Covid-19 crisis has aspects comparable to previous negative supply shocks. Lockdowns and travel bans interrupted supply chains. Going into the crisis, there was an intellectually dominant interpretation, associated above all with Larry Summers, of the future as lying in a great stagnation with low growth and increased income inequality, as a long-term negative demand shock. Theories of secular stagnation, with sustained low productivity growth and shortfalls in demand, conjured up the world of the 1930s and the Great Depression. This was importantly a misdiagnosis of the Great Depression: as well as a demand crisis, the middle years of the twentieth century brought a technology-driven transformative shift that would reconfigure supply and production.

The mindset that then confronted the worst (or at least the sharpest) economic crisis for hundreds of years in 2020 looked to a repetition of the demand shocks of the interwar period. Faced with the expectation that interest rates would remain at low levels for a very long period of time, big fiscal stimuli packages looked like a free lunch. But then a new problem emerged, and Summers was one of the first to grasp the extent of the new danger. There was not really a replication of a demand shortfall—just a temporary abstention from demand during lockdowns. The pandemic and above all the lockdowns imposed by governments produced quite quickly some of the classic signs of a supply shock: commodity prices rose, as supply chains were interrupted and scarcities appeared. Commentators (as in the 1970s) believed they could identify a new cycle of rising prices.

In the circumstances of the supply shock, space opened up for a new economic interpretation, one that focused less on thinking about aggregates than on the micro-adjustments being made on a very local and particular basis. The large-picture view looked out of date, a relic of twentieth-century economics. The most innovative approach to economics then looked instead on how unparalleled amounts of data and previously unavailable computing power could be made to speak and produce an interpretation or a vision of the future. Economists such as Harvard's Raj Chetty began to push a broader methodological shift in economics.

Letting data speak always seemed like a dream—that had been part of the vision already in the nineteenth century of Marx as well as William Newmarch or Stanley Jevons. In the past, however, analysts always used their prior assumptions and beliefs to impose some order on their data. Now big data and artificial intelligence (AI) combined to conjure the possibility of creating simultaneous multiplicities of competing narratives.

The various shocks have long-lasting effects, with responses that were conditioned by one particular set of circumstances continuing to affect policy responses even when the original circumstances have completely changed. Additionally, when people experience a particular dramatic moment of uncertainty, they look to the past for guidance or lessons. So we also reinterpret past moments in the light of present exigencies. Art historians have an analogy for this, when they consider not only the influence of Raphael on De Kooning, but also the influence of De Kooning on Raphael, or at least on the way that modern viewers will receive their impression of Raphael. The philosopher Arthur Danto consequently wrote of a "retrospective enrichment of the entities" of art history: in the same way, the experience of the 1970s or of 2020 changes our view of the 1840s.[30]

We might derive seven lessons of the seven crises:

1. The turning points of globalization in a world that is industrialized and interconnected do not resemble each other. Each moment of crisis challenges individuals, businesses, and governments in new and unprecedented ways, and leads to a redrawing of the mental map.
2. The lessons drawn from a previous crisis often stand in the way of generating effective solutions to a new problem.
3. Negative supply shocks make for an awareness of the importance of global supplies.
4. Negative supply shocks also lead to price rises; governments often respond by allowing an inflation which they hope will allow their citizens to think that they may obtain more resources.

5. Negative demand shocks push in the direction of national self-sufficiency or even autarky.
6. Negative demand shocks tend to be deflationary.
7. Inflation can be an attractive way of tackling (adjusting to) the immediate consequences of supply shocks, but it does not and cannot tackle the underlying problem of how to obtain reliable and secure resources, over large geographic distances.

The problems of globalization—coordination between very large numbers of independent agents—remain. Governments cannot run away from them. Voters in democracies, but also citizens in nondemocracies who will demand to exercise more voice, need to think about how the uncertainty can be turned into an opportunity rather than a threat.

1

The Great Famine and the Great Revolt

The 1840s provided the initial spur to modern globalization. Europe, on its way to becoming the most dynamic part of the world economy, experienced a powerful negative supply shock, with famine, malnutrition, disease, and revolt. The lessons learnt from misery eventually produced a strong move to greater global integration—globalization—in large part because of the dramatic role that foreign imports of grains played in satisfying urgent food needs in a crisis. France in 1845 imported 56,000 metric tons of grain, but in 1847 needed 757,000; the import figures for Britain and Ireland rose from 354,000 in 1845 to 1,749,000 in 1847. Those imports posed enormous financial as well as logistical problems: How were they paid for? What sacrifices were needed to access and pay for plentiful food? Could payments be made on credit, on the never-never? How could that process be managed? In particular, what institutions were required?

The mid-nineteenth-century upheavals rapidly produced a dramatic transformation of politics and business. There was a revolution in government, when public authorities took on many more tasks concerned with managing the economy, including guiding the course of trade liberalization. Business was also revolutionized through new corporate forms, the limited liability joint stock company as well as universal banks that mobilized capital in innovative ways.

The middle of the 1840s appeared as a classical hunger or subsistence crisis of the ancien régime of the kind that had wracked Europe at the beginning of the eighteenth century in the midst of the War of the Spanish Succession. The historian Hans-Ulrich Wehler called it the "last agrarian crisis of the old type" for Germany or Central Europe, although there have been plenty of twentieth-century famines outside western Europe.[1] But the crisis of the 1840s was also a modern business cycle downturn coupled with a financial and banking crisis. It began with an exceptionally vigorous boom that pushed prices up and seemed to contribute to the creation of scarcities. Prices rose dramatically in Britain, as well as in central Europe. It was in a sense, then, an eighteenth-century crisis, but also a twentieth- or twenty-first-century crisis. Another historian, Jonathan Sperber, thus rightly terms the mid-nineteenth-century turbulence as a "crisis of transition."[2]

The food crisis followed from bad weather and poor harvests, with the weather leading additionally to crop diseases, most famously the potato blight. The weather and the blight interacted, as the exceptionally heavy rain washed the spores of the fungi into the soil so that they attacked the tubers and led to a complete crop failure. This was not a crisis that could have been anticipated: an analysis of price fluctuations in the first half of the nineteenth century suggests that the complete failure was an outlandish event that was "far out of the range of actual or likely western European experience."[3] The food catastrophe was followed by epidemic disease. By 1847, British newspapers were reporting on the fevers that hit the starving population of Ireland:

> It is not food the unfortunate people now want most—it is medical attendance; not additional poor-houses but hospitals, they require. A pestilential fever, more mortal and destructive than cholera or plague, is carrying off the poor. All the food, solid or liquid, on earth could not save them without medicinal and sanitary accompaniments of the most extensive, active, and efficient sort. . . . There is not a house, from Bantry to Skull, that, with scarce a dozen exceptions, does not contain either the sick, the dying, or the dead. The latter lie where they die, or are barely pushed outside the thresholds, and there suffered to dissolve.[4]

On the other side of Europe, there were newspaper reports of cholera in the Ottoman and Russian Empires, and by the autumn of 1848 the disease had reached western Europe.

Most people spent two-thirds to three-quarters of their income on food. From 1845 to 1847 prices, especially in Central Europe and France, ran up. In Germany, rye, used to produce the poorest-quality bread for the poorest people, increased in price from 1844 to 1847 by 118 percent, potatoes by 131 percent, and more expensive wheat by 93 percent. It was the necessities of the poor that increased most in price. In Ireland, some 80 percent of the 1846 potato crop was destroyed by *phytophthora infestans*, and the move in potato prices was extreme. Belgium and the Netherlands also suffered deeply from the potato blight. The lumper, the knobbly and tasteless variety of potato that had practically become a monoculture in Ireland, because it could be grown easily in the poor soil of Munster and Connaught, sold at 16–20 pence (in the old British currency, with 12 pence to the shilling and 20 shillings to the pound) in the autumn of 1845; by April 1846 it was over 3 shillings, and by October over 6 shillings. In this way, the cost of the poorest food was more than the wage of a simple laborer, who could thus no longer feed himself, let alone his family. More expensive foods rose in price more modestly. The wheat price in Britain increased from 55 shillings a quarter (520 pounds) at the beginning of 1846 to 75 a year later, and spiked in May 1847 to over 100 shillings. Starvation accompanied by the outbreak of disease resulted. Modern research largely bears out the contemporary figure of one million Irish dying from hunger and the infectious diseases that followed in the wake of severe malnutrition.

There was thus a quite generalized and destructive negative supply shock. The financial crisis came directly from the food crisis, as speculators bet on continually rising prices in 1847, and were then surprised both by the actual harvest (which was abundant) and by the scale of the grain imports but also of the financing problem. At the same time, another upset came from an unrelated bubble in railroad construction and railroad stock that collapsed. As we shall see, the financial response was also catastrophically influenced by policy measures. The financial crisis and the food crisis accentuated each other. The financial crisis originated in Britain and France, at the time the twin commercial and financial centers of the world, and spilled out to the rest of continental Europe, with hunger spreading there too. Financial contagion also spread to North America and India.

One of the features of a financial crisis is that everything and everyone gets the blame: speculators, banks, banks of issue, governments, the newspapers, the gullible public, even the sick and starving themselves. At the height of the panic in October 1847, the *New York Daily Tribune* wrote about the potato failures: "Reports of the Potato failure continue to be made through the English, Irish, Scots, and Continental press. It is very remarkable that the numerous papers publish reports only of the disease, and entirely exclude those which deny its existence. There is no doubt a partial failure; but we would advise our readers not to enter on 'bread-stuffs' speculation on the faith of English newspaper reports which, in many cases, are inserted from interested motives."[5] There was—as the New York newspaper reported it—money to be made from speculation on rising prices. The next news item in the *Tribune* explained how the British press gave details of the failure of the American cotton crop just after the steamship *Caledonia* arrived in Liverpool with a load of cotton, in an "extremely injudicious and ill-timed" effort to force up cotton prices. The October 1847 crash, with a 30 percent fall in stock prices, thus appears as "one of the worst in British history."[6]

At first it is easy to think that the bad response came from ill-informed policy and foolish policy-makers. The weak and ineffective Whig (or Liberal) British prime minister, Lord John Russell, liked to boast of his ignorance of financial issues, and thought of economics "as a necessary evil."[7] The Irish novelist William Carleton dedicated his famine novel, *The Black Prophet,* to the "Prime Minister of Great Britain and Ireland . . . who, in his ministerial capacity, must be looked upon as a public exponent of those principles of Government which have brought our country to its present calamitous conditions, by a long course of illiberal legislation and neglect."[8] But the stage for crisis had been prepared extensively not by anything the Russell administration did, but by the innovations of its predecessor, the great reform government headed by the Conservative Sir Robert Peel. Peel was not an innovative thinker: he followed conventional wisdom, which he had observed deeply and thoroughly. The great observer of mid-nineteenth-century Britain, Walter Bagehot, wrote of how Peel was persuaded only when average opinion—"second-rate intellects"—took up a position. He represented for Bagehot the commonplaces of the "transacting and trading multitude."[9]

Pushed by the general sense of what was commercially necessary, Peel had embarked on a series of apparently bold modernizing reforms. First was the securing of the gold standard by the 1844 Bank Act, which established a system under which the Bank of England could issue an amount of banknotes as required for normal circulation solely backed by Treasury bills, but required a full gold coverage for any additional notes. The act was the legal underpinning of a monetary system that became globalized as the gold standard. The second legislative measure was the answer to the widespread sense that railroad stock issues were corrupt. A parliamentary committee chaired by a young reformer, William Ewart Gladstone, reached the conclusion that a more transparent process was needed that would guarantee investors complete and accurate information about the railways. A new Act for the Registration, Incorporation and Regulation of Joint Stock Companies in 1844 consequently set up a complex and apparently far-reaching registration process; but the unintended but perhaps predictable result was that public confidence in joint-stock companies surged and there was a new bubble.[10] Third, and most consequentially, the abolition of the Corn Laws (duties on imported grain) in 1846 was designed to provide relief from high food prices. Its political effect was to split the Conservative Party (in which landlords were heavily represented) and bring down the government. Peel also implemented a large-scale program of importing foreign corn to Ireland, and of government payments for the destitute in Ireland.

The combined aftermath of the Peel reforms proved catastrophic. The first obvious consequence was more intense speculation. As one of the London *Times* writers put it in a later survey,

> Earls and Marquises struggled with London capitalists and rustic land-owners to add attractiveness by the sanction of their names; the needy barrister professed affection for a seat at the councils of boards, which seemed likely to bring more profit than the law, and was as importunate as most persons to be ensured that position. Numberless M.P.'s, with a few Aldermen, made a traffic on their presumed responsibility; the plurality churchman and the ill-provisioned curate also were not behind in the general scramble, and the lifesome sketch of the country being engaged in one universal game of hazard was without the least exaggeration realized. Never before were "such times or such prospects."[11]

Figure 1.1. Wheat prices in the UK, 1845–1850 (shillings per bushel) (Source: Calculated from Global Financial Data)

The capital market gave a sense that everything and anything was possible—until it wasn't.

What caused the capital market to turn was the impact of food imports on the balance of trade and payments. The trade deficit required settlement in gold, and gold flowed out of the country. In order to try to reverse the movement, the Bank of England, in accordance with the principles of operation imposed by the 1844 Peel Act, increased its discount rate (interest rate) radically in April 1847. That move helped to reverse the currency drain, but at the cost of plunging business into crisis. Manufacturers and merchants could not get credit. And grain prices immediately spiked, in May 1847: that move intensified the uncertainty, but also the hunger, and the risk of widespread unrest and even revolt (see Figure 1.1).

The crisis looked as if it might have been intensified by the government's funding program. In order to provide famine relief, the liberal government initially proposed to raise two government loans, worth £14 million, for the financial year. When the effect of the first loan operation on government debt yields became clear, the government was bombarded with expert advice to cut spending to avoid a repetition: that meant publicly reversing the commitment to Irish famine relief. It announced the "cessation of all employment on public works and substitution of gratuitous relief in the form of food by Relief committees."[12] The already influential periodical the *Economist* argued that the government loan would accelerate the currency drain and worsen the financial crisis. "The money, it is true, goes to Ireland first, where it is expended on provisions chiefly imported from abroad, and from the dealers there finds its way back to England, to pay the bills drawn against those shipments of foreign grain from abroad, and to be transmitted to the United States, to pay the balance of trade created by the imports of food. The greatest part of the eight millions loan will, therefore, be an abstraction of the capital of the country to meet foreign payments."[13] Perhaps the most interesting part of the *Economist* article, however, pointed to a better future: the supply of Europe depended on better access to foreign-produced foods. How could that be achieved? "Except Russia, Egypt, and the United States, there are no countries in the world able to spare any quantity of grain worthy of mention—and for the surplus of those quarters, there are nearly one hundred millions of people now waiting, in this and the adjacent countries. One of two things must now occur. Either must the prices here rise even much above their present rate, or must the foreign supplies be very large." How could the rest of the world reliably supply the cheap grain, and other foods and commodities, required to feed Europe's population?

The *Times* made the same points as the *Economist* about the drain of coinage and gold bullion caused by Britain's trade position:

> We have now no accumulations to eat into, and must, consequently, pay for what we use. Concurrently, therefore, with our importations of corn and other provisions (which are now going on at a much greater rate and at much higher prices than in 1846), and, just in proportion as they beget a demand for our manufactures, we must have importations of raw material. Large purchases of hemp and flax are alleged to have been made in the north of Europe for spring shipment, and cotton from the United States is only delayed by the want of ships. Wool from Spain and the Mediterranean, saltpetre, oilseeds, etc., from India, and a host of minor articles have also been kept back by the same cause, and will pour in upon us to make up our deficiencies directly any relaxation shall take place (if such could be foreseen) of the universal influx of grains.[14]

The trade crisis produced two policy effects. The Bank of England raised its discount rate, a move that was expected to bring in foreign gold, but also made it more expensive and difficult for businesses to borrow. The measure thus led to a manufacturing shutdown. The government feared that borrowing to pay for the new crisis expenditures would impose strains on the capital market and drive up interest rates even higher. It would both be costlier to finance and worsen the general panic.[15] Countering the panic thus required fiscal retrenchment.

The fiscal adjustment had immediate and devastating effects. The soup kitchens which had kept people alive in Ireland were closed down in September, a direct response to the financial crisis. Instead, starving Irish farmers were forced into the workhouse. Thirty-six out of 473 medical officers died from famine fever.[16] Substantial emigration occurred, with 100,000 leaving in 1846, 250,000 the next year, and very high levels—around 200,000—in each of the ensuing five years.[17]

In a new wave of the British financial crisis, in November, the government responded to the Bank's appeal by lifting the restrictions of the 1844 Peel Act. The move came too late, in the sense that a great deal of the damage had already been done. In addition to a large number of small banks, four major banks had failed: the Royal Bank of Liverpool, the Liverpool Banking Company, the North and South Wales Bank, and the Newcastle Joint-Stock Bank. Gold flowed into London, the largest amounts on ships from New York, but also from Hamburg and Rotterdam. The *Manchester Guardian* quoted a circular from a Manchester bank stating that gold was "brought to this market by foreign buyers, who have carried it themselves, in their leather belts, from distant countries, because they did not consider it safe, during the crisis, to take bills or credits upon the merchant princes of the largest commercial city in the world."[18]

Bringing in gold from Europe to London just spread the crisis elsewhere. The French paper *Siècle* complained: "The alarm, which had extended from Paris to London, will return magnified from London to Paris, and a monetary and temporary embarrassment will thus be artificially converted into a commercial crisis. Let us consider under what circumstances the Bank of France created that confusion, which threatens to shake public credit? It has chosen the moment when money was abundant at Paris that the Treasury could have procured any sum required at three per cent; when the instalments of the railroad companies of Lyons and the North were paid with the greatest facility, and when the differences in the price of the five per cent stock, carried on from one month to another, had fallen nearly to par!"[19] The representative of Europe's foremost banking dynasty, Anthony Rothschild, complained that the government "must change their manners of doing business, they have completely ruined their credit by the manner that they have behaved to the railway companies." And Betty Rothschild imagined her young son praying "for Papa and for the chemin de fer du Nord."[20]

The financial emergency in Paris obliged the government to cut back on railroad spending, and consequently pushed workers out of their jobs.[21] There had already been rioting in the traditional revolutionary center of the faubourg Sainte-Antoine in May 1847, at the peak of the grain price spike, with the violence primarily directed against grain and bread traders. In November 1847 the financial crisis spread to Hamburg, the major gateway to the markets of Central Europe, and then on from there. The failure of the Schaafhausensche Bankverein in Cologne led to the closure of factories employing 40,000 workers.[22] By December, India had been infected by the financial contagion, with the failure of the banking and commercial establishment of Saunders, May, Fordyce, & Co. In Vienna, the banking house Arnstein & Eskeles, loosely associated with the Vienna Rothschild bank, failed in the early days of 1848.

The revolutionary potential was obvious in Britain. As the *Observer* newspaper put it, commenting on the 10,000 men discharged from railroads, with a large number of Lancashire cotton workers on short time: "Here is an actual army, combining all the elements of terror in its composition—intelligence and physical power, astuteness and desperation—sufficient to strike awe into the hearts of the most fearless."[23] Only Ireland (and Russia) were passive. In Ireland, at the initial stage of the famine, there had been widespread rioting, and secret organizations such as the Ribbonmen flourished. Later on, the weakening effects of disease and hunger were so great that there was little effective resistance. Elsewhere, the economic and social breakdown led to a political flashpoint, in 1848, with contagious revolutionary movements spreading from Paris and Palermo all over Central Europe, after the worst effects of the food crisis were already past. A continentwide tide of revolution swept away a slew of incompetent rulers and dithering governments.

The result was a Europewide questioning of how policy could be more effective, and how the poor might be helped—less perhaps from altruistic motives, but from the simple perspective of self-preservation on the part of elites. It was clear that mistaken policy measures had augmented the severity of the shock, and the crisis is a powerful illustration of Amartya Sen's proposition that famines are man- (or policy-) made.[24] The most stunning example was in Ireland, where the historical consensus explains that British doctrinaire of laissez-faire liberalism led to the disaster.[25] The Whig "ideologue" (Cormac O'Grada's term) Chancellor of the Exchequer Charles Wood thought that "Providence and foresight" ought to have been exercised by all classes in Ireland, including "those who have to suffer the most." But in the view of the British officials, the greatest evil of all was the failure of the Irish upper and middle classes, "those who in their several neighbourhoods," might have had the moral duty to "alleviate the sufferings of the poor."[26] A new twist to that story was recently given by the historian Charles Read, who showed that the fiscal stance of the British government, with higher taxes on small and medium farmers and above all traders, gave the final push: driven into bankruptcy, these entrepreneurs emigrated, and the supply chain broke down.[27] An Irish patriot who emigrated to the United States concluded: "No sack of Madgeburg, or ravage of the Palatinate, ever approached in horror and desolation to the slaughters done in Ireland by mere official red tape and stationery, and the principles of political economy."[28]

Better, more competent institutions were needed. The relatively inexperienced central banks, the Bank of England and the Banque de France, had not handled the crisis well, and were roundly criticized. The *Times* complained of the "extraordinary apathy" of the Bank of England in letting the reserves fall.[29] Its leadership was amateur, and perhaps even corrupt. Governor William Robinson had to resign as his merchant house was wiped out by "imprudent operations in corn."[30]

More broadly, in the wake of the disasters of the 1840s, governments needed to reinvent themselves so as to see their relationship with commercial prosperity in a new way. What is good government? Some analysts of globalization, such as Kevin O'Rourke, have envisaged a definition of politics which sees it as simply a measurement of the gap between the technological possibilities and the amount of global integration achieved.[31] On this metric, politics became notably better after 1850. The events of the 1840s laid the foundation for a wave of productive institutional adaptation, designed to remedy coordination problems raised by a multiplicity of small states with limited powers to deal with mobility: the creation of nation-states in Europe, with new constitutions, notably in Germany and in Italy; and the administrative reform of the Habsburg Empire, culminating in the constitutional compromise (*Ausgleich*) of 1867 and the establishment of the Dual Monarchy (Austria-Hungary).

The U.S. Civil War and the opening of Japan with the Meiji Restoration can also be seen in this context of a nation-building which emphasized the effectiveness and capacity of institutions. Indeed there are linkages with the European crisis. In 1854 emigration from Germany surged to a peak (250,000) in precisely the year that Kansas was declared open to free settlement. The surge of German and Scandinavian immigration into Kansas ensured that Kansas would become a free, rather than a slave-owning, state, and in this way undid the careful constitutional compromise of the Kansas-Nebraska Act. In that way, the surge of new immigrants helped to set the switches for civil war.

The most dramatic pattern for a remaking of government occurred in France, when Louis Napoleon Bonaparte, the nephew of the Napoleon of the French Revolution, was first elected president of the Republic, and then made himself president for life and finally emperor as Napoleon III. He was a largely uncommunicative figure. German chancellor Otto von Bismarck termed him "a sphinx without a riddle"; Adolphe Thiers, the centrist liberal politician he displaced, and who then later managed the transition to a new Republic, called him a "cretin"; and the republican Jules Favre exclaimed, "What an idiot!"[32] In reality, Napoleon III was a French version of Peel, a mediocre figure who soaked up average opinion. His embrace of the man in the street brought state involvement in the promotion of economic growth. He actively encouraged the Péreire brothers to set up a new bank, the Crédit Mobilier, to raise large amounts of money for infrastructure projects, notably more railroad construction. He saw this bank as a way of circumventing the traditional *haute banque*, which he identified with the previous lazy and inactive regime of the constitutional monarch Louis Philippe.

Something of a Bonapartist approach was adopted all over Europe, where the old regimes looked as if they had been ineffective and incapable. The Vienna revolution produced a parody of the Lord's Prayer directed against Chancellor Klemens von Metternich, who rapidly fled town: "Father Metternich, who art in Vienna, give to us a better regime. The will of the subjects be done, in Austria as it is in Hungary. Forgive us our justified insults and screams, as we forgive you the new un-Christian loan. Lead us not into temptation through nonforgeable bank notes, but deliver us from all evil by means of real silver. Amen!"[33]

There was a new bureaucratic reformism in Austria, personified above all by Karl Ludwig von Bruck, who was first appointed as trade minister from 1848 to 1851, and then brought back into government as finance minister in 1855, staying in the position until his dismissal in 1860. He was a large-scale projector, with a vision of an economically and politically linked Central Europe (Mitteleuropa), and his reforms, too, looked Peelite: in 1854 he supervised the liberalization of the stock exchange and started to promote railroads, and in 1855 he created what would be the most important Austrian bank, the Creditanstalt, on the model of the Crédit Mobilier. He explained that it was impossible to simply revert to the prerevolutionary era, "not because of paper constitutions, but because of the conditions of material life, the money economy, economic relations, and the strengthened middle classes and peasantry."[34]

The world could be rescued by more movement—of goods, of people (emigration in the case of the impoverished rural areas of Europe), but also of money. Better transport could bring goods more efficiently: on rails by land, and by steamship across the oceans. Trade became the subject of rhapsodic celebration: "What a gain to the consumer—that is, to the whole community, by reducing the cost of carriage on commodities from one end of the kingdom to the other, creating thus a beneficial interchange of articles otherwise impossible, conspicuous in its results, no less on the poor man's hearth than on the rich man's table! What a saving of time to the merchant to be enabled to move from Glasgow to London, or from Newcastle to Southampton, in twelve hours!"[35]

The combination of the economic crisis and the failure of the broader political reform movement generated a new wave of emigration from Europe (which also helped to raise living standards in Europe). German-speaking Central Europe saw especially high rates of migration. Those poor areas such as Scandinavia with high levels of emigration saw living standards rise more quickly than poor areas with little emigration: for instance, Kevin O'Rourke and Jeffrey Williamson contrast Sweden with Portugal.[36]

Monetary expansion followed the crisis, pushed to some extent by the discovery of gold (the Californian Gold Rush of 1849) and in part by financial innovation of the *crédit mobiliers* that expanded the business of banking. In consequence, very quickly, Europe looked much less likely to experience a repeat of the simultaneous move to political revolution.

Trade liberalization, which was given a model or template in the form of the 1860 Anglo-French agreement (the Cobden-Chevalier pact), international capital movements, and migration all took off after the political revolutions, although there was already a substantial growth of international trade before 1860.[37] Contemporaries were quick to celebrate the meaning of trade policy for political stability, domestic and international, although there was some pushback, especially outside Britain, where critics depicted free trade as a doctrine that would give advanced British industry an unfair advantage. In Germany Friedrich List tried to formulate an alternative, a "national system of political economy," but was largely uninfluential until long after his death. A French counterpart, Charles Gouraud, asserted the virtues of a French mercantilist tradition that he associated with French glory under Louis XIV, Colbert, and Napoleon, but he started off by admitting that the free traders were the most chimerical revolutionaries of the day.[38]

The lesson of open trade was embodied in the idea of world fairs or exhibitions. London's Great Exhibition had been conceived in the euphoric conditions of the mid-1840s as a celebration of British ingenuity and industry, as well as the virtues of peaceful commerce. By the time the ambition was realized in 1851, circumstances had changed. British producers debated about whether foreign exhibitors should be discouraged or excluded: they were almost unanimously opposed.[39] The dependence on foreign grain had become very clear. The *Times* noted: "The display of grain of every kind is a large one, and, as might be expected from all quarters of the world, the greatest number of competitors belonging to different countries being our own, the Russians, the Spaniards, the Belgians, the Canadians, and the United States."[40]

In fact some of the most stunning products at the Great Exhibition were foreign, and not particularly peaceful: the German Alfred Krupp's cast-iron cannon and the American Samuel Colt's revolver. The *Economist* commented: "it may be inferred that the superiority of the United States to England is ultimately as certain as the next eclipse. We shall retard the arrival of that inevitable superiority to the latest possible period by sharing as much as we can in the prosperity of the States. . . . Wages, profit, and interest of money, are all higher in the States than in England; they are the means of progress—and the more we can share them, the more will our progress proceed, *pari passu*, with that of the States."[41] The scientist Lyon Playfair saw continental Europeans catching up and overtaking Britain. For him, the exhibition showed "very clearly and distinctly that the rate of industrial advance of many European nations, even of those who were obviously in our rear, was at a greater rate than our own; and it if were so, as I believe it to have been, it does not require much acumen to perceive that in a long race the fastest sailing ship will win, even though they are for a time behind." He foresaw a globalization based on the "competition of intellect."[42] The event then taught a powerful lesson: opening to international trade was part of getting ideas from other countries in order to enhance performance. Competition was a key part of the capacity to generate competence.

Friedrich Engels in his 1895 Introduction to Marx's *Class Struggles in France* wrote how it had become clear to Marx in 1850 that "the world trade crisis of 1847 had been the true mother of the February and March revolutions, and that the industrial prosperity which had been returning gradually since the middle of 1848 and attained full bloom in 1849 and 1850 was the revitalising force of a restrengthened European reaction."[43] It is not clear that reaction is really the best way of describing the new and quite revolutionary form of governance that emerged in the 1850s and 1860s. The original reactionaries faded, like General Joseph Maria von Radowitz, a paleo-conservative minister and garderobier of King Friedrich Wilhelm IV's "medieval fantasies."[44] They were replaced by ambiguous figures like Louis Napoleon (Napoleon III) and Bismarck: modernizers who built a world in conformity with a new logic. One leading commentator, the liberal journalist who coined the term *Realpolitik*, August Ludwig von Rochau, concluded that the nation-state was "nothing more or less than a simple business transaction."[45]

We can document large general movements of prices, but also individual destinies in these desperate times. The starving left little written testimony, and writers of fiction largely avoided this catastrophe (wars or even plagues gave better literary material). The prominent modern critical theorist Terry Eagleton wondered why the famine was such a neglected topic in literature.[46] Some of the most sensitive writers, such as William Carleton (in the novel *The Squanders of Castle Squander*), eventually reached the conclusion that the experience of starving persons lies beyond the bounds of representation. Carleton's better-known *Black Prophet* documented the way in which famine bred a descent into irrationality:

> Every one acquainted with such awful visitations must know that their terrific realities cause them, by wild influences that run through whole masses, to forget all the decencies and restraints of ordinary life, until fear and shame, and the becoming respect for order, all of which constitute the moral safety of society, are thrown aside or resolved into the great tyrannical instinct of self-preservation, which, when thus stimulated, becomes what may be termed the insanity of desolation.[47]

Thomas Hardy, the Dorset writer who was seven at the time of the food crisis, later set one of his best-known novels, *The Mayor of Casterbridge*, in what he described as a lost world, when the corn price dictated the fortune of society. One of the critical plot twists depends on the ability of an outsider to find a solution to the problem of grain that had been spoiled by the inclement weather. Anthony Trollope, the son of the then-famous novelist Frances Milton Trollope, worked as a postal clerk in the famine-devastated west of Ireland, and did write a novel about the famine, *Castle Richmond*. But he was told by his publisher, the *Cornhill* magazine, that the topic was not suited to a target audience of women and children. So he turned instead to his Barchester novels, set in an English cathedral town and the surrounding countryside, which were much more commercially successful. The commercial middle-class world did not want to read about shortages and starvation. Trollope began the Irish novel, which was in the end published (with little success: oddly, it did somewhat better in Germany), with an apology:

> I wonder whether the novel-reading world—that part of it, at least, which may honour my pages—will be offended if I lay the plot of

> this story in Ireland! That there is a strong feeling against things Irish it is impossible to deny. Irish servants need not apply; Irish acquaintances are treated with limited confidence; Irish cousins are regarded as being decidedly dangerous; and Irish stories are not popular with the booksellers.

The British reading public did not want to read about Ireland or past misery. Trollope added to his tale a heavy redemptive gloss, which does not appeal to modern readers either.

> But though I do not believe in exhibitions of God's anger, I do believe in exhibitions of His mercy. When men by their folly and by the shortness of their vision have brought upon themselves penalties which seem to be overwhelming, to which no end can be seen, which would be overwhelming were no aid coming to us but our own, then God raises His hand, not in anger, but in mercy, and by His wisdom does for us that for which our own wisdom has been insufficient. But on no Christian basis can I understand the justice or acknowledge the propriety of asking our Lord to abate his wrath in detail, or to alter his settled purpose. If He be wise, would we change his wisdom? If He be merciful, would we limit his mercy?

Trollope tried to draw a lesson that the long-run results of the famine had been beneficial, describing first how "a state of things was engendered in Ireland which discouraged labour, which discouraged improvements in farming, which discouraged any produce from the land except the potato crop; which maintained one class of men in what they considered to be the gentility of idleness, and another class, the people of the country, in the abjectness of poverty." But then came the remedy:

> It is with thorough rejoicing, almost with triumph, that I declare that the idle, genteel class has been cut up root and branch, has been driven forth out of its holding into the wide world, and has been punished with the penalty of extermination. The poor cotter suffered sorely under the famine, and under the pestilence which followed the famine; but he, as a class, has risen from his bed of suffering a better man. He is thriving as a labourer either in his own country or in some newer—for him better—land to which he has

> emigrated. He, even in Ireland, can now get eight and nine shillings a week easier and with more constancy than he could get four some fifteen years since. But the other man has gone, and his place is left happily vacant.[48]

Trollope's providentialism is a mild version of the fearful doctrine peddaled by Anglican and Calvinist ministers in Ireland. In 1846, the Anglican priest Alexander Dallas called attention to the imminent apocalypse by using Trollope's postal system to disseminate his tract *A Voice from Heaven to Ireland,* which he wanted to reach all Irish households on the same day.[49] The Calvinist Hugh McNeile in 1847 preached a sermon titled "The Famine a Rod of God": "First—God himself personally directs all the affairs of this our world. Therefore, plagues, pestilences, famines, wars ought to be considered as God's agencies and not merely as arising out of second causes, whether of the state of the atmosphere or the ambition of man. Who hath appointed the rod? Second—Plagues, pestilences, famines, wars are used by God as national punishments for sin. Hear the rod."[50] How were poor people supposed to hear the rod? The most common response was to move away.

Emigration surged from the blighted territories, pushed by misery and pulled by the hope of better prospects across the Atlantic. Maybe we should turn to some nonfictional destinies. In July 1847, at the height of the commercial crisis, a young German immigrant in England, Bethel Henry Strousberg, tried like many others to flee. Strousberg did not get far: his steamer, the *SS Washington*, returned to Southampton harbor because it had not bunkered sufficient coal for the transatlantic voyage. Strousberg, who had absconded with the funds of the building societies he administered, was then arrested and sentenced to three months' hard labor. Then he left—briefly as it happened—for the United States in January 1849. He would soon return to Britain, establish himself as a gifted journalist, but flee again when the details of his past conviction were brought up in public. This time he returned to Germany and remade himself yet again, as the figure who would build up Central Europe by constructing railroads.[51]

Another destiny that would later prove influential: the wealthy Liverpool iron merchant Thomas Jevons, a cultivated and decent man, saw his business fail in 1848. For his sensitive twelve-year-old son, Stanley, a whole world fell apart. He would eventually move to Australia. Strousberg and Jevons became visionaries—in very different styles—of a new economic order. The most immediately transformative visionary of the 1840s crises, however, was a thirty-year-old German philosopher, who used a substantial inheritance from his father, as well as donations from his manufacturing friend, Friedrich Engels, to publish his revolutionary tracts.

Marx, the *Krisenhefte*, and Globalization

The most influential analysis of the multiple crises of the late 1840s was that provided by Karl Marx. Marx's work and legacy are characterized by a fundamental ambiguity that is frequently traced back to the profound intellectual changes or developments that separate the "Young Marx" from the "Mature Marx," with the former seen as a heroic visionary and the latter as the progenitor of the disastrous Soviet experiment. Marx's most dramatic and prophetic pronouncement, *The Communist Manifesto*, written together with Friedrich Engels in the revolutionary year 1848, is also by far his most telling and well-developed analysis of the process of globalization, and it is one which still looks apposite: "In place of the old local and national seclusion and self-sufficiency, we have intercourse in every direction, universal inter-dependence of nations. And as in material, so also in intellectual production. The intellectual creations of individual nations become common property."[52] It is that short and compelling work which is most often used in claims of Marx's relevance for the twenty-first century. It is a pamphlet, a manifesto, which Marx became ever more convinced needed to be underpinned by scientific study: otherwise what would be its basis as a truth-claim? Marx increasingly insisted that science was needed to pierce the veil of ideology.

By contrast with the *Manifesto*, his most mature work, *Capital*, is strikingly incomplete. It offers no satisfactory theory of the basic concepts—value, class, crisis—that lie at the heart of the promised revelation. It says little about the process of globalization, or about international trade and the global character of financial flows, which had appeared to be central to the message of the *Manifesto*. Volume 1, published in 1867, sets out a historical account of how state actions provided for a primitive accumulation of capital, and provides striking vignettes of the deprivations and horrors of industrial society. But at its core is a failure, as one of Marx's leading modern biographers, Gareth Stedman Jones, points out: the work did not identify "the laws of motion" of capital.[53] Jonathan Sperber concurs: Marx the economist was engaged on an odyssey but never reached his Ithaca.[54] Engels had reacted to an outline with the ominous warning: "IT IS A VERY ABSTRACT ABSTRACT INDEED."[55] The second and third volumes were finished by Engels, after Marx's death, but they do not really complete anything.

Marx's achievement is often thought to be an amalgamation or synthesis of British political economy, the French democratic and radical revolutionary tradition, and German romanticism. The latter appeared most emphatically in Marx's early writings, and most revealingly in the often mystical 1844–1845 manuscripts. *Capital* is the attempt to build out from British political economy, and to impose a materialist conception of history on French and German political fantasizing. Marx complained bitterly about German backwardness in economic thinking, with political economy remaining a foreign science (*eine ausländische Wissenschaft*): "Germans remained mere schoolboys, imitators and followers, petty retailers in the service of the great foreign wholesale concern."[56] The synthesis of such divergent national intellectual traditions could hardly ever be expected to be complete. In particular, the romantic German concept of an alienation, in which man's true nature was denied, could not really be precisely documented in what Marx believed would be a materialist presentation of the social and historical process.

The problem of connecting different modes of analysis is evident in Marx's discussion of crisis. It is only recently that the gigantic publishing venture of the Marx-Engels complete edition (*Gesamtausgabe*, or *MEGA*) has been extended to include a critical and decisive link in Marx's intellectual trajectory: the notebooks he prepared on the international economic crisis of 1857, which appeared in 2017 as *Krisenhefte* in *MEGA*, Part IV, Volume 14. The 159 manuscript pages include excerpts from specialized economic and financial periodicals, and statistical series. The first booklet was titled "1857 France," the second, "Book of the Crisis of 1857," and the third, "The Book of the Commercial Crisis." The statistical work was in part a continuation of Thomas Tooke and William Newmarch's *A History of Prices.*[57] What makes the *Krisenhefte* so revealing was that it was undertaken at the same time as Marx laid out in a journalistic and accessible form what a crisis theory might be. He was working as a European correspondent for the *New York Daily Tribune*, a task which provided a major part of his very meagre income, at a time when he was wracked by physical malaise, headaches, insomnia, liver disease, boils, and carbuncles, which he treated with the poison arsenic.

The outcome of this critical phase of Marx's thinking, which launched the prophet on the road to the neglected Berlin publication *On the Critique of Political Economy* (1859) and then to *Capital*, was unsatisfying to the author in two regards. First, he was fascinated at this stage by numbers, and thought the Belgian mathematician and astronomer Adolphe Quetelet had laid the foundation for a new discipline of "social physics." Marx had the intuition that by assembling data on different commodity prices, the valuation of financial instruments, shares and bonds, the operation and the reserves of the Bank of England and the Banque de France, as well as on production and employment, he would be able to uncover connections and discover empirical causal links. He was fascinated by the way in which prices fluctuated, documenting that they could not possibly reflect an unchanging "use-value" (*Gebrauchswerth*) of goods. Looking at data would uncover the fundamental and definitive laws of motion of capitalist society. But he lacked the statistical tools to really carry out this analysis.

One of the people Marx may well have encountered on his daily visits to the British Museum's reading room was Stanley Jevons, who had also been struck by Quetelet's work, and had a much deeper command of mathematics and calculus. Like Marx, Jevons worked on long rows of price series and tried to detect the patterns that drove business cycle fluctuations. He became the father of marginalist economics. Marx, however, seems not to have come across his work, and never refers to it.

It is perhaps too easy to transpose modern beliefs and especially techniques into the searching for connection and correspondence in the mid-nineteenth century. A contemporary academic, armed with STATA or perhaps even just Excel, would perhaps have been able to uncover more patterns and associations in the data, and on the basis of this analysis derive general conclusions about broad economic trends. Thomas Piketty, who boldly titled his major (and wildly successful) work *Capital*, is in this sense the true heir to Marx. Piketty uncovered in his long-term assessment of r (rate of return on capital) and g (growth rates) exactly the long-term "law of motion," the philosopher's stone that Marx had been searching for: the observation that the return on capital consistently over long time periods outpaced the growth of the economy, and thus generated increased inequality. In such a setting, the only way to make oneself was to inherit or marry money. The application may not work so well in the short run. In modern portfolio models expected returns on capital exceed growth, but then the outpacing is often due to some risk premium relative to a risk-free asset, and in crisis times risks increase.

The problem with Marx's legacy lies in the fact that no one in the 1850s or 1860s would have been able statistically to replicate either of the conclusions that Marx thought he had established earlier: a law of the falling rate of profit (the theme especially prominent in *Grundrisse*, the unpublished manuscript on "Foundations of the Critique of Political Economy" that he prepared but then abandoned in 1857–1858) and of the increasing immiseration of the working class. A sympathetic expositor of Marxian thought, David Harvey, observed: "Unfortunately his argument is incomplete and by no means rigorously specified. . . . [T]he text is plagued by all manner of ambiguities."[58]

Second, Marx was increasingly intrigued by the conditions in which political order changes. He initially in 1857 thought he was observing the final crisis of international capitalism. He was particularly eager to show how the most potent new political form that arose after the failure of the 1848 revolutions, Louis Napoleon's Second Empire, was destined to collapse. At the conclusion of a series of articles published in the *Neue Rheinische Zeitung* on the French events of 1848–1850, Marx established a theory about the international spread of crises: "The process originated in England, which is the demiurge of the bourgeois cosmos. On the Continent the various phases of the cycle repeatedly experienced by bourgeois society assume a secondary and tertiary form. First, the Continent exports to England disproportionately more than to any other country. . . . [W]hen crises on the Continent produce revolutions there first, the bases for them are always laid in England." And he prophesied: "A new revolution is only a consequence of a new crisis. The one, however, is as sure to come as the other."[59]

But both the international economy and Bonapartism proved initially quite resilient, and there was no general collapse in 1857 or immediately after. The globalized economy soon resumed its dynamic growth, and Napoleon III even tried to design rules for its operation, in an International Monetary Conference in 1867 that was intended to create the basis for a single universal currency, and in fact laid down some of the operating principles that would be realized in the international gold standard. The emperor faltered eventually because of a foreign policy miscalculation and not in the aftermath of an economic crisis.

Marx's 1857 analysis was not so much concerned with what would become the key elements of *Capital*, underconsumption theory or the law of the falling rate of profit. Instead, Marx at this time was building quite simply on contemporary business cycle theory.

It became standard for authors in the Marxist tradition to call 1857 the first global economic crisis.[60] But that is not right: 1825, following a bust in Latin American sovereign debt, was global, as was the 1837 crash which originated in the United States. Above all the late 1840s saw a general crisis, but it could not easily be described in Marxist terms as originating in overproduction or underconsumption.

A key role in the 1847 story, repeated a decade later in the crisis of 1857, lay in financial strain that required the world's most powerful central bank, the Bank of England, to violate its own rules. Marx saw key lessons in these crises in the Bank of England's suspension of the 1844 Peel Act, the crucial piece of legislation which limited the note issue of the Bank to its gold reserves. This looked like a massive design failure of the underlying institutions of capitalism, which produced systemic disturbances. Marx commented on the crash of 1857: "The truth is the English have very largely participated in speculations abroad, both on the Continent of Europe and in America, while at home their surplus capital has been mainly invested in factories, so that, more than ever before, the present convulsion bears the character of an industrial crisis, and therefore strikes at the very roots of the national prosperity."[61] The international flows provided a central mechanism of disturbance, as Marx saw it: "If the first reaction on Great Britain of our American collapse manifested itself in a monetary panic, attended by a general depression in the produce market, and followed more remotely by manufacturing distress, the industrial crisis now stands at the top and the monetary difficulty at the bottom."[62] Monetary difficulties would trigger a general crisis.

The monetary chaos that Marx was observing originated in the reliance of nineteenth-century monetary policy on a complex mechanism of bill brokers and banks dealing with financial instruments, bills of exchange. The bills could be used multifariously: they might relate to genuine commercial transactions (cargoes shipped across the oceans), but also were frequently simply a credit instrument (bills of accommodation). Any reader of nineteenth-century literature—Balzac, Trollope—is familiar with the economic and emotional distress of protested bills. Marx derived a great deal of his information from the experiences of Engels, a prominent manufacturer and thus also trader. As Engels wrote to Marx in 1857, the commercial world depended on "bill kiting: this way of making money by drawing bills on a banker or a bill broke and covering through another bill before maturity or not, according to how matters are arranged, is the rule on the continent and with all the continental houses here. All the commission houses do it."[63] Marx himself experienced how bills traded at big discounts when he tried to secure the payment in London in British pounds of the dollar bills sent to him by his newspaper employer in New York.

In 1857, it initially looked to Marx as if 1848 was repeating itself—perhaps ironically, since he had been contemptuously dismissive of dreamers who saw in 1848 a repetition of the great French Revolution, and famously derided Louis Napoleon as a joke version of the real Napoleon, with history repeating itself as tragedy the first time and farce the second. The business downturn of 1857 waked a familiar refrain: "The anxiety in the commercial world during the past week has, as you will conceive, in presence of the disastrous news from the United States and from England, been extraordinarily great; it may almost be compared to that which prevailed just after the Revolution of 1848."[64] Marx thought of parallels, while institutional actors thought of drawing lessons about the management of crisis.

The Banque de France tried to restrict gold exports, but Marx thought that the action would be in vain: "Despite all that the drain will set in and if it happens as in [October] 1856 in the gutter the shit will hit the fan."[65] But in fact, as modern economic history research shows, both the Bank of England and the Banque de France were increasingly skillful in managing the money market. The Bank of England derived a substantially increased profit from its emergency assistance to the market.[66] And the French government also realized that it could use greater budget spending to combat the effects of crisis.

The crisis then began to look as if it was a cyclical phenomenon—and certainly not the end of capitalism. As Marx in the *New York Tribune* put it at the end of the year, after the intense phase of the crisis passed: "The arrivals of [gold] specie in London, the somewhat easier state of the money market, and the further progress of improvement in America, combined with other somewhat favourable appearances, have given rise to some little cheerfulness to-day, and to a hope that we are not far from the lowest point of depression."[67] He even formulated a general law: "That if, by overproduction and over-speculation, a crisis has been brought about, still productive powers of the nation and the faculty of absorption on the market of the world . . . will only temporarily recede from the highest point reached, and that after some oscillations spreading over some years, the scale of production which marked the highest point of prosperity in one period of the commercial cycle, becomes the starting point of the subsequent period."[68] Here was a theory of business cycles, not of general collapse.

Toward the end of the French crisis, Marx excerpted a passage from the *Economist*: "The failures that have taken place have not been considerable in number or important in amount; and there has not been the slightest disposition to have a panic, though circumstances certainly appeared to justify one, and though the French have heretofore been extremely ready to rush into panics on the smallest pretexts."[69]

There followed other international financial crises: 1866, in the wake of the U.S. Civil War, and the much more serious and long-lasting crisis of 1873. But Marx looked past them. The first crisis appears briefly in Volume 1 of *Capital*, when he describes how the outbreak was "signaled by the failure of a gigantic London bank, immediately followed by the collapse of countless swindling companies."[70] The 1866 crisis produced an extension of the franchise in Britain, and a push for tenant rights and home rule in Ireland, a cause for which Marx cared passionately. By the late 1860s, Marx had convinced himself that gradual amelioration, and particularly the extension of voting rights, as well as the formation of workingmen's associations, would lead to widespread and progressive political reform. In January 1873, in an afterword to the second German edition of *Capital*, he looked forward to the approaching general crisis: "The contradictions inherent in the movement of capitalist society impress themselves upon the practical bourgeois most strikingly in the changes of the periodic cycle, through which modern industry runs, and whose crowning point is the universal crisis. That crisis is once again approaching, although as yet but in its preliminary stage."[71]

Were financial crises becoming more normal, milder, and less transformative? The 1866 crisis also saw a change in financial structure: bill brokers played a rather reduced role in the London money market compared to banks. After the 1860s, banks grew much faster. The major socialist thinker who extended Marx's analysis to the financial sector, Rudolf Hilferding, whose 1911 *Finanzkapital* remained the most important and influential updating of Marx's doctrine in the twentieth century, focused on how financial institutions led to a more stable, "organized" capitalism. His odd reworking of Marx's crisis theory was that financial sophistication and the rise of big banks made speculative crises less likely.

Very severe financial crises—in particular the major wave of bank failures in many countries in the early 1930s, or the turmoil of the Global Financial Crisis of 2007–2008—initially appear to kill off capitalism. The political response is to modify the rules of the game: strengthen state involvement in the economy and enhance regulation. Such measures put socialist parties in government into an acute dilemma, which was strikingly formulated by Fritz Tarnow at the 1931 Social Democratic Party congress in Leipzig: "now we stand at the sickbed of capitalism not only as diagnosticians but also as—how shall I say it—a doctor who wants to heal or as the cheerful heir who will inherit, who can't wait for the end and would like to help it on with a little poison."[72] Capitalism, even after major financial crises, is malleable and adaptable. There was a substantial irony in that on two separate occasions as finance minister of the Weimar Republic, in 1923, and then from 1928 to 1930, Hilferding tried to save capitalism. In particular he was a major architect of the stabilization at the end of Germany's hyperinflation.

The yearning for radical collapse constantly accompanies moments at which capitalism appears to be in crisis. I remember a chance meeting in the fall of 1987, just after a large stock market crash, with almost exactly the same short-term decline as the celebrated Wall Street crash of 1929, but which however had almost no serious longer-term economic effects. I was in the courtyard outside the Princeton History Department in Dickinson Hall, and saw my distinguished older colleague, the Marxist historian Arno Mayer, in conversation with the recently retired chairman of the Federal Reserve Board, Paul Volcker, an intellectual as well as a physical giant at six feet and seven inches. Mayer said, "Now at last capitalism has ended." Volcker smiled back and muttered, "Hmmm."

A century after Hilferding, it is possible to revisit the old debates about financial crisis and capitalist collapse. Capitalism and socialism, old antagonists, are now converging. Both originally were conceived as giving opportunities to people to give inputs, information, in a decentralized system of allocation in which spontaneous needs and wishes could be fulfilled. Both turned destructive when they produced concentrations of power—concentrations that governmental systems were supposed to regulate and control, but in practice often made only more oppressive.

The search for a deconcentrated and decentralized framework for interaction (busting the gigantic monopolies of Google, Facebook, or Amazon) looks like a reversion to an earlier dream of a social mechanism that can realize large productivity gains without slipping into political abuse.

Volume 1 of *Capital* includes some notorious purple passages, in which Marx looks forward to the moment when "[t]he integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated." This became the origin of a later orthodoxy encapsulated in the phrase "crash theory" (*Zusammenbruchstheorie*). Modern interpreters conclude that this passage bears "little relation to the rest of the volume."[73] It is a relic of the revolutionary desires of the 1840s, the yearning for a transformational moment that repeated the French Revolution, in a world cataclysm. Richard Wagner, who was also radically marked by the fantasies of the 1840s, has his Flying Dutchman yearn: "When does it sound, the trumpet call of destruction, when the world collapses?" (Wann dröhnt er, der Vernichtungsschlag, mit dem die Welt zusammenkracht?). The genius of capitalism was that it supplanted apocalyptic visions: it made crisis productive or creative.

2

Krach at the Margins

The financial crisis of 1873 gave the world a new word, *Krach*. Anglicized as "crash," it became the standard way of describing financial disruption. In January 1873, Karl Marx had written an afterword to the second German edition of *Capital* in which he looked forward to the approaching general crisis, which he believed would "by the universality of its theatre and the intensity of its action . . . drum dialectics even into the heads of the mushroom-upstarts of the new, holy, Prusso-German empire."[1] *Capital* found sales in Germany—unlike Marx's earlier *A Contribution to the Critique of Political Economy* of 1859, which had gone largely unnoticed in his homeland. A copy of *Capital,* for instance, found its way into the library of Germany's leading capitalist and speculator—in other words, its leading "mushroom-upstart"—the railroad promoter Bethel Strousberg. A few years later, Engels wrote with some satisfaction, not to say smugness, to Marx that he had picked up some volumes on German history from a second-hand bookstore that had bought them in a bankruptcy sale of Strousberg's well-stocked libraries.

By the 1870s, the world had become more interconnected. The transatlantic cable had carried news since 1858, though the second cable (1865) was more capacious and reliable. Steamships drove down bulk carriage costs, and at the same time the railroad opened up the interior of continents. In 1869 the Suez Canal was completed and the last spike hammered in America's transcontinental railroad. The American national poet Walt Whitman celebrated in "The Passage to India":

The earth to be spann'd, connected by network,
The races, neighbors, to marry and be given in marriage,
The oceans to be cross'd, the distant brought near,
The lands to be welded together.

And in "To a Locomotive in Winter," he eulogized the "type of the modern! Emblem of power and motion! Pulse of the continent." To give figures: U.S. railroads in 1860 covered 49,000 kilometers, in 1870 85,000, and in 1880 150,000. The equivalent figures in Germany are 11,000, 19,000, and 34,000; France lagged behind at 9,000, 16,000, and 23,000; and Austria-Hungary much further, with 3,000, 6,000, and 11,400. Russia, developing as the grain basket of Europe, opened up 11,000 kilometers of railroads in 1870 and 23,000 by 1880. In 1871, the American Union Pacific Railroad published a pamphlet titled "Around the World by Steam Via Pacific Railway," and in late 1872 the French writer Jules Verne started the serialization of his account of a bet in the Reform Club in London to travel around the world in eighty days.

Whitman's "type of the modern" created a favorable supply shock for European countries: the opening of the world economy in the 1860s, with the steamship reducing the cost of transoceanic transportation, and the railroad opening up continents to transporting export crops. The terms of trade turned in favor of the western Europeans, and they began to think about the effects.

The "great depression" of the 1870s followed quite straightforwardly from the apparently beneficial effects of the positive supply shock: the excitement about new frontiers, coupled with legal changes that made it much easier to establish corporations in many European countries and generated euphoria, overtrading, a wave of company formation, and speculation. The excitement, both in Europe and the United States, focused on railroad construction, the obvious way of opening up new areas that would boost supply. The new infrastructure required new methods of finance, and joint stock companies made possible the accumulation of larger amounts of capital. Railroads dominated the new stock markets that flourished across the world and drew in savings of a substantial middle class. The downside: a deflationary pressure as supplies from across the world came onto the market.

The new availability of supplies of provisions and goods seemed to make anything possible: a mood that was fed by the political changes which included the ending of civil wars or wars of unification in the United States, Germany, and Italy, and a consequent boom in real estate—especially in the new capitals, Berlin, Florence, and Rome, but also in other capitals. The world was competing through investment—including monumental buildings as well as worker accommodation in the hastily erected factory towns. Initially, in the sharp phase of a euphoric boom, wages surged everywhere.

Instability prompted learning: especially as Britain, now very obviously at the center of a financial and commercial global network, appeared much more stable than other countries. Both the new German Empire and Japan after the Meiji Restoration embarked on a deliberate course of studying foreign institutions and adapting them for their own use. That process of absorption often created strains and backlashes, with Germans complaining about the prevalence of foreign models and Japanese intellectuals lamenting the overwhelming of "our distinctive ways and customs." The German ethnographer and satirist Bogomil Goltz explained that "as man is the supreme creature, one might call the German the most perfect human, because in fact he unites all the most characteristic properties, talents, and virtues of all countries." The philosopher Georg Wilhelm Friedrich Hegel had placed German "reflexive depth" at the center of his inaugural lecture in Heidelberg. In Japan, there were sometimes complaints and sometimes exultations about how Japan was learning from a host of alternative western models—sometimes French, sometimes German—while Qing China seemed obsessed with imitating Britain.[2] Elsewhere, militarily weak countries simply had foreign institutions and foreign "learning" imposed on them, on the model of the Chinese Maritime Customs Service established by the western consuls in Shanghai in 1854 in the aftermath of the defeat of the Taiping Rebellion, or the *dette ottomane* revenue and customs administration that Britain and France and other creditors imposed in 1881.

There were thus multiple simultaneous causes of excitement. It was easy for commentators and critics to concentrate on just one, and sometimes analysts give long lists of multiple triggers for exuberance: the railroad, the steamship, the law, a competent civil service, the gold standard, the spirit of the age, the national will. The Prussian-German discussion frequently focused on the changes in company law in 1870, which lifted the requirement of state permission for the creation of a company, and applied through the North German Confederation (and then after 1871 the new German Empire). Like the British Joint Stock Companies Act of 1844, these changes unleashed a flood of often quite speculative company foundations. A general international euphoria arose out of the transition to the gold standard that accompanied German unification, with a promise of new stability, and was accentuated by the payment of the French reparations after the Franco-Prussian War in silver.

The euphoria generated heightened uncertainty about money. The generalized move to gold helped to push down the world silver price, and once that happened no country wanted to be left on the silver standard or with a bimetallic system. Since the volume of gold production in the world was falling off, it was easy for contemporaries to see the trade shock primarily in terms of a particular monetary problem, and from the late 1870s many commentators thought that a remonetization of silver could do the trick and push the world price level out of deflation and into a benign and stimulating inflation. The deflation and stagnation debate had an echo in the twenty-first century, and the complaints about deflation then—as now—masked the extent to which technical progress and the geographic extension of production was producing more, and hence more cheaply available, goods.

It looked as if a connected world needed a single monetary system. The high-water mark of the nineteenth-century movement to world money was the International Monetary Conference called by Napoleon III in 1867. It represented an extension of the principle on which a Latin Monetary Union had already been built between France, Belgium, Italy, and Switzerland. The 1863 International Statistical Conference in Berlin had already suggested a definition of the U.S. dollar as equivalent to 5 French francs, and of the British pound to 5 dollars or 25 francs. Such a redefinition would mean only relatively small changes in the metallic equivalent of the U.S. and British currencies (the pound was at a par of 25.22 francs). It would be relatively easy to change the weights of coins so as to create arithmetically neat equivalents. The new gold coin would contain 112.008 grains of gold, while the existing British sovereign contained 113.001.

Britain would thus need to undertake a slight devaluation in order to make the British coinage fit into the new system.

The attraction of a single world currency is that it makes possible a simple snapshot comparison of prices at any one moment. Already in 1848 John Stuart Mill in the *Principles of Political Economy* casually remarked that only political obstacles stood in the way of an inevitable world monetary unification ("let us suppose that all countries had the same currency, as in the progress of political improvement they one day will have").[3] Walter Bagehot and his influential periodical the *Economist* pleaded vigorously in favor of what seemed like a common-sense solution: "Commerce is anywhere identical: buying and selling, lending and borrowing, are alike all the world over, and all matters concerning them ought universally to be alike too."[4] This obvious appeal was accepted by all the luminaries of the time. In 1866 a U.S. Congressional Coinage Committee expressed exactly this sentiment when it concluded that "the only interest of any nation that could possibly be injuriously affected by the establishment of this uniformity is that of the money-changers—an interest which contributes little to the public welfare."[5]

The 1867 International Monetary Conference proposed the 25-franc gold coin as a basis for a new global currency. In Britain, the Report of the Royal Commission on International Coinage shows a majority of witnesses supporting currency reform. Stanley Jevons, who disagreed with Mill on almost everything, agreed on this and wrote in 1868: "I am much in favour of our joining the Monetary Convention to the extent of assimilating the sovn [sovereign] & the 25 franc piece because I think the sovn would then become the principal coin & medium of exchange all over the world. It seems to me that gold must be adopted as the future money everywhere & this is now recognised by the International Convention."[6]

Gold indeed became the de facto world currency, though national monetary systems were not replaced. And it immediately became the focus of controversy. Economic historian Marc Flandreau convincingly explains the shift in terms of a coordination failure, where France retaliated against Germany in suspending silver coinage while at the same time seeking to protect bimetallism as a domestic regime.[7] A Swiss expert, Carl Feer-Herzog, explained in 1871, "There are two billion in Germany waiting to be converted into gold. . . . The State which demonetizes first will do so at only a small cost, whereas the one which hesitates and waits will take all the losses resulting from previous demonetizations and pay for everyone else. The German economists have perfectly understood . . . what their country stands to gain by taking prompt action."[8] The Banque de France was worried that it was sitting on a large quantity of silver coins that might depreciate in value, and that the public—concerned by the drop in the silver price—would run on the Banque. At that point it seemed logical to curtail or suspend silver coining operations. In that way, the French response set the world on a course to a new international monetary system where the monetary role of silver declined. Napoleon III's adviser Michel Chevalier noted that it was destabilizing for nations to shift (either de jure or de facto) to a standard "at the very moment when it is impaired in value and launched in a movement of depreciation."[9] The economic historian Giulio Gallarotti sets out the logic in terms of a monetary "chain gang," which compelled all countries to move in the same direction, though the United States in going back to gold in what later famously became known as "the crime of '73" was driven less by this set of considerations than by the prospect of a surge in silver production from the Nevada Comstock lode and a likely silver price decline.[10]

The key feature of the post-1873 world was the coexistence of considerable price declines with no really substantial reductions in output. In the United States there was a long-lasting period of downward price adjustment following the Civil War, a repeat of the European deflation process after 1815 and the end of the Napoleonic Wars (see Figure 2.1). The U.S. recession that followed the 1873 financial crisis was mild, with a peak-to-trough decline of industrial output of 10.8 percent, comparable to the 10.5 percent of 1856 to 1858, but much lower than the major recessions of 1892–1897 or 1907–1908.[11] There may have been some increased unemployment, but the worst effects of the episode affected indebted farmers whose revenues were falling because of the decline in grain prices. In the UK, France, and Germany there was no fall at all in industrial output, just a small one-year hesitation in 1876–1877. Measures of agricultural production continued to show dramatic increases. The term often applied to this era, Great Depression, seems like a misnomer. But it did produce some spectacular movements or fluctuations in stock prices.

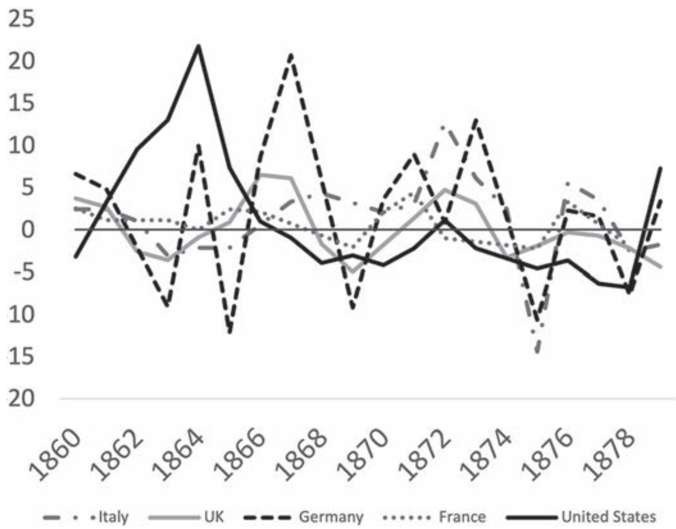

Figure 2.1. General inflation/deflation 1860–1880 (percentage rates) (Source: Calculated from Global Financial Data)

The euphoria of the period of company formation (in German, *Gründerzeit*) ended with major and nearly simultaneous stock market crashes in North America and Central Europe in 1873. The panic started with a collapse in Vienna on May 5, and a renewed shock wave on May 9, with the stock of banks and some speculative railroad companies particularly badly affected. The U.S. crash came after the failure of a major railroad constructor, Jay Cooke, on September 18, 1873. London was barely touched. The Berlin market only crashed in October. In all cases the panic seemed unexpected and wildly contagious. As a contemporary U.S. commentator put it: “A Wall Street panic comes suddenly like thunder from a clear sky. No shrewdness can foresee and no talent avert it. A combination without a moment’s warning can be formed that will sweep away the fortunes of merchants in an hour, shipwreck speculators, ruin widows and orphans, make farmers grow pale, and harm every industrial and mechanical interest in the land.”[12]

From other financial centers, Vienna appeared a microcosm of the world, in large part because it was promoting itself as just that. In May 1873, the World Exhibition opened in the capital of the Austrian Empire in the Prater amusement park. Back in 1851, the British exhibition at the

Crystal Palace had been hailed as a miracle of manufacturing, in a palace of glass and iron that embodied the new age. Vienna was now claiming the industrial mantle. The steel rotunda at the center of the exhibition, designed by the Scottish engineer John Scott Russell and the Austrian architect Karl Freiherr von Hasenauer, was the largest cupola in the world. The whole city was transformed. The old city walls had been torn down and replaced by a magnificent Ringstrasse, with grand new buildings. The new opera house opened in 1869, and the next year the grand Musikverein building was inaugurated. For the 1873 exhibition the grand palace of the prince of Württemberg on the Ringstrasse was turned into one of the world's most elegant hotels, the Imperial. Prominently displayed at the exposition were railroad adventures from across the globe, including Jay Cooke's presentation of maps on the reach of the Northern Pacific Railroad.

Vienna's financial exuberance was enhanced by the opening of the World Exhibition on May 1. The leading Viennese newspaper, the *Neue Freie Presse*, criticized those "warners against swindles and corruption," and invited the world to enjoy the city of "comfortable habits, beautiful women and merry song."[13] The fair itself helped to fuel the overexpansion, and the press now turned abruptly to criticism. As the *New York Times* put it: "Tempted by the bright hopes which were at first held out by the convenience of the Exhibition, and by the belief that thousands of rich foreigners would come here to make purchases as they did at Paris or London, many a firm went far beyond its means in manufacturing articles for exhibition."[14] The *New York Tribune* devoted a front-page article on May 1 to complaining about the "system of blackmailing and corruption" that prevailed among the U.S. commissioners for the exhibition.[15] The event was in part staged as a celebration of the twenty-fifth anniversary of Franz Joseph's accession to the imperial throne: an inauspicious throwback to the violent circumstances of 1848, which had led the eighteen-year-old to replace his dull and incapable uncle Ferdinand. At the grand opening by Emperor Franz Joseph and Empress Elisabeth, the weather was unfavorable.

On May 5, stock market reports coming into Vienna from Paris and Frankfurt were good, but bad news from Budapest about the Franco-Hungarian bank, followed almost immediately by news of the insolvency of a long-established Vienna bank, Russo & Mayersberg, triggered an abrupt reversal of sentiment. It was a *Krach*. It was immediately attractive to blame a whole system. "Senseless conduct" on the Vienna exchange, the *New York Times* opined (as a warning to Americans), must "lead to a disastrous reaction."[16] And on the part of the financial establishment, the immediate impulse was to look for straws to grasp that would generate new confidence. On May 17 the Rothschild bank tried to argue that political developments in France—the move to the right with the collapse of the liberal government of Adolphe Thiers and the installation of Marshal MacMahon as president of the French Republic—would "stabilize international finance." The Austrian minister of finance intervened "generally with success . . . to maintain firms and undertakings about whose solidity there could be no doubt."[17] But there occurred a wave of suicides—every evening in May and June a few failed speculators allegedly stepped into the Danube canal. At least one was a swindler, appropriately named Modern, who simply used the opportunity to disappear, laying out his clothes by the side of the canal and then swimming away and escaping incognito to Hungary.[18] And the crisis was used to draw up a major political indictment of the existing political system. Albert Schäffle, an economist who had briefly been minister of commerce in a short-lived federalist (i.e., opposed to centralizing German liberals) Austrian cabinet of 1871, penned an instant history of the crisis. He complained that the full extent of the disaster had not yet been reached, and lambasted the "communism and robbery conducted by the propertied classes."[19]

The financial events of 1873 appear on their face to be less coordinated than the myth would suggest. The initial Vienna report of the *New York Times* recorded that "Wall Street was very dull yesterday as far as stock speculation was concerned. . . . One of the most important announcements in the street yesterday was that a panic in the Bourse in Vienna was going on, and that the Government had interfered to settle up the financial difficulties."[20] But for a short while it looked as if there was a strong transatlantic linkage. The *New York Herald* reported on May 13 that Austrian securities had lost $100 million in value, and that U.S. securities had also been affected to the tune of $10 million, but that the really serious losses had been confined to American railroad bonds and "obscure securities of a miscellaneous nature."[21] The German government proposed to use French reparations to buy securities in order to stem the panic.[22] Many commentators saw analogies: "Vienna has the same bad reputation as New York, as being the most expensive place for its citizens to be found among civilized cities. A florin [the Austrian currency, generally known as gulden] buys less there than anywhere in Europe. . . . We think it highly probable that this is not all of the disaster. An inflated market like that of Vienna must collapse, and with it will vanish many a financial bubble in Berlin, Hamburg, and Frankfurt. It is not at all unlikely that a period of severe financial depression will begin for the Austrian Empire, and that the value of the depreciated currency will fall much lower."[23] There were some financial links between Vienna and German exchanges in Frankfurt, Hamburg, and Berlin.[24] But London held up, with no sign of a crisis at all: "Of course this report had a distressing influence upon speculation, and the probabilities of the Bank of England again raising the rate of discount were regarded as unfavorable. It is a matter of wonder to street operators and financiers that the prices of securities should have held up so well in London, when nearly every other great capital is now in the midst of financial disaster."[25]

Where there was a crash, it was a large winnowing-out process: some securities fell dramatically in price, while those considered solid scarcely shifted. This was especially true of railroads, the focus of attention in Vienna in May and in New York and Berlin later in the year. Over the period 1873–1875, 36 percent of the entire U.S. corporate bond market was in default, but commentators pointed out that some assets were still extremely secure. The *New York Times* pointed to "the fact is that in times of financial disturbance only old railroad corporations can meet their obligations." Austrian prices give a striking demonstration of the degree of variation between different qualities. The shares of the Österreichische Nationalbank, which on May 1 cost 947 gulden, were priced at 952 on October 13, and the leading railroad stock, Ferdinandsnordbahn, only moved from 2250 to 2010. By contrast, the Bankverein fell from 356 to 92, the Allgemeine Österreichische Baugesellschaft from 262 to 39.

The differences in the extent of price declines cried out for explanation. Analysts tried to distinguish two groups of actors—the established firms at fixed positions at the stock exchange (*Schranken*) and the *coulisse*, the term taken from the Paris Bourse to describe the stock exchange floor where "the mass of shouting and gesticulating speculators" drove markets, an activity which spilled over into neighboring cafes and provincial brokers' offices, with "Faiseurs" und "Matadore," those who wanted to play the game, and those who thought that they could fight the bulls.[26] Schäffle described the process as a decapitalization, in which "the big ate up the small and the biggest ate up the big."[27]

Actually, there was a story that had triggered the euphoria, and then led to a realization that the excitement might be nothing more than a bubble. Railroads and communications were at the center of the frenzy. There was a substantial increase in the number of companies formed and quoted on stock exchanges; and stock prices soared (see Figures 2.2 and 2.3). American bonds had attracted substantial numbers of European investors after the Civil War. When American railroads appeared overheated, those players turned to European securities instead.[28] The vulnerability focused on the boldest—or most marginal—of investors: in Europe Bethel Strousberg, in the United States Jay Cooke. Some, but

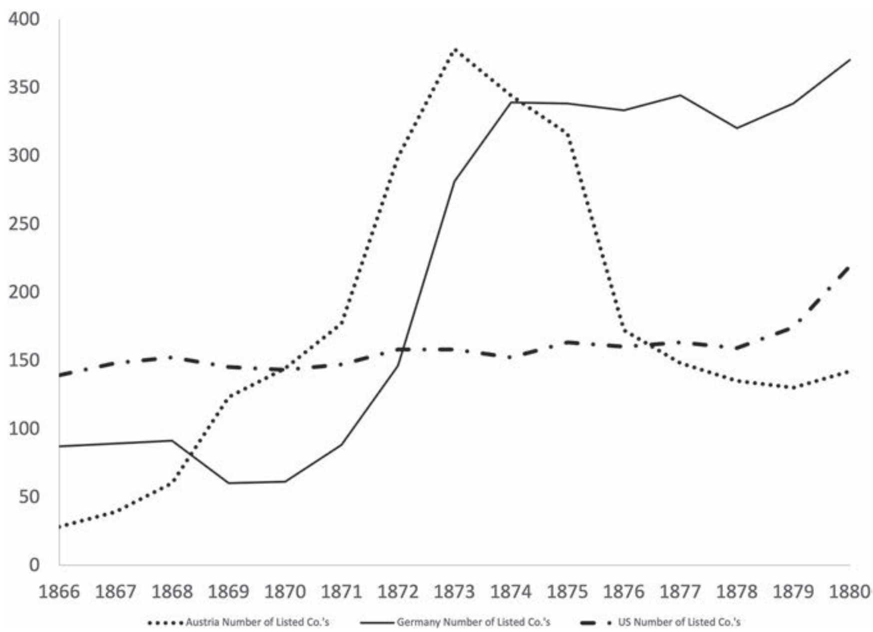

Figure 2.2. Number of companies quoted on stock exchanges, 1866–1880 (Source: Calculated from Global Financial Data)

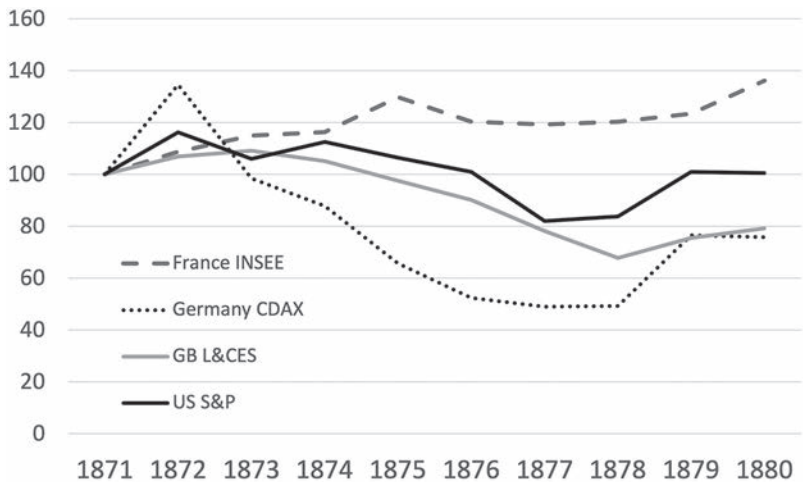

Figure 2.3. Share prices in France, Germany, Great Britain, and the United States, 1871–1880 (1871 = 100) (Source: Calculated from Global Financial Data)

not all, railroads had been puffed up on fraudulent promises, and faced exposure and revulsion.

In early 1873, the new German Empire appeared as if it might experience a politicized stock scandal analogous to that which broke in Austria. The leading liberal parliamentarian Eduard Lasker delivered a striking denunciation of the "Strousberg system" of corruption, in which he detailed the involvement of the high aristocracy and leading government figures in a speech of February 7 to the lower house of the Prussian parliament. Strousberg, a relatively successful financial journalist in 1850s Britain who founded a new paper, a more conservative rival to the liberal *Economist*, had to flee Britain when his fraud of 1847 was exposed, and moved back to his native Germany. He turned into an energetic financier of railroad and other speculative building companies, with a method adapted from his experience of London financing but tailored to the cash-strapped circumstances of mid-nineteenth-century Germany. His companies delegated the construction of a new rail line to a "general entrepreneur" who raised the money needed by selling shares at a price that far exceeded the cost of construction. The operation generated a substantial profit for the entrepreneur and an even greater one for Strousberg, who also founded industrial enterprises to sell the materials—iron, rails, wood—needed for construction. It was a system that invited both speculative and political attacks, which Lasker brilliantly provided. In an initial speech in January, Lasker had stated that he did not know the names of those involved in corruption: "I do not know about the tortuous paths. They are too hard to follow. But this I know for certain: there is trafficking in railroad concessions."[29]

Strousberg was a megalomaniac builder, not just of railroads. He commissioned the architect August Orth, who planned the terminus Görlitzer Bahnhof for Strousberg's main railroad line that would link Berlin to Vienna, to follow up with a whole array of designs. Orth built a new Berlin cattle market, a market hall (which would later be repurposed as the Friedrichstadt-Palast entertainment center), as well as Strousberg's own palace at the Wilhelmstrasse 70, right at the seat of government (the building later became the British embassy), and an extensive renovation of a medieval castle in Zbirow in Bohemia, the center of a gigantic estate on which the financier hoped to create a large steel and iron plant.

Strousberg's most problematical engagement had been in Romania. Romania, in particular the fertile fields of the Wallachian bread-basket, looked like an answer to Europe's food problem, especially after an agrarian reform of 1864 strengthened the position of large wheat-growing estates. Exports surged in the 1860s, together with prices.[30] The railroad entrepreneur signed up prominent German aristocrats, including the dukes of Ratibor and Ujest, to form a consortium to build a variety of lines financed through a bond issue that would be guaranteed by the Romanian government. Since Romania had just been put under a German ruler, Prince Karl of Hohenzollern-Sigmaringen, a Catholic remotely related to the Prussian and now German imperial dynasty, it looked as if the scheme had official approval. Unfortunately, the lines were constructed less quickly than those of a rival enterprise established by an Austrian financier, Count Ofenheim, who would also eventually be tried for fraud and deception. When it appeared that the railroad bonds would be defaulted in the middle of the Franco-Prussian War of 1870–1871, Bismarck stepped in with a rescue package backed by his personal financier, Gerson Bleichröder, and Adolph von Hansemann of the Disconto-Gesellschaft.

Lasker was a close political associate of Hansemann's. Strousberg later penned an extensive and eloquent defense of his actions while sitting in a Russian prison (in relatively opulent conditions) awaiting trial for bank fraud. The fundamental case against Lasker and Hansemann was whataboutism: the liberals had engaged just as much in security pumping and boosterism as political conservatives like Strousberg. Strousberg began by saying that his name was connected with a caricature of business deceit: "founding fever, share swindles, financial crises, hanky-panky with concessions, destruction of share capital, bad and expensive building. Discrediting of an important branch of the economy, demoralization of the public."[31] He wanted to show that in reality all big banks were engaged in a "base adulation of the golden calf" by using methods that were not illegal or dangerous but which would induce less well situated persons to use what would be called deception: "the bad example, crowned with laurels, is the real seducer."[32]

After the financial crisis of 1873, which Strousberg narrowly survived, the attacks continued and the vitriol increased. In the leading popular German magazine *Die Gartenlaube*, which reached its peak circulation in 1875 (382,000 copies sold), the anti-Semitic journalist Otto Glagau wrote: "Speculation and swindle are the two powers which today sit on the world's throne, making civilized humanity sigh and groan, and sicken and fade. Speculation and swindle have made an extraordinary catch, with hundreds of thousands and millions in their nets, and society is impoverished and sucked dry—that is what modern economic science calls a crisis, which is sometimes a trade and sometimes a business crisis. Such crises appear over the last quarter century more and more frequently, with a frightening regularity, and the lordly economists think of them as a necessary evil, analyzing them as contemporary sicknesses to which they offer a 'diagnosis' and 'therapeutic means' to overcome them."[33] Reworking his articles into pamphlets, Glagau presented them as denunciations of a Jewish conspiracy, which united Polish beggars and baptized ministers.[34]

Fascination with speculators and their downfall characterized the American response to the financial drama of the 1870s. Jay Cooke was the North American equivalent of Strousberg, with a very similar method of financing railroad construction, in this case the Northern Pacific Railroad. And railroads were the center of stock exchange activity: in 1873, 96 percent of corporate bonds traded on the New York Stock Exchange were railroad bonds, and 66 percent of the stock traded.[35] Cooke had been a major figure in financing the Union side in the Civil War and used the political contacts he developed to push the railroad across the continent, and into Mexico and Canada. The outrage against Strousberg-style speculators persists powerfully in the American historiographical tradition: for instance, historian Richard White drew up a massive indictment of the railroad barons that drove the new era: "Having helped both to corrupt and to transform the modern political system by creating the modern corporate lobby, which they used to compete against each other, they then found it an expensive and nearly impossible burden to bear."[36] The American West was the equivalent of Strousberg's Romania in European finance.

Cooke's banking house, Cooke & Company, gave credit against the expected returns from the sale of railroad bonds. If the demand for bonds faltered, the bank would not be able to meet its liabilities. But railroads looked more and more precarious. In each year from 1868 to 1870 just one company defaulted, but in 1871 three fell, and in 1872, twelve.[37] Cooke's Northern Pacific was a large enterprise and ran through mostly inhospitable terrain. In 1872 the line reached the Dakota Territory in Fargo, in a rich agricultural area that might supply the European demand for wheat—this was the equivalent of Strousberg's vision of supply based on Romanian grain. But the alternative Union Pacific Railroad and Central Pacific Railroad route had already been completed in 1869, and settlement around that line was proceeding faster. And further south there was the Missouri Pacific network. The Northern Pacific was the marginal addition to railroad capacity.

It was the run on Cooke's bank, with its large exposure to Northern Pacific bonds, that set off a major panic in New York. Banks had originally tried to deal with the emergency through the issue of certificates from a common clearing house, in effect the equivalent of a lender of last resort before the institution of a central bank. The large New York banks that dealt with deposits from across the country were in consequence able to continue to make their payments. The stock market was closed—for the first time as a result of a financial crisis—for ten days. The contagion then spread to Philadelphia and Washington, D.C. Cooke had been a major financier of the U.S. government in the Civil War, selling $500 million of bonds, and a close associate of Treasury Secretary and later Chief Justice Salmon Portland Chase: indeed, Chase's death on May 7, 1873, was probably more of a catastrophe for Cooke than the Vienna *Krach* a few days before. On September 8, two banks associated with railroad finance failed: the New York Warehouse and Security Company and Kenyon Cox. On Thursday, September 18, President Ulysses S. Grant breakfasted with Cooke at his fifty-two-room Italianate Philadelphia mansion, Ogontz, while in New York a hastily assembled group of bankers urged Cooke's New York partner Harris Fahnestock to close down the Cooke bank. The latter action, just before 11 o'clock, started the panic that was extended on the following day: the original stock market Black Friday.[38] The government gave advances to stem the panic, and the major damage was limited to railroad stock: Western Union fell from 92 1/2 on September 4 to 54 1/4 on September 20, and Union Pacific from 26 3/4 to 18 over the same time period. Even Cooke's nonfinancial companies looked secure. General Alvred B. Nettleton issued a statement on behalf of the trustees of Northern Pacific in which he said: "The intrinsic worth and ultimate security of Northern Pacific bonds have not been impaired by the panic. All the property pledged for their redemption still exists. The most unwise course possible would be to attempt to force these bonds or any other railroad securities on the market during the present period of depression and alarm."[39]

These events are usefully analyzed through the distinction made by Anna Schwartz and Michael Bordo between "pseudo crises" and real crises. In pseudo crises, there may be insolvent or illiquid banks, but such occurrences, inevitable in the framework of a dynamic and necessarily uncertain course of development, are neither necessary nor sufficient conditions for a financial panic. The real panic occurs when the monetary authority cannot prevent a sudden and significant contraction of the money stock. Judged by these criteria, 1847 was unambiguously a real crisis, marked by a failure of public authorities. By contrast, 1866 was not, and neither was 1873: even in the United States, where circumstances were closest to a real panic or crisis, and the New York Stock Exchange was closed for ten days after panic selling, and payments were restricted, payments quickly resumed, and by October 22 normalcy returned. Most of the country was barely affected: the major upheaval was restricted to New York, Philadelphia, and Washington. There was never any sign of this kind of development in London, and in Vienna and Berlin markets functioned continuously. There was not even anything fundamentally wrong with the railroad as the engine of America's modernization: as the historian Mary O'Sullivan points out, large companies such as the Pennsylvania Railroad regularly recorded profits and paid steady dividends from 1866 to 1913.[40]

The 1873 panic in New York was very briefly a real crisis in the Schwartz-Bordo sense, with a failure of currency convertibility as banks would not pledge to accept all other banknotes. Currency went to a premium as the New York and interior banks restricted payment in greenbacks.[41] But a majority of the failures in New York were brokerage houses rather than conventional banks.[42] Schwartz concluded that "[r]eal financial crises need not occur because there is a well-understood solution to the problem: assure that deposits can be converted at will to currency whatever the difficulties banks encounter."[43] Outside this brief North American episode, the stress of 1873 was not reflected in any failure of convertibility. The great financial historian Charles Kindleberger rightly observed that "[t]he financial crises in Austria and Germany were primarily asset-market phenomena with little or nothing to do with constriction of the money supply."[44] The asset market was driven by a reassessment not of the overall phenomenon of railroad investment as such, but of the marginal additions to railroad facilities: Strousberg's Romanian empire, or the Northern Pacific's penetration of Montana. The realization that problems proliferated on the margin was now becoming widespread. It changed views of how finance intersected with the broad path of economic development.

Financial development was viewed with suspicion by many contemporaries, and the crisis left a deep impact on economic and political psychology. The scars appear in the popular literature of the time. In 1875, the British novelist Anthony Trollope published his darkest and most powerful novel, *The Way We Live Now*, an indictment of the way a universal financial and speculative frenzy had seized every walk of life: the literary world, where novels were "puffed" just as much as shares on the stock market, or the aristocratic London clubland that depended on unpaid debt. The focus of the novel shifts from a fraudulent lady novelist to a great railroad industrialist, whose schemes and whose wealth in the end amounted to nothing. Trollope in his *Autobiography* wrote:

> Nevertheless, a certain class of dishonesty, dishonesty magnificent in its proportions, and climbing into high places, has become at the same time so rampant and so splendid that there seems to be reason for fearing that men and women will be taught to feel that dishonesty, if it can become splendid, will cease to be abominable. If dishonesty can live in a gorgeous palace with pictures on all its walls, and gems in all its cupboards, with marble and ivory in all its corners, and can give Apician dinners and get into Parliament and deal in millions, then dishonesty is not disgraceful, and the man dishonest after such a fashion is not a low scoundrel.[45]

Literary scholars have tried to find the "real-life" model for Trollope's railroad antihero Augustus Melmotte: some suggest as a model the "railway king" George Hudson, others the Conservative MP and banker and fraud John Sadleir, who made a killing in the boom of 1845–1846, and who poisoned himself with prussic acid in 1856. Some aspects are drawn from Strousberg, a German Conservative MP who, at the time of his greatest apparent prosperity in the late 1860s, and of his frenetic accumulation of real estate, also established himself in London at Grosvenor Place: Melmotte's palace was on Grosvenor Square.

Melmotte's origins, in a faraway country, are completely obscure; and Trollope drops a hint that he may be Jewish. He appears to have superhuman qualities. He apparently can create something out of nothing. His house in Grosvenor Square is a "fairyland" in which money literally transforms things. Finance is all to do with unleashing a wild imagination: "A railway from Salt Lake City to Mexico no doubt had much of the flavour of a castle in Spain. Our far-western American brethren are supposed to be imaginative. Mexico has not a reputation among us for commercial security, or that stability which produces its four, five or six per cent with the regularity of clockwork." But this is a world of illusion. Eventually, vast natural forces catch up with the would-be superman. Melmotte had "studied the criminal laws, so that he might be sure in his reckonings; but he had always felt that he might be carried by circumstances into deeper waters than he intended to enter"; and the storm eventually breaks loose.[46]

Trollope liked the storm analogy to finance: Melmotte's "life had been made dark by similar clouds before now, and he had lived through the storms that had followed them." Yet again: "Of course sooner or later some man must come with a thunderbolt."[47] It destroys him, and he kills himself with prussic acid. The storm metaphor had become a commonplace in financial literature. The most vivid contemporary account of the British stock panics of 1847 and 1857, written by a *Times* correspondent, begins with this meteorological analogy:

> The inhabitant of one of our coasts who watches the operations of a spring-tide, views with surprise and pleasure, which no familiarity with the phenomenon can diminish, the rapid advance of the waters beyond their accustomed bounds; and as ridge after ridge of rock and wide bases of sand disappear beneath the tidal current, and life and buoyancy take the place of what had been stationary, if not positively monotonous, he not unnaturally experiences a feeling of exultation similar to that which arises from the display of unwonted energy. Again, as old ocean from afar calls the waters back in that mighty effort to establish a re-adjustment of the liquid element, the same spectator finds, exposed below the usual line of retrocession, a blank and barren waste, out of all proportion to the advance that had been made, composed, for the most part, of deposits only fit to be the resting-place of slimy monsters, and tainting the fresh air. Quite analogous in its way was that high state of apparent commercial prosperity, especially in our connection with the United States.[48]

The title of the German counterpart to *The Way We Live Now* is indeed *Sturmflut* (Storm Flood), published in 1877, two years after Trollope's novel. From the book's title to its conclusion, author Friedrich Spielhagen never relaxes or lets the analogy drop. Speculation is like building defenses against the sea: sooner or later a wild storm destroys everything. The characters again and again draw the parallel: "Here too," in commerce, says a wise old Prussian civil servant, who offers a running commentary through the pages of the novel, "the normal path of things has been interrupted in the most surprising way, here too the floods have been piled up and then flowed out in a terrible storm—a storm of gold, my ladies—from West to East."[49] The novel deals with a plan to construct a new railway line and a harbor on a German island in the Baltic. The financing of the scheme is carried out by a fraudulent financier, Philipp Schmidt, in league with a corrupt and immoral and cowardly aristocrat. Like most financial novels, Spielhagen's has at least a partial foundation in contemporary reality. There had indeed been a terrible and destructive storm in the Baltic in 1872, on the night of November 12–13, one year before a dramatic stock exchange crash, in which many aristocrats who had placed their trust in a railway building scheme were ruined.

At the climax of the novel, Philipp Schmidt is unmasked as a scoundrel at the spectacular feast to celebrate the completion of his new and lavishly ornamented city palais. On the same evening a flood washes over the Baltic island: "The storm which today raged through the debate in the Chamber of Deputies will rip the roofs off many joint stock factories, shake many big houses which this morning stood firm and dominated the Stock Exchange, and bring others down."[50] The flood is a purgation that washes away the stagnant waters of corruption. The corrupt, lascivious aristocrat is reduced to an intimidated and gibberingly incoherent wreck before he is literally swept away by the storm waves. After the storm, after Schmidt is unmasked, the air is clear at last.

The storm and waves analogies continue to be widely used to this day. The major stock market crash of October 19, 1987, in some ways the first truly synchronized international financial crash, was preceded by an exceptionally violent extratropical cyclone the night of October 15–16, with the BBC's most celebrated weather forecaster dismissing it in advance as a false alarm. The fallen trees still prevented some traders from getting to work on the morning of Black Monday, October 19. The parallels between meteorology and financial forecasting looked too good to be true. In Martin Scorsese's movie narrative of excessive stock speculation, *The Wolf of Wall Street* (2013), the main character's yacht capsizes in a Mediterranean storm as he tries to evade border controls in order to move his illicit gains. Joseph Stiglitz's critique of the international institutions handling the Asia crisis portrayed small developing countries as "small boats on a rough and wily sea. Even if well designed and well captained, they are likely eventually to be hit broadside by a big wave and turned over. But the International Monetary Fund (IMF) program of capital market liberalization had sent them forth into the most tempestuous parts of the sea, in boats that were leaky, without life vests or safety nets, and without training."[51] Waves, however, can be studied and understood scientifically. By the 1870s there was a clear question: why couldn't economists devote themselves to the study of financial waves?

Jevons Looks for Waves and Patterns

The developments of the 1870s in the end did not look like a general crisis. The monetary system held up. The *Krach* was not a *Kladderadatsch*, a general collapse of society and the political order. There was no sustained deflation. There was not even an overall decline in stock prices: 1873 does not even appear in a list of the hundred months of greatest U.S. stock market volatility between 1834 and 1988.[52] A new school of thinking portrayed economic and financial developments—the waves that looked like storm waves—as responses to shifts in subjective assessments. The founders of the new school emphasized the individuality or granularity of decisions and the informational inputs that led to them; they were rightly suspicious of the big-theory pictures produced by classical political economy. In a lecture in 1871, the British banker and statistician William Newmarch explained how economics had been transformed into a science of observation: "Political economy has, of late, followed the path of all other departments of knowledge, by leaving behind, as far as possible, its former a priori abstract, and deductive character, and become, like every other subject of intellectual pursuit in our time, a science of observation, experience, fact, and induction."[53]

Marx combined or synthesized different national traditions—the French revolutionary tradition, German philosophy, and British political economy. He saw his work, with some accuracy, as the historical and scientific culmination of all three. By the early 1870s, a completely different new vision of the economic process emerged—by coincidence in the same three very differentiated cultures, and at the same time. Friedrich Hayek wrote in an essay on the Austrian economist Carl Menger: "The year 1871, in which both [Stanley] Jevons' *Theory of Political Economy* and Menger's *Grundsätze* appeared, is now generally and with justice regarded as the beginning of the modern period in the development of economics."[54] Menger, Jevons, as well as the French economist Léon Walras, arrived at a similar vision, usually summed up as marginalism, at almost the same time, completely independently, and deriving their approach from quite separate traditions and literatures. The essence of the method is sometimes also described as subjectivism, coupled with an insistence on the disaggregation of market phenomena. The new economists were suspicious of overarching generalizations about an allegedly eternal basis for value, and saw a world whose perceptions were continually shifting. They can be seen as the originators of the modern field of microeconomics, of the idea that microeconomic foundations (a multiplicity of separately explicable economic choices) were the basis of economic processes. Though they were very diverse in writing style and in the academic influences they drew on, they were—like Marx—obsessed with discoveries that might follow from the precise study of prices; and they were fascinated by the developments in currencies and money that followed the mid-nineteenth-century rupture. The "marginal revolution" that transformed economics occurred in the 1860s and 1870s, with three iconic figures advancing more or less simultaneously, but separately, a new theory of the determination of value. The coordination of the discovery process looks like a neat parallel to theories of the uncoordinated advance and discovery performed by markets.

In the wake of the apparent coincidence of discovery, a substantial academic debate blossomed as to precisely which conditions created marginalism. What was in the air at the time? The most plausible and conventional intellectual answer is that the marginalists transferred concepts that they found in the natural sciences, and that there was a cross-pollination of disciplines. The economic innovators of the 1870s were all fascinated by the application of analogies from natural sciences. But this explanation does not really deal with the timing issue: the mathematical foundations were laid by the work of Adolphe Quetelet and Antoine Augustin Cournot back in the 1830s, and there were marginalist precursors whose ideas simply did not catch on. The German Hermann Heinrich Gossen (1810–1858) anticipated the very famous trio of marginalists and now often appears in textbooks about economic thought, but failed completely in his lifetime. His brief career as a civil servant ended in 1847, when he resigned in order to avoid being dismissed for being too interested in his academic pursuits and too present in alehouses; in 1849 he turned to an unsuccessful exercise in selling insurance, which he gave up after a year.

Like Marx, he used his inheritance to finance his writing, but could not find a publisher. He believed that his book *Die Entwickelung der Gesetze des menschlichen Verkehrs, und der daraus fließenden Regeln für menschliches Handeln* (The Development of the Laws of Human Relations and the Resulting Rules for Human Conduct, 1854) would make him a new Copernicus, but he died of tuberculosis, broken, demoralized, and unknown. Eventually Jevons would cite him as a forerunner, thanks to the chance that the philosopher and economist Robert Adamson came across his book in a second-hand bookstore and gave it to Jevons. Walras too would write an article in the *Journal des économistes*, entitled "Un économiste inconnu: Hermann-Henri Gossen." The appeal of his work was probably reduced by its exaggerated philosophical and pseudo- or anti-religious claims, notably that selfishness would create paradise on earth and that Gossen was the "priest" of a "new religion."[55]

The three marginalist founders were much more sober than Gossen, but their groundedness alone does not account for their impact. Their work appealed because it could obviously and easily be used to explain the otherwise mysterious fluctuations of the 1850s and 1860s. The scientific parallels for economics were often formulated by the discussion of ocean waves. Menger offered one of the clearest formulations:

> If the locks between two still bodies of water at different levels are opened, the surface will become ruffled with waves that will gradually subside until the water is still once more. The waves are only symptoms of the operation of the forces we call gravity and friction. The prices of goods, which are symptoms of an economic equilibrium in the distribution of possessions between the economies of individuals, resemble these waves. The force that drives them to the surface is the ultimate and general cause of all economic activity, the endeavor of men to satisfy their needs as completely as possible, to better their economic positions. But since prices are the only phenomena of the process that are directly perceptible, since their magnitudes can be measured exactly, and since daily living brings them unceasingly before our eyes, it was easy to commit the error of regarding the magnitude of price as the essential feature of an exchange, and as a result of this mistake, to commit the fur-

ther error of regarding the quantities of goods in an exchange as equivalents.[56]

Stanley Jevons (1835–1882) should be counted as the principal creator of modern economics: not only in method, but also in nomenclature. Like many great economists, he was an iconoclast. Before Jevons, the discipline was generally known as political economy (a name still preserved in some of the major chairs in the subject at British universities). Jevons explained at the start of his *Theory of Political Economy* that the title was misleading and redundant:

> Among minor alterations, I may mention the substitution for the name Political Economy of the single convenient term Economics. I cannot help thinking that it would be well to discard, as quickly as possible, the old troublesome double-worded name of our Science. Several authors have tried to introduce totally new names, such as Plutology, Chrematistics, Catallactics, etc. But why do we need anything better than Economics? This term, besides being more familiar and closely related to the old term, is perfectly analogous in form to Mathematics, Ethics, Æsthetics, and the names of various other branches of knowledge, and it has moreover the authority of usage from the time of Aristotle.[57]

Political economy gave much too much of an implication that this was a science of how the polity could steer a general process whose essence lay in a lack of deliberative coordination.

The essence of Jevons's vision lay in the variety of wants. He began his later popularization of the new approach with the observation that "[o]ur wants are various. After a little reflection, we shall see that we generally want but little of any one kind of commodity, and prefer to have a portion of one kind and a portion of another kind. . . . A library all made of copies of the same book would be absurd."[58] The key to the behavior of prices lay in the extent to which they were expressions of relative preferences. The lesson of the violent commercial and stock market upheavals of the early 1870s was that prices do not move in the same direction. The central task of the analysts was to explain why some prices rose and some fell, and then to ascertain what information was conveyed by those signals.

Jevons was a powerful representative of the new classes in Britain—the industrial bourgeoisie, but also of a new sort of provincial high culture that was utterly different from (and more cultured than) the conventional and rather philistine establishment of British politics, finance, and the ancient universities of Oxford and Cambridge. His father, Thomas, was a prosperous Midlands merchant who moved to the flourishing port city of Liverpool. Thomas was passionate about engineering improvements, and knew the builders of the first railroad, Robert Stephenson and Joseph Locke. Thomas himself in 1815 built what was thought to be the first sea-venturing iron boat. His mother, Mary Anne, was the daughter of William Roscoe, a Liverpool poet and Renaissance scholar who had written a *Life of Lorenzo de' Medici*. Both father and mother were unitarians, and Stanley Jevons retained a deep religiosity, accompanied by a suspicion of organized religion. He combined that religion with the fascination with machinery that he inherited from his father. He celebrated the 1851 Great Exhibition in the Crystal Palace as the perfect image of a giant social machine.

There was a shadow of physical and mental illness over this intensely intellectual family. Stanley was the ninth child born to Thomas and Mary Anne, but only three of the older siblings survived infancy. His mother died when he was aged ten. Jevons's oldest brother, Roscoe, descended into irreparable madness after the death of his mother. The next-older brother, Herbert, was unable to settle down and suffered from constant ill health. A younger sister, Henrietta, spent most of her adult life in an asylum.

Jevons was a polymath who contributed substantially to logic, geometry, and meteorology as well as economics, statistics, and economic history. He became interested in economics by reading extensively in 1856 while working as an assayer for the Australian mint, in an effort to understand the problem of railroad funding. His work at the mint brought him into contact with a large number of complex financial problems that could be solved relatively easily using calculus. With that work done, he had leisure to explore his exceptionally large range of other intellectual interests.

Jevons was the earliest of the heroic trio to reach a clear theory of the determination of value. The first—and in some ways most clearly compelling—account of marginalism appears after his return from Australia, in a letter of 1860 to his brother Herbert:

> During the last session I have worked a good deal at political economy; in the last few months I have fortunately struck out what I have no doubt is *the true Theory of Economy*, so thorough-going and consistent, that I cannot now read other books on the subject without indignation. While the theory is entirely mathematical in principle, I show, at the same time, how the data of calculation are so complicated as to be for the present hopeless. Nevertheless, I obtain from the mathematical principles all the chief laws at which political economists have previously arrived, only arranged in a series of definitions, axioms, and theories almost as rigorous and connected as if they were so many geometrical problems. One of the most important axioms is, that as the quantity of any commodity, for instance, plain food, which a man has to consume, increases, so the utility or benefit derived from the last portion used decreases in degree. The decrease of enjoyment between the beginning and end of a meal may be taken as an example. And I assume that on an average, the *ratio of utility* is some continuous mathematical function of the quantity of commodity. This law of utility has, in fact, always been assumed by political economists under the more complex form and name of the Law of Supply and Demand. But once fairly stated in its simple form, it opens up the whole of the subject. Most of the conclusions are, of course, the old ones stated in a consistent form; but my definition of capital and law of the interest of capital are, as far as I have seen, quite new. I have no idea of letting these things lie by till somebody else has the advantage of them, and shall therefore try to publish them next spring.[59]

It was clear that Jevons wanted to constitute himself as an innovator, an intellectual entrepreneur.

The theory was sketched out more fully in an academic paper presented in 1862, published in 1866, and is at the core of Jevons's first comprehensive exposition of economic theory in a book published in 1871. Jevons later frequently set out this chronology, for instance in a somewhat proprietorial letter to Walras on reading the Frenchman's pathbreaking article in 1874. He was profoundly pained by the thought that some continental economist might have anticipated his discovery:

> Pray accept my best thanks for your kindness in sending me a copy of your Memoir, and for the very courteous letter in which you draw my attention to it. When your letter came I had, indeed, already noticed in the *Journal des Economistes* your very remarkable theory. I felt the greater interest in the subject because my own speculations have led me in the same direction, now for the last twelve years or more. It is satisfactory to me to find that my theory of exchange, which, when published in England, was either neglected or criticised, is practically confirmed by your researches. I do not know whether you are acquainted with my writings on the subject. All the chief points of my mathematical theory were clear to my own mind by the year 1862. . . . You will find, I think, that your theory substantially coincides with and confirms mine, although the symbols are differently chosen, and there are incidental variations.[60]

Jevons's expansion of his intuition would not have occurred without substantial input from an accumulation of empirical material—or at least Jevons would not have succeeded in convincing others that his method was significant and useful. The economist Lionel Robbins later commented on the "sheer genius" of Jevons's "capacity in handling facts."[61] Indeed, Jevons was scarred by the relative neglect encountered by his first theoretical foray into economics, which he blamed on an excessively abstract approach. "I am better in theory than I am in fact; but theorists have a bad odour until their soundness is established by the slowest possible process. Hence it is a good thing to begin by diagrams, tables of prices, and such things, so that you can never be charged with arguing without a reference to or knowledge of facts."[62]

It is particularly striking to trace Jevons's trajectory. The first of his works to attract substantial public attention dealt with the relative movement of gold prices in the 1850s, after the large gold discoveries in California and Australia.[63] Jevons had a particular insight from his Australian work as assayer of the mint, at the moment when the gold rush was transforming the Australian economy. He gave the first precise calculation of how a new discovery lowered the price of gold (or raised the gold price of other goods). He explained (again using the wave metaphor):

> I was so much struck with the enormous and almost general rise of prices about 1853, that I was led to suspect an alteration of the standard of value. At the same time the late operative depression of trade in reducing prices as low as they are likely to go, (as it were to low tide), has seemed to me to render the subject more and more mature for decision. It shows that the great rise of prices in 1858 has not been, and thus probably will not be compensated by any equal fall; that there is consequently a permanent rise of prices certainly constituting a fall in the value of gold, and probably arising from the gold discoveries. . . . The lowest estimate of the fall that I arrive at is 9 Per Cent, and I shall be satisfied if my readers accept this. At the same time in my own opinion the fall is nearer 15 Per Cent.[64]

The second work that struck a public chord was a treatise on the future of coal, which was quoted in parliamentary debates by the leading intellectual (and economist) John Stuart Mill, as well as by Prime Minister William Gladstone. The book made a powerful case for the centrality of carbon energy and particularly coal to the British Industrial Revolution, but also explained how coal reserves were limited, and how the consequence was that British primacy would inevitably be eclipsed: "coal alone can command in sufficient abundance either the iron or the steam; and coal, therefore, commands this age—the Age of Coal. Coal, in truth, stands not beside but entirely above all other commodities. It is the material energy of the country—the universal aid—the factor in everything we do. With coal almost any feat is possible or easy; without it we are thrown back into the laborious poverty of early times."[65] Carbon energy was replacing human or animal physical force as the driver of economic development; but the advance would not be restricted to the original setting in which marginal cost (the scarcity of timber in the wake of deforestation) had pushed the coal revolution. The marginal cost of production would rise, while production would open up elsewhere. Coal for Britain would thus become relatively expensive. Britain urgently needed to build a buffer against a world that would be less favorable to its reliance on one source of energy. Jevons's answer was to reduce the current level of public debt in order to build a buffer for the future decline in coal production: "An annual appropriation towards the reduction of the debt would serve the three purposes of adding to the productive capital of the country, of slightly checking our present too rapid progress, and of lessening the future difficulties of the country. If commenced without delay, and continued with perseverance, the vast debt, now nearly eight hundred millions sterling, might be easily reduced to inconsiderable dimensions within that period now before us, which we must believe to comprise England's climax of prosperity."[66]

Jevons had become acutely aware of the impact of global developments through his work on prices: even when the extent of actual engagement was small, developments elsewhere could have a substantial impact on investors' psychology. As he put it, reflecting on the emergence of euphorias: "The impulse from abroad is like the match which fires the inflammable spirits of the speculative classes. The history of many bubbles shows that there is no proportion between the stimulating cause and the height of folly to which the inflation of credit and prices may be carried. A mania is, in short, a kind of explosion of commercial folly followed by the natural collapse."[67]

Jevons was also profoundly personally affected by the course of business cycles, to which he devoted substantial attention. In January 1848, in the business depression caused by the wave of harvest failures and the collapse of many railroad companies, his father's firm, Jevons and Sons, failed. The moment was a shock to the twelve-year-old boy, who recalled a Sunday morning when, instead of going to chapel, the grandfather and father huddled hopelessly over the books of the firm.

The other paths to marginalism looked much more academic, and much more secure. Léon Walras was born in 1834 in Evreux, the son of the economist Auguste Walras, who in 1831, in a work entitled *Of the Nature of Wealth and the Origin of Value*, set out to create what he saw as a mathematical economic science. Léon was twenty-two when his father "completely initiated me into his theory of exchange value and into his theory of property . . . when I realized, by a clear and quick intuition, the truth of his system, and I decided to devote my life to establish the necessary deductions to link his principles of pure economics to his conclusions of social economics."[68] He later recorded that "[i]t was my father who provided the economic definitions which are the basis of this system; it is Cournot who provided me the mathematical language most appropriate to formulate them; but it is I who have given, not only a complete exposition, but the rigorous demonstration of the system of liberal competition in exchange and production as realizing the maximum of utility."[69] Walras's method went further, in that the outcome of the application of marginalist thinking was a system of equilibria that could be mathematically presented.

Carl Menger, the son of a lawyer, came from a minor noble family in the Habsburg Empire (he carried the title Edler von Wolfsgrün). He had a doctorate in jurisprudence from the Jagiellonian University in Kraków. He eschewed mathematics. He did not seem to know Cournot's work, which gave a critical tool to Walras and Jevons. Hayek mistakenly believed that Menger "had nowhere commented on the value of mathematics as a tool of economic analysis. There is no reason to assume that he lacked either the technical equipment or the inclination."[70] In fact, in an 1884 letter to Walras, Menger simply and quite offensively stated that "the mathematical method is false."[71] The basic skeptical outlook came straightforwardly from a German romanticist tradition. His view of the importance of the individuality of the *Volk*, and the particular character of a developmental phase, with local and temporal differences, made him skeptical of existing economic generalizations.[72] There was also a profound and religious mysticism about his view of goods, which distinguished it dramatically from the vision of Jevons or Walras: "Everything which makes us happy, pleases, advances, we call in ordinary life a good: God is the highest good."[73]

He too came to the problem of assessing value though the study of prices. As an Austrian civil servant, he had the task of writing surveys of markets for the official Austrian newspaper, *Wiener Zeitung*, and later reported that "it was in studying these market reports that he was struck by the glaring contrast between the traditional theories of price and the facts which experienced practical men considered as decisive for the determination of prices."[74] The stock market and its vagaries thus produced a new economics, defined by the need to explain differences in behavior and interpret how these differences would affect investors and, more important, producers and consumers. Their changing preferences would then create new signals.

Why did it take so long for the extent of Jevons's (and his contemporaries') achievement to be realized? Two considerations played a key role. The first was that these ideas were somehow in the air already, and that Jevons had only formulated them partially and incompletely. Alfred Marshall, the maker of the discipline in Cambridge, was notoriously ungenerous about citing precedents to his great work of synthesis and systematization. The second reason for Jevons's neglect was the bone that he had picked with the great but confused guru of mid-Victorian British intellectual life, J. S. Mill. It was Jevons's hostility to Mill that made Marshall additionally reluctant to give him credit. Jevons himself saw the problem. As he formulated it in a letter to Walras, "I have no doubt whatever about the ultimate success of our efforts, but it will take some fighting; the disciples of J. S. Mill being bitterly opposed to any innovation upon his doctrine. I have already been very severely criticised for what I said about him by the London Examiner, which upholds his views, but I am going to criticise J. S. Mill without the least fear of the final result."[75] At another point, Jevons indicated the extent to which he wanted to rechannel the "classical" trajectory of British economic thought: "I am beginning to think very strongly that the true line of economic science descends from Smith through Malthus to Senior, while another branch through Ricardo to Mill has put as much error into the science as they have truth."[76] But there would soon be a pushback against the marginalists and their concern with the waves generated by the agglomeration of individual choices. The next swing of the globalization pendulum would shift the focus, from interpreting the international mechanisms of trade and financial flows as distributing price signals to millions of individuals, to thinking about them as offering a way collectively to redistribute resources.

3

The Great War and the Great Inflation

The First World War is a turning point in the story of modern globalization. It also produced the most devastating demonstration of the destructive effects of inflation: the German hyperinflation. That experience remained, along with the Great Depression, as the great bogey of economic history and analysis. The memory of both continues to haunt policy-makers, and they are both part of a general discourse even for generations and countries that have no direct experience or memory of those policy catastrophes.

The most dramatic and also the most famous inflationary experience of the twentieth century was that of Germany after the First World War, although other central European countries, including Austria, Hungary, and Poland, had similar experiences. By November 1923, the German currency, the mark, had fallen to one trillionth ($1/10^{12}$) of its prewar value. In the last stages of inflation, prices changed several times a day. Shopkeepers followed the foreign exchange rates and immediately adjusted their charges. Vast amounts of paper money were needed to make even single purchases.

While the German inflation is the most famous, it is not the most extreme historical experience. Hungary after the Second World War suffered a worse depreciation, and the recent hyperinflation in Zimbabwe (2007–2008) was faster, with a daily rate that reached 98 percent (for 1920s Germany, a recent calculation shows "only" 20.9 percent as the highest daily rate). The *assignat* inflation of the French Revolution, with a highest daily rate of price changes of 4.77 percent, is also a major cultural reference point.[1] The German inflation became so iconic because it seemed to be linked to the fate of the Weimar Republic, which collapsed less than ten years after the end of the hyperinflation. Already before the end of Weimar, in 1931, British prime minister Ramsay MacDonald was waving German inflation banknotes as part of his electoral campaign, in order to demonstrate the consequences of fiscal irresponsibility, warning of how a pantechnicon would be needed to bring "wages in paper at the end of the week."[2] So the Weimar experience became the principal historical showcase argument in favor of fiscal orthodoxy, or what is now often called dismissively "austerity."

The great strategic thinker George Kennan strikingly conceptualized the First World War as "the great seminal catastrophe of this [twentieth] century—the event which . . . lay at the heart of the failure and decline of this Western civilization."[3] The war changed the politics of the globe. Four great dynastic empires—Habsburg, Hohenzollern, Ottoman, and Romanov—fell. Perhaps one of the reasons the British and French Empires survived and appeared triumphant was that they could not simply be thought of as dynastic enterprises. The war brought the United States definitively into world politics.[4] The 1919 Paris peace conference then redrew the map.

The Great War also revolutionized economics, widening the scale of production across the world. The European belligerents depended on foods and raw materials, as well as manpower, on a global scale. Indian and Japanese textile production surged. The distinction between an industrial North Atlantic zone and an agrarian periphery was vanishing. There now seemed to be a world of abundance and plenty, surrounding a core of fire and destruction. At the center of the conflict, the material devastation was enormous, but even greater were the opportunities and growth lost as a result of the engagement in over four years of unproductive and all-consuming conflict.

The destruction of productive resources in Europe left a high cost, and the political struggle would focus on how that cost was to be distributed. There were in the simplest of analyses two choices: imposing costs through a domestic arrangement, or attempting to make other people pay. Other peoples' money: that latter option looked like a miraculous path out of misery and shortage. The war sorted out losers and winners, and wartime propaganda suggested that winners might impose all their costs on the losers. The war changed thinking about globalization, with a turn to a geopolitical frame. The thought of military action invited a throw of the dice. An aphorism of Sun Tzu suggests that "victorious warriors win first and then go to war, while defeated warriors go to war first and then seek to win." The belligerents of 1914 saw winning as part of a business in which they would also impose the costs of victory on the defeated.

Uncertainty and fear produced fantasies about new ways of solving the military stalemate, and desperate searches for new processes and machines. Even the idea of harnessing artificial men, robots or homunculi, gripped the imagination of bewildered and war-weary peoples.[5] Silent movies pushed the vision: an initial landmark of the imagination came with Paul Wegener's and Heinrich Galeen's *The Golem* of 1915, which was also popular in the United States under the title *The Master of Fate*. In 1916–1917 the most successful wartime movie series appeared in Germany about a laboratory-made artificial man who struggles because he has no emotions, and can only be destroyed by another artificial man: Otto Rippert's and Robert Reinert's *Homunculus* series. A strange reality produced strange fictions.

Scarcity

The First World War was planned around scarcity and hardship. A negative supply shock was part of the calculation or the plan for the conduct of all-out war. Long before war broke out, states designed blockade strategies designed to starve the other side into submission. Shortages would become a principal military weapon, and overcoming them the key to success.

Shortages immediately generate a climate of crisis, with an urgent need for relief. They demoralize populations, and prompt protests, demonstrations, even violent overthrow. The urgency of relief pushes policymakers into taking decisions on the fly—bad decisions. In addition, shortages prompt everyone affected to organize and mobilize in order to seek relief: a process in which the most powerful and the loudest win out. They thus breed power and loudness—and factionalism and political disintegration.

An emergency—and a war is a very dramatic kind of emergency—changes the dynamics of policy-making. In normal times, designers of strategic visions have to think about the long term, about policy sustainability. In an emergency what happens in the short run dramatically affects long-term prospects, and makes the difference between a good or tolerable future and one constituted by misery, hardship, and humiliation. It thus becomes essential to do whatever it takes in the face of the emergency, even if the measures adopted are not compatible with longer-term stability. Policy-makers are forced to gamble. There are obvious medical parallels: faced with a medical crisis, patients will take extreme measures, with pharmaceuticals or procedures that have many bad side-effects but give a chance of survival. Surviving in the war required extraordinary measures.

Governments in 1914 were astonishingly quick in shutting down possible sources of immediate financial destabilization. In the United States, Secretary of the Treasury William McAdoo closed the New York Stock Exchange on July 31 for what would be a four months' freeze in order to prevent foreign stockholders from selling off stock and then moving out of the U.S. dollar.[6] The London Stock Exchange was closed on the same day, for five months, the Treasury issued emergency currency in small denomination notes, and the Bank of England bought large amounts of bills.[7] Germany too suspended gold convertibility and issued emergency currency; commentators celebrated the central bank president as the financial equivalent of a general, a *Generalgeldmarschall*.[8] The short-term benefits in avoiding financial panic were obvious, and no one cared about long-term implications because of the expectation that the war would be short. In any case, the priority for Germany and Britain was winning, and money could only help.

The belligerents in the First World War started from different positions, which might have been expected to generate different strategies. Western Europe was already heavily dependent on imported food, with North America and Russia as major suppliers. Russia was a gigantic grain exporter, whose trade would be interrupted by war; the loss of earnings from grain exports would create shortages of industrial goods. Russian wheat production dropped during the war (and even further during the Bolshevik Revolution): from 227 million quintals in 1914 to 166 million in 1917 and 87 million in 1920.[9] The United States would play a part as a major source of grains, and other raw materials. But how could the imports be financed, if European belligerents could not export the accustomed products? Britain was a major grain importer, but with a powerful navy that could be expected to safeguard the sea lanes. By contrast, the major Central Powers, Germany and Austria-Hungary, were major food importers, with sea access that could easily be subject to blockade. It was obvious that Germany's planners would draw up plans, such as the infamous Schlieffen plan, that were supposed to make the war short. But if those plans were not realized effectively, could there be a Plan B in which the economy and society were redirected toward long-term mobilization?

The Central Powers were tempted to think that some easy solution existed, whereby they might turn the tables and impose a blockade on western Europe. Could interruption of the trade routes, enforced by submarines, lead to starvation in Britain and France? And would that collapse follow quickly? It was the decision to launch unconditional submarine warfare, affecting the neutral shipping of the United States, that brought that country into the war in April 1917. The German military high command, which had long been pushing for that solution, consistently argued that the British collapse would follow quickly, and before large numbers of American troops would arrive at the theater of war.

The debates about mobilization and resource provision were familiar to all the policy-makers long before the war. For Germany, one of the standard arguments for agricultural protection had been to maintain high-cost production in order to assure supplies in the event of military conflict. German farmers might be at a comparative disadvantage, but at least the supply channels were secure. For Britain, the need to secure food for an island that could not feed itself was often cast as a case for an empire tied to the motherland.

The radical British jurist Frederick Harrison had written about how German military superiority would lead to disaster for Britain: "famine, social anarchy, incalculable chaos in the industrial and financial world would be the inevitable result. Britain may live on . . . but before she began to live freely again she would have to lose half her population, which she could not feed, and all her overseas Empire which she could not defend. . . . How idle are fine words about retrenchment, peace, and brotherhood, whilst we lie open to the risk of unutterable ruin, to a deadly fight for national existence, to war in its most destructive and cruel form."[10] The German threat would mobilize a British response in kind.

The UK planned a blockade that originated in plans of the Admiralty to circumvent the needs of a conventional war, involving the commitment of a large land army (which Britain did not possess). The naval advocates made their case very clearly years before the outbreak of war: starvation would be the major British tool. Director of Naval Intelligence Sir Charles Ottley wrote about how "(in a protracted war) the mills of our seapower (though they would ground the German population slowly perhaps) would ground them 'exceedingly small'—grass would sooner or later grow in the streets of Hamburg and widespread dearth would be inflicted." Captain Maurice Hankey, the brilliant strategist who acted as Naval Assistant Secretary to the Committee for Imperial Defence, concluded that "in view of our maritime ascendancy our proper way of rendering assistance to France was to put such severe economic pressure on Germany that she could not continue the war."[11]

For some time, of course, it was not clear whether there would be a short or a long conflict. Indeed, the most frequent argument for why the war had to be short depended on the inability of broken supply chains to keep modern industrial societies alive. That case had been brilliantly presented in journalist Norman Angell's famous *The Great Illusion*. In the case of a war,

> German capital would, because of the internationalization and delicate interdependence of our credit-built finance and industry, also disappear in large part, and German credit also collapse, and the only means of restoring it would be for Germany to put an end to the chaos in England by putting an end to the condition which had produced it. Moreover, because also of this delicate interdependence of our credit-built finance the confiscation by an invader of private property, whether stocks, shares, ships, mines, or anything more valuable than jewellery or furniture—anything, in short, which is bound up with the economic life of the people—would so

> react upon the finance of the invader's country as to make the damage to the invader resulting from the confiscation exceed in value the property confiscated.[12]

It was thus the utmost folly, in an age of commercial prosperity, to destroy the nation's riches by going to war: "Germany would lose a hold upon the trade of the world which it has taken her many years of toil to create." Angell quotes German writers arguing that "Germans are winning the war of peace competition so unmistakably, that it would be folly for them to translate the struggle from the arena of Germany's attested superiority to an arena where the conflict must, at any rate, be doubtful."[13]

The reflection does indeed accord with much German commercial thinking. The German economist Karl Helfferich wrote that wars would have to be short: "anyway, what kind of war would that have to be that could block our land and sea frontiers to grain imports?" He went on: "even to consider such a possibility . . . is to look upon our foreign policy with limitless mistrust." A few years later, now a banker at Deutsche Bank who was deeply engaged with the making of German policy in the Middle East, Helfferich restated that view as a lesson to be learnt from the Russo-Japanese War.[14]

After the outbreak of war, John Maynard Keynes told his fellow Bloomsburyite David Garnett that

> he was quite certain that the war could not last much more than a year and that the belligerent countries could not be ruined by it. The world, he explained, was enormously rich, but its wealth was, fortunately, of a kind which could not be rapidly realised for war purposes: it was in the form of capital equipment for making things which were useless for waging war. When all the available wealth had been used up—which, he thought would take about a year—the Powers would have to make peace. We could not use the cotton factories in Lancashire to help our navy blockade Germany; Germany could not use its toymakers' factories to equip her armies.[15]

The perception about short wars was not universally shared. In particular, the military were gloomier than the economists, but generally the generals could not provide good answers to the question of how to pay for the conflict. Chief of the General Staff Helmut von Moltke foresaw that "this war will grow into a world war, in which England will intervene. Only a few can imagine the extent, duration and end of this war. How this will all end, nobody now knows." Moltke predicted the "mutual tearing apart of the cultured European states."[16] Soon after the outbreak of war, Moltke had a nervous breakdown. He was replaced by General Erich von Falkenhayn, who in August 1914 predicted that the war would last a year and a half at least.[17]

The immediate thought in August 1914 was of how to arrange the logistics to keep large numbers of men (and horses) on the front. Everything else was secondary. Only as the course of the war was extended did the larger problems of supply become clear. Starving families at home would imperil morale and soldiers would be demoralized by the letters they received, or by their impressions of domestic misery on brief home visits.

Food problems emerged quite quickly. The hunger crisis was already evident in Austria in the first months of the war, because of the quick Russian occupation of large parts of Galicia, a key grain-growing area. In April 1915 ration cards were given out for bread and flour, and in 1916 sugar, milk, coffee, and lard followed. By 1916, Vienna had developed a system of people's kitchens, *Volksküche*, to feed the population, and a substantial part of the city green spaces was used to cultivate vegetables. Protests against profiteering and speculation grew, and for the authorities looked like a convenient way of deflecting grievances. In January 1917, lists of speculators were printed and posted on pillars. The authorities also tried, rather ineffectively, to prohibit the long lines that formed, with people often standing all night to wait for stores to open in the morning: the lines were thought to be a source of disorder.[18]

Germany was not far behind Austria. Prewar Germany had imported one-fifth of its food supply measured by calories, but 27 percent of proteins and 42 percent of fats. In February 1915 a bread card was introduced, and a rationing system begun in Berlin was soon extended to other cities and most other foods. Combined with ceilings on food prices, the result was that it looked for a time as if the supply problem was under control. But the prices concealed deteriorating quality, with potato flour mixed into bread, or milk watered down, or burnt acorns substituting for coffee. *Ersatz* was the word that dominated the war experience of consumption.

The turnip, a widely used substitute, became so prevalent that the exceptionally harsh winter of 1916–1917 was known as the "turnip winter." There were major scarcities. Agricultural production dropped as crops were starved of nitrates—which were now required for the production of explosives. In 1916, the potato harvest was half that of peacetime levels. By the winter of 1917, after another bad harvest, the daily calory supply in some cities had fallen to just 1,000 calories. Children were sent away into the countryside, and in 1917 even to neutral countries, the Netherlands or Switzerland.

"Dancing the Polonaise" became a euphemism for standing in line; and as people stood in queues, they exchanged complaints and grievances about the inadequacy of the bureaucracy. The queue became a prime site for social radicalization. As in Vienna, the logic of queues (*Anstellen*) became a flashpoint. Complaints about anarchy in the market for consumer goods flourished, and people demanded more and better plans to ensure a more just distribution.[19] Black markets proliferated, and with them accusations of market manipulation and speculation. Riots broke out in Berlin-Lichtenberg in October 1915, in the center of Munich in June 1916. Vienna had disturbances in May 1916. By the spring of 1917, news of the Bolshevik Revolution threatened to inflame German cities. In June 1918, after a reduction in rations, large numbers of Vienna's residents moved in an organized and confrontational style into the surrounding countryside to seize hoarded food.[20]

Food shortages had a long-term impact on Germans' view of the world, and on the centrality of consumption.[21] Everything revolved around food: the politics of revolution but also the politics of the household. The self-consciously patrician German novelist Thomas Mann noted how his breakfast was ruined by quarrels with his wife, Katia, over the amount of butter consumption. When his household was allocated one fig, he gave it to his favorite daughter, Erika, to eat, and explained to her siblings that here was an early lesson about how to get used to injustice.[22]

A historical consensus has seen the failures of food allocation during the war as a major cause of the disenchantment with politics, and a promoter of violence and extremist radicalism. Some authors try to push back against this and claim the administration worked reasonably well, and that there was something of a new egalitarian wartime social consensus built around the standardized soup ration, the *Eintopf*. It is also clear that, apart from brief periods of scarcity, Germans generally did not starve in the First World War. Historian Avner Offer provides detailed tables of average weights of middle-aged German males and females though 1917 and 1918, with no signs of decrease, and quotes letters from Germans explaining how it was no hardship to do without fatty foods and beer—"If I look thin, you must not think I am anything but perfectly well. I never felt better in my life." He quotes an American physiologist, who helpfully concluded that "had the Germans been vegetarians, there would have been no problem."[23] Russell Henry Chittenden, a Yale professor supposed to be the father of modern biochemistry, and one of the members of the U.S. Advisory Committee on Food Utilization, recommended a low-protein diet as a healthier form of living, and argued that accepted dietary standards were too high. The war could be painted as an experiment in healthy living.

The young British economist Claude Guillebaud visited Berlin in 1919 and reported:

> I was surprised by the good external appearance of the vast majority of the persons whom I met about the streets. There are very few fat people in Berlin to-day, but equally there is no obvious expression of hunger and exhaustion on the faces of the people. The bulk of the middle and upper classes looked in quite normal health, and their faces did not appear sunken or pinched. The poor certainly showed the influence of privation to a greater extent, but although lack of food and the depressing influence of defeat have taken the desire and the capacity to work hard from the majority of people, the bulk of adults are, in appearance at least, a long way from actual starvation. The food of the poor is monotonous and unpalatable to a high degree, but it is at least sufficient to maintain life for the healthy adult who is neither old nor constitutionally liable to disease.[24]

Starvation certainly occurred in hospitals, whose staff provided graphic accounts of how patients could not be let into the fresh air because they would seize unripe fruit, chestnuts, even grass and weeds, in order to attempt to satisfy an unbearable, impossible hunger. And there were health problems that followed from poor nutrition. Lung diseases increased, above all tuberculosis. Health deterioration came also from conditions of work. In heavy metallurgy but also in making explosives, many workers were poisoned with nitrate compounds, trinitrotoluene, trinitroanisole, dinitrobenzene, or picric acid and naphthalene and phenol compounds. The vulnerability to influenza in the waves of contagion that accompanied the end of the war and the first years of peace was heightened by the legacy of wartime conditions.

Nutrition changed world views. The lower middle classes and the middle classes lost precisely the elements that made their lifestyles distinct from the working class: the *gut bürgerliche Küche* (the hallmark of respectable working-class eateries) vanished with the peace. The first wartime survey of the War Committee for Consumer Interests reported a "grinding down of the Mittelstand [middle orders] and the rise of a 'barbaric' economy in which there are only 'rich and poor.'"[25] In order to anticipate future grain shortages, the pig population was drastically reduced in early 1915 in the so-called *Schweinemord,* with much of the resulting meat wasted because of inadequate conservation and canning techniques. The climate of shortages produced resentments against others. It was the "experts" who had recommended the pig slaughter. Later, it was easy to turn on the over two million POWs who needed to be fed alongside Germans. Xenophobia flourished along with hunger and disease, and prepared a mental map for the future.

Russia, with a large grain-supplying area, should not have experienced such grave shortages. Since Russia could not export so much of its cereal production, more should have been available for domestic production. When bottlenecks came, they were a consequence of bad logistics. Unlike in other belligerent countries, the number of animals increased, intensifying the pressure on grain. The census of 1916 recorded a 25 percent increase in cattle, and higher numbers of sheep and goats. The harvest remained relatively plentiful, with the 1917 harvest only 12 percent below the 1914 level. But supplies to the cities and industrial centers, whose populations shot up with the need to produce munitions, failed utterly. In December 1916, for instance, Petrograd received under 15 percent of the amount of grain that the planners believed it needed. The government blamed the situation on inadequate transport and on the unavailability of railroad trucks. There may have been enough trucks, but they were not in the right location—because of military demands, but also because of other disturbances. Shortages hit everything: thus one suggestion was that railroad workers did not show up because they did not have the shoes that they needed for their work. The consequence was that rats ate a great part of the Russian harvest.[26] The story of urban food shortages, along with miserable accommodation, is a large part of the tale of the 1917 Revolution. The revolution against the tsar began on February 23 (March 8) with tens of thousands of women in Petrograd protesting under the slogans "Down with high prices" and "Down with hunger." But that was just the culmination of years of "bazaar disorders," "hunger riots," "pogroms," and "women's riots" that had already appeared all over the empire in 1915.[27]

In unoccupied France and in Britain, there were no life-threatening shortages, but plenty of scarcity and popular protest. Paris only began to ration sugar in 1917 and bread in 1918, and Britain only introduced rationing in February 1918. But Britain had a greatly diminished agricultural sector and had made the strategic bet that it would always be able to supply itself through imports. A large part of its shipping capacity—17 percent by weight—handled grain.[28] The war brought immediate dislocations: a shortage of shipping, then of stevedores, meaning that ships remained in port longer as the unloading took more time. By the beginning of 1915, the Board of Trade concluded that "the rise in prices of foodstuffs has been so great that the welfare of the masses of the people is seriously threatened."[29] Prices were rising, not least because the various allies were involved in a bidding war against each other to get grain. The result was not only a series of committees, on food prices, food supply, and so on, but also a quite fateful decision to extend the fighting to the east in order to ensure access to the large surpluses of Russian grain. Unless the straits of the Bosphorus were in friendly hands, Russian grain could not pass through the Black Sea to the Mediterranean. The result was the decision to launch the Dardanelles campaign against the Ottoman Empire—a move that nearly succeeded, but ended as a humiliating fiasco. As Prime Minister Herbert Asquith put it in a letter to his girlfriend, "There is no doubt that we are at last beginning to feel the pinch of war, mainly because all the German ships wh[ich] used to carry food are captured or interned, and the Admiralty has commandeered for transport &c over 1000 of our own. Further, the Australian crop has failed, & the Russian (wh[ich] is a very good one) is shut up, until we can get hold of Constantinople & open the Black Sea."[30]

By 1916, the UK's supplies were exhausted, and it became a key question of how to replace them. A meat shortage developed, caused in part by the belief that the army needed to be fed at a higher level than the civilian standard, as well as by the need to relieve meat shortages in France.[31] There was also a substantial decline in the number of pigs, and a ploughing-up campaign to turn pasture into arable land. The alternative to rationing was to borrow abroad, to look for foreign relief, as a way of financing the trade deficit that resulted from large-scale imports that were needed not just to manage the war, but to sustain civilian morale. By 1917, the government launched a campaign for a "National Lent," with announcements that King George V was eating a quarter less than normal. Lecturers fanned out over the country to promote dietary restraint. They were not effective. At the end of 1917, there were large-scale demonstrations and occasionally violent protests.[32]

The Cost of War

The cost of war—especially a long war—is too great to be borne at the time it is incurred. There was a widespread understanding that an expensive all-consuming war is best financed by a lien on the future: by borrowing. In one sense, however, the war has to be paid now: the shells are fired, the soldiers fed and paid, the field hospitals built. The nitrates that go into explosives cannot at the same time be used to fertilize arable land. The beef eaten by soldiers on the front cannot be fed to miners digging for the coal that is needed to push the economic war mobilization. In short, other nonmilitary consumption of goods competing with military requirements must be reduced. Bitter disputes occurred about how this should happen: in particular, what was the best mix of borrowing and taxation. The deprived consumer might simply be disciplined by having the means to consume taken away—by a tax or a levy. Or she might voluntarily defer consumption, by buying bonds or other instruments (even holding cash would do) that would entitle her to future goods (and hence diminish the goods available to other competing consumers). Is it better to have something taken away or to be given a promise of uncertain value and be filled with doubt as to whether the promise can be met?

Classical political economy in Britain had handled the question of war finance or funding in the aftermath of the wars of the French Revolution and Napoleon: expensive wars of long duration, but whose relative cost was less than that of twentieth-century total wars. Just to give a ballpark figure: average annual war expenditures in the French wars were 12 percent of GDP for the last year of the war; the equivalent figure is 32 percent for the First World War.[33] The great economist David Ricardo regarded an immediate levy or a tax as the most prudent option. A perpetual tax to cover the future interest on war debt would diminish the "national capital."

> The greatest advantage that would attend war-taxes would be the little permanent derangement that they would cause to the industry of the country. The prices of our commodities would not be disturbed by taxation, or if they were, they would only be so during a period when every thing is disturbed by other causes during war. At the commencement of peace every thing would be at its natural price again, and no inducement would be afforded to us by the direct effect, and still less by the indirect effect of taxes on various commodities, to desert employments in which we have peculiar skill and facilities, and engage in others in which the same skill and facilities are wanting. . . . Let us meet our difficulties as they arise, and keep our estates free from permanent encumbrances, of the weight of which we are never truly sensible till we are involved in them past remedy.[34]

He also added a pragmatic argument:

> There cannot be a greater security for the continuance of peace, than the imposing on ministers the necessity of applying to the people for taxes to support a war. Suffer this sinking fund to accumulate during peace to any considerable sum, and very little provocation would induce them to enter into a new contest. They would know that, by a little management, they could make the sinking

> fund available to the raising of a new supply, instead of being available to the payment of the debt. The argument is now common in the mouths of ministers, when they wish to lay on new taxes, for the purpose of creating a new sinking fund, in lieu of one which they have just spent, to say, "It will make foreign countries respect us; they will be afraid to insult or provoke us, when they know that we are possessed of so powerful a resource."[35]

Ricardo's argument might be stood on its head: a substantial debt, held by the people, would be a demonstration of national self-confidence and assertiveness. The First World War belligerents regarded their bond issues as important moments of propaganda; and they looked at the issues by their opponents carefully in order to study the state of morale and consequently the degree of commitment to all-out mobilization.

In Britain, Ricardo's arguments were almost precisely echoed one century later by the Cambridge economist Arthur Pigou, who like Ricardo was not a militarist and viewed the extent of military mobilization with distrust. He added a set of considerations that concerned social justice: the war would be an opportunity to build a more equal society, and that could best be achieved through taxation, rather than through rewarding rich bondholders with large future shares of the national pie. "Of the money needed by the State the rich man must provide in one way or another more than the poor man, and the very rich man more than the moderately rich man; and the amount provided must increase, not merely proportionately, but progressively as wealth increases."[36] War finance involved a fundamental issue of social distribution: "the root principle, in accordance with which the Government should decide how far to finance the war by taxes and how far by loans, is the judgment that it forms concerning the right ultimate distribution of war costs between people of different grades of wealth."[37]

In the twentieth century, as a result of the new domestic politics, the rise of the working class and of socialist parties, there was a new reality that needed to be taken into account and that involved a reduction in borrowing, since that borrowing favored the wealthy rentier. As Pigou put it: "In the present cataclysmic and exceptional war, the very rich and the rich ought to bear a proportion of the objective burden very much larger than that [in peacetime]. There is one way, and one way only, in which this result can be brought about. The ratio in which the war is financed with money borrowed from people with large incomes should be much diminished: and the ratio in which it is financed with money collected from them under some form of progressive taxation should be much increased."[38] The problem had existed before 1914. Government spending had increased, with more costly infrastructure and social outlays, and in 1892 the German economist Adolph Wagner had formulated his law of increasing state activity.[39] He also called this the increasingly "communist character" of the economy in culturally advanced countries. By the early twentieth century, the growing arms race between the major powers added a further element of expenditure, and paying the bill became increasingly cantankerous politically.

Two principles or approaches to war finance clashed with each other: the one leaned to bond finance because that offered the best sign of financial strength; the other pushed for higher taxes in the name of social justice. The substantial resistance to the latter course was rarely framed as an opposition to more justice, a fairer society, or a proper recompense to those who had shed their blood, seen their families decimated, and borne the costs. Instead, the case rested on the notion that taxing would diminish incentives to participate in the war effort. Businesses would be less patriotic in converting to war production; workers would be demoralized by too large an element taken out of their pay packet, or too heavy an excise placed on their beer. The emphasis on borrowing was increased as a result of the debate about the importance of civilian morale. It was crucial not to lower morale by cutting off consumption unduly. That militated against tax increases.

There were substantial tax increases in Britain, with the income tax rising from 1s 2d to 6s in the pound, and an excess profits tax. From 1914 to 1918 the revenue from income and property taxes tripled, from 3.0 percent to 9.6 percent, but that was not nearly sufficient to pay for a war that was consuming at least 50 percent of GDP. So the bet or the mortgage on the future expanded: in 1914 the national debt amounted to £706 million at face value, and rose to £2,190 million by 1916, and £7,481 million by 1919.

The war loans issued on the London Stock Exchange were a major exercise in propaganda, with crafted propaganda appeals. "The British sovereign will win": a play on words, since the sovereign was a British coin, and also the monarch, and at the same time the sovereign people. The first loan, announced in November 1914, was for £350 million, with a 3.5 percent nominal coupon. A second loan followed in June 1915, for £901 million, and carrying a coupon of 4.5 percent. In order to motivate buyers to be confident about the future, holders of the first bond were allowed to convert their securities; when the third loan came, in June 1917, at 5 percent, it included the same provision. Later, the practice attracted substantial criticism: had the bondholder been overpaid? The wartime prime minister, David Lloyd George, later admitted that the high yields on war bonds kept money dear "for all enterprises, industrial, commercial, and national."[40] The Scottish Independent Labour politician Tom Johnston, who in 1931 was briefly a cabinet minister and in the Second World War returned to office as secretary of state for Scotland, penned a coruscating indictment of the "financiers" in 1934. He quoted the exuberant headlines of the wartime financial press ("Money is at last coming into its own") as an instance of the work of "the controllers of the Money Power, the men who cold-bloodedly raised their demands upon their fellow-countrymen with every German advance in the field and with every German U-boat campaign at sea; the men who organized the creation of hundreds of millions of unnecessary debt; the men who inflated rates of interest."[41] Johnston's book carried a ringing endorsement from the veteran socialist Sidney Webb.

Britain, and its allies, had another way of managing their wartime needs—but that would also depend on the lure of high interest rates as a way of selling securities to foreign purchasers. In the first years of the war, the increase in the British debt was mostly managed through the issuance of short-term debt; but by 1915 another possibility seemed unavoidable. The country was wracked by a debate about the shell shortage that constrained military operations. The trade-offs were brutally clear: there was a desperate need to reduce consumption. Keynes, by now a Treasury official, wrote a memorandum making the argument that "without a policy for the confiscation of private income, a considerably reduced army and a continuance of subsidies to allies are *alternative*."[42] The constraints could be lifted by importing money in order to pay for resources. The pound–dollar rate began to deteriorate from December 1914 as trade deficits increased. At first, Britain had been able to manage to pay for a trade deficit by selling off foreign securities that had been conscripted by the government. When that source was exhausted, Britain borrowed internationally. The initial experience was discouraging: a large Anglo-French bond issue on the American market in late 1915 disappointed, as the Hearst press and pro-German and pro-Irish groups, especially in the Midwest, polemicized against it, even though there was a high nominal yield (5.46 percent) and the pricing brought the effective yield to 6.75 percent.[43] Only after the United States joined the war in April 1917 did a really superior mechanism emerge: the U.S. Treasury urged Americans to buy "Liberty Bonds" as a patriotic gesture. The first issue, on April 28, 1917, just days after the declaration of war, was relatively disappointing (and only offered a yield of 3.5 percent). The third and fourth bonds, with a higher yield (4.25 percent), were spectacularly successful. Over the whole course of the war, the UK succeeded in raising £1,292 million on the American market.

France, which borrowed from both Britain and the United States, moved quickly to access foreign debt markets, with the operation starting in the first months of the conflict. By 1915, Britain had reached agreements on funding not only France but also Italy (as a virtual bribe to bring that country into the war) and an increasingly desperate Russia.

The tax rates in France were much lower than in Britain: there had been no income tax at all before the war, and the 1914 move to institute one only took effect in 1916, and with relatively low rates (2 percent, reduced for lower-income groups). As in Britain, there were war profits taxes.

Matters looked rather different on the other side of the trenches (see Figure 3.1). Unlike France and Britain, Germany had no ready access to external funding, although at the outset of the war some German financiers hoped that German-Americans in New York might help them. At the end of March 1914, overall German public debt amounted to less than two-fifths of GDP, and sovereign debt to less than 10 percent of GDP. More than 90 percent of the central (*Reich*) debt was in the form of long-term loans. Germany appeared to keep its debt down. The German increase during the war looked smaller than that of the UK, but it carried

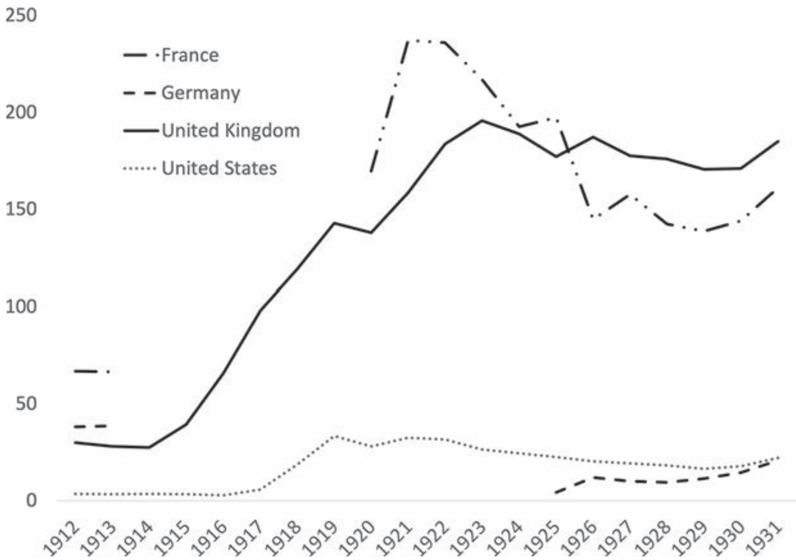

Figure 3.1. Public debt as share of GDP, 1912–1931 (percent) (Source: IMF HPDD [Historical Public Debt Database])

a heavy interest rate charge. By 1919, war-related debt represented more than 50 percent of GDP; almost 40 percent of it was short-term. Interest payments on the debt in financial year 1918 (April 1918—March 1919) absorbed almost 80 percent of regular tax receipts. The striking feature of public debt in Germany is that from the beginning it was camouflaged, so that it was impossible to really quantify the extent of the promises made: a dramatic contrast with the British tradition, which emphasized fiscal transparency, and where the large volume of public debt appeared to push up borrowing costs. Right at the outset of the war, under a decree of August 4, 1914, the government issued *Darlehnskassenscheine*, small-denomination loan certificates notionally secured on industrial and agricultural assets: they amounted to a practical parallel currency, but did not appear in the consolidated debt or bank note issue statistics.

By contrast with the western powers, which increased tax rates massively during the war, in Germany the major new income and wealth taxes had been imposed just before the war. In 1913, the parliament (Reichstag) passed a nonrecurring armaments levy (*Wehrbeitrag*), which included a payment on property values that escalated from 0.15 percent on small assets to 1.5 percent at the top, with a payment on income scaled from 1 to 8 percent. During the war, the central state's revenue, which had relied largely on customs payments in peacetime, collapsed. But there was a substantial reluctance to move with more tax increases, with the Treasury Secretary in 1915 telling the Reichstag that more taxes were neither reasonable nor desirable. The war profits tax came late, in 1916, and was accompanied by taxes on tobacco and cigarettes; the rates were increased in 1917, and a tax imposed also on the central bank.

The Treasury Secretary, Karl Helfferich, had been a major proponent of the idea that Germany started from a position of unique financial strength. He was still asserting that position at the end of the second full year of the war. He chose bonds rather than taxes as a way of demonstrating Germany's power in mobilizing resources: being able to sell bonds amounted to a public vote of confidence, and tied the wealthy classes into the destiny of the fatherland. In March 1915, he told the Reichstag about:

> [a] battle, which will decide the outcome of this struggle of nations, and which will be fought not only with the weapons of war, but also with the weapons of the economy and finance. The enemy has recognized what it means, for him and for us. So far, we have been at the forefront of the financial struggle; none of our opponents has even come close to achieving the level of our performance. Without any tricks or deception, we raised around 25 billion marks in three huge bond issues with increasing success. France has not yet been able to consolidate 10 billion marks of its war spending in its only major domestic bond issue, the so-called Victory Bond; Britain has so far raised between 18 and 19 billion in consolidated bonds against our 25 billion. We beat England's first bond with the result of our second, its second bond with the result of our third bond. England has so far failed to follow up on our third bond. Its short-term debt is growing into the unmeasurable; the debt will not be far from 15 billion by the end of this month, including the five-year American bond, and perhaps it is already beyond that. Nevertheless, the British Treasury Secretary hesitates and falters.[44]

Helfferich's most celebrated promise was that the conflict would not in the end cost the victorious German people much at all: the defeated powers would pay for everything.

> For the time being, therefore, the only path that remains is to defer the final settlement of the costs of war by means of credit until the time of peace. And I would like to stress again today that if God gives us victory and thus the possibility of shaping peace according to our life needs, then we cannot and must not forget the question of costs along with everything else; (vigorous agreement) we owe it to the future of our people. (Very true!) The whole future living standards of our people must, as far as possible, remain free from the immense burden that the war is generating. (Very true!) The instigators of this war have earned the lead weight of the billions; (very correct!) may they, not us, drag it through the decades. (Very good!) Gentlemen, I do not fail to realize that the enormous financial weakening that the war has already imposed on our opponents will make the task I just mentioned a particularly difficult one. (Very right!) But what can happen in this direction will be done. (Bravo!)[45]

The payment might come in the form of reparations, or as the cession of territory. Helfferich was part of a group that envisaged a postwar German-led Mitteleuropa with the addition of Belgium (above all because of the ports); also increasingly he was interested in large stretches of territory in an independent Ukraine, which would supply German food needs. The same kind of promise could be used to make and bind allies: in February 1917, in the notorious Zimmermann telegram, Germany appeared to offer Mexico the territory of Texas, New Mexico, and Arizona if Mexico were to join Germany in a future war with the United States. In the meantime, Germans' money would be conscripted for temporary service:

> Gentlemen, it is important to make it clear to all the people that this war is being waged more than any before, not only with blood and iron, but also with bread and money. For this war there is not only a general conscription, but also a general financial conscription, the obligation to save and a general obligation to pay. (Very right!) No one should evade this conscription, not even the humblest or smallest person. The waster of needed food or the slave of mammon, who cannot separate himself from his savings, is not a whit better than the deserter who evades military duty.[46]

That conscription meant signing up to the bonds. The first series in 1914 had a nominal yield of 5 percent, and after ten years might be converted into regular 4 percent bonds. It was a success, and Helfferich (then still at Deutsche Bank) declared that it had raised twice as much as had been expected. In February 1915 the exercise was repeated. There was also one attempt, in April 1915, to raise $10 million in the United States, but the exercise was not successful and was not repeated. The German Information Service distributed Helfferich's Reichstag comments in New York.[47] The preeminent German banker Max Warburg lobbied his influential younger brother, Paul, who had emigrated across the Atlantic to become one of the creators of the Federal Reserve system. The *New York Times* reported relatively favorably on the German bond issue, but simply noted that foreign demand had been "moderate."[48] The *Wall Street Journal* did a calculation showing the daily expenditure on the war: $8 million for Germany and $4 million for Austria-Hungary, compared with $10 million for Britain, $8.65 million for France, and $8.5 million for Russia.[49] The sinking of the *Lusitania* on May 7, 1915, with the loss of 128 American lives, put paid to any realistic chance of Germany being able to tap the New York money market.

By contrast with Germany, the failure of the Austrian war loan in early 1915 was widely seen as a sign that the older empire was falling apart. In particular, Czech industrialists and large landowners only bought token amounts, despite the clergy launching campaigns from the pulpits to demand patriotic sacrifice.[50]

Helfferich saw moves to limit wages and profits as undermining the mobilization effort. He ferociously resisted suggestions by the industrialist Richard Merton to limit producers' discretion in contract pricing. After Merton officially submitted a long memorandum on pricing, he was sent on a fact-finding mission to a particularly dangerous section of the front. Any alternative to the free market would in Helfferich's eyes require an impossible "degree of unselfishness, sense of obligation, subordination." A new tax would make it impossible for the German Empire "to conduct a new war in the foreseeable future unless it was completely on the basis of a nationalized economy."[51] Taxes would be a visible prominent reminder of the cost and pain of war—better to do war on the never-never, *Tod auf Raten*, *mort à credit* (the title of a surreal novel of 1936 by Louis-Ferdinand Céline on the meaninglessness of existence).

Ruling out effective taxes, and at the same time the inability to access additional real resources externally, either through foreign borrowing or through winning the war, left inflation as the only way of managing the cost of conflict. The financing of war was thus in Germany unaccompanied by a substantial rise in the real value of government debt: the war was paid by the devaluation of currency claims. The dynamic remained in the postwar era. It produced in Germany, as elsewhere in central Europe, notably in Austria and Hungary, hyperinflations.

Inflation and Hyperinflation

Resisting hyperinflation would have required a heroic political act, in which the cancellation of existing claims would be accompanied by the imposition of real fiscal burdens. Only one country, the new state of Czechoslovakia, tried that—successfully, although the tax measures were unpopular and the finance minister responsible, the conservative liberal economist Alois Rašín, was assassinated in 1923. Rašín complained to Foreign Minister Edvard Beneš in January 1919 that "[t]he people think that freedom means no taxes, and no one does anything about the implementation of tax policy, so I don't know in what way to manage it further. The state is in danger because most of society sees it as a miraculous solver of all problems. Everyone wants employment and maintenance support, in short they want a subsistence paid by government spending."[52] But the stabilization exercise was easier in Czechoslovakia, as there was a substantial group of rich property-holders regarded as aliens, the aristocratic and often German-speaking landowners from the old monarchy whose land might be nationalized and used as a basis for fiscal stabilization. There was in short an internal enemy who might pay the price for reform and stability. The Expropriation Act No. 215 of April 16, 1919, confiscated all agricultural land over 150 hectares and other land (including forests) over 250 hectares. By 1922 a total of 1,229,688 hectares of agricultural land and 2,733,376 of nonagricultural land had been taken from 1,730 owners: that amounted to 28.2 percent of all Czechoslovakian land. Some of this land was returned, but most was sold off by the state to small-holders in a bid to establish a prosperous Czech peasantry.[53]

Inflations could be justified in a way analogous to the wartime calculation: it was a way of imposing costs on someone else. That dynamic was particularly explicit in the German discussion. Germans saw their inflation as a way of wriggling out of the reparations settlement imposed by the Treaty of Versailles. Chancellor Wilhelm Cuno privately confessed in July 1923, as the German hyperinflation reached its terminal extreme phase, that "naturally the wish had been to deal with reparations first and clean up the tax problem afterward."[54] Even the process of inflation involved initially luring gullible foreign investors into buying German paper banknotes in the expectation that there would be a profitable recovery of the exchange rate. By October 1921, the *Wall Street Journal* was lambasting what it now called a "gigantic fraud," by which 50 billion mark notes ended up in the possession of American investors, to whom they were worthless.[55]

The Central European postwar inflations and hyperinflations had two fundamental causes: a low savings rate (following from wartime changes in income distribution), and poor monetary and fiscal policy. The consequence of the First World War was an erosion of incomes and a dramatically reduced savings rate. At the same time, at least for a while, Germans were able to sustain their living standard and run large trade deficits. They had this luxury because investors in the rest of the world for a while put their money into buying German assets: currency, securities, real estate. British and American investors were gambling on a German recovery. After all, before 1914, Germany had been, with the United States, one of the two strongest economies in the world. Only at a relatively late stage in the story of the German inflation, in the summer of 1922, did the foreigners see that Germany was unlikely to be able to pay off all its debts to foreigners (including reparations). In 1922, a political event—the assassination of the Foreign Minister Walther Rathenau on June 24—underlined the political instability of the Weimar Republic. From that moment, foreigners no longer wanted to buy German assets. The big capital flow of the earlier period came to a sudden stop. The mark went into a free fall. A large part of Germans' discussion of inflation was couched in terms of the country's relations with an outside world that was increasingly seen as hostile and malevolent. The capacity of the government to control price developments disappeared altogether at the beginning of 1923, after Germany failed to make a delivery of reparation coal and France responded with a military occupation of the Ruhr Valley in an attempt to seize coal and other resources. The German government then paid Ruhr workers and businesses not to work, and the fiscal gap was impossible to bridge.

The second driving force of the inflation was thus the policy of the German government and the German central bank. Both were highly sensitive to political considerations. Both worried that rising unemployment might destabilize the precarious political order. So they were willing to do anything in fiscal and monetary policy to counteract any kind of economic slowdown. The government ran large budget deficits as it tried to keep up employment in the state-owned railroad and postal systems, and also to generate more purchasing power. It kept on looking for new and ingenious ways to administer repeated fiscal stimuli, which were then monetized by the central bank. Equally significant, large industrial producers demanded continued access to cheap central bank credit, at low interest rates that became rapidly, in real terms, grotesquely negative: the central bank discount rate remained at just 5 percent until the summer of 1922. The president of the central bank, an elderly Prussian bureaucrat called Rudolf Havenstein, boasted about his success in getting new printing plants (132 factories, as well as the bank's own facilities), printing plate manufacturers (29), and paper factories (30) to meet the enormous demand for new money. He found more and more ingenious ways of stimulating bank lending to large businesses on ever more dubious securities. And he repeatedly explained that keeping the money presses rolling was a patriotic duty. There was in short what would now be called a "Havenstein put," analogous to the "Greenspan put" of the early twenty-first century, in which the central bank would keep its interest rate at levels sufficiently low that German business could continue to expand.

In the longer run, inflation destroyed German savings and made the economy of the unstable democracy of Weimar vulnerable to yet more shocks. It also had a dramatic effect on popular and political psychology. Attempts to compensate losers in the German inflation, by revaluing some assets but not others, set one group against another, and prompted the belief that politics was about negotiating between organized interest groups.

The constant alteration of prices, the dramatic story of fortunes made and fortunes lost as a result of speculation, made ordinary Germans, and Central Europeans, vulnerable and neurotic. Gender relations were transformed by the madness of prices. Men saw women and women saw men as fundamentally calculating, materialistic, and disenchanted with any romantic illusions.[56] Money was all that mattered. Because it played along with very old established clichés about Jewish dominance of finance, the inflationary uncertainty fueled anti-Semitism. Later on, some shrewd observers such as the scientist and writer Elias Canetti reached the conclusion that it was the Great Inflation that made the Holocaust possible, by creating a world in which large numbers seemed unreal and incomprehensible.[57] Bureaucrats simply wrote down impossibly big sums without thinking of the human consequences.

It is worth thinking about the precise mechanism by which unstable prices translated into destructive and ultimately murderous social behavior. In stable times, we expect each partner in a commercial transaction to believe that the price was fair, and that both sides benefit from the exchange. I buy a meal that satisfies my hunger, and the innkeeper in return has money that can be used to satisfy their needs. When prices move, I am upset by having to pay more. The innkeeper is angry because the money I have given no longer buys so many goods. We both think that we have lost out in the transaction, and that we have been manipulated by some sinister force. We also feel guilty for taking advantage of others—getting rid of our banknotes as soon as possible. We start to think that we are behaving in a speculative and grasping way. Non-Jewish Germans after the First World War in the middle of the currency disorder thus took up activities that they associated with Jewish actions, hated themselves for their breach of traditional norms, and externalized that powerful emotion by blaming the groups associated with finance and money. There was also a backlash against mobility, especially across Germany's new eastern border, and foreign Polish and Jewish traders were depicted as taking advantage of Germans; but foreign (western European and American) tourists also seemed to be living the high life in Berlin and other fleshpots on the cheap as the mark depreciated relative to the strong foreign currencies. They too provoked resentments.

The inflation destroyed ethical values, but it also corroded and undermined political structures. Germany was (and is) a federal country. Federalism depends on precise rules about the distribution of revenue and expenditure. The inflationary process, with a constant uncertainty about the real value of taxes and government payments, produces for the territorial units the same feeling of losing out that is experienced in personal life. Taxes seem to go to the center—to Berlin, or to Moscow (for the waning Soviet Union), or to Belgrade (for Yugoslavia under stress). On the other hand, spending looks as if it is associated with proximity to the seat of the federal government. Such interpretations fuel separatism. In the year of the hyperinflation, Saxony tried to break away under a radical left-wing regime ("the red hundreds"), while Bavaria moved to the radical right (and in November 1923 Adolf Hitler staged an unsuccessful putsch). The Rhineland separatists wanted to reach their own arrangement with France.

Calculations about access to credit and the government printing press reinforce the push to separatism. The German central bank was extending credit at highly negative real interest rates: that amounted to a subsidy. But only firms that could assert their national importance, and their closeness to the political process in Berlin, had a chance of getting that subsidy. Everyone else though they were losing out.

As the political disintegration proceeds, tax collection becomes more difficult—especially in the further or remote regions; and spending also collapses. In consequence, regional governments have substantial incentives to invent new fiscal mechanisms.

The dynamic that almost led to a breakup of Germany in the late summer and fall of 1923 would later lead to the disintegration of both the Soviet and the Yugoslav federations at the end of the Cold War. There was hoarding as the ability to make or trust cash or credit transactions broke down: thus, from 1990, Ukraine stopped supplying food to Russia. Central banks favored well-connected enterprises. The central federal government then blamed the outside world, or the international community, for all the chaos and disorder. For Serbia, the origins of inflation lay in international sanctions. The Soviet collapse also quickly produced a narrative of Russian victimization, as the result of the implementation of a Cold War strategy of Russia's enemies that worked together with a supposedly treasonous Soviet leadership under Mikhail Gorbachev that "sold out" to the West. The Serbian and Russian explanations of inflation and economic vulnerability look like very close echoes of the constant refrain both of Weimar's leaders and of the increasingly radical opposition to the "system," namely that it was the foreign powers or the international order that had created the inflation through the impossibly large reparations bill. Inflation led to the targeting of minorities, but also to an explosion of rage at the iniquity of the international order.

Short of large-scale Czech-type confiscation, only a dramatic economic and political collapse, of the type that occurred in Austria and Hungary in 1922 and in Germany a year later, could lay a basis for an effective monetary and financial stabilization. There was discussion of nationalization in all these countries, but it was rejected—in large part because of the argument that such an operation would give an easy lever to the reparations creditors to seize resources. The argument was of course put forward with exceptional vigor by existing property-holders. The whole debate left a permanent mark on politics: the idea that seizing the assets of a specific group might end every fiscal conundrum played powerfully into the growing anti-Semitic movement. It laid the basis for Nazi policies of expropriation.

What began as an error in economic thinking thus ended up as a catastrophic unleashing of the politics of violence. No figure is more responsible for this trajectory than the mastermind of the ultimately failed strategy of German wartime financial mobilization, Treasury Secretary Karl Helfferich.

The Economist out of His Depth: Karl Helfferich

Germany had a unique obsession with money and with financial stability even before the catastrophes of the First World War and the hyperinflation. Thomas Mann's fairy-tale second novel, *Königliche Hoheit* (Royal Highness, 1909), is an over-the-top depiction of this dominant German mentality. It followed his stunning debut novel, *Buddenbrooks*, which had dealt with the decay of a commercial family. The new work started with a narration of the decline of a traditional German small territorial state, a grand duchy, and its economy. The subsequent turn to optimism and a happy ending is a surprise. The state is rescued only when the prince starts to read books on political economy, thereby convincing an American heiress (the father is modeled on Andrew Carnegie) that he really has the good of his whole people at heart—as she does. She marries him, the bond yields of the country fall, and prosperity returns. Political economy was at the heart of German statecraft: but what would happen if the economy books were wrong? Karl Helfferich became the principal exponent of a German view of money.

Helfferich was born in 1872, the son of a merchant who, in the commercial as well as political enthusiasm accompanying the creation of the German Empire, had the year before started up a textile mill in his hometown, Neustadt an der Weinstrasse, on the edge of the picturesque Pfälzerwald in western Germany. The son was thus literally a product of the entrepreneurial enthusiasm of the *Gründerzeit*. As a child he was precocious and disputatious, and something of a bully to his younger brothers and sisters. He apparently always insisted on taking the German side when playing with tin soldiers.

The first of his family to study at university, he read law in Munich and then, through a family friend, met Georg Friedrich Knapp, professor of political economy at Strassburg (Strasbourg), who was interested in economic history and in 1891 produced a massively influential book titled *The State Theory of Money*. This work was filled with a strange new vocabulary to describe how it was the state that created money. Knapp termed himself a chartalist or nominalist, opposed to "metallists" who argued that precious metals had a worth of their own. The new language of economics was taken from Greek, and lent itself easily to ridicule and parody. Thus his stage theory of monetary development: "(1) We presupposed the hylogenesis of the means of payment, for only hylic means of payment allow of pensatory use. (2) Then morphism appears; only morphic means of payment can be proclamatory and therefore Chartal. (3) Finally, it is only in the case of Chartal means of payment that the hylic basis can disappear; they alone, therefore, can be autogenic."[58] Knapp's reputation outside Germany, never great, became increasingly problematic as he was widely seen as one of what the economist T. E. Gregory termed "the main intellectual factors making for the catastrophe of the inflation."[59] Howard Ellis's survey of German monetary theory concludes: "We should never be led to suspect from the State Theory that Gresham's law sometimes directly thwarts the will of the states, or that trade rejects state money altogether if it becomes hopelessly depreciated."[60]

But Knapp's vision of the state as the center of the monetary process fitted a contemporary demand that wanted national sovereignty over money, and saw money as a tool in a struggle for power. It is a vision that despite all its problems comes back resonantly at regular intervals—usually at moments of doubt about the direction of globalization. Knapp's argumentation about how the state creates money and his explanation of the wonderful consequences is structurally similar to today's arguments in favor of so-called Modern Monetary Theory, or MMT. Knapp thought of money in two distinct ways. First, there was domestic currency, which he called autogenic money.

> Instead of always highlighting only the shortcomings of autogenic money, one should occasionally also think about what it still does: it frees us from our debts; but whoever abolishes his debts, does not need to think long about whether he has also received a substance or not. Above all, it frees us from the debts against the state, because the state as an issuer emphatically recognizes that it as the recipient allows itself to accommodate this means of payment. The more taxes in the state mean, the more this circumstance is relevant. By creating autogenic means of payment, the state gives to these instruments the power of debt repayment.

Second, there was international (or, as Knapp characteristically phrased it, pantopolic) money, which could only be managed through "exchange control," or "extradronic control."[61] He absolutely rejects any idea that there is any connection between the domestic monetary situation and exchange rates.

The analysis developed at the end of the nineteenth century has a modern American parallel in Modern Monetary Theory. The central basis is an idea of monetary sovereignty. The leading MMT proponent, economist Stephanie Kelton, gives the contemporary American reader a linguistically pared-down version of the Knapp view on the emancipatory advantages of domestic money that follow directly from it being a liability of the state. Money and government debt should not be considered as a liability of the state, requiring citizens to pay higher taxes in the future, but rather as an asset that enables citizens to realize their dreams. The debt part is a fiction that doesn't matter. "If we wanted to, we could pay off the debt immediately with a simple keystroke." And again, "The entire national debt could be paid off tomorrow and none of us would have to chip in a dime." The government's spending capacity is infinite; all that is limited are the productive resources of the economy. "Financing isn't a constraint; real resources are. Closing the health-care deficit will require more primary care doctors, nurses, dentists, surgeons, medical equipment, hospital beds, and so on."[62]

But then there follows a crucial qualification: Kelton goes "extradronic" like Knapp. She proceeds to assert that only states that control their foreign exchange market can obtain these marvelous blessings. How very Knapp of her! The implication is that states that borrow in their own currency have a large, perhaps infinite, room for maneuver. Fifty years ago, only a relatively few rich industrial countries could borrow long-term in their own currency. The rest suffered from what Barry Eichengreen and Ricardo Hausmann termed "original sin": there was no market confidence in the solidity of the currency and they were dependent on foreign-denominated debt.[63] Now a large number of upper-middle-income states, such as Mexico, can borrow long-term in domestic currency. But the problem does not end with government borrowing: if there is substantial corporate borrowing, by an economically essential group of companies, the threat of an inability to pay may create an implicit liability of the government to step in with a bailout. Seen in this light, most, perhaps all, countries except the United States no longer have true monetary sovereignty, and MMT becomes a purely American belief. For instance, the UK looks as if it has monetary sovereignty in the MMT approach, but there is plenty of private borrowing in dollars, and thus exposure to a foreign currency whose value cannot be manipulated by the government. The U.S. position is quite different. The long-term trade deficit of the United States is not a problem in this view, and results simply from the desire of the rest of the world to hold dollars. If there is a private-sector deficit, it stems from the government allowing its deficit to fall below the trade deficit. There is thus considerable room for expansion of the budget deficit, or of fiscal outlays. Again, this is a peculiarly American issue.

There is an even more fundamental objection to this line of monetary analysis than the observation that it can apply only in a substantially closed economy. Critics in the early twentieth century quickly pointed out that

Knapp was completely oblivious to the question of a limitation of money supply: Ellis rightly concluded that the work was "sterile."[64] But it was a sterility that had large—and disastrous—consequences.

Under Knapp's supervision, Helfferich completed a doctoral dissertation, which he published as *The Consequences of the German-Austrian Currency Union of 1857*. Knapp was enthusiastic about his disciple and recommended him to his former student Karl von Lumm, who was head of the Reichsbank Statistical Department, and in effect the bank's chief economist. Helfferich could not have been a more different personality than Knapp. Whereas the professorially bearded Knapp was a gentle and unworldly soul who liked to wallow in his absurd lexicon of newly coined economic terms, the bullet-headed Helfferich was a man who wanted to be at the center of any kind of action. He was a fundamentally political animal. Knapp was happy to live as a professor in Strassburg, remote from the political center; Helfferich was desperate to get to Berlin and to the seat of power. Helfferich soon became a gifted and energetic propagandist for the gold standard, then under attack from populists and agrarians who wanted a silver currency and rising prices that they saw as relieving their indebtedness. That led to a break with Knapp, who was less enthralled by gold. The young man wrote with enormous facility, dictating at "machine-gun speed" and developing a substantial talent for polemics that Knapp disliked greatly (and warned him against). Helfferich rightly saw that free silver coining would not solve the basic problem of German grain growers—their high costs—and proceeded with a quite forensic discussion of German prices, wages, and borrowing costs. He thought that ending the gold standard would lead to a "fateful economic and social catastrophe."[65] The vigor of the polemic against one of Germany's leading bimetallists, the Conservative Reichstag deputy Otto Arendt, led to a libel action and almost cost Helfferich his second doctorate (*Habilitation*). At this point he tried to synthesize his academic work into a systematic work of exposition, a textbook on money.

Helfferich's *Das Geld* (Money) was massively influential, going through numerous editions, with constant revisions to account for the dramatic shifts in monetary realities that occurred up to the early 1920s; the last revision appeared in 1923, when Germany was devastated by hyperinflation. The work is in many ways a continual engagement with the world view of

Knapp, with Helfferich consistently arguing for the gold standard, whose origins had been the major subject of his historical work.

The peculiarity of *Das Geld* is that it largely treated money as a commodity, which facilitated national and international commerce and thus had a sort of analogy to transport. Helfferich had little time for marginal utility: instead, money "serves for the satisfaction of wants exactly in the same way as do all those other kinds of goods which are in the nature of intermediaries or agents."[66]

Helfferich repeatedly tried to define in a Knappian way an ideal monetary order as one that would produce no socially and politically destabilizing disturbances.

> Changes in the value of money, no matter in which direction they take place, thus produce conditions which create serious alterations in the distribution of income and of wealth, disturbances in the bases of all economic calculations, and accordingly in the economic life of the community. Both in the interests of the economic system as well as of justice, it therefore appears most desirable to maintain the value of money as stable as possible, i.e. to keep the factors which determine exchange relations on the side of money as fixed as possible. . . . The smaller the influence which money exercises and the less the course of economic life is affected by money, the more closely does money approach that ideal which is commonly described as the "stability in the value of money."[67]

A paper currency might be theoretically desirable in that it would potentially offer the possibility of establishing a stable value currency shielded from the vagaries of precious-metal discoveries. But in practice, he wrote in the early versions of the work (in words that were retained right through the last edition and the experience of the paper mark and the German Great Inflation):

> The changes proceeding on the side of money will therefore, in the case of a paper currency, influence the exchange relations between money and other goods in general more directly, and for that reason more strongly, than in the case of a metallic currency supplemented by a properly organised banking machine. . . .

> In contrast with metallic currencies, we have found in paper currencies an organisation of money which, from the purely theoretical point of view, appears to place the control over the value of money in the hands of the State. In such an organisation, the supply of currency is not dependent on phenomena which are more or less beyond our powers, such as the output of the precious metals or the international movements of these metals. It is, in fact, entirely dependent upon the will of those authorities whose duty it is to issue the paper currency. The very nature of such an organisation of money would make it appear possible to have, at all times, absolute equilibrium between the supply of and the demand for currency, and so to secure stability of value, with complete independence of the currency from any economic phenomena.[68]

That might appear attractive, and "a paper currency pure and simple constitutes in a certain sense the extreme point in the historical development of money"; but the outcome would push the emergence of interests and a powerful distributive struggle:

> Even to the State itself the unrestricted possibility of making money out of nothing is too tempting for us to feel quite certain that there would be no misuse of the power for fiscal purposes. Added to this, especially in these times of economic controversies, a fight would result between the interests concerned, and this fight would, in the absence of an objective criterion, be decided in advance, not by reason and justice but by brute force only. On the one side we should have all those who owe money fighting for the greatest possible issue of money and for the largest possible diminution in the value of money, and on the other side we should have creditors and all those in receipt of fixed salaries, dividends, and wages who would be interested in the preservation and the increase of the value of money. The fight which would be waged round the value of money would, more than any other economic conflict between various interests, necessarily lead to the demoralisation of economic and of social life. Such destructive controversies can be avoided—not completely, as otherwise we should never have had a "currency question"—by placing the value of money in a position of dependence upon one

> of the precious metals, the value of which is not within the sphere of influence of the economic parties, and the properties of which give a greater guarantee of security for an approximate stability of its value than has so far been observed in any other commodity.[69]

This passage was an uncanny anticipation of the way in which inflation strengthened interest groups who could exert pressure on the political process: industrial interest associations, labor unions, farmers' organizations. They could easily push weak governments—whether wartime governments anxious about maintaining support for the war, or the governments of the new Weimar Republic, faced with the disappointment and disillusion produced by a lost war.

Helfferich moved from academic life into the German colonial office, and then to the major bank which sought close ties with the government over the expansion of German influence overseas: Deutsche Bank. After 1906, he became the main promoter of the Berlin-Baghdad Railway, a project pushed and financed by Deutsche Bank. In December 1905, the Catholic Zentrum (Center) Party deputy Matthias Erzberger launched an extensive attack on German colonial policy in the Reichstag, focusing on the North Cameroon Railroad, which had been extensively managed and then publicly defended by Helfferich. Helfferich came away from the discussion in the Reichstag committee with contempt for Erzberger's demagoguery and a strong sense that parliamentarism involved a waste of resources and a hobbling of the administration.

He was exuberant at this point about all the possibilities open to Germany. In September 1912, he became nationally famous as a result of a euphoric speech to the Fourth German Bankers' Congress: "No nation in history has got anywhere by wearing a hairshirt and tightening its belt. Progress calls for enjoyment of life and creative enthusiasm, and these things we have no wish to lose."[70]

He continued to work on statistics and economics—not least in order to make strong statements about Germany's potential. At the beginning of the fourth edition of Helfferich's pioneering investigation of German national income, published in June 1914, he added a preface to deal with the question of financial preparedness and financial mobilization. He commented that "it is not surprising that, in our age of the utmost mobilization of all forces for the struggle for national self-preservation and influence in the world, financial power is also at stake in the Great Game, when nations that feel themselves financially superior to us use that superiority in their political calculations. Only a few years ago I heard repeatedly from the mouths of foreigners, 'You Germans can't carry on the show financially.'"[71] Helfferich went on to contrast Germany with France, which had prided itself on its financial sophistication, and now found itself strained by its military budget. He thought it the mission of the book to point out German strength, so that "in the interest of the world, the illusion vanishes that a goal can be attained through financial policy that was not possible through military power or ententes and alliances: the beating down of Germany."[72]

It was not surprising that the peace and the Versailles Treaty, in which France would make Germany pay, appeared to Helfferich just as a continuation of the war. As he put it in a new edition of his textbook on money, "the so-called 'Peace' then created has been described by no other than M. Clemenceau, the man who shaped it, as the 'continuation of the War by other means.'" The monetary system was just an open clash of political interests: "In the place of the international monetary system of pre-war days, co-ordinated by the use of gold, we now have a chaotic medley of national systems unrelated to each other and without any equilibrium."[73]

Helfferich now turned himself into a politician of the nationalist right. The prewar national liberal orientation was subsumed: all that remained of that old outlook was a passionate hostility to taxes. He used his fluent pen and propagandistic talents to orchestrate campaigns against the major figures of the early Republic. He reflected that "it is difficult not to write a satire about parliamentary government in Germany," and yearned for "the feared and respected German Empire [*Reich*], the Eden of our past and the Nirvana of our future."[74] Matthias Erzberger, the Catholic Zentrum Party opponent of prewar imperialism, who had needled Helfferich as a colonialist and attacked Helfferich as wartime finance secretary, now signed the Peace Treaty and then tried to draw up a financial stabilization program. Helfferich attacked Erzberger as personally dishonest and a destroyer of the Reich (*Reichsverderber*), concluding the peroration with the question, "Shall the German nation and the German people be brought to ruin by the cancer Erzberger?"[75] A libel trial followed, with the court under nationalist judges concluding that Helfferich had proved many of his charges of conflict of interest and fining him only a trivial 300 marks for his libel. Erzberger was destroyed politically, and a few months after the end of the trial was assassinated by two young officers belonging to a terrorist group, the Organisation Consul.

Helfferich's attacks on the Weimar governments continued. By 1922, he was attacking in particular Foreign Minister Walther Rathenau for his policy of "fulfillment," paying reparations and negotiating in the hope of getting a more favorable settlement. On June 23, 1922, he spoke in the Reichstag of how "a German Government which gives up important attributes of sovereignty belongs on trial for treason." The next morning, on his way to the Foreign Office Rathenau was gunned down by the Organisation Consul as his car turned a bend in Berlin-Grunewald. For the government, it was clear that Helfferich was the real murderer. The economist proceeded to take his seat in the Reichstag as usual, even though the president of the assembly advised him to stay away. Chancellor Joseph Wirth concluded his moving eulogy to Rathenau with words directed at Helfferich and his party: "There stands the enemy, who is dripping his poison in the wounds of the German people. There stands the enemy—and there is no doubt at all—this enemy stands on the right."[76]

The cowardly assassinations that followed, predictably, from Helfferich's vicious rhetoric did not end his career—on the contrary, he played a central role in the last phases of the German hyperinflation that took off after the Rathenau assassination, with a stabilization plan that envisaged a new currency based on a mortgage on rye production. Temporary banknotes were issued, but in the event, a more conventional form of stabilization around a gold-based currency came in, pushed by a center-right coalition. It would not have been viable without a reparations settlement, in the form of a new plan, the 1924 Dawes Plan, which Helfferich saw as a "second Versailles" and continued to propagandize against. He wrote about how "the German people is lost beyond all salvation if it takes these curses upon itself anew."[77] In the early months of 1924, Helfferich was repeatedly in Italy, mostly for health reasons, but also to visit the Italian dictator Benito Mussolini. Early on the morning of April 24, he died, incinerated in a fiery rail accident in Switzerland when his northbound Milan–Basel express hit the Milan-bound train. Thus ended a career that began with a politically convenient misrepresentation of the character of money, which regarded money as a source of a domestic struggle over distribution but then believed that an international mechanism, war, could tilt the balance so as to produce the resources that would heal all the domestic wounds. Helfferich was the dismal economist who brought the logic of sovereign money to its ultimate and destructive conclusion.

4

The Great Depression

The Great Depression remains the defining event in how we think about globalization. It appeared to bring about a complete reversal—what in 2001 I called the "end of globalization"—with a turn to what were alternatively described as autarky, economic nationalism, and beggar-thy-neighbor policies. Those Depression-era mindsets persisted. In the 1930s, some writers talked of the phenomenon as the "end of capitalism": that was the title of a sensational book of 1931 by the German journalist Ferdinand Fried. Fried explained how the world economy and debt were interconnected and how societies could liberate themselves from debt by breaking off from trade and the financialized world economy.[1] Fried was writing for the "new" conservative or revolutionary journal *Die Tat*; he soon became a Nazi sympathizer, rose to the rank of SS-Sturmbannführer, and after the war reinvented himself as the chief economic writer for the center-right newspaper *Die Welt*.[2]

The interwar slump seemed to turn conventional economics upside-down. Understanding what delivered the shock of the Great Depression consequently has become what Ben Bernanke memorably called the "holy grail" of macroeconomics: but we know from medieval stories that the knights almost never succeed in their quest.[3] As Alfred Tennyson put it in "Sir Galahad": "O just and faithful knight of God! Ride on! the prize is near." Sir Galahad only glimpses the grail.

In a sense the answer to the modern analytical quest is obvious: the Great Depression followed from the massive disruptions (a supply shock) that followed the Great War. It was a continuation of the deglobalization rupture brought by the First World War, made all the more severe by the bungled attempts to revive or reinvent internationalism. Most obviously, the war disrupted European production and agriculture, and led to the spread of manufacture and cultivation elsewhere. In that sense, the military conflict extended the partial globalization of the late nineteenth century, which only fully encompassed flows of capital and people to temperate countries of European settlement but left much of the globe on the margin of development. Now India and Japan greatly increased their textile production. The output of Indian mills rose from 1,136 million linear yards in 1914–1915 to 1,614 million in 1917–1918.[4] Japan's cotton cloth output increased by a factor of four between 1913 and 1929, with yarn output doubling.[5] The value of cotton textile exports increased tenfold from 1913 to 1918.[6] Grain production outside Europe increased, with Southern Hemisphere output rising from 57.5 million quintals in 1914 to 88.2 million in 1920, as well as higher North American production.[7]

As European recovery set in after the combat ended, and fields once more had fertilizer applied, and crop yields rose, there appeared to be overproduction, a glut. This might have fueled a spending or consumer boom: and in the 1930s one of the causes of economic recovery from the slump in some highly import-dependent industrial countries, notably the UK, was the favorable development of the terms of trade as the cost of imported foodstuffs fell. But in the 1920s, demand was constrained by the high costs of servicing the war debt, that is, making payments to the nonspending rentiers whom Charles Pigou had so clearly identified as the major beneficiaries of Anglo-American war finance. The wartime supply shock in this way turned into a problem of inadequate demand.

The interwar slump was a worldwide phenomenon, but its effects varied enormously from country to country, and the policy options—such as they were—were also quite different. Looking at policy-making in some places is a matter only of analyzing precisely why policy was restricted and stymied: that was the case in highly indebted countries, which faced only highly unattractive and politically unpleasant alternatives.[8] Devaluing in order to obtain export advantages (or demand from abroad) would only increase the burden of foreign currency–denominated debt, so that devaluations were inevitably followed by defaults; but that move would restrict the availability to finance trade, including needed imports. As a consequence, economic strategists in countries with impossible debt levels, such as Argentina's Raúl Prebisch, concluded that only a longer-term strategy of development through import substitution offered a path to redemption: raising the level of domestic demand. Prebisch, who had developed an extensive and sophisticated system of exchange controls in the 1930s, saw this sort of control as essential to building a strategy that would allow agricultural producers to escape from the trap of low commodity prices. Even where it looked as if there were more policy options, there were strong incentives to cut off links with an external system that imposed deflation and depression.

Britain, whose traditions of economic thinking would influence the world's debate on countercrisis strategy, might appear to have had more options for tackling the economic dilemmas, but the country largely failed to realize the opportunity. The analysis that emerged triumphant out of the depression and is associated forever with the Cambridge economist John Maynard Keynes reflected a very peculiar British material context. The country was in a long-term relative economic decline, and there were major structural problems before the worldwide slump hit. In the mid-1920s, over one and a quarter million workers were unemployed (out of a total workforce of almost 12 million insured); three-quarters were in the old staple industries, in particular cotton and woolen manufactures.[9] Political leaders could not imagine any other solution than cost cutting, in particular through wage reductions (rather than investment in increasing productivity). Prime Minister Stanley Baldwin, who came from an iron and steel family, explained that "all the workers in this country have got to take reductions in wages to help put industry on its feet."[10] The pressure was undoubtedly made worse by the choice of the exchange rate—the prewar rate—at which the government returned the country to the gold standard and gold convertibility in 1925, and which produced a constant pressure to deflate. But it may have been a mistake, generated by the mentality of the time that sought a return to the apparent certainties of the prewar rate, even to choose any parity: the country was vulnerable to financial runs which were pushed by the easy target offered by a fixed exchange rate.

The UK in the 1920s, then, even before the slump, looked and felt depressed. That was in remarkable contrast with the two other major industrial economies of the world, Germany and the United States. Germany experienced a boom in the later 1920s driven by foreign borrowing on the promise of a better future and dreamed about a rationalized technologic future,[11] while the United States, which largely generated the financial exuberance that fed a world upswing, looked quite euphoric. The inflow of funds to Germany effectively allowed Germany for the moment to not pay reparations, or at least make no net transfer payments.[12] Japan too was building up a powerful and dynamic export industry. At the end of the 1920s, the Soviet Union looked to forced breakneck industrialization as a way out of stagnation. In undynamic Britain, Keynes felt that he was offering not just solutions to a British malaise, but a policy framework that had a much wider, perhaps global, applicability. As he put it in a letter to George Bernard Shaw in 1935, on the eve of the publication of his masterwork, *The General Theory of Employment, Interest, and Money*, "I believe myself to be writing a book on economic theory which will largely revolutionize—not, I suppose, at once, but in the course of the next 10 years, the way the world thinks about economic problems."[13] In short, he thought that a British problem required a global solution.

Globalized Exuberance

The United States in the roaring twenties was driven by exuberance. Everything seemed to be going right; the opportunities were boundless. Computer analysis of newspaper content makes it possible to pick out moments at which psychology or sentiment affected markets.[14] A constant theme of reporting in the optimistic phase of rapid expansion was the favorable state of public-sector finances, with the United States having the lowest debt of any large industrial country in relationship to public wealth, and paying less in interest rates.[15] Euphoric articles in 1926, on the 150th anniversary of the declaration of independence from Britain, explained the American success story: "to compare the two nations in a sentence, the United States has now three times the population of Great Britain, five times the wealth and six times the income. . . . The Ford profits were $94,000,000 this year. No one in Britain can comprehend such a fact. This amount is more than three times as much as the capital of the biggest automobile manufacturer in England. . . . American wealth has doubled in the last dozen years—this is a rate of progress that has never been known in Europe. Compared to these unparalleled figures, British progress seems like 'the short and simple annals of the poor.'"[16] Articles such as this had a measurable effect on American business confidence and hence investment behavior. U.S. investors were supremely confident in the new American capacity for global leadership.

There was also good news about a Europe in the mid-1920s that seemed to be leaving wartime devastation behind it, and about the chances of a stable solution to the overriding political issue, the reparations problem.[17] Press articles explicitly addressed the new investing environment in terms of "optimism" and a "cheerful atmosphere," with relief over the stabilization of the European political situation, which would bring Europe firmly back into the international financial economy.[18] The sentiments produced by internationalization generated a powerful self-confidence. In the mid-1920s, there was extended discussion about European, especially German, companies going to the American capital markets.[19] The press was generally boosterish. Thus Edward V. Decker, president of the Northwestern National Bank Minneapolis, was quoted as opining on how "we are learning more to work together, farmers, bankers, businessmen, railroad men, and we propose to march forward with a united front, believing and expecting that we will have our share of the world's prosperity during the next few years."[20]

When matters appeared to sour in the last years of the roaring twenties, there was no obvious source of catastrophic news. Analysts have spent long and pointless hours looking for the precise trigger of the October 1929 stock market collapse in the United States: but there is no apparent gun, smoking or not.[21] At the beginning of 1929, General Motors' Alfred Sloan announced that "[g]enerally speaking, business is excellent and will be better in most lines. Manufacturers, wholesalers and retailers are not unduly overextended in credit. Industry is not suffering from the overproduction which has sometimes characterized it in the past. I can see nothing but good signs along the road of business for the present year."[22]

In February 1929, there was a surge of phrasing in newspapers that indicates anxiety or avoidance, mostly associated with the Federal Reserve's effort to curtail an overexuberant boom through the restriction of broker loans. The daily "Abreast of the Market" gossip and news column in the

Wall Street Journal of February 11 explained that "[s]entiment generally continues pessimistic. There is a feeling that the latest warning of the Federal Reserve Board has attracted more attention than those of the past month, and as a result a general tendency to clean house is noted, particularly among those outsiders who have been outspokenly optimistic right along. Conservative observers plan to continue to favor taking profits whenever opportunities are presented, because they feel that before the market reaches a level where good buying will be encountered stocks can be repurchased at more reasonable figures."[23] The newspaper reported on a National City Bank report's "alarm" at the "extraordinary growth of unregulated non-bank loans being made for speculative purposes, not because the size of brokers' loans is of itself dangerous, but because non-bank lenders feel little responsibility towards the money market, may withdraw their funds at a moment's notice, and thus place upon banks the responsibility of maintaining the money market on an even keel."[24] There were complaints about the "smug silence" of the New York Fed, which worried that it simply did not have the instruments to contain market exuberance.[25] Other worries included difficulties for railroad mergers, such as objections to a merger of the Chesapeake & Ohio with the Baltimore & Ohio.[26]

Innovation as well as psychology drove the mania of the 1920s. New variants of future bets, put and call options, proliferated. There were also new concepts: the investor and pundit Benjamin Graham became an authority by pushing the idea of value investing. And there were all sort of incentives to mislead and misbehave: Graham recalled later how "most customers' men ran discretionary accounts for their clients, which gave them the right to buy or sell what they pleased without specific authorization or orders." These men shared half of the profits with the customer, but none of the losses.[27] They thus had a powerful incentive to take on more risk, passing on the costs to others.

One of the most innovative, and most globalizing, interwar entrepreneurs was the businessman and engineer Ivar Kreuger. Born in 1880, he had traveled widely before returning to his native Sweden, where he started a construction company with another engineer, Paul Toll: Kreuger and Toll. Just before the First World War, he took over two struggling match companies, and came to dominate Swedish match manufacture through a new company, Svenska Tändsticks Aktiebolaget (Swedish Match Company). In the early 1920s, he saw an opportunity for raising money in the United States, and created U.S. subsidiaries of both the Swedish companies, American Kreuger & Toll and the International Match Corporation, with a Liechtenstein-based holding company, Continental Investment AG. The American money was used to acquire undervalued assets, mostly in match manufacture, in inflation-shaken Central Europe. From the mid-1920s Kreuger moved into lending to governments, often with a condition attached that his match companies should be given a monopoly. Countries that borrowed from Kreuger included France, with a $75 million credit, but also Greece, Ecuador, Latvia, Estonia, Yugoslavia, Hungary, Bolivia, Guatemala, Poland, Turkey, and Romania.

In October 1929, Kreuger was about to crack open the European pièce de résistance, the German market, and negotiated a $125 million loan at 6 percent interest for the cash-strapped German government in return for the granting of a match monopoly. The money was to be raised on the American market through one of the newfangled instruments, a mixture of a bond and an option. On October 24, a large advertisement appeared in the American press, with simultaneous coverage as a news story, which had an additionally appealing political dimension as the proposed match monopoly held out a way of squeezing cheap Soviet matches out of the German market. A capital increase for Kreuger & Toll would provide a certificate at a price of $23 for every three certificates already held (and priced at $36). The certificates represented debentures which shared equally with ordinary stock when disbursements were over the "ordinary" rate of 5 percent: they had regularly been at 25 percent for the past ten years. Thus there was a likely yield of 5.9 percent. The news was boosterish: the *Wall Street Journal* reported the extensive wood and pulp holdings, and declared that all the assets on the balance sheet were valued "on a conservative basis."[28] Unfortunately, October 24 was not a normal day on the New York market: it subsequently became known as "Black Thursday," the beginning of the stock market crash, with record volumes of stock traded and several suicides of failed speculators. On the following Friday, Kreuger sent a striking cable to his American banker, the Boston house of Lee Higginson, in which he offered to take over for his Swedish syndicate half of the debentures that the American underwriting banks had acquired. The American bankers were amazed at the fortuitous rescue. Joseph R. Swan, for instance, of the Guaranty Company, purred, "He certainly plays up handsomely and, also, I think, wisely."[29] The result was that the issue was a great success, and that the price stood up well on Monday, the 28th, another day of a massive historic sell-off on Wall Street.

Kreuger looked as if he understood the psychology, and could tame even the wildest of markets. Everyone who encountered him remarked on his unusual powers of persuasion. Carl Bergman, one of his Swedish associates, later wrote:

> There was an odd air of greatness about Ivar. I think he could get people to do anything. They fell for him, they couldn't resist his peculiar charm and magnetism. That was his secret, his psychological quality of leadership, his extraordinary intuition. He could grasp things immediately. Above all, there was a look about him that made a difference. I saw J. P. Morgan's eyes many times in New York. They were like fire coals. But Ivar's eyes were not like that. They had another quality. Though small and narrow, they seemed capable, if he desired, of looking right through you.[30]

The German Finance Ministry official who dealt with Kreuger, Hans Schäffer, was amazed by the way that the very rich man took Schäffer out for a humble and rather austere meal in Berlin: there was no boasting about endless champagne, merely a flow of beautifully constructed phrases.[31] Kreuger—like Bethel Strousberg—had residences all over the world, in Stockholm, Paris, Berlin, and New York, as well as country retreats in Sweden. The elaborate "Matchstick Palace" in the center of Stockholm, No. 15 Vastra Tradgardsgatan, was a neoclassical four-story building with 125 office rooms, constructed out of pale marble and granite around an open horseshoe-shaped courtyard, with statuary of mythical figures: at the center was a bronze by Carl Milles of Diana standing on one leg and pointing at the sky. The boardroom was decorated by the expressionist painter Isaac Grünewald. Kreuger's own vast room had a world clock in order to emphasize his global empire.[32]

After the big bank and credit collapses of the summer of 1931, Kreuger appeared the only figure with the stature to rescue the world. At the newly established central bank of central banks, the Basel-based Bank for

International Settlements, the Belgian banker Emile Francqui proposed a private-public corporation that would raise the money to bail out endangered states, and Kreuger took a prominent part in the initial discussions.

In 1932, however, the Kreuger empire unraveled. Kreuger was trying to put together a deal with J. P. Morgan and the International Telephone and Telegraph Corporation (ITT) through the Kreuger telegraph company, L. M. Ericsson, but misrepresented the financial condition of the Ericsson business. On the basis of the falsification, ITT had bought 600,000 Ericsson shares. Kreuger first tried to give an explanation in terms of translation problems between English and Swedish, but then fled New York for Paris, where, on March 12, despairing, he died of a gunshot wound in his apartment. At his bedside was a prophetic novel by the Russian writer Ilya Ehrenburg, *Edinyi Front*, about a businessman with a Scandinavian name who built up a match empire that threatens the Soviet system, and who eventually dies of a heart attack in a Paris apartment. Kreuger's brother waged a long campaign to have the death pronounced as a murder. After Kreuger's death, it became clear that the large quantity of Italian government bonds he was attempting to pledge as collateral were forgeries (the brother insisted that they were just sample sketches for a possible loan). Mussolini denied any interest in Kreuger's dealings: "Even if we were dying of starvation, we'd never take a lira as a loan from France."[33]

Whether the whole Kreuger complex was insolvent was unclear: Lee Higginson unsurprisingly, as one of the major creditors, insisted that the concern was correctly valued. The Swedish Match Company survived and was bought by the Wallenberg family. The lawyer Frank Partnoy's recent study of Kreuger concludes that the appearance of failure was the result of disposal of assets at fire sale prices: like Lehman Brothers in 2008, this was a business where the bankruptcy was probably illusory.[34] The Kreuger story was an indication of the extent of America's new global engagement, which depended on stories spun by charismatic outsiders.

Throughout the period, political leaders thought that they could instill a return of confidence through upbeat statements. In November 1929, President Herbert Hoover announced a cut in personal and corporate taxes, and then tried to reassure: "The problems with which we are confronted are the problems of growth and of progress." He used the calming psychological term "depression," rather than the more dramatic and current "crash," "crisis," or "panic."[35] After the crash, in November 1929, the leading monetary and business economist Irving Fisher had blamed "mob psychology," insisting that the panic was "not, primarily, that the price level of the market was unusually high."[36] The result of the psychologizing was that eventually "depression" would soon sound much worse than crisis or panic, and became a no-word for policy-makers, who used the milder "recession" instead in dealing with late-twentieth-century problems.

In his December 1929 State of the Union address, Hoover noted that it was the memory of past crashes that was endangering business confidence:

> The sudden threat of unemployment and especially the recollection of the economic consequences of previous crashes under a much less secured financial system created unwarranted pessimism and fear. It was recalled that past storms of similar character had resulted in retrenchment of construction, reduction of wages, and laying off of workers. The natural result was the tendency of business agencies throughout the country to pause in their plans and proposals for continuation and extension of their businesses, and this hesitation unchecked could in itself intensify into a depression with widespread unemployment and suffering. I have, therefore, instituted systematic, voluntary measures of cooperation with the business institutions and with State and municipal authorities to make certain that fundamental businesses of the country shall continue as usual, that wages and therefore consuming power shall not be reduced, and that a special effort shall be made to expand construction work in order to assist in equalizing other deficits in employment.[37]

But Hoover completely failed to engineer that cooperative effort in a country torn apart by economic crisis. Promises like his, especially when constantly repeated and reiterated, turned the audacity of hope into the mendacity of words. When promises cannot be kept, confidence quickly erodes. Richard Whitney, the vice-president of the New York Stock Exchange who had tried to reassure the market with a big bid in October 1929, in his first public statement three-quarters of a year later merely said that a panic produces "a sharp disillusionment of society as a whole," and that "no practical measures have been suggested which would have prevented it or minimized its force."[38]

There was a pervasive uncertainty about how to interpret news. Thus in the spring of 1930, when it appeared certain that the controversial Smoot-Hawley Tariff Act would pass into law, opinions on whether it would help or harm the economy were divided.[39] The *Wall Street Journal* argued that passing the tariff would remove doubts and hindrances: the "final disposal of the tariff in the next few days with an end to the uncertainty that has surrounded the bill for many months is expected to act as a distinct stimulant on business. This is the view of high and well-informed government officials."[40] But a few days earlier, a report by the New York investment and merchant banking firm Dominick and Dominick suggested that retaliation from Canada and Argentina was likely, and argued that a continuation of American prosperity depended on foreign markets: "Already our factories supply 96% of the domestic consumption and our producers must look to foreign markets to absorb the increasing output."[41] In reality, of course, no one could *know* what the tariff would do to the world economy or U.S. trade, and that veil of ignorance fanned fears and hopes—and made for market volatility. In another example of the escalation of fears and phobias, the collapse of timber prices in the economic downturn was ascribed to a Soviet plot: "a widespread assault upon the economic structure of the United States and other so-called capitalistic countries, by invading them with underpriced goods, is avowedly part of the Russian program."[42]

The British economist John Maynard Keynes made the Wall Street crash the centerpiece of his indictment of American capitalism. From his perspective, the problem lay in a system of valuation in which values had no necessary or direct correspondence to long-term productivity. America was uniquely volatile because of the extent of popular participation in the stock market, while more exclusive or "aristocratic" markets were less vulnerable. Keynes told a visiting American financier that "they were all sub-normal and even sub-human; also that he and his friends were of gangster mentality."[43] He later concluded in the *General Theory*: "Even outside the field of finance, Americans are apt to be unduly interested in discovering what average opinion believes average opinion to be; and this national weakness finds its nemesis in the stock market."

From 1929 to 1932, U.S. GDP fell by a third, from $103.1 to $58.0 billion. How much of the collapse was the result of the stock market collapse? The Dow reached its low (40.56 points) in July 1932. The result of the long decline was a substantial loss of wealth, which had an immediate impact on consumption. Demand was reduced. Investors (sometimes described as 600,000 widows and orphans) lost more than $20 billion as a result of the stock exchange collapse. This is a vast amount of wealth, but it still does not account for the extent of the collapse of demand and the shrinkage of GDP.

Financial Stress

Finance in the 1920s, in the world before the crash, was dominated by larger-than-life personalities such as Ivar Kreuger, while politicians regularly looked as if they were floundering. The charms of financiers might raise demand through the magic of credit. But then the financiers got taken down and nothing was left. Hoover looked utterly discredited by the end of his only term of office as president. Prime Minister Ramsay MacDonald in Britain was visibly tired, and in fact was suffering from the initial stages of senile dementia. Chancellor Heinrich Brüning in Germany did not understand the financial aspects of the German collapse: when later he came to write his memoirs in exile in America from the Nazis, he relied on conversations with the financier most directly responsible for the bank collapse, Jakob Goldschmidt.[44] Bank failures, rather than the stock market panics, were really the main driver of the Great Depression, on both sides of the Atlantic.

It is striking how the American collapse of October 1929 did not lead to dramatic panics on other stock markets in Europe or Asia, where the news from Wall Street was just one more element in an increasingly gloomy economic picture. In a world of very substantial capital mobility, it is surprising how disconnected the different stock markets were and how markets treated October 1929 as a purely American phenomenon, one that arose out of the peculiarities of the American psyche. The depression was transmitted to other countries by depressed American demand for imports, by the fall-off of capital exports. The movements of the British

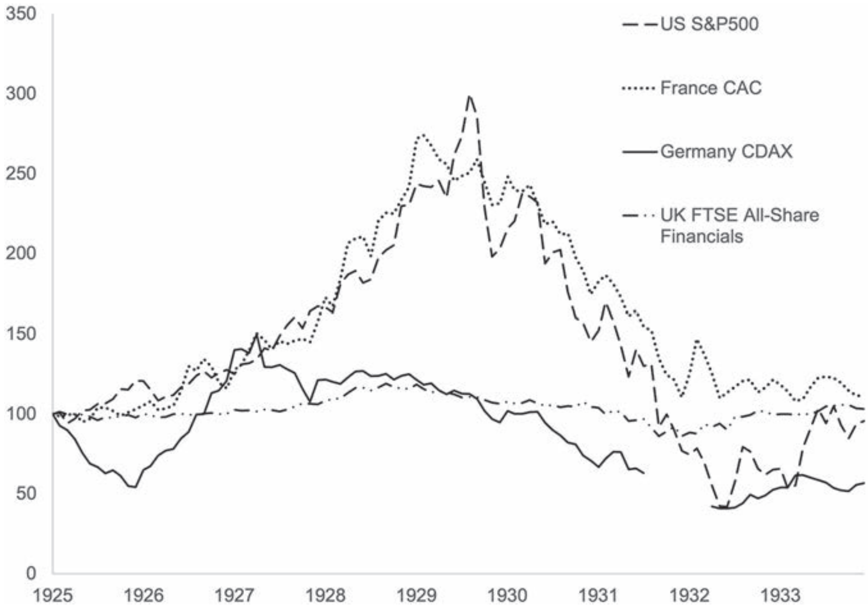

Figure 4.1. Stock indices in France, Germany, the United Kingdom, and the United States, 1925–1934 (1925 = 100) (Source: Calculated from Global Financial Data)

and German stock markets were quite closely correlated with each other, but not with Wall Street (see Figure 4.1).

When everything looks uncertain, patterns of behavior revert to the past. In October 1929, the New York market expected J. P. Morgan to rescue it, because that banking house had done so in the panic of 1907. So on Black Thursday Morgan sent Richard Whitney, vice-president of the New York Stock Exchange, onto the floor of the exchange to make a subsequently famous bid for U.S. Steel. When he did not repeat the action on the next Monday, there was a real panic.

Ben Bernanke's study of financial instability in the Great Depression concluded that the United States was the only country in which the discretionary element of policy was seriously destabilizing, since elsewhere policy was constrained by the logic of the gold standard—Keynes's "golden fetters" in the analysis very clearly laid out by Barry Eichengreen.[45] Perhaps France (with substantial surpluses) also corresponds to that American position, with a substantial room for policy maneuver.

Thus the question becomes why the gold standard had operated tolerably well in the pre-1914 era, at least in the industrial core. Peripheral countries were wont to be driven off gold by financial shocks. In the prewar world, Britain had tried to stabilize the system, while in the interwar era America, with isolationism, and France, with a terror of German revanchism, opted out of constructive international politics.

One productive way of thinking about the new 1920s order is how more countries had after the war become "peripheral." That is, they were trapped by debt in a world in which they could not control their own demand. They relied on foreign sources of financing. Germany, unambiguously part of the late-nineteenth-century core, had been driven out of that core by the costs of both the war and the peace settlement. In moments of euphoria, financial flows surged into the periphery, and the increase in the extent of lending fueled confidence at the core. The debt build-up led to "revulsion" and crises, as it became clear that the debt was secured on the basis of values that were collapsing. That applied to international debtors—in South America and Central Europe, with Germany being by far the largest debtor. But it also applied domestically. In the United States, the weakness was most apparent in the agricultural states, where owners of 45 percent of all U.S. farms, amounting to 52 percent of the value of farm mortgage debt, were delinquent in payments.[46] The total volume of personal debt was reduced dramatically: from $27 billion before the Depression to less than $9 billion in 1934.[47]

As prices fell, producers had to sell more in order to service the debt, and their efforts drove prices down even further, in a vicious spiral.

The final blow—what made the Great Depression really "Great"—came with a series of contagious financial crises emanating from Central Europe. There was something very haphazard about 1931, at least in its origins. Banking crises eventually came to play a major role in the intensification of the depression in the United States, but most U.S. banks were vulnerable because they were small and local. In Europe, however, a decisive stage of the crisis came with the failure of megabanks, which raised almost impossible policy dilemmas for the national governments. The example of the European bank failures of the summer of 1931 in turn translated into a new shock for the U.S. economy, and some of the major money-center banks became vulnerable to investor and depositor panics.

Unfortunately, relatively few accounts of the American Depression fully take into account the impact of the European collapse, and the role that it played in fanning financial uncertainty and in leading banks to call in loans. In fact it was the international panic of the summer of 1931 that turned a bad recession in the United States into the Great Depression.[48]

In the course of the winter of 1930–1931, a number of insiders, notably the influential Zurich banker Felix Somary, had made the rounds of the financial cognoscenti delivering grim warnings of the dangers that threatened the German and Italian banking systems; he also warned about the imminent collapse of the Kreuger empire.[49] In the event, the first real sign of major European problems came in tiny Austria rather than in its northern or southern neighbor.

The problems of Austrian banking went back to the aftermath of the First World War and the dissolution of the multinational Habsburg Empire, leaving a dwarf state contemptuously known as "Deutschoesterreich." The big banks of the empire needed to adjust to the reduced circumstances of Austrian life. In 1929 the government pressed the largest and most famous of Austrian banks, the Creditanstalt, to merge with an insolvent institution, the Bodenkreditanstalt. All the other Austrian banks had refused a part in this deal, doubtless because of the Bodenkreditanstalt's poor condition. But the Creditanstalt was bribed into acquiescence. A secret part of the deal was that the Austrian National Bank would make deposits in foreign banks, mostly in the London market, that would be passed on as credits to bolster the Creditanstalt. The amounts thus could be shown as foreign reserves on the balance sheet of the National Bank, while being recycled as support for the largest commercial bank. The governor of the Bank of England, Montagu Norman, called this "tainted money" when he became aware of the exposure of the British banks in the aftermath of the collapse.[50]

But losses in the commercial bank continued to mount. At any point after 1929, the Creditanstalt might have gone into bankruptcy. In May 1931, the management of the Creditanstalt started to press for an investigation into their assets, as they argued that "in view of the continued industrial depression it was necessary to make a conservative valuation of their debtors in order to establish a genuine Balance Sheet." They found losses on their credits of 52 million schillings, losses on industrial participations of 28 million, in addition to the 60 million of losses they had taken from the Bodenkreditanstalt deal.[51] It is still not quite clear why the directors were overcome by this sudden urge to honesty and to the market valuation of their assets (at the worst possible moment). The most likely explanation is that the new leading figure, Zoltan Hajdu, who had had some sort of religious conversion experience, also saw himself as a divine instrument against the former management of the bank, in particular the spectacularly corrupt Friedrich Ehrenfest, who was pushed out as a director in July 1930, and whose activities were later central to the government's legal case against the Creditanstalt management: he had taken very large unauthorized loans from the bank to finance his personal investments.[52]

The Creditanstalt's story is an exemplar of the process of the contraction of the credit multiplier: it was locked into its relationship with its many large industrial customers, but as it lost deposits it cut its credits to its smaller customers, the small businessmen who were not only at the heart of economic life but were also central to politics. That common pattern also obtained in Germany, where banks that failed (and had cut their credits to small- and medium-sized customers disproportionately) were drivers in the process of political radicalization. The vote for the Nazi Party increased more dramatically in the towns where the failed banks were located.[53]

The contagious transmission of crisis to Germany was not inevitable. Although it was a neighbor of Austria, there was little direct German participation in Austrian finance. Indeed German banks held less than 4 percent of the Creditanstalt deposits. But German banks looked like the Austrian banks in that their capital basis had been eroded by inflation and hyperinflation in the early 1920s; and there was in addition to the incipient banking crisis a currency crisis that was prompted by the government's attempt to negotiate a customs union with Austria, and by its insistence that the postwar reparations settlement be renegotiated.

Until the beginning of July 1931, the German authorities and the German central bank, the Reichsbank, had more or less explicitly announced that they would never allow a major German bank to collapse.[54] Within a few days, after it became clear that the Reichsbank could not find support from the British and American central banks, it took precisely the opposite stance: it was compelled to stand by and let the German credit system collapse like a house of cards. Thus 1931 unleashed a ferocious debate about regulation, the relationship of financial institutions to the state, and public ownership. The critical discussions took place over one weekend, July 11–12. At issue was the extent to which the panic was the outcome of the political or diplomatic uncertainty, or whether it followed from the particular deep-rooted problems of the German banking system. There was a latent vulnerability, which ensured that any negative news could be a tipping point.

The critical figure in these debates about the future of German banking was Jakob Goldschmidt, the head of the Darmstädter und Nationalbank (or Danat Bank) and a master trader, who by 1931 sat on the boards of 123 German corporations. He was an extravagantly outgoing figure, who in public addresses made himself into the principal exponent of the idea of globalization and openness in 1920s Germany. He explained with missionary zeal that "the search for private profit is the main driver of economic development, and influences the worker no less than the employer; it will produce through the rise of the individual a higher form of cooperation." A critical part of this was integrating Germany in the international economy: "We are dependent on the credit of the world, and this credit must find a basis for confidence in the system and in the method. The world must be able to see openly and clearly the developments that influence the behavior of the individual and the community."[55] But now a very harsh light shone on the very unstable world Goldschmidt had helped to create.

In June and early July 1931, it became clear that the Danat had lost a great deal of money, in particular through its exposure to a major textile producer, Nordwolle; and rumors about its insolvency were spreading (and were reported in a Swiss newspaper). Goldschmidt had already found out about the extent of the losses of Nordwolle on May 11, by coincidence the day of the Austrian bank failure, and also learned that another bank, Dresdner Bank, had extended substantial credits to Nordwolle.

Chancellor Heinrich Brüning, an austerely pious Catholic politician, later thought that the banks should have restored confidence by extending a network of guarantees of each other's deposits. This idea went back to a suggestion by the Swedish banker Marcus Wallenberg that there was a good Swedish precedent on how to solve a bank problem, in that in 1920 Svenska Handelsbanken had been rescued by a common guarantee of the other large Swedish banks. But in fact, the principal civil servant involved, as well as the head of the Reichsbank, had said before the other German bankers were even heard that this proposal (which emanated from the Danat) was unrealizable.

On July 13, the government imposed a banking holiday, and then reconstructed the major banks with government capital. The collapse of the German financial system had a direct impact on some specialized London merchant banks, but there were no substantial implications for large American financial institutions that had been involved in bank lending and in bond issues for Central Europe.[56] Nevertheless, the signals that came from the financial collapse of a large country were profound. Germany could be used as an exemplary case, in which public spending and the need to finance public debt could crowd out private credit: the German banks had been pushed to hold short-term government debt, and needed to run down their other assets in consequence. That lesson was correct in the case of credit-constrained Germany, but incorrect for the United States, where there should have been more fiscal room for maneuver.

Bad news from the rest of the world could drive U.S. expectations, in a world in which both news and their emotional valence were globalized. That was especially true in 1931, with two distinct waves of anxiety: one in February largely concerned with domestic fiscal issues, when conservatively oriented investors were worried about the effects of larger government spending in a measure to counter the Depression; and another in June and July, when foreign news—which also played a prominent role in the *New York Times*'s coverage—dominated the pessimistic turn. Both discussions ran in the same direction: they called attention to the perils of government spending.

In February 1931, most of the sudden spike in negative reporting came from worries that a proposed early payment of the war veterans' bonus that was being debated by Congress would place a strain on the bond market. There might be parallels to the fiscal struggles of Depression-era European governments: for instance, one press article listed the details of the "unanimous opposition against the proposal to cash veterans insurance adjustment certificates expressed by Industrial and financial leaders throughout the country."[57] The press also delved into concerns about the congressional investigations, by a committee under Carter Glass, of the brokerage loans ("loans for others") that had driven the surge in speculation in 1928 and 1929.[58] In the summer of 1931 bad financial news from Europe added to the prevailing anxiety.

The banking and the stock market crises fed into each other in a complex transmission channel. The reduced wealth as a consequence of the stock market panic reduced the collateral on which individuals and corporations could borrow, and thus pushed the process of credit disintermediation that characterized the Great Depression. Banks lent less, and as they cut back their loan books, they forced borrowers to liquidate stock and other assets, and drove prices down further. This is the process identified at the time by Irving Fisher as debt-deflation, one that was later built into a model of transmission mechanism as the credit channel by Ben Bernanke.

International Rescues?

Could there have been a coordinated international effort to prevent, halt, or reverse the collapse of demand? That would have required restarting the credit engine that was sputtering and dying in a world in which no one was any longer prepared to take on risk. The two big surplus countries, France and the United States, appeared to have the only governments with substantial room for maneuver. Both were paralyzed. France was stymied by the consciousness that the Depression was making Europe more dangerous and threatening to France, and by the fear that any international support that Paris might give would only strengthen France's enemies. The United States was obsessed by the domestic consequences of the slump and saw bankers as an international profiteering interest group.

President Hoover tried one bold gambit: the declaration of a one-year moratorium ("holiday") on reparations and war debt payments, announced on June 20, 1931. It looked like good news to the U.S. financial world. Stocks advanced on Wall Street, and the press initially celebrated "one of the most effective measures that could be taken to relieve international uncertainty and world depression." But it was also clear that pessimistic and deflationary expectations had become deeply entrenched, and "the speculative community has resigned itself to a spirit of hopelessness."[59] When the German situation worsened rather than improving, the brief moment of optimism fizzled, and international action from the United States appeared hopeless.

The only realistic alternative in the middle of the German banking crisis was that France might put up money to help out, but this was a pretty slender straw to grasp. The highest official in the German Finance Ministry was pushing for this solution, and had some informal contacts through intermediaries in the financial and journalistic worlds with Pierre Laval, the strongman of the French right; but such assistance was probably as much a realistic prospect as the idea in 2008 that China's sovereign wealth fund could bail out American financial institutions. Even before the outbreak of the German banking crisis, as nervousness was increasing, the new international bank, the Basel-based Bank for International Settlements (BIS), contemplated a plan involving Kreuger to involve private bankers in an internationally coordinated rescue mechanism, in what became known as the Kindersley Plan. A BIS official wrote to Kreuger that "our French friends were a little 'skittish' about the suggestion, because it looked to them like a British device to get money out of the French market into a corporation which would be predominantly managed by non-French personalities."[60] Nothing came of these exploratory discussions.

By January 1932, John Maynard Keynes, who paid a brief visit to Hamburg and Berlin, asked his German audience: "Can we prevent an almost complete collapse of the financial structure of modern capitalism?" The answer lay in the structure of asset prices: "The immediate causes of the financial panic—for that is what it is—are obvious. They are to be found in a catastrophic fall in the money value not only of commodities but of practically every kind of asset,—a fall which has proceeded to a point at which the assets, held against money debts of every kind including bank deposits, no longer have a realisable value in money equal to the amount of the debt."[61] Financial institutions were at the center of the transmission of the effects of the fall in the value of goods to the rest of the economy. Keynes saw the cancellation of debt as a way to alleviate the pressure. Or as an alternative, a turn to monetary expansion, or inflation:

> Thus a process has been set moving which may relieve in the end the deflationary pressure. The question is whether this will have time to happen before financial organisation and the system of international credit break under the strain. If it does, then the way will be cleared for a concerted policy of capital expansion and price raising—which one can call inflation for short—throughout the world. For the only alternative solution which I can envisage is one of the general default of debts and the disappearance of the existing credit system, followed by a rebuilding on quite new foundations.[62]

Since international rescue operations were unviable, or had failed, the only alternative appeared to be a retreat to economic nationalism. Trade protection could be defended as a second-best policy, a mechanism to limit the contagious spread of monetary deflation emanating from a mixture of policy and the constraints of the gold standard. After the 1931 financial crises, countries moved much more radically to curtail foreign exposure, with more impositions of quantitative constraints (quotas) as well as a raising of tariffs.[63]

Limiting flows of money was also attractive as an option, though the extent of the crisis had destroyed the prospect of any substantial new inflows to the debtor countries. So capital controls in practice restricted themselves to stopping outflows: to keeping borrowed money trapped in the now closed-off economy of the debtor.

Other aspects of globalization were on the wane too. A limitation of population movements appeared as a logical response to economic uncertainty, and had already been introduced systematically in many countries, including France and the United States, in the 1920s, before the Depression. Slump anxieties merely intensified the pressure to control migration.

Was there any hope for multilateral solutions? The high point of international cooperation was supposed to be the 1933 London World Economic Conference.[64] But its failure was almost predestined. Monetary experts argued that an agreement on currency stabilization would be highly desirable, but that it required a prior agreement on the dismantling of trade barriers—all the high tariffs and quotas that had been introduced in the course of the Depression. Trade experts met in parallel and made the mirror image of this argument. They agreed that protectionism was obviously a vice, but thought that it was a necessary one that could not be addressed without monetary stability. Only leadership by a determined great power, prepared to sacrifice its particular national interests in order to break the resulting impasse, might conceivably have saved the meeting. But such leadership was unlikely. Governments were unwilling in times of great economic difficulty to make sacrifices that might entail a short-term cost. Even if the result would have been longer-term stability, the immediate political consequences were too unpleasant. In adverse economic circumstances, governments felt vulnerable and unsure, and they could not afford to alienate public support.

Faced by a realization of inevitable failure, participants looked for a scapegoat. The 1933 conference looked like a classic detective novel in which every party had a reason to be a suspect. Britain and France had turned away from internationalism, adopting trade systems known as "Imperial Preference," which favored their vast overseas empires. Germany's president had just appointed Adolf Hitler's radical and aggressive government. The German delegation was led by a right-wing demagogue, Alfred Hugenberg, who though not a Nazi wanted to show that he was actually an even more implacable nationalist than Hitler himself. The Japanese government had just sent troops into Manchuria. Of all the major powers in London, the United States looked the most reasonable and internationalist by far. It had a new, charismatic president, who was known as an Anglophile and a cosmopolitan spirit. Franklin Roosevelt was already taking vigorous action against the Depression, and was trying to reorder the failed U.S. banking system. Roosevelt did not know what line to take at the conference, and his stream of advisers offered inconsistent counsel. At last, he lost patience and announced that for the moment the United States had no intention of stabilizing the dollar. This radio message, delivered on July 3, 1933, was known as "the bombshell." Roosevelt talked about the need to restore "the sound internal economic system of a nation" and condemned the "old fetishes of so-called international bankers."[65]

Everyone pretended to be shocked at the failure of internationalism. But, at the same time, they were delighted to have found someone who could be blamed for the failure of the conference. The collapse of the conference, and Roosevelt's "bombshell," were emphatically welcomed by Keynes. On July 4, 1933, he published in the *Daily Mail* a celebration under the headline "President Roosevelt Is Magnificently Right."[66] Keynes and Roosevelt were the makers of a new age of deglobalized politics.

The Magician: Keynes

Keynes grew up in the sunny, optimistic, intellectually confident atmosphere of Edwardian Cambridge. He was the son of a don, John Neville Keynes, who was a mathematician, economist, and also an influential university administrator. In the Cambridge mindset, every problem had an answer that might be discerned through analysis and reflection. Keynes's leading modern biographer, Robert Skidelsky, speaks of the "arrogance of a place."[67] His first biographer, the economist Roy Harrod, started his account with a distinct program: "If I achieve my purpose, the life-work of Keynes will be seen, in part, as an expression of this Cambridge civilisation, both in its stability and self-confidence and in its progressiveness." But he then added a particular note of melancholy, for this was a waning, fading civilization, and thus there was a question: "Will that life-work in due course have to be regarded as a splendid afterglow of a civilisation fast disappearing, or may it perhaps be a link between one phase of British civilisation and the next, stretching across a period of confusion and uncertainty?"[68]

The underlying optimism set Keynes off as distinctive after the Great War: after the death of a whole generation of brilliant young men, but after the death too of prewar realities and certainties of British global preeminence. Keynes's disciple Colin Clark later wrote how "[m]ost British economists at that time—but not Keynes—were in a mood of extreme pessimism, probably the still prevailing aftermath of the suffering of the First World War, in which so many of their friends had died. Their pessimism was not only about the impossibility of countering any of the effects of the world recession, but about Britain's economic situation even before it started."[69] The British background, and the general despondency produced by the Great War, is a key to understanding the evolution of Keynes's thought. He wanted to provide effective answers to British stagnation. At the same time he was obsessed by the vulnerabilities and failures of the international system, and by the hypocrisies of diplomatic efforts to salvage or reshape the international order.

Keynes emerged into public prominence as a result of his writing about the Paris peace process, the brilliant tract *The Economic Consequences of the Peace*, published at the end of 1919. He had been profoundly disgusted by the Peace Conference and its politics. He resigned from the British delegation and returned to London and Cambridge. He needed to swap the "fog and filthy air" of Paris for the ethical climate of the rarified intellectual circle of the Bloomsbury group and of the philosopher G. E. Moore's Cambridge. The Bloomsburyite Virginia Woolf wrote in her diary on July 8, 1919, after Keynes had resigned from the Treasury and the text of the Versailles Treaty had been published, that Keynes was suffering from a disillusionment "forced on him by the dismal and degrading spectacle of the Peace Conference, where men played shamelessly, not for Europe, or even England, but for their own return to Parliament at the next election."[70] At the end of May, Keynes had written to the Bloomsburyite Duncan Grant, his former romantic partner, "I've been as miserable for the last two or three weeks as a fellow could be. The Peace is outrageous and impossible and can bring nothing but misfortune."[71] In a few weeks, Keynes formulated his response on paper—a product of deep conviction.

He saw the challenge as a structural and economic one, but the problem as psychological and personal. One of the most compelling sections of the ensuing book came with the pen portraits of the Allied leaders. In particular Keynes conceived his work as a tragedy (after all, he quotes Shakespeare's *Macbeth*), a tragedy of one man, Woodrow Wilson. Wilson, the first American president to visit Europe while in office, had originally appeared as the man who might rebuild Europe and restore a devastated civilization: "What a place the President held in the hearts and hopes of the world when he sailed to us in the *George Washington*!"[72] And then came the disillusion of a peace treaty that appeared to Keynes to be based on French ideas of punishment and vengeance. Thus Keynes needed to look for the origins of a betrayal and found it in a character flaw (the Presbyterian personality) of the president: "What had happened to the President? What weakness or what misfortune had led to so extraordinary, so unlooked-for a betrayal?"[73] Keynes's interpretation, centered on the ideas and ideals of Wilson and their betrayal, was an outgrowth of his long-standing conviction, best articulated in the concluding passages of the *General Theory*, that ideas rather than interests direct the course of the world.

Keynes's book became a bestseller. The first printing of 20,000 quickly sold out, and a new run of 30,000 was produced. *The Economic Consequences of the Peace* has remained almost constantly in print to the present. Austin Harrison in the *English Review* hailed it as "absolutely authoritative," and then popularized the message in the *Sunday Pictorial* as "Reverse the Treaty—or Crash."[74]

The most concrete policy recommendation of the *Economic Consequences* was the launching of an international loan for reconstruction. Keynes thought of £200 million (or 3.6 percent of the UK's GDP at the time). That suggestion was one which could have been realistic, but it needed more than a book to put it into practice. The underlying thought was to mobilize interests rather than ideas for the task of reconstruction. Keynes was a central part of a group of bankers and financiers who met in late 1919 in Amsterdam in the house of the prominent Dutch banker Gerard Vissering to draw up an alternative rescue and recovery mechanism. The group hoped that by submitting the report to the League of Nations and organizing a meeting of financial minds from around the world, it would be possible to sort out the mess of postwar settlements and reset the European economy on a prosperous path. They emphasized the fundamental truths of the government debt crisis where a "decrease of excessive consumption and an increase of production and taxation are recognized as the most hopeful—if not the only—remedies." One particular issue was at the heart of the deliberations in Amsterdam and the attempt to formulate an alternative strategy to the one adopted at Versailles: Germany—and indeed Central Europe more generally—would require substantial external financing in order to make the transition from a depleted wartime economy to peacetime.

One influential member of the Amsterdam group, James Alexander, president of the National Bank of Commerce in New York, suggested an innovative way of handling the capital inflows that were required for European reconstruction. The heavy debt burdens and instability of Europe made the prospect of lending to European nations and businesses extremely risky. In order to both reduce the risk of default and widen the scope of lending across European risk classes, Alexander advocated that all the credit needs of Europe should be pooled together, securitized, and sold to American investors. In other words, rather than having a different credit arrangement with each individual borrower in Europe, American investors would buy the rights to one share in the cash-flow stream from the interest and principal payments of all European borrowers. Additionally, the debt needed to be strongly backed by high-value collateral in order to both provide the lender an asset in case of default and reduce the incentive for the borrower to default in the first place, since it would sacrifice the collateral. Alexander wrote that "[t]he individual European buyer [of American goods] must be prepared to give a general mortgage upon his entire assets. His loan should be further endorsed by a consortium of banks in his own country, reinforced, where possible, by government guarantees."[75]

Even with innovative financial engineering, the lack of a clear outcome to the reparations and inter-Allied debt issues created massive uncertainty for the investment community. Even if European securities were backed by legitimately valuable European assets, it was not clear that the average American investor would feel comfortable "going long" on Europe after the continent had just fought a terrible civil war and newspapers continued to report strife across the Atlantic. In order to accumulate the level of capital needed in Europe, the savings of everyday Americans across the country had to be tapped. In this case, the average American investor was the average American farmer, small-time businessman, or working professional. Because of the breadth of investors needed on the American side of the deal, the case for European collateral, no matter how strong in theory, was fairly impracticable.

On January 16, 1920, copies of the memoranda were sent to the major neutral and Allied governments—except for France, where not enough signatures had yet been secured. Keynes was not optimistic about the chances of gaining governmental support, writing to Vissering on January 31, "I have no great hopes of any adequate results."[76] "It is evident," Keynes continued, "that the Americans are determined to do nothing, and this, combined with the very unsatisfactory situation in France, makes it look a very burdensome task for any other country to enter on a course of action [to help reconstruct the European economy]."[77] And in one of Keynes's many prophetic statements, he concluded, "All this makes it increasingly probable that things will have to get worse before they can get better."[78]

Keynes quickly found himself in a political predicament, in the aftermath of the December 12, 1919, publication of his jeremiad, *The Economic Consequences of the Peace*. How could a tract that was so harshly and satirically critical of the U.S. administration persuade Washington to be benign and generous? Keynes wrote to Lord Robert Cecil, a leading British representative to the League of Nations, for advice as to whether Keynes should sign his group's memorandum. Cecil was particularly concerned about the reaction in Washington to Keynes's book. "I admit I am a little afraid of the result [of *The Economic Consequences of the Peace*]," Cecil wrote to Keynes, "on the mind of President Wilson and his entourage. He is a vain man and the picture you draw of him in the book is not likely to minister to his vanity. He is said to be very 'rancunier' [bearing resentments and grudges]. As you point out we must appeal to American generosity and if we had the administration against us obviously we should fail." In a January 6, 1920, letter to Keynes, Cecil reiterated his position, writing, "we are out on an almost forlorn hope for a very big result and must not throw away any chances." Keynes's signature "might antagonize powerful influences."[79]

Keynes's attention shifted from international to domestic issues: there was simply more that could be changed, or done right, at home. Responding to the malaise of the 1920s in Britain and then to the Great Depression drove him first to look at the interaction between money and aggregate economic performance. His *A Treatise on Money* of 1930 had at its center a reflection on how monetary mismanagement could derail the credit basis of an economy; it was intended in large part as a contribution to the debate about whether the wrong choice of parity in 1925, when Britain returned to the gold standard, had driven the Bank of England to an excessively restrictive monetary policy.

In the 1920s, as the financial adviser to his college, King's, in Cambridge, Keynes applied a credit-cycle theory of investment—which he also propagated for a wider audience as the founder of the London and Cambridge Economic Service—as a way of choosing how to allocate investments between equities, fixed income, and cash. It was not in fact a strategy that brought remarkable success.[80] So Keynes started to reconsider his position.

There was a double set of assumptions that Keynes increasingly brought to bear in his analysis: on the one side, dislike of the instability produced by the chance interactions of financial markets, with their regular bouts of euphoria followed by collapse; and on the other, an appreciation of what systematic planning, in wartime Germany, and later in Mussolini's Italy and the Soviet Union, might do. By 1932, he concluded that "it is a remarkable and a significant thing that the two most extraordinary political movements of the modern age, approaching their task from opposite moral and emotional poles, should agree in this vital particular—that state planning, that intelligence and deliberation at the centre must supersede the admired disorder of the 19th century."[81] In 1932, he also warned against hot money flows: "The Macmillan Committee [the government-appointed commission investigating the sources of industrial decline] pointed out that the resources of the Bank of England might not prove large enough in an emergency for dealing with the huge globus of loose money, pertaining to exchange speculators and international safetyfirsters, which flops about the world in these days, embarrassing now this banking system and now that."[82]

The greatest puzzle appeared to be why the United States—the land of prosperity, with a massive dominance after the European powers had bled themselves into the ground—should be so vulnerable to collapse. There might have been an argument to be made in terms of the conceptual framework of *A Treatise on Money*, that the central bank was running a mistaken policy regime. Indeed, this thought later formed the core of the famous analysis of Milton Friedman and Anna Schwartz in their *Monetary History of the United States*. It was not difficult to explain why Germany was so miserable, after the lost war and the costs of the reparations regime; but the United States must have been the prisoner of its style of thinking, of an addiction to a rugged individualism that seemed to be the core of the American character and the American way of life. Keynes asked:

> For what are the economic events of the modern world which must most strike the apprehension of the dullest observer? The extraor-

> dinary capacity for the production of material wealth—though it were for the purposes of subsequent destruction—which we developed during the War; and the opposite picture today of starvation amidst plenty, our incredible inability to carry to our mouths the nourishment which we have produced with our hands. For the War was the nearest thing we have ever had in this country to a planned regime. The environment was unfavourable, the haste was excessive and hurried improvisations were inevitable. Yet it showed us the potentialities of modern technique to produce. On the other hand today it is in the United States, where the national tradition is most antagonistic to the notion of planning and the forms of government least adapted to improvised planning, that the failure of the economic system, relatively to its opportunity, is most obvious.[83]

Keynes then reflected on the powerlessness of the individual in the face of mass psychology, and chose an extraordinary example: Ivar Kreuger, the Swedish "match king" who had built up a new monopoly for matches, based on a clever linking of raising financial loans in return for obtaining the concession for his companies to supply their matches. The Kreuger mechanism looked like the most ingenious way of achieving the vision set out in 1919 by the Keynes-Vissering group: building up a solid European business that would act as a security for American lending. Keynes was extraordinarily impressed by Kreuger's vision and audacity, and then eager to draw a simple lesson from his failure:

> But at such a time as the present the most outstanding opportunity for state planning throughout the world is to be found in the avoidance, or in the mitigation of industrial slumps during which there is so vast a loss of the world's potentialities for the creation of wealth. Here again we have a problem which lies completely outside the scope of the individual. The individual is helpless,—disastrously so, as there are abundant examples today, strewn upon the carpet of the world, to show. There is virtually nothing that he can do, however ardent his desire and however pressing his personal interest. He is swept along, together with all his fellows, on a flood which he cannot control or direct. And nothing can be of the least avail which does not come from concerted action at the centre. We

> have a poignant example today of the helplessness of the individual, however powerful and however great his genius, in the tragic death of Mr Ivar Kreuger. Here was a man of perhaps the greatest constructive business intelligence of his age, a man whose far-flung activities have been in the widest sense in the public interest, who had conceived it his mission in the chaos of the post-war world to furnish a channel between the countries where resources were in surplus and those where they were desperately required, one who built on solid foundations and surrounded himself with such safeguards as could be humanly devised in the circumstances,—suffering what the ignorant might mistake for the fate of the common gambler, but in truth crushed between the ice-bergs of a frozen world which no individual man could thaw and restore to the warmth of normal life. The spectacle of capitalists, striving to become liquid as it is politely called, that is to say pushing their friends and colleagues into the chilly stream, to be pushed in their turn by some yet more cautious fellow from behind, is not an edifying sight.[84]

The storms of nineteenth-century finance had now become for Keynes the icebergs of a frozen world.

Keynes was consequently impatient about small-scale reform proposals. Already in 1929, he had advocated, as part of the Liberal Party's election platform, a large-scale program of public works. In 1932, he wrote to the Conservative MP (and co-owner of the publishing house that handled Keynes's work) Harold Macmillan, who desperately wanted some alternative to Depression austerity:

> My main feeling is that you are not nearly bold enough with your proposals for developing the investment functions of the state. You are trying it would seem to minimise the part which the state must play and you endeavour to get your results by a sort of combination of private enterprise and subsidy; and I doubt the feasibility of this at any rate in present times. If the amount of stimulus required is moderate, your devices might avail. But at the present time it would be extraordinarily difficult to bring about an adequate volume of investment even if one had the whole forces of the state behind one.[85]

The solutions could only come from a national framework. In a world of financial instability, countries needed to detach themselves in order to engage in rational planning. It was less important to apply tariffs: as an Edwardian liberal, Keynes saw trade restriction as an inferior method of regulation. In the run-up to the definitive end of Britain's free trade commitment at the 1932 Ottawa British Empire Economic Conference, he described the increased tariffs in the British budget as a "first-class curse," and said it was "distasteful, though it may be necessary, to be adding to them." He hoped that, with the exception of taxes on foods, the move to high tariffs would "stop there." Anything a tariff could do was better achieved through exchange-rate depreciation.[86] Then Keynes engaged in a dramatic rethink, in which international trade became the major culprit for demand deficiency. In his 1933 essay "National Self-Sufficiency," he would explain how circumstances had changed:

> But it does not now seem obvious that a great concentration of national effort on the capture of foreign trade, that the penetration of a country's economic structure by the resources and the influence of foreign capitalists, and that a close dependence of our own economic life on the fluctuating economic policies of foreign countries are safeguards and assurances of international peace. It is easier, in the light of experience and foresight, to argue quite the contrary. I sympathize, therefore, with those who would minimize, rather than with those who would maximize, economic entanglement among nations. Ideas, knowledge, science, hospitality, travel—these are the things which should of their nature be international. But let goods be homespun whenever it is reasonably and conveniently possible, and, above all, let finance be primarily national. Yet, at the same time, those who seek to disembarrass a country of its entanglements should be very slow and wary. It should not be a matter of tearing up roots but of slowly training a plant to grow in a different direction.

He now looked back at the prewar patter of globalization to interpret the origin of the 1914 catastrophe as conflict over trade: "the age of economic internationalism was not particularly successful in avoiding war." As a consequence, "a greater measure of national self-sufficiency and economic isolation among countries than existed in 1914 may tend to serve the cause of peace, rather than otherwise."[87] Harmony among nations thus required a limit to global intercourse.

The greatest, but also most problematical, exposition of Keynes's post-crisis thought, *The General Theory of Employment, Interest, and Money* of 1936, is torn by a deep tension. There are two directions in which the logic might point: the first is toward an intellectual framework that could be relatively easily applied in a policy setting, as in the situation of the 1930s—that was the Keynes that led in the direction of a new synthesis as articulated rapidly by John Hicks and Roy Harrod.[88] In the Hicks interpretation, in the longer term the marginal productivity of capital would fall; but government action might push the economy to a better equilibrium.

In *The General Theory*, Keynes laid out a vision in which international harmony could be achieved if countries no longer competed over trade:

> I have pointed out in the preceding chapter that, under the system of domestic *laissez-faire* and an international gold standard such as was orthodox in the latter half of the nineteenth century, there was no means open to a government whereby to mitigate economic distress at home except through the competitive struggle for markets. For all measures helpful to a state of chronic or intermittent under-employment were ruled out, except measures to improve the balance of trade on income account. Thus, whilst economists were accustomed to applaud the prevailing international system as furnishing the fruits of the international division of labour and harmonising at the same time the interests of different nations, there lay concealed a less benign influence; and those statesmen were moved by common sense and a correct apprehension of the true course of events, who believed that if a rich, old country were to neglect the struggle for markets its prosperity would droop and fail. But if nations can learn to provide themselves with full employment by their domestic policy (and, we must add, if they can also attain equilibrium in the trend of their population), there need be no important economic forces calculated to set the interest of one country against that of its neighbours. There would still be

> room for the international division of labour and for international lending in appropriate conditions. But there would no longer be a pressing motive why one country need force its wares on another or repulse the offerings of its neighbour, not because this was necessary to enable it to pay for what it wished to purchase, but with the express object of upsetting the equilibrium of payments so as to develop a balance of trade in its own favour.[89]

The second Keynesian vision is of a world with radical financial instability. That was the mechanism that destroyed the international system in the Great Depression, and it was one that would reemerge after the 1970s. The logic of that style of Keynesianism was later articulated most clearly by Hyman Minsky.[90] In the 1930s, Keynes was addressing primarily a British debate: some British economists treated the phenomenon of large-scale unemployment as an indication of a permanent oversupply of goods and the complete satisfaction of human wants. In pushing back against this vision, an alternative narrative emerged, in which the problem was created by speculation and business mistakes. The result was that instead of effective price adjustment to clear markets, quantity adjustment became the way in which an equilibrium was restored: but it was a suboptimal equilibrium. Elizabeth and Harry Johnson concluded that Keynes had provided "a stock-market speculators' theory of asset prices and price movements."[91]

Eliminating financial instability required a much more radical approach. As Keynes put it in *The General Theory*, "The only radical cure for the crises of confidence which afflict the economic life of the modern world would be to allow the individual no choice between consuming his income and ordering the production of the specific capital-asset which, even though it be on precarious evidence, impresses him as the most promising investment available to him."[92]

Squaring the circle—reconciling policy orientation with profound underlying fragility—involved trying to construct an international order without financial instability. That was the task that Keynes set himself in preparing a postwar order during the Second World War.

The centrality of Keynes in resolving the problems of the interwar economy had generated a powerful myth: an all-knowing guru would devise an ingenious solution from an ivory tower. John Hicks's review of *The General Theory* talked of it as the "alleged more than Jevonian revolution."[93] There was a magical quality about Keynes's work, a kind of enchantment. Keynes's first biographer, perhaps hagiographer, the economist Roy Harrod, caught the mood perfectly when he talked about Keynes at the United Nations' International Monetary Conference in Bretton Woods of 1944, which laid down the precise institutional plans for a multilaterally shaped international postwar recovery. Keynes "was always ready with his beautifully polished sentences; he detected any inconsistency in the opposition, even in the most abstruse matter, with lightning celerity, and pointed it out with seeming gentleness in barbed and sometimes offensive sentences."[94] It is astonishing how frequently the term "magic" is used in biographical and analytical treatments. Of *The General Theory*, Skidelsky writes, "Keynes was a magical figure, and it is fitting he should have left a magical work."[95] The American policy-makers Adolf Berle and Harry Dexter White told the British economist Lionel Robbins, "Your Baron Keynes sure pees perfume."[96] Robbins, originally a free marketeer who had had a dramatic conversion to Keynesianism, expressed the same thought in phrases more high-flown. He wrote, after a dinner in Washington, how Keynes "uses the classical style of our life and language, it is true, but it is shot through with something which is not traditional, a unique unearthly quality of which one can only say that it is pure. The Americans sat entranced as the God-like visitor sang and the golden light played around."[97]

A Globalization Pause

When Keynes wrote to George Bernard Shaw in 1935 about revolutionizing the world's approach to economic problems over the next ten years, he could not have imagined the extent and scale of the conflagration that would sweep over the world after 1939. He had imagined—with hope but also with concern—that a bloc of peaceful nations headed by Britain, but including France, the Soviet Union, and the United States, would be "collectively so formidable that only a madman will afront it."[98] But obviously that was a calculation that did not explain how to bring either the United States or the Soviet Union into that peaceful league.

The question haunting the world in the late 1930s and in the Second World War was how to resurrect often contrasting national versions of capitalism, not how to restore globalization. Keynes was optimistic about the possibilities of reviving a domestically managed system. National economic management would manage shortages and surpluses, and an international mechanism would ensure that the impact of international trade was not disruptive or destructive.

Keynes defended the idea of capitalism, and saw himself as a doctor who would restore the patient to health. "It is better that a man should tyrannize over his bank balance than over his fellow-citizens and whilst the former is sometimes denounced as being but a means to the latter, sometimes at least it is an alternative." That was the voice of reason: but in the 1930s, the alternative attractions were multifold. All over Europe, the old elites defected to new faiths. Just a few examples: the Hungarian countess Catherine Károlyi (the "Red Countess") recalled her visit to Cambridge University, where a young communist student explained to her that it was extremely regrettable but "imperative" that the old universities of Oxford and Cambridge should be completely leveled when the revolution came, and British undergraduates with clipped upper-class accents spoke of the Soviet Union as the "promised land."[99] Barbara Pym, the impeccable novelist of middle-class Britain, as a student went around Oxford with a Nazi swastika pin, and traveled to see Hitler give a speech in Hamburg: "I thought he looked smooth and clean and was very impressed."[100]

Keynes's fundamental optimism stood in stark contrast to the gloom of the great Austrian economist Joseph Schumpeter. Schumpeter—perhaps also driven by a concatenation of personal tragedies—had developed a deeply pessimistic view of the interplay of political and economic developments. Capitalism had been the great motor of innovation, celebrated in his early work as "creative destruction." But now it was destroying itself. His polemic was developed during the course of the Second World War, when he found himself profoundly at odds with U.S. policy and worried about what he feared was the imminent takeover of Europe by the Soviet Union. He started with the ringing question: "Can capitalism survive?" and the answer: "No. I do not think it can." He went on to explain that this, as a personal opinion, was "uninteresting," and he then put the word "inevitability" (with respect to capitalism's demise) in quotation marks.[101] The major argument was that capitalism provoked a backlash from the intelligentsia. "Unlike any other type of society, capitalism inevitably and by virtue of the very logic of its civilization creates, educates and subsidizes a vested interest in social unrest."[102] Schumpeter also identified other mechanisms pushing to dissolution: the business enterprise was becoming bureaucratized, and was losing the family dynamic that pushed for capital accumulation as the traditional family structure came under strain. "With the decline of the driving power supplied by the family motive, the businessman's time horizon shrinks, roughly, to his life expectation. And he might now be less willing than he was to fulfill that function of earning, saving and investing even if he saw no reason to fear that the results would but swell his tax bills. He drifts into an anti-saving frame of mind and accepts with an increasing readiness anti-saving theories that are indicative of a short-run philosophy."[103] Corporate life eroded the creative process. "Thus the modern corporation, although the product of the capitalist process, socializes the bourgeois mind; it relentlessly narrows the scope of capitalist motivation; not only that, it will eventually kill its roots."[104] Schumpeter's analysis suggested that capitalism was a product of other social structures and behaviors that were now eroded: "the capitalist order not only rests on props made of extra-capitalist material but also derives its energy from extra-capitalist patterns of behavior which at the same time it is bound to destroy."[105] In short, Marx turned out to have been right. Keynes saw oversaving and underinvestment as driving stagnation; Schumpeter saw undersaving as the dynamic that would destroy capitalism.

After the war, Schumpeter identified a new dynamic as central to the erosion of business structures and creativity. In a note added in 1949 to a new edition of *Capitalism, Socialism and Democracy*, Schumpeter warned about postwar inflation: "Perennial inflationary pressure can play an important part in the eventual conquest of the private-enterprise system by the bureaucracy—the resultant frictions and deadlocks being attributed to private enterprise and used as arguments for further restrictions and regulations."[106]

Schumpeter had always been concerned with radical structural breaks, with discontinuities. He thought he offered a contrast with the neoclassical tradition. Walras had described affairs in a steady state. Even Keynes was giving a fundamentally static analysis.[107] Instead Schumpeter insistently asked: "How do things become different?" He then concluded: "When something fundamentally new occurs in the world we are confronted by an enigma."[108]

In many ways, Schumpeter's bleak vision was closer than that of Keynes to the realities of disrupted economic and political existence in midcentury Central Europe. But how to make the world more like the stable world that Keynes hoped for?

The critical point was to limit capital mobility. This theme had emerged already strongly in the 1930s. The U.S. Treasury official Harry Dexter White had started to argue early in the New Deal that there was a need to return to equilibrium. Stability of exchange rates, price levels, and the balance of payments would mean "the highest and most widespread degree of prosperity among the countries involved."[109] Frank Coe and Laughlin Currie, also at the U.S. Treasury, made the case in a series of memoranda in 1935 and 1936 that this new equilibrium would only be possible with capital controls.[110] There had always been a tendency to see the New Deal as providing a model for the rest of the world.[111]

White in 1942 argued that "there are situations in which many countries frequently find themselves, and which all countries occasionally meet, that make inevitable the adoption of controls." The problem of volatility had been the heart of the 1930s constraints on good policymaking: "Flights of capital, motivated either by prospect of speculative exchange gains, or desire to avoid inflation, or evade taxes or influence legislation, frequently take place especially during disturbed periods. Almost every country, at one time or another, exercises control over the inflow or outflow of investments, but without the co-operation of other countries such control is difficult, expensive and subject to considerable evasion."[112] The people who would benefit from capital mobility were a narrow wealthy elite: that part of the American population that had disastrously bought foreign bonds in the 1920s. An increase in the effectiveness of control meant less freedom for owners of liquid capital: "It would constitute another restriction on the property rights of this 5 or 10% of persons in foreign countries who have enough wealth or income to keep or invest some of it abroad, but a restriction that presumably would be exercised in the interest of the people at least so far as the government is competent to judge that interest."[113]

Meanwhile Keynes argued that wartime Britain had "gone a long way towards perfecting" the use of capital controls, and could act as a model for the rest of the world.[114] The message about capital controls was given an academic or intellectual underpinning in the League of Nations publication *International Currency Experience*, the bulk of which was written by Ragnar Nurkse, published in 1944, and in the League's parallel 1945 publication *Economic Stability in the Post-War World*. Nurkse's book distilled a series of lessons from the interwar experience that lay behind the Bretton Woods solution. There is actually a strong personal link between the League, the lessons it learned from the slump, and the new order. Indeed Nurkse was offered a senior position in one of the institutions created at Bretton Woods, the International Monetary Fund, which he turned down to take a chair at Columbia University; but a number of his colleagues at the League did go to the IMF. Some of them—notably Jacques Polak of the Netherlands—saw the IMF as a continuation and extension of the experience and work of the interwar League.[115]

Nurkse argued that the interwar choice of exchange rates had been wrong, but that attempts to correct those only made matters worse. There were competitive devaluations, aimed at getting short-term trading advantages. The frequency of exchange adjustments was in fact a major cause of the destruction of the international trading system. "The more frequent the exchange adjustments, the stronger are likely to be the disequilibriating tendencies not only in the capital flow but also in the movement of trade; the more frequent and disturbing will be the internal shifts of labour and other resources; the more seriously will exchange risks hamper foreign trade."[116]

The new consensus was built into the Bretton Woods agreements and the IMF's Articles of Agreement. While the articles generally required a rapid restoration of trade payments (current account transactions), Article VI, Section 3 authorized controls on capital movements indefinitely (there was a long debate in the 1990s about whether to replace that section with a provision for capital account liberalization). The view from Bretton Woods was overwhelmingly about the influence of the state in national reconstruction. The London *Observer* explained the British position that "few countries in Europe will be prepared to leave reconstruction entirely in the hands of competitive private enterprise."[117] China and the Soviet Union—both part of the "Big Four" at Bretton Woods—pushed this vision too. The Soviet Union, with a planned economy, pressed many concessions into the language of the agreement, and Keynes indeed complained that "it has been the concern of the American policy to appease the Russians and let them in."[118] White told the press at the beginning of the conference that "[t]he only ones who would lose . . . were the type of speculators who in pre-war days used to pounce like 'buzzards' on the wide fluctuations in foreign exchange. The fund . . . would stop such speculation."[119]

The Bretton Woods meeting was thus a genuinely international event: indeed, it remains the only successful conference aimed at redesigning the world's monetary order: the many subsequent attempts failed. It occurred in a remote location, in the New Hampshire mountains, away from the swampy heat of wartime and un-air-conditioned Washington (indeed Treasury Secretary Henry Morgenthau, Jr. lamented that he had not brought woolen socks).[120] The conference succeeded because it did not attempt to impose an overall pattern or template for government behavior.

The ideas about national development laying the foundation for a better and stabler world were not purely American. In 1918, Sun Yat-sen had written *International Development of China,* laying out "Four Great Necessities of the People—food, clothing, shelter and means of travel" and proposing a scheme under which "the various Governments of the Capital-supplying Powers must agree to joint action and a unified policy to form an International Organization." It was a way of taking control out of the hands of foreign bankers, who had behaved abusively in the prewar era. As he put it: "In my International Development Scheme, I intend to make all the national industries of China into a Great Trust owned by the Chinese people, and financed with international capital for mutual benefit."[121] There was also a common ground between Latin American and U.S. visions, based on what the historian Fredrick Pike sums up as "condemning business civilization."[122] The commonality laid the basis for increased cooperation between the United States and Latin American countries in the 1930s, as the United States worried about Nazi attempts to establish an economic penetration of the Western Hemisphere. Mexicans welcomed the idea that the United States might fund public-sector development through institutions such as the proposed Inter-American Bank, which represented in many ways a blueprint for the World Bank. As the Mexican economist and public servant Alejandro Carrillo put the case in 1941, "We in Mexico are very much opposed to free-lance capitalists coming into the country and investing money in any way they think best, because we believe that that type of investment would tend to disrupt Mexican economic life instead of helping to develop it."[123] State-led investment was another matter.

The new rhetoric of Bretton Woods went right back to the early days of the New Deal, to Roosevelt's July 1933 "bombshell message" to the assembled economic policy-makers of the world at the London World Economic Conference, when he attacked the "old fetishes of so called international bankers."[124] Secretary of the Treasury Morgenthau was more explicit at Bretton Woods when he called to drive "the usurious money lenders from the temple of international finance." "The institution proposed by the Bretton Woods Conference would indeed limit the control which certain private bankers have in the past exercised over international finance." His closing address explained that "[c]apital, like any other commodity, should be free from monopoly control and available upon reasonable terms to those who would put it to use for the general welfare."[125] A pamphlet produced by the trade union organization Congress of Industrial Organizations Political Action Committee that took up the administration's case for the Bretton Woods accord argued, "We have the history of international finance after the late war, handled by the 'right people' with the 'right safeguards.' What did we get? We got world depression—the rise of Fascism—the worst war in human history."[126]

There was a substantial pushback against the vision of reconstructing the world on the basis of national planning. The U.S. Republican Party, financial interests, and a large part of the press opposed the Bretton Woods plans. The *New York Times* explained that the plans did not "exercise any real control" over destabilizing and inflationary policies by governments, and argued that the United States would best contribute to international cooperation and stabilization by balancing its own budget.

> In several respects the conference will get off to an unfortunate start. Important as the problem of stable exchanges and world monetary soundness is, it would be impossible to imagine a more difficult time for individual nations to decide at what level they can fix and stabilize their national currency unit. . . . Each nation should abandon the fallacious idea that it is to its own advantage to inflate or devaluate, or that it gains when it erects huge tariff barriers or subsidizes exports or blocks its currency, or when it forbids its own citizens to export gold, capital or credit. Each nation should abandon the fallacious idea, in short, that it gains when it makes economic war upon its neighbors.

In a similar vein, the *Washington Post* concluded that Bretton Woods was "unnecessary if countries follow sound policies by balancing their budgets and adjusting their trade balances."[127]

Apart from the trade payments issue, other globalization mechanisms were left out of the Bretton Woods settlement. Some smaller countries complained that trade was omitted from the agenda completely. They saw that trade in the postwar world was likely to be dominated by the United States, as the major alterative suppliers of machine tools, Germany and Japan, had been wrecked by the war. They complained that trade imbalances "would almost be bound to develop such disruptive tendencies as might be capable of wrecking any plan."[128] Only in December 1945, well after the end of the war, did the United States launch an initiative for an International Trade Organization, but then it was rather late. Other countries demanded exemptions and protections, and the U.S. Congress then felt alienated by the ingratitude of the old allies. There was no organization to supervise the liberalization of trade (until the establishment of the World Trade Organization in the post–Cold War world), and trade liberalization occurred instead in fundamentally bilateral trade arrangements that could be multilateralized in the framework of an overall agreement, the General Agreement on Tariffs and Trade (GATT). European countries only started to liberalize their trading payments (payments on current account) in the late 1950s; Japan only did that in 1964. The rest of the world maintained exchange controls until much later. There were important rounds of tariff reductions under the GATT, most notably in the early 1960s (the Kennedy Round), but key products—textiles and agriculture—remained largely outside the negotiating framework.

Increased trade was an important engine of growth in the generalized recovery after 1945, but as a share of world output it remained until the 1970s substantially below the levels of 1913 (13.4 percent) or 1929 (10.8 percent). In 1950 that level was 6.5 percent, by 1960 it had risen to 8.1 percent, and in 1970 it stood at 9.5 percent. The major surge to renewed globalization (which might perhaps be described as overtrading) came later.

Nor did the world look open to big population flows. There were initially, as part of the postwar settlement or a result of the independence of former colonies, enormous resettlements of population: Germans from Czechoslovakia, the Soviet Union, and Poland (around 12 million in total moved by 1950), or Muslims and Hindus in the Indian subcontinent, where estimates of the number of "displaced" are between 10 and 20 million. These flows constituted a fundamental alteration of the labor market. The German economic recovery of the 1950s was a major beneficiary from the inflow of expellees.[129] France and Britain had major inflows from empires or former empires. The U.S. labor market was transformed by the "Great Migration" of African Americans northward from the old South. But in the perspective of the 1940s and 1950s, there were unlikely to be continuing large international movements of peoples. For the moment, immigration to the United States, and the number of refugees throughout the world, were low.

Globalization had been curtailed, walled off, by war and its outcome. The largest—perhaps the first—really global war had not brought a reversal of the 1930s reversal of globalization. Bretton Woods was a product of the awareness of global connectedness and interdependence, but it did not—and was not intended to—restore a world of globalization, which was now widely dismissed as a relic of a nineteenth-century world view.

One main reason for the more skeptical view of global interconnectedness was the nonpolitical development that revolutionized the world: technology. The international history of the twentieth century can be described in terms of two U-shaped curves. One is the U of globalization, with a large amount of interconnectedness before the First World War, a collapse in the Depression of the interwar years and the Second World War, and then a resumption from the 1970s. The second looks like a mirror image: the inverted ∩ of American productivity growth, or of the productive potential of the world's leading and most dynamic economy. In the interwar period, notwithstanding the Great Depression, productivity surged, and the Second World War pushed that growth even faster. Then after the 1970s there was a slowdown, and as the economist Robert Gordon analyzed it, total-factor productivity grew only at a third of the extraordinary rate achieved between 1920 and 1970.[130]

There are three explanations for the interlocking U-curves: technical change, war, and the logic of deglobalization.

In the first place, the extraordinary American development of the mid-century was driven by dramatic technical change (see Figure 4.2). Overall innovations transformed the economy, above all electrification and the spread of the automobile and of the trucking industry. The economic historian Alex Field described how "the years 1929–1941 were, in the aggregate, the most technologically progressive of any comparable period in US economic history."[131] Companies expanded their research and development activities, with many new laboratories established even in

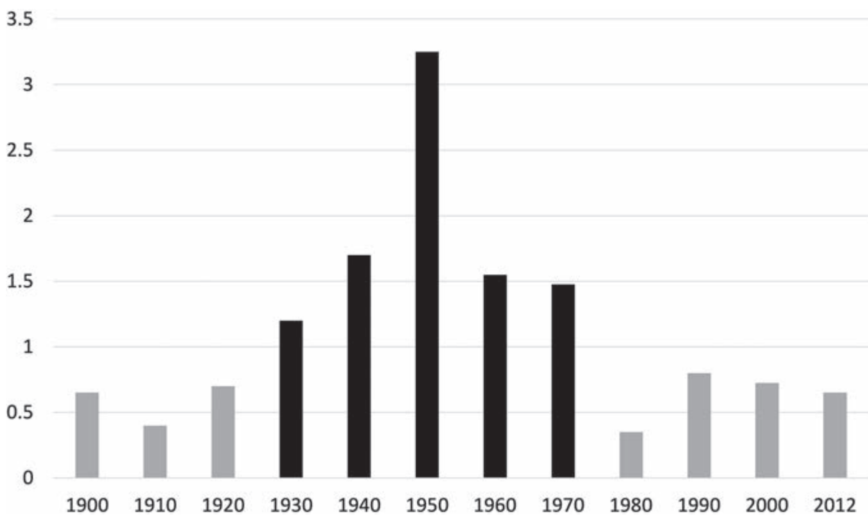

Figure 4.2. Annual growth rate of total-factor productivity in the United States for the preceding ten years, 1900–2012 (Data from Robert J. Gordon, "The Turtle's Progress: Secular Stagnation Meets the Headwinds," in Coen Teulings and Richard Baldwin, ed., *Secular Stagnation: Facts, Causes and Cures* [London: CEPR, 2014], 53)

the middle of the Great Depression. Telephony, motor vehicles, electric goods, utilities, communications, all matured. They changed people's lives as they interacted. In urban settings, by the late 1930s almost all American households had electricity connected, 94 percent had piped water and sewage pipes for waste, 80 percent had interior flushing toilets, 58 percent had central heating, and 56 percent had refrigerators. Households installed washing machines. In the countryside, the tractor revolutionized productivity.

The trauma of the Great Depression did not slow down the American invention machine. If anything, the pace of innovation picked up in the last half of the 1930s.[132] And then came a new push as a result of the war. Henry Ford's mammoth Willow Run factory in Michigan, which built B-24 bombers, was erected in less than a year, starting in March 1941, and turned out its first plane in May 1942. The plant had originally been designed to produce bombers at the unbelievable rate of one per hour, but it was a long struggle to achieve that rate. In a classic example of learning by doing, the production rate gradually increased, reaching seventy-five per month in February 1943, 150 per month in November 1943, and a peak of 432 per month in August 1944.[133] The wartime production model created a new template that could be applied to creating consumer prosperity.

Second, international politics pushed the productivity engine harder. A strong case can be made that the Second World War represented an economic miracle that rescued the American economy from the threat of secular stagnation of the late 1930s.[134]

And finally, there was a logic of deglobalization that brought real improvements for workers who were now protected by new restrictions on international mobility. The lack of competition for jobs from recent immigrants made it easier for unions to organize and push up wages in the 1930s. The high tariff wall allowed American manufacturing to introduce all available innovations into U.S.-based factories without the outsourcing that has become common in the last several decades. The lack of competition from immigrants and imports boosted the wages of workers at the bottom of the income pyramid and contributed to the remarkable "great compression" of income distribution during the 1940s, 1950s, and 1960s. Robert Gordon concludes that it was the extensive deglobalization that laid the groundwork for an American Great Leap Forward (the terminology used by Alex Field in a satirical dig at communist China's growth terminology).[135] In other words, there was a demand push that followed from cutting off the labor market to further immigration, which may have pushed the technical change further. Demand management, first as countercyclical antidepression policy, then as part of the process of military mobilization, created a basis for increasing productivity and a general raising of living standards. The war created household saving that after 1945 was spent on consumer goods that had been unavailable during the war, the classic case of "pent-up demand." But even in the postwar miracle, in the United States the exceptional rates of productivity growth of the interwar era fell off.

The last two effects, world war and the one-off income gains from deglobalization, could not be repeated over and over again. The effects of the mid-twentieth-century innovations on geography and distance, however, seemed to hold out new opportunities. These improvements were fundamentally distinguishable from the nineteenth-century innovations, the railroad and the steamship that brought the world together and that Walt Whitman had celebrated. By contrast, the twentieth-century innovations allowed a greater localization of production. Electricity distributed power across distances, so that production did not need to be concentrated in the large halls that were needed for mechanical power transmission, with the power of large motors or turbines being transmitted by belts and pulleys. Road networks were more like capillaries than the arterial systems created by the railroads. In 1925 the United States created the Joint Board on Interstate Highways and in November 1926 launched a program to rationalize the transportation infrastructure of around 80,000 miles of improved highways.[136] Nineteenth-century technology spanned the world; the twentieth-century revolution personalized and particularized technology. Individuals or families had telephones, cars, refrigerators, radios, washing machines.

Then something else occurred on the foundation laid by the particularizing and logistical innovations. War required competent government-run logistics. The Second World War provided an unprecedented mobilization of national resources, coordinated by the government. On May 26, 1940, President Roosevelt announced in a fireside chat the U.S. government would "harness the efficient machinery of America's manufacturers" to produce 50,000 combat aircraft over the next twelve months to confront the "approaching storm" of global war. "The Government, working with industry, is determined to increase that capacity to meet our needs." "Therefore, the Government of the United States stands ready to advance the necessary money to help provide for the enlargement of factories, the establishment of new plants, the employment of thousands of necessary workers, the development of new sources of supply for the hundreds of raw materials required, the development of quick mass transportation of supplies. The details of all of this are now being worked out in Washington, day and night."[137] War demonstrated the staggering competence of the U.S. government.

The potential had been seen already in the 1930s by some other countries. In particular, both the Soviet Union and Nazi Germany looked to Fordism as a way of constructing national economies. Historian Stefan Link's recent book shows how Soviet and German engineers were mesmerized by American technology and sought a similar transformation.[138]

The downward U of globalization and the upward U of American productivism were thus intimately intertwined. The United States then became a model or template for the rest of the world, not simply as a result of its new political supremacy (though that helped greatly to propagate the vision). Globalization immediately after 1945 took place not so much through big flows of trade, people, or even money, but of ideas. The United States as a big economy with a very large internal market had never been very dependent on foreign trade, and in this sense was never very globalized. Its major contribution to the development of the world in the mid-twentieth century was the demonstration that the American Dream could be the antidote to the Great Depression.

The Great Depression, which began as a story of a demand shortfall, necessitated an economic analysis of the catastrophe, and invited a large public-sector mobilization. That mobilization could only take place in a national context, and—as military mobilization—it was distinctly dangerous. It could be imitated, destructively, elsewhere. Or, later, in a more peaceful context, it could lead to a pale civilian version of the military mobilization: an insistence that every country needed its own plan, its own economic vision of the future, its own airline, or even its own automobile producer. That was development, even fast development, a term that became current in the 1940s. But it was development without substantial globalization, just what the doctor (Keynes) ordered.

5

The Great Inflation: The 1970s

The Great Inflation began with economic overheating; its outcome produced widespread shortages and price hikes that destroyed confidence in government. It was a crisis produced by plenty and excess; in its wake globalization was rethought. The 1960s saw expanding international trade, and a generalized optimism about how human society could be controlled and directed. The euphoria generated was directed to ensuring that economies fired on all cylinders, that a little bit more growth could be squeezed out of the mechanism of macroeconomic management. Hubris lay in the belief that governments could achieve their objectives. The upward pressure on demand in the end created a supply constraint and then, in the 1970s, a supply shock.

Unemployment in the United States was driven down substantially below modern calculations of a "natural rate of unemployment," around 5.7 percent in 1965 and 1966.[1] Consumer price inflation rose from 1.7 percent in 1965 to 3.0 percent the next year and 5.9 percent by 1970. Rather belatedly, in 1969, the Federal Reserve tightened its policy, and thus engineered a mild recession in 1970, but that did little to dampen inflationary pressures. There is a monetary policy paradox in which too much monetary stability creates a false assurance that speculation is riskless and thus drives the formation of bubbles that are prone to collapse. The fiscal version of this trap, which was sprung in the can-do atmosphere of the late 1960s, is that fiscal fine-tuning, following the recipes of Keynes, would ensure that every downturn or occurrence of economic slack could be counteracted through active demand management. Everything seemed possible—until it wasn't, and analysts then began to rediscover "unpleasant arithmetic."[2]

Governments initially thought they needed to do more. Even regimes that announced that they would follow conservative free-market principles—Richard Nixon's presidency in the United States or Edward Heath's British Conservative administration—soon ended up imposing controls and restrictions in order to pursue (unsuccessfully) continued prosperity. The effect of Nixon's price controls was to encourage more consumption, more imports, and eventually there were shortages, especially of heating oil in the winter of 1972–1973. The chronology matters because a great deal of the mythology of the 1970s arose from belief that the rest of the world—in particular the oil producers, but also other commodity suppliers—had abused their position. In fact, they were responding to developments driven by the United States—and by the many other western countries that had embarked on the same course of self-confident expansion. Initially it was tempting to think that the oil producers were "the clear and central villain of the piece."[3] A more realistic view, however, sees the oil price as responding to global supply and demand, and in particular to the general economic expansion of the late 1960s and the early 1970s.[4]

We can see the bewilderment generated by the new economic shocks in the shifts of the simple vocabulary Americans have used to describe their view of the world. Americans in print used the word "progress" more frequently than "crisis," in a striking contrast with gloomy twentieth-century Germans. But from 1967, the use of "progress" fell off swiftly, while "crisis" rose (and "progress" in French or German also incurred increasing disapprobation after 1967, though the French decline started earlier). After 1966, Americans, at least in print, started to use the phrase "progress is good" much less frequently. In the 1970s, the situation grew much worse, according to data from Google's Ngram viewer. Vietnam, the gasoline shortages, Watergate, and stagflation amounted to a national loss of faith.

The defining economic parameters that eventually bred 1970s pessimism and malaise lay domestically, in the combination of high inflation with high unemployment and low growth. The driver was a widespread belief in the capacity of economic growth to raise productivity, make more growth, and push down prices as a consequence of productivity gains. An influential model evolved by Nicholas Kaldor looked at the long-term relationship between technical progress and the rate of growth and derived a "technical progress function." An expanded manufacturing sector would lead to a self-sustaining virtuous cycle of higher rates of growth and hence also of higher wages.[5] The influential economist Roy Harrod then drew the logical consequence that stronger demand growth might reduce (rather than increase) inflation.[6] These optimistic expectations were severely disappointed.

Previously, policy-makers had supposed there was a trade-off between inflation and growth, defined by a Phillips curve, the relationship identified by the New Zealand economist William Phillips: in the original version, the relationship was between wages and employment. High growth or rising employment would generate a shortage of workers and wage pressure that would be translated into rising prices. An economic shock would reduce the demand for employment and lead to a wage mitigation, and a slower pace of price increases. For the world's major industrial economies, this relationship could be clearly empirically demonstrated through the 1960s. In the 1970s, however, wages continued to move up even though there was substantial unemployment. Keynes's theory of adjustment depended on irrational or arbitrary behavior of wage-earners, who in the original vision suffered from a "nominal wage illusion": they did not notice that inflation was eroding their real incomes, and the lower real wages generated higher levels of employment. If the nominal illusion faded with higher levels of inflation, a new answer to the adjustment question was required. Wage settlements could only be constrained by discipline, by the imposition of guidelines or even controls. Lenders of money had their own illusions too. The rise of inflation drove down real interest rates below any historic trend, deep into negative territory, reduced government debt, and thereby fueled the illusion that deficits do not matter.

The new Phillips relationship was also a consequence of an underappreciated consequence of transformative technical and economic change. New technologies allowed new production, as well as a shift to services in rich countries. But the labor for the new activities was not instantly available, and a substantial transfer of people from one area to another was incompatible with the policy emphasis on full employment. The problem was most acutely diagnosed, not in the case of western market economies, but in the world of Soviet planning, where János Kornai analyzed how there could be no real economic system from which both excess demand and excess supply had been eliminated: "'Optimization,'" he wrote, "is not possible: we want full employment, but we do not want labor shortage. They are joint products, which, it seems, necessarily appear together."[7]

Growth and Productivity

Though the source of the inflation problem was domestic, the arguments and responses that it provoked lay in external policy, in the shaping of how a national economy related to the rest of the world. And the United States led the way. In August 1971, President Nixon dramatically ended the gold convertibility of the dollar (at that time restricted to foreign official institutions), and imposed a ninety-day freeze on wages and prices, as well as a 10 percent surcharge on imports to "ensure that American products will not be at a disadvantage because of unfair exchange rates." There were new exchange rates from December that were intended to help American producers.

Nixon's secretary of commerce, Peter Peterson, announced new energy initiatives in late 1972, warning of how there would be a shortage of funds to pay for oil imports that would drive a competition for export earnings: oil was taking the place that corn had occupied in the tumultuous debates of the hungry 1840s in Europe (see Figure 5.1). As Peterson put it, "One result could be that all major deficit countries could find themselves forced to engage in a wild and cannibalistic scramble not only for energy but for external earnings to pay their bills. This could create an extremely rigorous competition for manufacturing exports and the sort of export subsidies which could be deleterious to the interests of all parties in the long run." He added that "comparative advantage is slipping away," and finished apodictically: "The era of low-cost energy is almost dead. Popeye is running out of cheap spinach."[8] Even a year later, when Nixon addressed what was now clearly an "energy crisis," he explained that "our deeper energy problems come not from war, but from peace

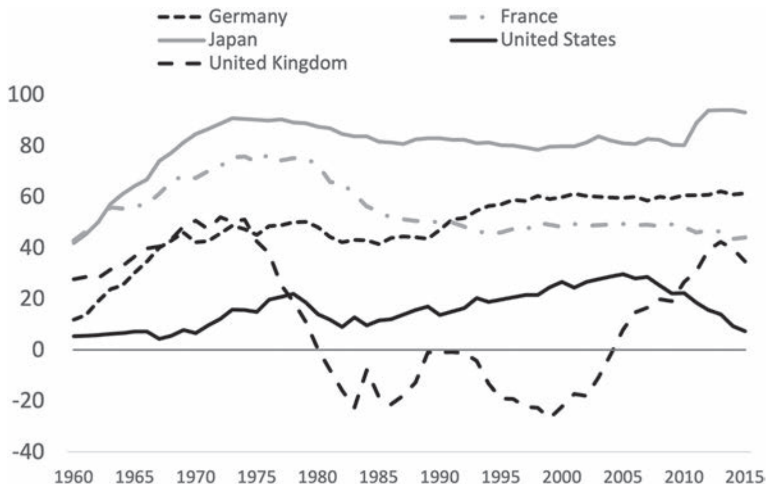

Figure 5.1. Energy share of net energy use, 1960–2015 (percent) (Source: World Bank Data)

and from abundance. We are running out of energy today because our economy has grown enormously and because in prosperity what were once considered luxuries are now considered necessities." The measures Nixon announced, a ban on converting coal to gas, a reduction in the fuel for aircraft, a nationwide speed limit, and a reduction of heating oil consumption, were presented—as food restrictions had been in earlier eras—as actually being beneficial for health: "lower the thermostat in your home by at least 6 degrees, so that we can achieve a national daytime average of 68 degrees. Incidentally, my doctor tells me that in a temperature of 66 to 68 degrees, you are really more healthy than when it is 75 to 78, if that is any comfort."[9] Faced with discomfort in a globalized world, it is always tempting—especially for politicians who want to deflect responsibility and blame—to credit the outside world as the originator of new pain.

The most obvious explanation of the crisis or malaise then came in terms of the supply shock generated by (mostly Middle Eastern) oil-producing countries, organized in the Organization of Petroleum Exporting Countries (OPEC). OPEC's move to increase oil prices, and then to use petroleum as a political weapon, occurred against a background of currency disorder engendered by the Nixon shock: the par value system built around the dollar collapsed in August 1971, and the attempt to restore it in December 1971 at the Smithsonian monetary conference was unconvincing and short-lived. Since petroleum prices were conventionally quoted in dollars, oil producers at first wanted to protect the real value of their exports, and then in March 1973, when the restored par value system finally disintegrated, realized that increasing oil prices could be employed as an economic and also a political weapon. There was thus a new "oil nationalism." In 1974, OPEC's oil revenues tripled to $108 billion, accounting for an eighth of all world exports. All the major industrial countries were heavily dependent on oil imports.

The higher oil price might be regarded as the imposition of a new (wealth- and income-reducing) tax; and thus the industrial countries mostly decided not to adjust immediately. The immediate response in most countries was to accommodate the shock. That monetary and fiscal accommodation pushed inflation, which rose to 11.0 percent in the United States in 1974 (and then, after a second oil shock, to 12.0 percent in 1980), and to higher levels in some other countries: in the UK, consumer price index (CPI) inflation in 1975 was 24.2 percent, and in 1980 18.0 (see Figure 5.2). Countries employed differing strategies to reduce their fuel imports: France pushed nuclear energy as an alternative to carbon, the UK developed oil and gas fields in the North Sea, Germans and Japanese accepted greater fuel economy. The United States alone thought it did not need to act until a fuel economy campaign was belatedly launched in the late 1970s. Over the 1970s, the number of lightweight Japanese cars produced rose from 2.4 to 6.4 million, and this branch became a niche export market.

The language of shortage reappeared everywhere. Some importing countries imposed "car-free days" as a way of rationing gasoline consumption. There was "panic at the pumps." Black American activists thought that the heating cuts would create "flu epidemics in the ghettos," and Rev. Jesse Jackson claimed that the energy crisis would be "the all-purpose alibi to justify further erosion of black rights."[10] The shortages extended well beyond fuel. That was in some part—indeed in large part—a consequence of government policy. Under Phase IV of the Nixon price controls, from August 1973 some ("old") oil prices were controlled, while others ("new") were left unregulated, and supplies were

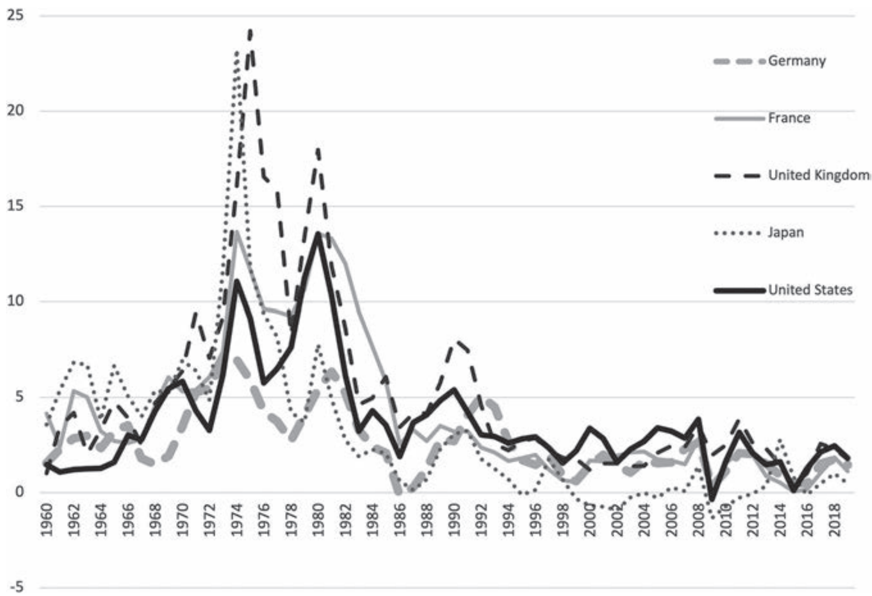

Figure 5.2. Comparative CPI inflation, 1960–2020 (Source: World Bank Data)

accorded as a priority to agriculture, sanitation, and emergency services: allocations that looked like sensible priorities, except that the trucking industry was left out. Truckers reacted with fury and open conflict broke out, with militants wielding clubs and guns. Other goods also became scarce by 1974. Meat supply in New York fell by 40 percent; elsewhere stores rationed products such as beef, eggs, or flour.[11]

In 1972 the Club of Rome presented a wildly influential report, *The Limits to Growth*, which contrasted in a Malthusian way the exponential growth of population and demand, and the limited supply of the world's nonrenewable resources. It was based on computer modeling of a series of feedback loops and interactions, based on the approach developed by MIT's Jay Forrester. The basic behavior model of the world system was set at exponential growth of population and capital, followed by collapse. That model clearly indicated longer term unsustainability. The report concluded with a grim warning: "The growth phase cannot continue for another one hundred years. Again, because of the delays in the system, if the global society waits until those constraints are unmistakably apparent, it will have waited too long."[12] There were also some guesses about dates. Capital would be increasingly devoted to resource extraction, and the result would be a collapse in industrial output per capita from about 2015. From about 2020, reflecting declining expenditures on education and health, mortality would rise, and from 2030 global population would fall. Viewed from the perspective of 2022, the prognosis looks astonishingly prescient.

Were the 1970s the moment at which the immediate adjustment that the Club of Rome recommended in order to ward off the threat should have taken place? The oil producers shrugged off the gloom. Sheik Ahmed Zaki Yamani, the Saudi oil minister, was repeatedly quoted opining that "[t]he stone age did not end because the world ran out of stones, and the oil age will not end because we run out of oil."[13] The quotation became a slogan of oil producers, but also of the petroleum industry, and politicians went along with the underlying world view. In fact, political institutions focused on growth pushed for continued growth. Internationally, as states spent more on oil, grain, and other commodities, they found their balance of payments squeezed. Unable to afford vital goods from abroad, governments had to make hard choices. Many foundered as they tried to ration scarce goods, deciding who could drive cars when, or whether they should pay nurses more than teachers, police officers, or civil servants.

The immediate and instinctual response to scarcity was protectionism. In the United Kingdom, where the balance of payments problem appeared earlier than elsewhere, the government tried a "Buy British" campaign, supported by all the major political parties. Leaders encouraged citizens to wear stickers and badges with the Union Jack and the message "I'm backing Britain." (The press magnate Robert Maxwell distributed T-shirts with the same slogan, but they turned out to be made in Portugal.) In the mid-1970s, after the first oil shock, the government briefly flirted with what the left of the Labour Party called a "siege economy," with extensive import restrictions. In the United States, there was acute anxiety about Japanese competition, and in 1981 Washington pressured Tokyo to sign an agreement that limited Japanese car exports. The move backfired, however. Because of the new "voluntary" quantitative restrictions, Japanese producers merely shifted their focus away from cheap, fuel-efficient cars and toward luxury vehicles.

The most extensive intellectual case for protectionism was made in Cambridge—the home of Keynes and Keynesianism. The Department of Applied Economics, and especially its director, Wynne Godley, a talented and cultured man (he had been the principal oboist at the Royal Opera House, Covent Garden), insistently argued the need for tariffs and trade protection. In 1975, the department's *Economic Policy Review* announced that "there seems now to be no way of obtaining simultaneously an improvement in the current balance and keeping unemployment below one million other than by introducing some form of import restriction."[14] As Godley later put it, the boom of the 1960s had sent the wrong signals: "People were misled by the fact that in the boom periods money and jobs were easier to find by selling foreign goods than by manufacturing them for ourselves."[15] His colleague Francis Cripps explained: "In order to get the system growing again, you've got to find some way of shifting the balance of advantage so that the people who need growth most can start to gain somehow in their share of trade. Then the whole trading system can take off again."[16] The idea was to grow capacity very quickly behind a protectionist curtain. This was the 1976 recommendation: "If any viable arrangement can be reached which removes the balance-of-payments obstacle to future growth of demand, the British economy should now be capable of a period of very fast growth (by the standard of past performance) at a sustained rate of 5% a year or more for many years to come. This would provide the opportunity for a transformation of industry and the economy in which the critical structural problems existing today could be resolved."[17]

This extreme advice was not heeded. Indeed, by the early 1980s, after the second oil shock following the Iranian Revolution, the Cambridge view shifted to a focus on the international system as a whole, and an argument that higher oil prices, and indeed commodity prices in general, would be a way to promote a new sort of growth: "very high world oil prices would provide a stronger inducement to developed countries to reduce their energy consumption and would help a wide range of countries to develop less accessible oil reserves and other natural energy resources."[18]

As the cost of imported goods increased, governments did not want to force an adjustment and compress wages and incomes. A common historical interpretation holds that the Federal Reserve was bullied by Richard Nixon, and later by Jimmy Carter, to push inflation. Edward Nelson's recent wide-ranging study of Milton Friedman and the U.S. monetary debate refutes that interpretation. Fed Chair Arthur Burns, a man of impeccable monetary orthodoxy, and an early teacher and a friend and a father figure of Friedman, consistently insisted that the Fed was determined to prevent a new inflationary spiral. But he had a mistaken theory of how inflation arose. He was confident that he would succeed because price and wage controls—which he advocated—would control the wage-push effect that might be generated by a onetime shock. There was also a measurement issue, in that the Fed based its assessments on the room for expansion (or the output gap) on values that turned out to be substantially larger than those calculated later using revised values.[19] Until 1981, the Fed did not respond to inflation by increasing interest rates sufficiently to keep real rates (and expected future rates) positive.[20] The Fed thus went into the Great Inflation of the 1970s with a wrong doctrine, and Friedman built his reputation on his prediction of a bad inflationary outcome. The inflation unleashed by the Fed was destabilizing, and it also—especially in the later 1970s—undermined the role of the dollar as an international currency.

At the outset of the inflationary development, asset prices (notably stock prices) rose, but as the realization of the inflationary process sank into market psychology, the markets sputtered after 1972 in the United States and the UK. By contrast, there were dramatic surges in Japan and, later and more modestly, in Germany (see Figure 5.3).

In Europe, especially in France and Germany, inflation was understood largely as imported from the outside, through the international monetary system. In the 1960s, French policy-makers and theorists had attacked the role of the dollar in the international monetary system: President Georges Pompidou pressed Finance Minister Valéry Giscard d'Estaing to explain to the IMF Annual Meeting that "you cannot set watches to a defective clock."[21] German economists such as Egon Sohmen saw inflation as imported, and the critique was taken up vigorously by the influential German central bank, the Bundesbank.

In May 1973, the Bundesbank saw an opportunity to end the fixed exchange link with the dollar and embark on a course of monetary control.

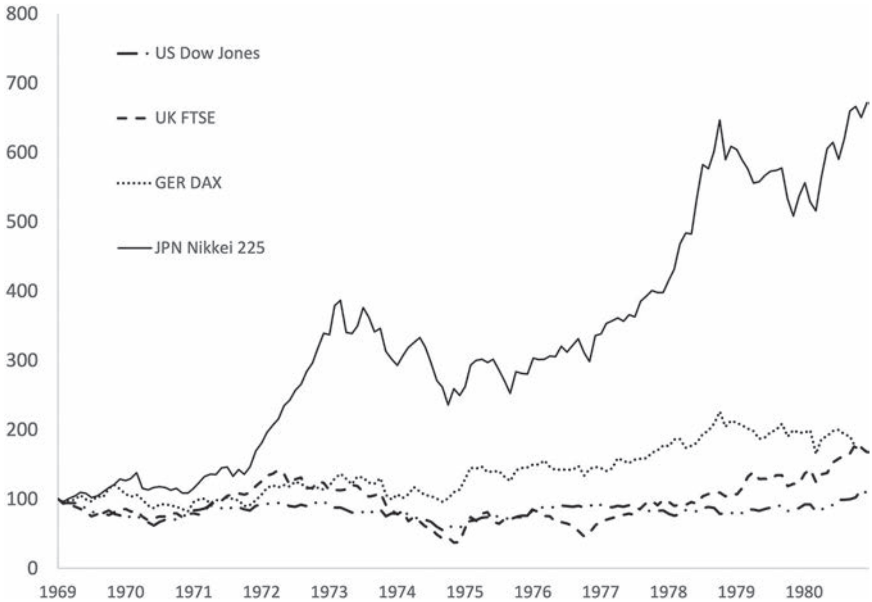

Figure 5.3. Stock market indices, 1969–1980 (1969 = 100) (Source: Calculated from Global Financial Data)

Its move was not welcomed by all Germans. The banking sector feared that there would be bank failures; exporting businesses worried about exchange-rate appreciation. But the central bank persisted. From 1974, the Bundesbank operated with a target range for central bank money, a narrow measure of the money supply, which it saw as a way of communicating an appropriate inflation goal to markets, and to the parties in coordinated wage bargaining processes. Later, with much lower rates of inflation than the United States, and lower interest rates in consequence, Germans argued that the initial success allowed them to treat the oil price increase that followed later in 1973 as a genuinely one-off event, accommodate it, and in consequence experience a milder version of the general world downturn in 1975.[22]

The different responses figured prominently in a debate about the competence and effectiveness of governments. The unsuccessful attempts to deal with the energy question and the price inflation question through controls discredited the leaders who presided over those strategies. In the United States, President Gerald Ford became unfairly a figure of fun:

someone who could be presented in late-night comedy programs as a man who had played too much football at high school, or who couldn't walk down the street and at the same time chew gum (there were also much cruder varieties of the jibe). His successor, Jimmy Carter, looked even more hapless. In a dramatic moment of introspection, he canceled a scheduled Independence Day speech in 1979 and went instead to Camp David for ten days, where he invited Americans from all over the country to present the president with their honest views. Then he presented the outcome in a televised address on July 15: it became known as the "crisis of confidence" speech, or also as the "malaise" speech (though Carter did not use that word). He started with the brutal criticism: "This from a southern governor: 'Mr. President, you are not leading this nation—you're just managing the government.'" His lower lip then trembled. He cited others: "This was a good one: 'Be bold, Mr. President. We may make mistakes, but we are ready to experiment.'" The "crisis of confidence" was striking "at the very heart and soul and spirit of our national will. We can see this crisis in the growing doubt about the meaning of our own lives and in the loss of a unity of purpose for our nation. The erosion of our confidence in the future is threatening to destroy the social and the political fabric of America."[23]

The initial reaction to this speech was enthusiastic, and opinion polls showed a widespread appreciation of the frank reckoning. Once the dust settled, however, the frank avowal defined Carter as a leader who had lost control. And that was the theme that dominated the 1980 presidential campaign, with many holding up "ABC" signs: Anyone But Carter. The eventual Republican challenger, Ronald Reagan, made very effective use of the "malaise" theme. Inflation provided the key to the indictment—it had reached 18 percent at the beginning of 1980, as Reagan pointed out in a decisive televised debate with Carter: "he has blamed the people for inflation, OPEC, he has blamed the Federal Reserve system, he has blamed the lack of productivity of the American people, he has then accused the people of living too well and that we must share in scarcity, we must sacrifice and get used to doing with less. We don't have inflation because the people are living too well. We have inflation because the Government is living too well."[24] Politicians generally attacked inflation, and at the same time did not know what to do about it, as disinflationary courses looked hard and unattractive: and the combination of handwringing and an absence of ameliorative policies made them look ineffective.

The British government looked even more incompetent, because of the heavy reliance of both Conservative and Labour administrations on price and wage controls. In 1974, Conservative Prime Minister Edward Heath, after bitter struggles with unions (in particular the coal miners) that shut down the country, called a premature general election to resolve the question "Who governs Britain?" The electorate rejected him. The Labour government that replaced Heath's also worked with wage and price controls. In both the Conservative and Labour guises, wage guidance and controls involved impossible choices. Were nurses more valuable than teachers, policemen than coal miners? The process of making awards set off distributional conflicts, and also ratcheted wages up as one group pointed to another settlement and claimed that they needed more. The temporal spacing of settlements created the possibility of leapfrogging, and that increased discontent and heightened politicization.

By 1976, a currency crisis developed as UK costs exploded. Chancellor of the Exchequer Denis Healey turned back from Heathrow Airport, where he was supposed to be flying to the annual IMF meeting, in order to manage the urgent domestic crisis. Later, in the winter of 1978–1979, a "winter of discontent" with strikes and shortages, garbage piling up uncollected in the streets, and bodies waiting for burial, Prime Minister James Callaghan returned, with a sun tan, on January 10, 1979, from an international meeting in the Caribbean (Guadeloupe) and was misquoted when he landed in a phrase that became the obituary for his government, and indeed for the old Labour Party: the popular tabloid the *Sun* ran as its banner headline "Crisis? What Crisis?" Callaghan's words were in fact: "I don't think other people in the world will share the view that there is mounting chaos." He stated that the mounting chaos interpretation was a "rather parochial view."[25] Callaghan in the end was deeply depressed: he felt he had been bitterly let down by his own side, by the trade union movement to which he had devoted his political life.[26] The devastating pun, devised by the advertising agency Saatchi & Saatchi, that drove the Conservative election campaign was "Labour isn't working."

It wasn't just parties and governments that weren't working. Capitalism also looked as if it had failed. Heath branded Tiny Rowland of Lonrho, a buccaneering maverick who had pushed his company into wild expansion in Africa, as the "unacceptable face of capitalism." Rowland, born to German parents in a First World War internment camp in India, as a white Rhodesian farmer moved on to bridge "the commercial gap between the end of the British empire and the rise of the international company."[27] Lonrho had pushed a dramatically expensive expansion project in South Africa, the opening of a new mine, Western Platinum, and had betted on volatile commodity markets. In 1973 the board tried but failed to expel him. He then went on to buy a major British newspaper, the *Observer*, in the hope of generating better publicity.

Italy and Germany had their own version of malaise, "lead years" (*anni di piombo*, *bleierne Zeit*), driven by a constant threat of terrorism. In Germany the threat mostly came from the leftist Red Army faction, but it was more complex in Italy, where there was both neofascist terrorism and the activities of the Brigate Rossi, with rumors of the involvement of the intelligence services in both. The Italian prime minister from 1974 to 1976, Aldo Moro, the Christian Democrat who tried to build a coalition of stability with the Communist Party, was kidnapped by the Brigate Rossi and killed after fifty-five days as a hostage. Both Italy and the UK required an IMF package negotiated in 1977–1978 to impose some external discipline.

By contrast with the British and Italian leaders, Chancellor Helmut Schmidt in Germany looked more firmly in control. But he was consistently depressed about the viability of democracy and the threat that the Bonn Republic (West Germany) would be like Weimar, irritated by the opposition in his own party, and on several occasions seriously contemplated resigning as chancellor. People called him "The Doer" (*Der Macher*). He had a reputation for competent and unideological management from his time as a minister in the city-state of Hamburg during a great flood in February 1962. He derided promises and big visions: "whoever has visions should go to the eye doctor." In April 1974, shortly before he became chancellor, Schmidt composed a memorandum titled "Ökonomisches Papier" (Economic Paper) warning of the consequences of the oil shock and inflationary international currency developments. He feared that "democratic structures within the industrial societies would break up," especially in countries that needed to export in order to earn the currency necessary to pay for imports: Japan and Europe. This projection was "not an apocalyptic vision but a real possibility for the world economy." As chancellor, Schmidt constantly pushed the need to "stabilize national economies and stabilize the world economy by international action." He began to talk of a need for "global economic governance" (*Weltwirtschaftsregierung*).[28] In a long interview with *Spiegel* he explained that in economic matters, Germany was a *Weltmacht*, a world power. He also emphasized, talking about himself in the third person, that "the current chancellor has occupied himself very intensively over the last three years with world economic and monetary problems and in that sense has brought fortunate preconditions for a special judgment in this area."[29] He saw himself as a "world economist" (*Weltökonom*), advising American presidents in a rather paternal way.[30] The investments of the oil producers in other countries, including in Germany, where oil countries started to invest in the German automobile industry, was a good way of bringing the Arab leaders to "realize what they were doing." "People think that the world is ending if foreigners buy stakes in German industry: that isn't the case."[31]

Japan experienced its own version of the generalized spread of doubt about politics. The early 1970s was the era of crazy prices (*kyoran bukka*); in 1974, consumer prices rose by 23.2 percent. The government of Kakuei Tanaka, which had promised an ambitious infrastructure investment and development plan (the Japanese Archipelago Rebuilding Plan), collapsed in 1974 amid corruption scandals. His successor, Takeo Miki, was uncorrupt and popular with the public, but lost the support of his own party. The hesitations of politics, however, were compensated by coordinated action by the big business associations, Keidanren and Nikkeiren, to modernize and transform Japan's economy.

The 1970s was thus a decade of diverging views about inflation in the major industrial countries: Germany looked like an outlier, with only 7.0 percent in 1974 (Italy was at 19.2, the UK at 15.9 percent, the United States at 11.0). Even in stability-oriented Switzerland, the inflation rate was higher than in Germany. The divergence only started to change with a dramatic reorientation of U.S. policy, which followed from an intellectual reassessment of monetary policy, but also from the sense that the weakness of the dollar undermined the U.S. position in the world. The United States–United Kingdom axis turned from being at the top of the international range of inflation outcomes to a center of stability, but the disinflation was a long and painful process.

On October 6, 1979, the new chairman of the Federal Reserve Board, Paul Volcker, announced a reorientation of policy "emphasizing the supply of reserves and constraining the growth of the money supply through the reserve mechanism" in order to obtain "firmer control over the growth in money supply in a shorter period of time." The nominal federal funds rate target was raised sharply from around 11 percent in September 1979 to around 17 percent in April 1980. The result was a sharp recession, to which the Fed responded with a cut in rates. In 1981, there was a new tightening, and another recession, after which the Fed brought the nominal federal funds rate down, from 19 percent in the summer to the 14 percent range by the end of the year. In the summer of 1982, there was a further reduction, to around 10 percent.

The UK, under the new government of Margaret Thatcher, turned in March 1980 to a Medium Term Financial Strategy in order to squeeze out inflation, with the specification of a series of declining target ranges for the major monetary target (£M3) over a four-year period on the principle that "control of the money supply will over a period of years reduce the rate of inflation." Both the American and British approaches initially prompted widespread criticism, not least because of surges of monetary growth that occurred in the process of disinflation. For Britain, for instance, from January 1980 to July 1981, the main money supply measure, £M3, grew by 34 percent. Later Volcker gave a retrospective view of the successes of central banks and monetary policy in promoting stabilization, explaining that "the record is quite clear that, despite varied efforts here and abroad, central banks did not discover any monetarist holy grail. In the end, no country in which inflation had become embedded seemed able to moderate that inflation without a painful transitional period of high unemployment, recession, and profit squeeze."[32]

Volcker became disenchanted with the monetary targeting exercise, especially as the Carter administration ground to a debilitating close and Ronald Reagan won the November 1980 election. In November, the central banker lamented:

> I think what we are seeing now in general terms is the famous collision between the recovery and monetary targets that are in some sense too restrictive to permit recovery unless the momentum of inflation declines. I didn't expect to reach [this stage] this early, but here it is. A number of people have commented that these targets, just to put it very quickly, lower the limit on the ability of the economy to expand. They are going to continue to do that, I suspect, given all the uncertainties, with targets of the type that we have until inflation declines. And that's a very unsatisfactory picture from any perspective, other than sole-minded concern about hitting the targets.[33]

So he started to retreat, but it was not clear what compass the Fed should follow.

In December, Volcker stated bluntly in the Federal Open Market Committee (FOMC) meeting, "when we talk about credibility, I think far, far too much emphasis is put on these monetary targets." He became ever more passionate, and finally exploded:

> When I listen to people talk about credibility and their discouragement about inflation—and they are plenty discouraged—what I hear about the last year, specifically on Federal Reserve policy when you get away from the money market analysts, is: "You brought us to the brink in the winter and we got a little worried. We have been through that kind of experience before and in two months it all evaporated and nothing happened." They weren't looking at the money supply decline and saying all the pressures are off the money markets and it's full speed ahead. . . . They thought some results might be seen over the year and after two months the markets were easy again and they said: "We shouldn't have worried." What else did we hear cited? Chrysler. A big company gets in difficulty and the government steps in, just as it did a few years ago when New York City got in difficulty. What happened this spring—I, at least, was part of it and I won't implicate any of you—is that we had a calamity in one commodity market. People got darned worried about it. The Hunts arranged a bail-out in the end. We acquiesced in permitting them to do it. Why did we acquiesce? Because we

> were worried about the second biggest brokerage house in the United States, and the biggest brokerage house in the country was not all that far behind. And at least one of the biggest banks in the United States was in potential jeopardy. Money eased anyway; maybe it wouldn't have happened. . . . In effect, one way of putting it is that they think if there's a clash between the monetary target and a real problem in the economy, we are going to give way, whether we are inside the target or outside the target. And they don't translate those targets into their own behavior very readily even if they're fairly sophisticated.[34]

On the other hand, Volcker did make it clear that he saw the need to avoid excess demand.

A critical part of the Fed's policy depended on altering market psychology. As Volcker had set out the problem in the December 1980 meeting, the dramatic movement of the silver price had been an obsession, an indication of the extent of inflation fears. The fever intensified with a spectacular attempt to corner the silver market by three Texas brothers, Nelson Bunker, William Herbert, and Lamar Hunt, the sons of an oil tycoon. In early 1979, the silver price had been around $6 an ounce, and the Hunts started to buy up silver in the late summer. On January 21, 1980, the New York Commodity Exchange prohibited traders from taking new positions in future markets and raised margin requirements: the price briefly surged to $49 and then fell back to $37.[35] That was a record single-day drop. The Hunts then offered to buy 5 million ounces at $40, and William Herbert Hunt blasted the "unrealistic margin requirements," which had created an "illiquid market."[36] The Hunts were broken, and in late March failed to meet a $100 million margin call. They had accumulated debts of some $1 billion. Volcker was exultant, and explained how he would "look forward to the liquidation" of the Hunts' silver. He now declared that "the best defense against that type of behavior [excessive speculation] must be the discipline of the market itself."[37] The market might be a defense mechanism against extortion by powerful interest groups.

Inflation could fall once the commodity threat was removed, in part because the bursting of the silver bubble (and the related falling back of gold prices) made it clear that there was no alternative to the dollar.

By July 1981, Volcker was reporting "some signs of progress on inflation and inflation psychology."[38] The containment of inflation occurred in the context of a sharp recession: the National Bureau of Economic Research calculated its duration as July 1981 to November 1982. In November and December 1981 unemployment reached a postwar peak of 10.8 percent of the labor force. The Fed started to shift slightly in the light of a major banking problem, the collapse of Penn Square in June 1982, and then of the outbreak of the Mexican debt crisis in August 1982, a problem that originated at least in part from the Fed's tightening of interest rates. At this point Volcker began to move away from concern with the growth of monetary aggregates to a simpler focus on interest rate targeting.[39] But the striking point of his policy stance was a resolute commitment to keep monetary policy separate from fiscal policy: thus in August 1982, as the Mexican crisis was developing, he refused to contemplate a deal with Congress to cut interest rates if Congress would agree to reduce the size of the budget.[40]

It appears paradoxical that the oil shock in the end created more globalization rather than a turn to economic nationalism. One mechanism that drove the new linkages was a financial revolution, which transferred the large surpluses accumulated by oil producers into lendable funds in big international banks. The development of international capital markets, offshore and thus largely free of direct government control, was the major financial innovation of the period. The availability of money made resources available for governments all over the world that wanted to push development and growth, and international demand thus surged. The alternative strategies, such as British Labour's siege economy, looked like a mechanism that would cut off access to markets and prosperity.

The possibility of increased trade depended on technology as well. The basic innovation that revolutionized international commerce, the standardized container, with the possibility of speeding up loading and unloading in ports and then allowing direct transportation to users and distributors, had been introduced in the 1950s.[41] The first container port in the United States was the Elizabeth Port Authority Marine Terminal in New Jersey (1962); from 1966 there was regular service between the United States and the UK, where the first dedicated container terminal, in Felixstowe, opened in 1967. But the traffic in containers took off in the 1970s: it was only in 1973 that containers transported more of the U.S. cargo trade than traditional breakbulk ships. And then in the 1970s increased competition, and the pressure of shippers on the carriers, drove down prices. The big surge in size of container ships only occurred in the 1990s, however.[42]

The most obvious and immediate victors of the energy crisis were Japanese automobile producers. A relative outsider to the industry, the motorcycle maker Honda in 1973 created a new "stratified charge" engine that allowed a higher ratio of air to gasoline and thus substantial fuel economies. The firm then shifted heavily into automobile manufacture. Japan, a country with a much more obvious energy constraint than the United States, rapidly became the foremost source of fuel-efficient cars, which now clearly outcompeted American "gas guzzlers." By 1980, 200,000 American automobile workers were unemployed, a direct response to the surge in Japanese imports: from 1975 to 1980 the annual sales of Japanese cars in the United States rose from 800,000 to 1,900,000. The same challenge occurred in the UK. The first Japanese car imported there, the Daihatsu Compagno which arrived in 1965, was not well received: only six were sold, and reviewers reported it to be "technically retrograde" and complained that its acceleration "to 60mph was too slow to be timed."[43] But then the Japanese sales surged, and British automobile producers sputtered in the face of foreign competition.

Automobiles provided the most obvious instance of the new dynamic: business had to learn to compete effectively in quality and innovation, and that would occur only with open markets. But the same process of opening through competition was evident elsewhere. If Americans wanted comfort, they could turn to wine. At a blind tasting organized by a British upper-class wine seller in Paris in 1976, nine French judges weighed the qualities of competing top products. American wines outclassed French wines in both whites and reds. The American reporter who covered the event for *Time* loved repeating the verdicts of the judges: on the best white, a Napa Chateau Montelena, "Ah, back to France"; and on the expensive French Bâtard Montrachet '73, "That is definitely California. It has no taste." The report was titled "The Judgment of Paris."[44]

Learning is always more difficult for hegemonic countries. Paul Krugman liked to comment that "as a nation we are often unwilling to learn from foreign experience."[45] The 1970s made that process a necessity. But it helped in that process to package learning in an optimistic envelope. Ronald Reagan preached about "morning in America," Margaret Thatcher explained (while still in opposition) that "we don't want pessimists in our party."[46]

Thus, crises in the 1970s led to the same realization as in the 1840s: openness produced resilience, and financing needed to be available for trade to expand. The eventual impact was obvious: trade in goods, which in 1970 had amounted to 9.5 percent of global GDP, increased to 14.9 percent by 1980. Even more striking was the growth of trade in goods and services over the same period: from 12.1 percent in 1970 to 18.2 percent in 1980.[47] The cycle swung back to globalization once again.

The 1970s produced change outside the industrial economies. Many countries saw an opportunity presented by the availability of cheap finance on international markets to borrow in order quickly to develop industrial capacity. The IMF reoriented itself to providing low or minimal conditionality to poorer countries hit by the oil crisis through a newly devised oil facility. But most middle-income countries had much easier access to syndicated bank lending from American, European, and Japanese banks, and saw an opportunity to expand. They rejected any kind of supervision or control as they began both to compete with imports and to develop some export markets. Mario Enrique Simonsen, Brazil's finance minister, argued that the IMF should not attempt to give "judgments, analyses and forecasts" to the private sector.[48]

Even where there was no large-scale borrowing, there was a change in attitude and orientation. Younger Indian economists (most prominently Jagdish Bhagwati) developed a criticism of the rent-seeking behavior caused by lobby groups and special interests who could profit from restrictions on international trade, but there was not at that time a political momentum sufficient to overcome the accumulated might of the beneficiaries of the license or regulation raj.[49] By the early 1990s, Finance Minister Manmohan Singh was asking, "What does South Korea have that India doesn't?" and then started to lay out a program for opening and reform.[50]

The most dramatic movement occurred in China, with the defeat of the radical "Gang of Four" (which included Mao Zedong's widow, the actress Jiang Qing) and the ascendancy of Deng Xiaoping. Deng in November 1978 visited Singapore, was greatly impressed by its openness and modernity, and started to think about the application of that foreign model. He later reflected how "Singapore's social order is good. Its leaders exercise strict management. We should learn from their experience, and we should do a better job than they do."[51] At the "Working Conference" established by the Communist Party Central Committee and meeting in November and December 1978 in the Jingxi Hotel in Beijing, with a strong representation of regional party leaders, a plan was drawn up for economic modernization. There was a turn toward private industry because of the need for technical expertise, but also because of the attractions of linking managers in China to international networks created by Chinese emigration ("greater China"). As Deng put it, "The most important thing is that they should not continue to be exploitative. Apart from that there is no reason why they should continue to be stuck with the label of capitalist."[52]

All these expansions, liberalizations, and openings were launched with relatively high levels of inflation. Inflation may indeed initially have made adjustments in production easier, because relative prices could move easily without provoking fears of price and wage cuts, at least as long as some degree of nominal wage illusion remained. Once that disappeared, inflation only generated confusion about prices and uncertainty about investment for the future. Fighting inflation then soon came to be the major policy issue for the industrial world: a test of competence and of the capacity of governments to manage the benefits of openness. The overcoming of inflation became the basis for a "reformulation of democratic capitalism," one which many observers retrospectively treat skeptically because they see it as the beginning of a destructive experiment in "neoliberalism," or "a learning process with a fatal outcome."[53]

Conquering Inflation

There was nothing inflationary or inflationist about Keynes. At the end of the First World War, Keynes's major accusation against the Allied peacemakers is that they were plunging Central Europe into chaos and inflation. He made up a Lenin quote ("the best way to destroy the

Capitalist System is to debauch the currency"), and then described how that process would engage "all the forces of economic law on the side of destruction."[54] In the Second World War, his most important contribution to domestic planning was the tract *How to Pay for the War*, which set higher taxes as the key mechanism for avoiding an overexpansion of consumer purchasing power, with inevitably inflationary consequences. A better and more sustainable course would defer mass consumption until the peace.[55] The economist Roy Harrod recalled his first meeting with Keynes, when he had been ushered into a sparsely furnished modernist drawing room on the first floor of his house in London's Bloomsbury area, 46 Gordon Square. Keynes talked about ideas and about current events and "the excitement was almost unbearable." Keynes went on to lay out Colin Clark's theory that "no nation will endure paying more than a given percentage of its national income in taxation, and if it has to carry a greater load it will almost automatically find escape from its plight by inflation."[56] One of the libels that Keynes's posthumous critics devised was that Keynes was an inflationist.

Demand management could have been an effective anti-inflationary tool, but it turned out to be a weak instrument because of the substantial political pressures to push up demand. Inflation became the central concern of the new gurus working to produce a post-Keynesian world. The two thinkers who pushed most prominently against the philosophy that had led to the 1970s were Milton Friedman and Friedrich von Hayek. They are often vilified as purveyors of a destructive neoliberalism. Paul Krugman depicted Friedman as a modern Ignatius Loyola, where "Friedman's followers have acted as a sort of disciplined army of the faithful, spearheading a broad, but incomplete, rollback of Keynesian heresy."[57] Hayek, according to the historian Perry Anderson, was one of a sinister quartet of the "intransigent right," whose "voice was heard in the chancelleries."[58] Margaret Thatcher had read Hayek's most famous political tract, *The Road to Serfdom*, as an Oxford undergraduate, and in the 1970s liked to take *The Constitution of Liberty* out of her handbag and say, "*This* is what we believe."[59]

In policy terms, however, the new gurus played a rather minor role: Ronald Reagan did not take Friedman's advice to abolish the Federal Reserve, and Thatcher ignored Hayek's view that the best way to end inflation was to delegate monetary policy to an independent central bank. The one area of policy initiative that did derive directly from the Friedman/Hayek view was the importance of privatizing nationalized industries in the UK. The intellectual aura that the two created was far more important than any specific policy measure.

Though both figures taught for an extended time in the University of Chicago, and were both passionate advocates of a free-market philosophy, they were quite different not only in temperament but also in their fundamental vision and in their prescriptions. They had both been molded by the Great Depression, but in quite different ways. Friedman, born in 1912, had been a university student in the most dismal period of American economic history and policy-making, between 1928 and 1932. He later explained, "My parents were very poor; they never had an income which today would qualify as [above] poverty. My father died when I was fifteen. My mother supported the family thereafter by running a small retail store. . . . I never got a penny from my parents. I worked my way through college. . . . I went to college between 1929 and 1932, the greatest depression in our history."[60] His parents' small savings had been invested in the small (but important-sounding) Bank of United States, which catered above all to New York immigrants, and which failed (with no deposit insurance) in December 1930. Friedman's later academic account presents this failure of what he (probably incorrectly) saw as an illiquid but solvent bank, which was not given liquidity support because of the anti-Semitism of New York financial authorities, as the key event in the history of the Great Depression.[61] It was inevitable that he was concerned with the role of bank failures and the incompetence of monetary authorities.

By contrast, Hayek, born in 1899, had studied in Vienna at the time of the great post–First World War inflation and hyperinflation. He received his doctorates in law in 1921 and in political science in 1923, and then worked, with the support of Ludwig von Mises, as the director of a newly established Institut für Konjunkturforschung (Institute for Business-Cycle Research). He came to Britain at the invitation of Lionel Robbins, then a free-market intellectual, to teach at the London School of Economics, arriving in London by boat train on a weekend in September 1931 to find out on his arrival that the British pound had left the gold standard (and that in consequence his salary was worth substantially less). It is unsurprising that he was fascinated throughout his life by issues around inflation and international monetary relations, but also that he saw in the story of interwar Central Europe a grim warning for the UK (he became a UK citizen in 1938). Friedman may have seen Hayek, who liked classical references and Latin quotes, as an aristocratic figure, inherently in conflict with Friedman's more popular or even proletarian concern with clear exposition. It was always easy to listen to or read Friedman, while Hayek's never-simple prose became more tangled and complex later in life.

Hayek's interpretation of the Depression was also quite different from that of either Keynes or Friedman. In January 1931, he had traveled to Cambridge to give a lecture in which he explained to a stunned audience the flaws of what he called the "new gospel" as preached by Herbert Hoover, Henry Ford, but also by the underconsumptionist economists William Trufant Foster and Waddill Catchings: that the Depression could be counteracted by a strengthening of consumer purchasing power or by the injection of "additional money." This view, for which there was substantial sympathy in Cambridge, Hayek explained, "for many years has already been the tacit foundation of practical politics." In its place, he suggested a complex model in which the problems were created by the time lags in finishing investment or producers' goods, and argued that the demand for producers' goods had been "artificially increased by additional credits granted to production." But the worst consequences followed from consumer demand being "artificially and constantly increased by authoritative influence."[62] The argument looked like a reassertion of Jevons's insistence on the time dimension of production as producing substantial price movements. In Hayek's account, the Depression had been so severe because the U.S. monetary authorities had stopped a natural end to the boom in 1927, and had engaged in "deliberate attempts . . . to prevent, by all conceivable means, the normal process of liquidation."[63] These themes were fundamentally anticipations of Hayek's more extensive treatment in *Prices and Production* (1932), which contained the same emphasis on the importance of relative prices as shaping the structure of production, and the same warning about the "misdirection of production caused by additional credit." Price averages could not be a satisfactory basis for judging the stance of monetary policy.[64] In the Cambridge formulation, Hayek added a ringing peroration: "It may very well be that we are in a crisis of capitalism, but not because the capitalistic system has proved a failure but because for more than a decade we have been systematically destroying capital."[65]

Keynes was not present at the 1931 lecture on which Hayek's book was based, but his disciple Richard Kahn had broken the icy silence to ask, "Is it your view that if I went out tomorrow and bought a new overcoat, that would increase unemployment?" Hayek responded, "Yes, but it would take a very long mathematical argument to explain why."[66] Another Keynesian, the Hungarian Nicholas Kaldor, who had started as a disciple of Hayek's, later provided a stunning and complete demolition of Hayek's argumentation, which obviously stood at profound odds with either the Cambridge or the Chicago visions of how economies operated.

Hayek's clearest work was *The Road to Serfdom* (1944), which was not so much an analysis of either Nazi or Soviet economics, but an analysis of how the mixed economy of Weimar Germany in the 1920s had led to economic and political breakdown (and hence to the Nazis), and how it might provide a warning to policy-makers in the postwar era.

Friedman (like Keynes) did not believe that Hayek was a real economist, and ensured that he was not appointed in the University of Chicago Economics Department, but rather to the high-level interdisciplinary ideas factory, the Committee on Social Thought. In Chicago, Hayek once attended Friedman's seminar and witnessed a discussion of money supply in the UK, but gave the impression of being bored by the technicalities and never returned.[67] On the other hand, Friedman (also like Keynes) admired Hayek's approach to political philosophy, and in particular the elaboration of the ideas in *The Road to Serfdom*. He thought "personally Hayek was a lovely man, a pure intellectual. He was seriously interested in the truth and in understanding. He differed very much in this way from Mises."[68]

There was a basic commonality between Friedman and Hayek in viewing the problems of the 1970s as arising fundamentally from misguided intervention by governments. In November 1973, in the immediate aftermath of the Yom Kippur War and the first oil shock, Friedman explicitly used Hayek's language of the "road to serfdom" in defense of the idea that markets respond to price signals, and that interference with those signals is self-defeating because of the perverse effects it generates:

> The oil problem offers a particularly clear illustration of how the price system promotes both freedom and efficiency, how it enables millions of us to cooperate voluntarily with one another in our common interest. It brings out equally why the only alternative to the price system is compulsion and the use of force. It is a mark of how far we have gone on the road to serfdom that governmental allocation and rationing of oil is the automatic response to the oil crisis. This will not prevent higher prices, which will in fact do the job but you may be sure that the rationing authorities will take the credit.[69]

In the spring of 1974, with chaotic gas lines in the United States and many western European countries, Friedman highlighted the contrast of the American with the German response: "After the Arabs cut output, Germany imposed no price controls on petroleum products. It did initially restrict Sunday driving but soon removed that restraint. The price of petroleum products jumped some 20 or 30 per cent, but there were no long lines, no disorganization. The greedy consumers found it in their own interest to conserve oil in the most painless way. The greedy oil tycoons found it in their own interest to see to it that petroleum products were available for those able and willing to pay the price."[70] The international comparison looked like an appropriate natural experiment in policy design and government competence.

Though they shared a broadly similar concern with the effects on the economy of the distortion or upending of price signals as a result of political actions, Friedman and Hayek viewed the problem from different ends of an analytical telescope. Friedman saw the fundamental problem as expressed in price movements that could be simply measured as inflation or deflation. There was thus a simple remedy: control of monetary growth in a nearly mechanical way. He preferred a policy rule, such as a continued 2 percent expansion of a measure of the money supply. By contrast, Hayek wanted to examine the political and social order that created the framework for policy decisions, and was suspicious of any broad approach to macroeconomic aggregates and variables. The core of the Austrian tradition for him lay in the differential movement of prices: any moment when prices moved together more or less homogenously in one direction suggested the presence of distortions that would generate wrong signals.

Economic agents required constantly changing and differentiated price movements in order to make decisions about a changing world.

In "The Methodology of Positive Economics" (1953), Friedman argued that the goal of science was to be "in principle independent of any particular ethical position or normative judgments."[71] A hypothesis, no matter how unrealistic its assumptions, was good if it resulted in better predictions. "Viewed as a body of substantive hypotheses, theory is to be judged by its predictive power for the class of phenomena which it is intended to 'explain.' Only factual evidence can show whether it is 'right' or 'wrong' or, better, tentatively 'accepted' as valid or 'rejected.'"[72] Thus, for instance, "[t]he articles on both sides of the [marginalist] controversy largely neglect what seems to me clearly the main issue—the conformity to experience of the implications of the marginal analysis—and concentrate on the largely irrelevant question whether businessmen do or do not in fact reach their decisions by consulting schedules, or curves, or multivariable functions showing marginal cost and marginal revenue."[73] Or, even more strikingly, Friedman believed that there was no need to assume that there was perfect competition to make Marshallian empirical observation a useful guide to the outcome of the price determination process. It was important to look at empirical developments and then derive empirical results that might be directly applied to make better policy.

By contrast, Hayek thought the question of motivation and how knowledge was established was central to the analytical process, and then also to formulating appropriate responses. He emphasized the centrality of human consciousness in all social sciences, including economics. "It is probably no exaggeration to say that every important advance in economic theory during the last hundred years was a further step in the consistent application of subjectivism. That the objects of economic activity cannot be defined in objective terms but only with reference to a human purpose goes without saying."[74] He conceived of money as analogous to a language, used to inform and translate human wants by means of prices as signals or signs to which humans would respond. As a consequence, he paid much less attention to devising policy rules, and more to thinking about the framework within which economic agents would interact.

Friedman's 1967 Presidential Address to the American Economics Association is widely considered as "a turning point in the history of macroeconomic research."[75] It applied his method to produce a guide for monetary policy: a policy rule. The central analytical point concerned the existence of natural levels of economic activity: of employment, and also of interest rates. The natural interest rate was contrasted with a market or nominal rate: "The monetary authority can make the market rate less than the natural rate only by inflation. It can make the market rate higher than the natural rate only by deflation."[76] At any moment of time, there is some level of unemployment which has the property that it is consistent with equilibrium in the structure of real wage rates.[77] Monetary policy should not in consequence seek to alter the level of employment in terms of small-scale adjustments: "We simply do not know enough to be able to recognize minor disturbances when they occur or to be able to predict either what their effects will be with any precision or what monetary policy is required to offset their effects."[78] Friedman predicted that the Phillips curve that had appeared in the data throughout the 1950s and 1960s, in which rising prices reduced unemployment, would break down if policy-makers followed conventional Keynesian wisdom and started to exploit it.[79]

This part of Friedman's analysis received considerable support in that the speech followed an independently derived argument about the long-run verticality of the Phillips curve, developed by Edmund Phelps, on the basis of an argument about the ignorance of both sides in the wage-determination process.[80] Expectations were central to the Phelps argument, which amounted to an anticipation of many of the themes of the rational expectations revolution that followed in the 1970s.

In the last part of his address, Friedman derived a rule: "the monetary authority should guide itself by magnitudes that it can control, not by ones that it cannot control. If, as the authority has often done, it takes interest rates or the current unemployment percentage as the immediate criterion of policy, it will be like a space vehicle that has taken a fix on the wrong star. No matter how sensitive and sophisticated its guiding apparatus, the space vehicle will go astray. And so will the monetary authority."[81] The central bank could avoid large fluctuations in economic activity (such as the Great Depression) by adopting publicly the policy of achieving a steady rate of growth in a specified monetary total. The precise rate of growth, like the precise monetary total, he thought to be less important than the adoption of some stated and known rate.[82] In a footnote, he suggested a 2 percent growth rate as a suitable guide.

History has been less kind to this part of the Presidential Address. Martin Eichenbaum dismissed it as "chaff."[83] Franco Modigliani accepted the natural rate hypothesis but added, "Friedman went on to say other things in that paper that were not right."[84] In retrospect, the prescriptions looked appallingly vague. Saying that it did not matter what money measure was adopted looked like a hand-waving exercise: and when central banks tried to do something like monetary targeting in the early 1980s, they were wracked with contentious divisions over precisely which money measure should be adopted.[85] The monetary aggregates behaved in different ways, and there was a striking amount of financial innovation, such as interest-bearing checking accounts (or NOW accounts in U.S. parlance), which seemed to violate the traditional assumption that money did not carry interest.

Friedman had always believed that empirical observations could be used to generate better policy rules. The practical recommendation of the Presidential Address followed directly from the analysis in the *Monetary History of the United States* that there was a very clear long-term historical relationship between changes in income and changes in the money stock. The statistical work showed how remarkably stable over a long period of time was the "money multiplier," the ratio of the percentage change in income to the percentage change in the money stock: in the United States this figure had been around 2. The reserve base fixed by the central bank determined the money stock (via the "money multiplier"), which in turn determined nominal income (via the velocity of money). The ratio between currency and deposits was also quite stable over long periods of time.[86] The view that there was a highly stable money demand function could also be derived—rather more tentatively—from historical UK data.[87] But from the 1970s, the relationship on both sides of the Atlantic shifted in an unpredicted way, and velocity became highly unstable.[88] The econometrics of Friedman's approach was subject to a considerable onslaught.[89] The Chicago vision thus concentrated on a measure of reserve base, whose relation with other monetary aggregates was historically clear, but where the relationship became unsteady as it began to play a part in policy.

The *Monetary History*, written jointly with Anna Schwartz, constituted Friedman's most striking legacy to the policy debate. It owes something to the tradition of business-cycle research pioneered by Wesley Mitchell. Friedman later reflected on how Mitchell's "theoretical work is throughout interwoven with his empirical work and made a part of an 'analytic description' of the phenomena under study."[90] It has been criticized for not providing an adequate explanation of how banking crises may occur independently: the book's central demonstration was intended to be that capitalism or the financial system was by no means inherently flawed, but rather that the dramatic monetary contraction which led to bank failures was produced by policy mistakes in the Federal Reserve system. The overall conclusion has also been criticized as "ideologically loaded," or a restatement of a conclusion that had already appeared in Friedman's best-selling manifesto *Capitalism and Freedom* (1962): "The fact is that the Great Depression, like most other periods of severe unemployment, was produced by government mismanagement rather than by any inherent instability of the private economy."[91] And critics complained that the central thesis of the *Monetary History* was built on "pedestrian statistical techniques and historical analysis that had been dismissed as old-fashioned by some of the leading economists of their day."[92] Krugman indeed complained in his remarkable and offensive obituary that "over time Friedman's presentation of the story grew cruder, not subtler, and eventually began to seem—there's no other way to say this—intellectually dishonest."[93]

There is an irony in the way that Friedman correctly attacked the empirical observations that produced the Phillips curve, arguing that they need not always hold, while developing a model based on a similar empirical relationship about income and money. Like the Phillips curve, it correctly described a reality of the 1950s and 1960s (and indeed in this case earlier); but like the Phillips curve, the relationship misbehaved in the 1970s and later.

Friedman started his counterrevolutionary manifesto, which he delivered in London as the Harold Wincott Lecture, by claiming that Keynes would agree with him: "if Keynes were alive today he would no doubt be at the forefront of the counter-revolution. You must never judge a master by his disciples."[94] The message looked ambiguous: monetary policy was powerfully influential, but at the same time it could not be used as a powerful tool of policy management. “The depression is a tragic testament to the effectiveness of monetary policy, not a demonstration of its impotence. But what mattered for the world of ideas was not what was true but what was believed to be true.” The constant reference to the Depression was needed because a reference to long-run data series and constants (such as the observed demand for money function) would not convince an audience of the central message: “Nonetheless, the public at large cannot be expected to follow the great masses of statistics. One dramatic episode is far more potent in influencing public opinion than a pile of well-digested, but less dramatic, episodes.” The reason why money was not suited to micromanagement was because the immediate operations produced a pendulum effect on interest rates: “One important feature of this mechanism is that a change in monetary growth affects interest rates in one direction at first but in the opposite direction later on. More rapid monetary growth at first tends to lower interest rates. But later on, as it raises spending and stimulates price inflation, it also produces a rise in the demand for loans which will tend to raise interest rates. In addition, rising prices introduce a discrepancy between real and nominal interest rates.” It looks here as if Friedman is moving to a theory of how expectations affect the impact of policy: expectations of higher inflation would push up the nominal interest rate. The overall lesson was strikingly clear: “It follows from the propositions I have so far stated that inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output. However, there are many different possible reasons for monetary growth, including gold discoveries, financing of government spending, and financing of private spending.” He might have added that all of these reasons are more likely to occur in times of disruption and uncertainty.

Friedrich von Hayek produced some analysis that seemed to parallel Friedman’s vision. His critique of a tendency to inflationism looks rather like the Friedman version that gave rise to rational expectations modeling. Inflation could only be a stimulus when the fundamental economic process was not properly understood: “Inflation thus can never be more than a temporary fillip, and even this beneficial effect can last only as long as somebody continues to be cheated and the expectations of some people unnecessarily disappointed. Its stimulus is due to the errors which it produces. It is particularly dangerous because the harmful aftereffects of even small doses of inflation can be staved off only by larger doses of inflation."[95] The origins of this view go back to Hayek's early writings, and in particular to the work that established his reputation, *Prices and Production*. On the face of it, that work, published at the crisis moment of the Great Depression, was an extreme statement of a liquidationist position: "The only way permanently to 'mobilise' all available resources is, therefore, not to use artificial stimulants whether during a crisis or thereafter—but to leave it to time to effect a permanent cure by the slow process of adapting the structure of production to the means available for capital purposes."[96] Hayek presented price movements as the key source of information, and thought it delusional to "assume that we can neglect the influence of money so long as the value of money is assumed to be stable."[97] There is thus a considerable skepticism in particular to the quantity theory, which in his view led to the "isolation of the theory of money from the main body of general economic theory."[98]

Like Friedman, however, Hayek in his postwar writings saw the monetary response of authorities rather than the actions of individual agents as generating inflation: "The process is sometimes described as though wage increases directly produced inflation. This is not correct. If the supply of money and credit were not expanded, the wage increases would rapidly lead to unemployment. But under the influence of a doctrine that represents it as the duty of the monetary authorities to provide enough money to secure full employment at any given wage level, it is politically inevitable that each round of wage increases should lead to further inflation."[99] On the other hand, the process was pushed not simply by the monetary policy response but because of the tendency of organized interest groups to push wages in a competitive bidding-up process. So inflation is not primarily or simply a monetary process. In 1960, Hayek could not imagine a breaking of union power through a deep recession and high unemployment rates:

> Though this race between wages and inflation is likely to go on for some time, it cannot go on indefinitely without people coming to realize that it must somehow be stopped. A monetary policy that

> would break the coercive powers of the unions by producing extensive and protracted unemployment must be excluded, for it would be politically and socially fatal. But if we do not succeed in time in curbing union power at its source, the unions will soon be faced with a demand for measures that will be much more distasteful to the individual workers, if not the union leaders, than the submission of the unions to the rule of law: the clamor will soon be either for the fixing of wages by government or for the complete abolition of the unions.[100]

By the 1970s, the interpretation looked prophetic.

The much more explicitly political and social theory of inflation depended on Hayek's distinctive approach to economic knowledge. "The study of spontaneous orders has long been the peculiar task of economic theory, although of course biology has, from its beginning, been concerned with that special kind of spontaneous order which we call an organism."[101] This was an approach based on a conviction that social knowledge was accumulated as a result of the interaction and the learning of a multiplicity of participants in a social process, or a market: "My main contention will be that the tautologies, of which formal equilibrium analysis in economics essentially consists, can be turned into propositions which tell us anything about causation in the real world only in so far as we are able to fill those formal propositions with definite statements about how knowledge is acquired and communicated. . . . The empirical element in economic theory . . . consists of propositions about the acquisition of knowledge."[102] The *Constitution of Liberty* (1960) aimed at laying out the philosophy and the institutions required for the development of a spontaneous order, through which "coercion of some by others is reduced as much as is possible in society."[103] It was a warning against the presumption of any individual—or authority—of knowing too much. "The Socratic wisdom that the recognition of our ignorance is the beginning of wisdom has profound significance for our understanding of society."[104] Hayek disliked thinking in aggregates—including monetary aggregates. He complained about the way a scientistic approach to social phenomena had led to what he called the engineering approach (he added that in Stalin's Russia artists were described as "engineers of the soul"): the engineer was "not taking part in a social process in which others may take independent decisions but lives in a separate world of his own."[105]

The quantity theory of money as espoused by Friedman was thus just an example of a dangerous modern fallacy, resulting from the tendency to think in large aggregates:

> What I complain of is not only that [the quantity] theory in its various forms has unduly usurped the central place in monetary theory, but that the point of view from which it springs is a positive hindrance to further progress. Not the least harmful effect of this particular theory is the present isolation of the theory of money from the main body of general economic theory. For so long as we use different methods for the explanation of values as they are supposed to exist irrespective of any influence of money, and for the explanation of that influence of money on prices, it can never be otherwise. Yet we are doing nothing less than this if we try to establish direct causal connections between the total quantity of money, the general level of all prices and, perhaps, also the total amount of production.[106]

Money in Hayek's view was not simply the product of the state or of a public authority, and hence could not easily or readily be controlled through policy action. He wanted to go further and deprive governments of any power to issue money—and instead create what he called a monetary "catallaxy," the term which he wanted to use as a replacement for "economy" to describe a less coordinated, spontaneous "order brought about by the mutual adjustment of many individual economies in a market."[107] The prospect of developing private moneys obviously looks much more realistic in the 2020s than it did in the 1970s.

What was required was some mechanism or ordering framework for exchanging the multiplicity of price signals, or of moneys: "We know of no substantially different alternatives to the credit institutions on which the organization of modern business has come largely to rely; and historical developments have created conditions in which the existence of these institutions makes necessary some deliberate control of the interacting money and credit systems."[108]

Occasionally Hayek expressed a nostalgia for the world that was lost, the gold standard: "an even larger number would probably agree today that the defects of the gold standard have been greatly exaggerated and that it is doubtful whether its abandonment was a gain. This does not mean, however, that its restoration is at present a practical proposition." The functioning of the international gold standard rested on certain attitudes and beliefs which have probably ceased to exist. "It operated largely on the basis of the general opinion that to be driven off the gold standard was a major calamity and a national disgrace. It is not likely to have much influence even as a fair-weather standard when it is known that no country is prepared to take painful measures in order to preserve it."[109]

Hayek's complaint about Keynes's *General Theory* related to its conceptual framework, and again the fundamental objection was to an overreliance on macroeconomic aggregates: "The real issue was the validity of what we now call macro-analysis, and I feel now that in a long-run perspective the chief significance of the *General Theory* will appear that more than any other single work it decisively furthered the ascendancy of macro-economics and the temporary decline of micro-economic theory."[110] The problem was that neither Friedman nor Hayek seemed to offer a concrete alternative toolkit. Indeed, they both made it clear—Hayek with a much deeper philosophical founding—that any such toolkit was dangerous and likely to be abused. Friedman indeed rather provocatively suggested that the Federal Reserve should simply be abolished. He sometimes thought of characterizing himself as a "philosophical anarchist."[111] He later stated, "There is no institution in the United States that has such a high public standing and such a poor record of performance. . . . It financed the inflation of the 1970s. On the whole it has a very poor record. It's done far more harm than good."[112] At his first meeting with Paul Volcker (in the U.S. Treasury), Ronald Reagan told Volcker that "I've had several letters from people who raise the question of why we need the Federal Reserve." Volcker replied, "Unfortunately we're the only game in town right now fighting inflation."[113] He was right. The outcome of the 1970s debates was clearer on the fiscal issue, on which Hayek had been a persistent warner. As Eichenbaum put it, "there is now widespread agreement that countercyclical discretionary fiscal policy is neither desirable nor politically feasible."[114]

Friedman and Hayek were intellectual provocateurs. When they seemed to turn to policy recommendations, the results were extreme and unlikely to be realized: the abolition of the Federal Reserve, or the legalization of drugs (an increasingly prominent concern of Friedman's), or Hayek's version of competitive nonstate currencies. But they both set off a wider range of debates that were gradually accommodated in an intellectual mainstream that had clearly failed. The most central was the idea of rational expectations, as developed by Robert Lucas and Thomas Sargent. In Friedman's and Hayek's vision this was simply a belief that economic agents react to new information and discount changes that they see in government policy, most dramatically in labor market behavior, where workers are sensitive to inflation rates. Lucas and Sargent went much further than Friedman did and argued that policy conclusions drawn from large-scale macroeconomic models were useless for forecasting, because of the feedback loops produced by constant new information. This analysis was compatible with Hayek's radical skepticism about macro calculations; but in the form developed by Lucas it lent itself to a synthesis with the Keynesian tradition. New Keynesians could take the framework of rational expectations and use it to develop, on the basis of imperfect or partial information and imperfect competition, a theory of why rigidities could arise. Those rigidities might produce temporary demand shortages that could then be counteracted by monetary actions. On the basis of a new consensus, central banks used Dynamic Stochastic General Equilibrium (DSGE) models to guide central bank activity as a way of shaping expectations and stabilizing outcomes. The result, lower inflation and sustained macroeconomic growth with stability, looked highly impressive, and before 2008 commanded a near universal consensus.

The general movement in the 1980s to lower inflation, and to more openness—more globalization—appeared to follow from a new institutional setup that created stability and provided a loose intellectual supporting framework. At its heart was the centrality of a free determination of prices for the operation of markets. That—rather than any precise policy formulation—might be thought of as the clearest policy impact of Friedman, who was bursting to have an influence on policy, and Hayek, who ran away completely from any such idea. Economist Robert Mundell concluded in 1981: "Today, in 1981, the United States does not have a gold standard, or a Keynesian commodity standard, or a Friedman paper standard. It has a Volcker standard. But who can predict the future value of the pound, the dollar or the yen on the basis of a Thatcher standard, a Volcker standard or a Nakasone standard?"[115] Friedman's lessons were not useful as a guide to the techniques of dealing with inflation, but they served as a stunning jolt to previous U.S. complacency that the United States had the best policy and best theory. The wider world might provide practical demonstrations of how business and enterprise might evolve. Friedman also forcefully expounded a simple vision, fully shared by Hayek, of competition as the driver of innovation; and that was especially relevant to the quest for modernizing technology and production by opening up and learning. The two thinkers described and celebrated the forces that would spur a new wave of globalization, but did not analyze the institutional mechanisms that might harness or direct it.

6

The Great Recession: 2008

Robert Lucas's 2003 Presidential Address at the American Economic Association started with the proposition that modern macroeconomics, born out of the angst of the Great Depression, had "in this original sense . . . succeeded: Its central problem of depression prevention has been solved, for all practical purposes, and has in fact been solved for many decades." At the time, this seemed a statement of a broad theoretical consensus that the era of major downturns had ended for good; after 2008 it was widely ridiculed; but by 2021 it was again frequently cited with approbation.[1] The Great Depression had been a crisis of globalization—and the sense of deep and perhaps unsolvable crisis in 2008 inevitably brought the historical analogy. But in the Great Recession that followed the Global Financial Crisis of 2007–2008, globalization was contested, not overthrown. To the extent that it was rescued or revived, the immediate impulse came from central banks. These institutions now constituted the heart of policy-making.

A financial shock with clear origins in the United States in 2008 generated a dramatic collapse in global demand and in international trade. It challenged U.S. leadership in the global economy: the real underpinning not only of the Bretton Woods concept, but also of the "nonsystem" (a term coined by the economist John Williamson) that had prevailed in monetary matters since the 1970s. Learning lessons from an apparently similar collapse in demand, the Great Depression, involved an unprecedented degree of action and coordination in bank rescues, the use of monetary policy to supply liquidity, fiscal stimulus, and agreement generally to keep open markets. But the political-economy implications of this apparently initially astonishingly successful intervention hit back: if fiscal effort was mostly in practice about rescuing banks, wasn't that a taxpayer-financed reward of the culprits and villains?

What became conventionally known as the Global Financial Crisis or the Great Recession (to distinguish it from, but also draw an analogy with, the interwar Great Depression) was blamed by many policy-makers on globalization. Thus, for instance, Mervyn King, governor of the Bank of England: "The origins of the crisis lay in our inability to cope with the consequences of the entry into the world trading system of countries such as China, India, and the former Soviet empire—in a word, globalisation."[2] Globalization was running too hot. In the 1920s, the same phenomenon ended with a collapse of credit structures and a radical contraction of demand. In the 1970s, economic overheating generated an inflationary build-up of credit and a great deal of uncertainty and doubt about political institutions, but no collapse. Òscar Jordà, Moritz Schularick, and Alan M. Taylor suggest loose monetary conditions, the product of globalized finance, were a key trigger of bubbles and financial stress, with structural changes in finance magnifying that effect.[3] In the new millennium, the old systems were misfiring, breaking down. Was the new crisis the end of globalization, or the end of capitalism? The parallels to the 1920s collapse appeared inescapable. In the Great Depression, monetary authorities had failed, and were accused of having made illegitimate interventions in politics: the Bankers' Ramp or the *mur d'argent* (wall of money) that constrained political action. In the aftermath of the Depression, central banks were nationalized and subjected to tight political control. Now they resolved to put the interwar lessons into practice.

The central analogy of modern financial malaise no longer lay in the vast ocean storms and overpowering waves that had constituted the central metaphor of the nineteenth-century wave of globalization, but the more harmless and indeed even attractive form of bubbles. Princeton economist Markus Brunnermeier explains bubbles as occurring when "the asset price movement was considered excessive—rightly or wrongly—by market participants and . . . the result was often (but not always) a sharp price decrease when the bubble burst." They are mostly financed by debt.[4]

The term entered popular culture after the 2007–2008 financial crisis. In the 2015 movie *The Big Short*, the actor Margot Robbie sits in a bubble bath and explains, with a glass of bubbly champagne in her hand, that big banks "made billions and billions on their 2 percent fee they got for selling each of these [mortgage] bonds. But then they started running out of mortgages to put in them. After all, there are only so many homes and so many people with good enough jobs to buy them. Right, so the banks started filling these bonds with riskier and riskier mortgages, that way they can keep that profit machine churning, right? By the way, these risky mortgages are called subprime, so whenever you hear subprime, think shit." But the policy consensus believed that there was no need for central banks to act against bubbles until the moment when they saw a generalized inflation risk. In what was called the Great Moderation, it appeared that inflation, and price disturbances, had been eliminated. Central bankers used a new acronym, NICE, to describe their world as Non-Inflationary Continuing Expansion.

Millennial globalization involved a number of related phenomena: most important, an expansion of production in new manufacturing centers. World supply was being pushed up, as it had been during the First World War. Often the debate focused on the largest of these new entrants into the world economy, China; and the whole process was described as a China effect or "China shock."[5] The new producers, the new emerging economies, were running large trade surpluses, in part because they wanted to accumulate reserves so as to avoid the fate of rapidly expanding East Asian economies in the 1990s, which had overheated with large deficits and consequently large external (dollar-denominated) debt. The post–Asia crisis policy implication, especially taken to heart in China, was that the exchange rate needed to be held down, often through an informal and unannounced pegging against the U.S. dollar. An alternative explanation supposed that the extent of reserve accumulation by China and other emerging economies was irrational, and that there must be another motive: the need to generate employment for as many people as possible in poor countries with large potential workforces locked into unproductive agricultural activities. There was indeed an explicit embrace in many emerging market economies of a theory of export-led growth, on the model pioneered by postwar Germany and Japan, and then by South

Korea after the 1960s. Forcing exports raised the same concerns as it had done in the past, when American policy-makers had told Germany and Japan that not all countries of the world could run surpluses.

The expanding surpluses corresponded to high savings levels. They would have disappeared if there had been higher levels of consumption in the newly industrializing areas of the world. But the newly productive workers worried about their future in countries which had no organized social security provision for old age, and poor public medical care. There were also high levels of corporate and government savings, which held down demand and led to calls from the richer, older industrial countries that the new entrants should do more to boost global demand and hence growth.

Surpluses in the newly globalizing economies corresponded to deficits in some but not all major industrial countries. The phenomenon was most pronounced, and most analyzed, in the United States and the UK. In the early 2000s, Kenneth Rogoff, then chief economist at the IMF, warned about expansionist "Bushonomics," driven by the large tax cuts of 2001 and 2003, when the government's fiscal position moved from a surplus of 1.2 percent of GDP in 2000 to a deficit of 4.7 percent of GDP by 2003. Rogoff conjectured: "Suppose for a minute that we were talking about a developing country that had gaping current account deficits year after year . . . a budget ink spinning from black into red . . . open-ended security costs, and a real exchange rate that had been inflated by capital inflows. With all that, I think it's fair to say we would be pretty concerned."[6] Mervyn King in the UK had delivered similar warnings. After the crisis, he put the issue together in a simple analogy of a sudoku game, pitting high savers in Asia against the Anglo-American low savers (see Table 6.1).

As King put it, the nine numbers in the simple table could not be chosen independently. Sudoku for economists was simpler than ordinary sudoku because only three numbers could be chosen. If both groups of countries wanted high or full employment levels, and the high-saving group was targeting a trade surplus, the low-saving group mathematically could not target a reduction in its trade deficit. "Either trade deficits must remain high, which is not likely to prove sustainable, or something else must give." As King presented it, "Sudoku for economists shows

Table 6.1. "Sudoku for Economists": 2008 Data ($ billions)

	Domestic Demand	*Net Trade*	*GDP*
High-saving countries	18,000	1,000	19,000
Low-saving countries	28,500	–1,000	27,500
TOTAL	46,500	0	46,500

Source: Mervyn King, speech at the University of Exeter, January 19, 2010

that it is essentially a political and not a technical problem," in which the low-saving countries (his own UK, or the United States) needed to stop acting in "the role of consumer of last resort."[7]

For the financial world, globalization meant something quite particular, not just the extension of manufacturing. Financial systems looked stable: the United States believed that Depression-era banking legislation including deposit insurance had solved the problem of bank runs; and the UK could point out that there had not been a major or generalized bank run since 1866, perhaps even since 1825. Lessons about financial instability that might have been drawn from previous crashes were thus ignored or forgotten. The United States was manufacturing debt that was then used to boost demand, and selling it merrily to the rest of the world, not just to the export-promoting superindustrializers. The braggadocios of Lehman Brothers put it quite brutally: "the Lehman financial guys tried to explain the need for globalization in the hope of obfuscating the bald truth, instead stressing the grand world expansion strategies that set us apart from the pack. That meant unloading the CDOs [Collateralized Debt Obligations] all over the planet, especially to Europe and Japan." Richard Fuld of Lehman believed that globalization meant "decoupling from the US market because it was no longer all-powerful."[8] The Goldman Sachs trader who contemptuously referred to naive European banks and investors as "muppets" later explained: "Getting an unsophisticated client was the golden prize. The quickest way to make money on Wall Street is to take the most sophisticated product and try to sell it to the least sophisticated client."[9] Globalization could give greater access to unsophisticated money. The key linkage was the purchase of U.S. securities by European banks, which in turn financed themselves on the U.S. money market, in large part through the deposits in money market funds made by American retail customers.[10]

What eventually gave was the structure of credit in the United States. The crisis that shook the world in 2007–2008 unambiguously had its roots in the overblown financial system. At the time, it appeared as a collective nervous breakdown that originated in a collapse of property prices (see Figure 6.1). The mystery was how losses in the subprime sector, a relatively small sector of the U.S. housing market, could produce a general collapse of financial intermediation. The whole of finance suddenly looked like a minefield, where no one could know where the unexploded detonators lay, and in consequence financial players, and retail depositors, could trust no one. Large and complex financial institutions, vertically

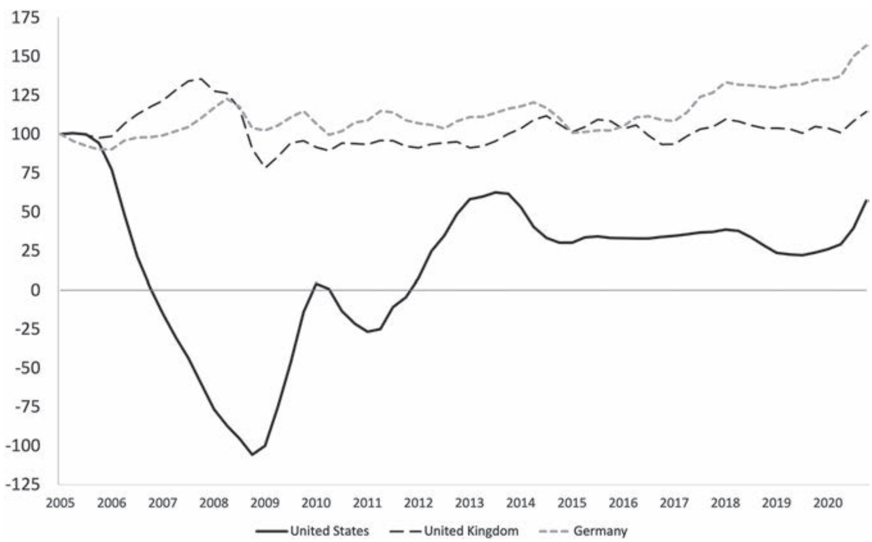

Figure 6.1. Residential housing price index for Germany, the United Kingdom, and the United States, 2005–2020 (2005 = 100) (Source: St. Louis Federal Reserve FRED data)

integrated and often including mortgage originating and repackaging, were vulnerable. The value of their assets, established by internal algorithms, was unclear and no market price existed. And then the collapse occurred. The interbank market, which had seemed an absolutely secure pool of constantly accessible liquidity, dried up as banks were unwilling to take on the suddenly unknowable risks of exposure to other financial institutions.

The iconic event of the financial crisis, the failure of Lehman Brothers, occurred over the weekend of September 13–14, 2008, with the bankruptcy filing on Monday morning, September 15. A slow-motion collapse was already well under way before the dramatic weekend negotiations. As funding dried up in the preceding week, it was apparent to everyone that Lehman would fail because the other banks had shut it off. On the Monday morning, the major newspapers, both the more free-market *Wall Street Journal* and the more liberal *New York Times*, welcomed the Fed's and the Treasury's decision to let an institution fail. Lehman was after all not a megabank (it was not Citigroup) and markets are supposed to punish bad behavior. It was only when it was clear that the Lehman failure would bring down AIG, a very large insurer and indisputably systemically important, that the authorities believed they were obliged to step in in order to prevent a universal collapse.

The result of the financial freeze was a sudden and abrupt economic downturn. Trade contracted, as ordinary commercial credit was unavailable. Unemployment soared, in the United States to a peak of 10 percent in October 2009. Manufacturing fell by around 20 percent, and new home construction by 80 percent. There was clearly a substantial output gap: the amount by which economic activity lay below potential. The IMF's October 2009 *World Economic Outlook* calculated the output gaps as being −3.6 percent for Germany, −4.9 percent for the UK, and −4.5 percent for the United States: after revision, in 2020 the same figures were recalculated as −3.8 for Germany, −3.056 for the UK, and −7.403 for the United States. The extent of the U.S. collapse at the time, then, was underestimated.

The revisions are in part based on a downward adjustment of the growth paths of the western economies, more dramatically for the Europeans (and especially for Britain) than for the United States. The crisis produced a long-term scarring, affecting the chances of growth and pushing economies onto a slower path; and the longer the crisis continued, as in Europe, the greater the permanent losses inflicted by the downturn. Output losses and slower productivity gains were particularly pronounced in countries which had experienced major banking crises, and the effect was especially pronounced in the Eurozone.[11] The shocks affected income and wealth distribution, and in consequence had a political effect of mobilizing populist discontent against the elite's economic management. In the older economies, those countries with larger output and employment losses in the initial aftermath of the crisis registered greater increases in income inequality compared with their precrisis average.[12]

One of the additional drivers of a sense of crisis was the radical shift in the economic geography of the world. The past forty years of Chinese development had constituted the longest period of the highest rate of sustained economic growth in the economic history of the world. The date at which China was predicted to overtake the United States was constantly revised backwards in time. In 2003 a Goldman Sachs report estimated that it would be 2041; by 2007, before the severe financial crisis, that was revised to 2027; and after the financial crisis the *Economist* presented a calculation that showed 2019 as the date. In 2014, the *Financial Times* announced that "the US is on the brink of losing its status as the world's largest economy, and is likely to slip behind China this year, sooner than widely anticipated, according to the world's leading statistical agencies."[13] In 2020, the British economics consultancy Centre for Economics and Business Research forecast that China would overtake the United States by 2028, thanks to what at that time looked like a faster recovery from the Covid pandemic.

In retrospect, the 2007–2008 collapse appears as a debt crisis. The bid for home ownership was just one area where consumers, eager to acquire assets and a lifestyle they had once thought they could not afford, discovered they could use leverage.[14] Continually rising property prices would make this a secure bet, as the value of the property would constantly increase and make the debt more affordable.

Low interest rates encouraged countries as well as individuals and corporations to borrow. But—unlike in the 1970s—governments in poorer or emerging market economies did not press to borrow, in part because of the legacy of the 1997–1998 East Asia crisis, which highlighted the dangers of indebtedness. Some of the most serious imbalances occurred within the industrial world, as central banks embraced solutions that made debt ever more affordable.

The official response went through two phases: first "big bazooka" rescues, followed by a reckoning with the fiscal but also the political cost. In the immediate aftermath of the sudden shock of 2007–2008, the financial sector—rescuing banks—was the focus of attention. The U.S. Treasury and the Federal Reserve planned measures to buy up problematic assets, so that the market would be given a floor. But the valuation was a very complex and time-consuming exercise, and so the U.S. administration turned to a simpler but apparently effective method that had been pioneered in the UK: recapitalize banks using government money, so that they would be in a position to carry eventual losses.[15] This should prop up confidence. It was like treating a heart attack: the heart (financial services) needed to be massaged in order to restore circulation.

The same exercise was repeated in many rich countries. At the time, it was impossible to tell what the long-term fiscal implications would be: it was conceivable, after all, that the values of banks' assets would recover, and that the government would in the end turn a profit on the deal. That happened in the United States, as well as in Switzerland; it did not happen in the UK or Ireland.[16]

The immediate financial rescue however looked like a public relations disaster for governments. The banks had largely caused the crisis through perverse incentives through which they (and their employees) took profits, but now proposed to socialize the losses: shouldn't they be punished rather than rewarded?

It is possible to argue that a better course might have involved the reduction of unsustainably high debt, for American households, or for that matter for highly indebted countries such as Greece. Where debt meant insolvency, wasn't the market answer the application of a "haircut"? A powerful book by Atif Mian and Amir Sufi later argued exactly that case for the central problem of highly indebted American households: that the mortgages that had provoked the subprime crisis should be written down, and that the application of such discipline would deter future overlending and misbehavior on the part of lenders.[17] A substantial number of analysts, notably Kenneth Rogoff and Carmen Reinhart, made a similar point about country debt; prominent officials at the IMF pushed the same case in May 2010 as the Greek financial crisis erupted onto the international stage, and called on the advice of the world's foremost expert in debt write-off, Cleary Gottlieb's Lee Buchheit. What prevented the adoption of such a measure was the fear that it would spark market contagion, that other categories of debt and other countries would be affected, and that a debt restructuring would bring down a precariously balanced house of cards. There was an analogous argument in the case of American household debt, where it became clear that the problem lay not only in subprime mortgage debt, but much more widely, in the upper price segments of housing. The default rates had risen in areas where house prices had increased disproportionately as a result of high-income and high-credit-score purchases.[18] In the middle of a crisis, the ramifications of debt write-off looked much too complex. Better to add purchasing power, boost asset prices, and stop any questioning of fundamental value. The easiest solution to a debt crisis was thus to add more debt.

The alternative of supporting consumers through fiscal measures was a crucial step in healing, and also a political necessity, and policy-makers might draw on the lessons of the Great Depression. In the initial phases of the crisis, the reaction to the demand shortfall was a traditional Keynesian stimulus. Former Treasury Secretary Larry Summers, who became an adviser to Barack Obama, called for a fiscal stimulus on December 19, 2007, saying it should aim to be "timely, targeted, and temporary."[19] On January 18, 2008, Treasury Secretary Hank Paulson announced a stimulus package: "Our economy is growing slower than expected, and that means we need to act quickly to put together a package that is temporary, simple enough to get enacted quickly, effective at boosting growth and job creation this year, and large enough to make a difference."[20] In November 2008, immediately after the election, Obama's transition team recommended a $300 billion stimulus, and a month later raised the proposal to $600 billion. Berkeley economist Christina Romer proposed a much larger $1.7 to 1.8 trillion package, based on the size of a calculation of the output gap, but Summers objected to that; when this was brought down to $1.2 trillion, Summers told her, "$1.2 trillion is nonplanetary. People will think we don't get it." Thus the figure came down to $800 billion.[21]

The details of a $787 billion stimulus were quickly finalized, and the stimulus was launched on February 17, 2009, as "the most sweeping economic package in US history."[22] President Obama signed the legislation in Denver's Museum of Nature and Science, intending to highlight how much of the spending was directed toward green jobs.[23]

In retrospect, the package was criticized by Democrats as inadequate, too small: Vice-President Joe Biden later noted, "And we paid a price for it, ironically, for that humility." Democratic Senator Chuck Schumer concluded that "[w]e cut back on the stimulus dramatically and we stayed in recession for five years." Another influential Democrat, Jim Clyburn, believed that "[o]ne of the—if not the—biggest mistakes that Obama made, in my opinion, was getting the Recovery Act done and not explaining to people what he had done."[24]

The proposition that fiscal stimulus was needed was made at an international level too. In April 2009, the IMF argued that fiscal stimulus must be "at least sustained, if not increased in 2010, and countries with fiscal room should stand ready to introduce new stimulus measures as needed to support the recovery. As far as possible, this should be a joint effort, since part of the impact of an individual country's measures will leak across borders, but brings benefits to the global economy."[25] Demand needed to be internationalized in order to ensure continuing prosperity.

With stunning speed, however, the world moved from an international consensus that fiscal stimulus was needed to deal with the threat of a new Great Depression to a concern about the long-term implications of the rise of debt and the threat of fiscal unsustainability. The causes of that reversal can be located in the psychology of financial markets, in the work of policy academics, in political maneuvers, in simple fatigue with both crisis and anticrisis measures, and finally in widespread frustration at the use of money in bank bailouts.

The first explanation focuses on financial markets, with bond vigilantes as the major villains. Their mantra was a much-quoted phrase of James Carville, an adviser to Bill Clinton, who responded to a rapid spike in bond yields in 1993–1994 with a quip: "I used to think that if there was reincarnation, I wanted to come back as the president or the pope or as a .400 baseball hitter. But now I would like to come back as the bond market. You can intimidate everybody."[26] In mid-2009, the bond market started to terrify. The yield on ten-year U.S. Treasuries had fallen from December 2008 (on December 18 the close was 2.77) to April, but from late April it started to rise and reached a close of 3.98 on June 10. On May 21, Moody's Investors Service announced that it was "comfortable" with a AAA debt rating that would not be "guaranteed forever" against the backdrop of the United States' deteriorating fiscal position, as a result of the need to borrow $2 trillion, or 14 percent of GDP.[27]

Edward Yardeni, who claimed to have coined the term "bond vigilante" in 1984, commented on the 2009 rise in Treasury yields, "Ten trillion dollars over the next 10 years is just an indication that Washington is really out of control and that there is no fiscal discipline whatsoever." The investment manager and bond specialist Bill Gross claimed that "[t]here's becoming an embedded inflationary premium in the bond market that wasn't there six months ago." Interestingly, the market was often personified as being China, as Chinese surpluses accumulated and were held in U.S. government securities: Chinese premier Wen Jiabao said in March that China was "worried" about its $767.9 billion investment in U.S. Treasuries. Former Fed Chairman Alan Greenspan was quoted as saying: "The yield spreads opening up imply that inflation premiums are rising. If we try to do too much, too soon, we will end up with higher real long-term interest rates which will thwart the economic recovery."[28] The *Wall Street Journal* commented, "It's not going too far to say we are watching a showdown between Fed Chairman Ben Bernanke and bond investors, otherwise known as the financial markets. When in doubt, bet on the markets."[29] In Rio Rancho, New Mexico, Obama said, "We can't keep on just borrowing from China. We have to pay interest on that debt and that means we are mortgaging our children's future with more and more debt." The foreign holders of American debt would eventually "get tired."[30]

A second interpretation holds that it was the academic framing of the policy debate that changed perception to focus on the dangers of government overspending: in particular, one influential book might have played a key role. In September 2009, Carmen Reinhart and Kenneth Rogoff published their ironically titled study *This Time Is Different*. On one level, the book was a stark warning about the extent of the damage done by complex financial crises, and consequently of the long time (seven years on historical average) that recovery would take. It was inevitable that readers would ask whether there were shortcuts that might bring quicker recovery. The book framed the post–financial crisis debate by casting contemporary issues in terms of centuries of banking, and especially sovereign debt, crises. Each collapse was preceded by waves of euphoria in which bond salesmen told their customers that "this time is different" and that governments could really keep their promises.[31] But of course they did not, and quite regular collapses and defaults occurred over the course of centuries. The message was that too much government debt could be dangerous.

Third, the academic discussion also dominated the political arena, where the message of austerity was repackaged and reformulated as a political battle cry. George Osborne, the Conservative who became chancellor of the Exchequer after the UK general election in May 2010, liked to quote Rogoff. He explained to a City of London audience in the 2010 Mais Lecture that Rogoff, in warning about the consequences of excessive debt, had provided "the most significant contribution to our understanding of the origins of the crisis."[32] In this version, which became dominant in Anglo-American conservative discourse, austerity might be used to fight a regressive class war, using budgetary constraints as a way of punishing poorer and marginal people, often from ethnic minorities, who could be lambasted as "welfare queens." Some politicians pointed to bond markets to rationalize their case. But others liked to cite (and often miscite) Reinhart and Rogoff. U.S. Congressman Kevin Brady, for instance, a Texas Republican, cited *This Time Is Different* before it was even published, and then misquoted Reinhart and Rogoff to the effect that "inflation of 8 to 10 percent is one likely way the government will end up financing the huge run-up in federal debt." There would be, Brady warned, a resumption of the 1970s, rising inflation, weak economic growth, and rising unemployment.[33] A few months later, in March 2012, Brady suggested a Sound Dollar Act, which would require the Federal Reserve to monitor gold and the foreign-exchange value of the U.S. dollar, and end the Fed's dual mandate, replacing it with the single mandate for price stability. Another prominent fiscal conservative, Tom Coburn (R-Okla.), gave a characteristic indictment of stimulus: "This is about spending money we don't have for things we don't need. That's 80 percent of this bill, spending money we don't have for things we don't need that will not stimulate the economy. That's what this bill is about, and that's why you're seeing such a reaction, because, if we're going to spend the money, let's at least make sure that it accomplishes its purpose. And any of you who have studied this bill recognize that that is not in the works."[34] The radical Republican grouping, the Tea Party, took its label from fiscal hawkishness during the American Revolution and scored major successes in a campaign for fiscal retrenchment. Judson Phillips, a Tennessee attorney and leader of the Tea Party Nation, explained: "That's what got this whole thing started way back in early 2009, when the stimulus bill came out. People just realized that we can't afford this, and we can't spend our way into prosperity."[35]

Fourth, the massive amount of government spending did not seem to have achieved very much: it was certainly not transformative. An interesting suggestion by Jason Furman, Obama's chair of the Council of Economic Advisers, argued that fatigue had set in: "paradoxically, the worse-than-expected macroeconomic outcomes reduced the desire to take more macroeconomic measures. Even though the bulk of the unexpected deterioration of the economy happened by early-to-mid 2009, before the bulk of the Recovery Act went into effect, this was viewed by some as evidence that the law had not worked, making future stimulus counterproductive."[36] As doubts about the effectiveness of fiscal action set in, worries about the deficit increased.

Fifth, money spent bailing out banks looked like a gift from the taxpayer to those responsible for setting off the financial crisis in the first place. If budget deficits were mostly the consequence of financial sector rescue packages, they were a difficult sell to a broad audience. As Obama's chief of staff, Rahm Emanuel, later put it, "Bank bailout was kryptonite," and the nation was "hungry for retribution."[37] Some commentators also attributed the rise of the Tea Party to the idea that the government was helping mortgage holders, especially from vulnerable minorities, who did not really deserve a mortgage and home ownership.[38] Spending government money soon began to look generally toxic. Larry Summers said: "I would have guessed that bailing out big banks was going to be unpopular, and bailing out real companies where people work was going to be popular. But I was wrong. They were both unpopular. There's a lot of suspicion around. Why this business but not that business? Is this industrial policy? Is this socialism? Why is the government moving in?"[39] The political scientist Megumi Naoi has demonstrated statistically that resentment against the government, and belief that government-funded stimulus programs were ineffective, emerged among the Republican voters in congressional districts that received more generous stimulus-funded jobs per capita during the Great Recession, and where states boasted about and advertised the stimulus.[40] Government spending thus generated not a tide of gratitude but an upswell of discontent.

All the elements of the U.S. discussion appeared in differing combinations across the world. The Tea Party was homegrown American. Events in Greece completely turned the debate around in other countries too, but most dramatically in Europe—away from the stimulus consensus and toward austerity. Greece was—quite wrongly—interpreted as a trial balloon, or a vision of the fiscal future of the world. On October 4, 2009, George Papandreou led PASOK, the socialist party, to a landslide victory in parliamentary elections that had been called prematurely by the center-right New Democracy government of Kostas Karamanlis. Karamanlis had made an argument for some fiscal retrenchment, but PASOK put the case differently. Conceding that there was a need to combat patronage and cut down on abuse, PASOK promised that its new government would increase salaries and pensions faster than the rate of inflation and would hire "international personalities" to advise on creative budgetary expansionism. A prominent campaign slogan was "We have money."[41] That after all was the flavor of the time.

Then a dramatic reversal occurred. Some European finance ministers later complained that IMF advice to raise government spending and increase debt as a contracyclical instrument ("use fiscal space") in the face of the economic crisis—directed at Cyprus, Slovenia, and Spain—had been "contagious" for other countries, including Greece, where more caution should have been exercised. The 2008–2009 IMF advice on a 2 percent fiscal stimulus had, after all, been directed at all countries.[42] Greece had what initially looked like very idiosyncratic problems. Immediately after the 2009 election, on October 6, however, the Bank of Greece presented a report stating that "we are facing an unprecedented fiscal derailment, which could only be explained to a very small degree by a slump in economic activity." The fiscal deficit for the first nine months was calculated at 9.7 percent of GDP. It was “absolutely certain” that the country’s fiscal position was unsustainable.[43] Greece then appeared as a harbinger of similar events in other countries, with Portugal, Ireland, Greece, and Spain lumped together under the defamatory acronym “PIGS.” The historian Niall Ferguson went on to explain that the contagion would be general: “For this is more than just a Mediterranean problem with a farmyard acronym. It is a fiscal crisis of the western world. Its ramifications are far more profound than most investors currently appreciate.”[44]

The left found itself in retreat. In France, the Socialist leader (and later president) François Hollande reflected on how, although the irrationality of markets and inadequate supervision had created the crash, the destructive system had not been shaken and that “international institutions of a liberal inspiration used the crisis to justify an austerity for which otherwise they could not find plausible arguments.”[45]

The fiscal lesson was taken particularly seriously in the UK, which became another influential case of a turn away from fiscal expansion. The Labour government in 2009 started to sound increasingly cautious. In particular, Chancellor of the Exchequer Alastair Darling made the point “on numerous occasions . . . [that] getting spending down, halving our borrowing in the four-year period, was non-negotiable: it was absolutely essential.”[46] The opposition Conservatives promised even more cuts, went on to win the 2010 election without gaining an overall parliamentary majority, and then formed a coalition government with the Liberal Democrats. The government embarked on a changed tack—generally known as “austerity” by its critics—that seemed to explicitly follow the advice of Kenneth Rogoff and others who had warned about the destabilizing effects of large government debt. British policy-makers at this point warned alarmingly about the possibility of the UK turning into another Greece. The Treasury’s chief economist, David Ramsden, worried that “it has been estimated that the U.K. has become the most indebted country in the world.” Its precrisis economic growth model had rested on “unsustainable levels of private-sector debt and rising public-sector debt.” Its fiscal position was the UK’s “key vulnerability”; there was thus a case for urgent action to put British public finances back on a sustainable footing.[47] In June 2010, the new government set itself a “fiscal mandate” that involved balancing the cyclically adjusted current budget by the end of a rolling five-year forecast period and putting the ratio of public-sector net debt to GDP on a downward path by 2015–2016. The new government's first budget aimed to meet these targets one year early through a structural adjustment amounting to 8 percent of GDP over five years. At the same time, the government also set out a national infrastructure plan focused on transport and energy, with energy investment scheduled to double over the five-year plan period. George Osborne's theory rested on the belief that eliminating the structural deficit within four years would provide room for maneuver, and for spending on long-term investment rather than on social transfers.

A key part of the bad dynamic in Greece—but also elsewhere in the Eurozone and in the UK—was the doom loop which linked banks and governments in multiple ways. The simplest linkage was through the cost of bailouts of bad banks: that involved a fiscal expense, so the creditworthiness of the government sank and the yields on bonds rose, with the result that their prices fell. But the government debt appeared as an asset on bank balance sheets, whose capital was thus further eroded. And there were other links: higher government debt meant higher taxes in the future and more costs for businesses (including banks), and thus reduced profits, so the value of other assets in bank balance sheets eroded.

Multilateral Responses

Emergency measures to help the financial sector—to restore the circulatory function to the economy's heart—were not enough: there was a need to return more fundamentally to health, to make the economic order more resilient or less vulnerable. The financial sector malaise highlighted the weak points of financialized capitalism, or of globalization, especially for critics of the U.S. position in the world. After the October 17, 2008, European Union–Canada Summit in Quebec City, French president Nicolas Sarkozy made an "impromptu call" to President George W. Bush requesting a summit meeting, along with European Commission President José Manuel Barroso: he envisaged a radical reorientation, the replacement of Anglo-Saxon free markets. Sarkozy, accompanied to the Washington meeting by France's finance minister, Christine Lagarde, suggested a number of quite specific proposals, such as ending mark-to-market accounting (and the "tyranny of US accounting"), limiting securitization, and pruning back rating agencies that seemed to dictate the fiscal viability of governments as their assessments were built into regulatory requirements for banks' capital adequacy. But Bush pushed back and wanted to leave the task of reform to "experts." Sarkozy then erupted that it was the experts who had brought the world into the mess, and looked penetratingly at U.S. Treasury Secretary and former Goldman Sachs chief Hank Paulson.[48]

The Washington summit (November 14–15, 2008) was preceded by large-scale offers of support as countries sought preemptively to build their weight on the international stage. It came at a unique moment, when the world's political geography seemed to be shifting. The U.S. presidential election (November 4, 2008) and the defeat of the Republican candidate, John McCain, who had seemed the favorite to succeed Bush in the summer, was widely read as a sign of American weakness and relative decline. Japan's prime minister promised $100 billion in loans to boost the resources of the International Monetary Fund, while China offered Pakistan a $500 million aid package at the same time as Pakistan was negotiating an IMF program. It looked as if the hour of the emerging markets had come. Brazil's president, Luiz Inácio Lula da Silva, took the opportunity to give a lecture to the big countries about their poor governance: "We are not asking for assistance; we are not asking for you to give us funds. What we want you to do is to fix your own economies. The best thing you can do for us is to return to growth."[49] Lula explained: "We are talking about the G20 because the G8 doesn't have any more reason to exist. In other words, the emerging economies have to be taken into consideration in today's globalised world." President Hu Jintao of China demanded a "new international financial order that is fair, just, inclusive and orderly."[50] Sarkozy pressed for a concrete program within 100 days. Already in advance of the meeting, he had said the summit could "re-found capitalism." Some politicians from outside the western world offered an even more radical critique of modern capitalism. At a press conference on March 27, 2009, Lula announced: "This crisis was caused by the irrational behaviour of white people with blue eyes, who before the crisis appeared to know everything and now demonstrate that they know nothing."[51]

The London G20 summit of April 2009 was a dramatic and decisive turning point in the world's response to the Global Financial Crisis. The day before, April 1, had been dominated by large-scale antiglobalization and anticapitalism protests in the heart of the City of London, around the Bank of England. A particular target of the demonstrators was the crisis-hit bank RBS, whose former chief executive, Sir Fred Goodwin (aka "Fred the Shredder"), had been awarded a controversial pension payout: a branch of the bank was attacked and looted, and "burn a banker" and "scum" written in spray paint.[52] On April 2, the conference met some distance away in East London, at the ExCeL Exhibition Centre in Royal Victoria Dock (ten years later, that hall would be turned into an emergency ward for the treatment of Covid-19 victims). The relations between the major countries participating were acutely strained. Some years later, it emerged that the UK's security service had engaged in electronic surveillance of the conference participants.

The tensions lay in one dimension between the United States and the UK on one side, and the major continental European countries, France and Germany, on the other. The Anglo-American view—which was also expressed very powerfully by the IMF—was that a large fiscal stimulus was required; the continental Europeans argued that their fiscal systems provided a large battery of "automatic stabilizers," that an extra discretionary effort was misplaced, and that some countries might be unwise to undertake large spending programs as their room for budgetary maneuver ("fiscal space") was limited. A second dimension lay in tensions between France and Germany on the one hand, where debates in the aftermath of the crisis had concentrated on tax justice and where the governments demanded an energetic and coordinated response to tax evasion, and some other countries, notably China, which felt that the focus on tax transparency was an attempt to stifle the development of their own financial systems. The small tax havens, of course, were not represented in the G20, which by definition was a grouping of nineteen large countries (and the European Union). The small open economies that had been major winners of globalization in the last decade—Ireland, the Netherlands, Chile, New Zealand—were not there. The G20 was a meeting of vulnerable and divided large economies.

Given the contention, it was surprising that the meeting was so conspicuously successful: it counts as one of the high-water points of international economic cooperation, alongside the Bretton Woods Conference, and a stark contrast with the failure in the Great Depression of the 1933 World Economic Conference, which was also, incidentally, held in London (but on the other side of town, in the Kensington Geological Museum). The political scientist Dan Drezner makes the thesis that "the system worked" the center of his argument, and indeed the title of his book analyzing the response to the crisis.[53] The summit communique self-consciously adopted the language of Bretton Woods: "the belief that prosperity is indivisible; that growth, to be sustained, has to be shared."[54] British prime minister Gordon Brown saw it as creating a "new world order." As he put it: "This is the day the world came together to fight recession not with words but with a plan for economic recovery and reform." European Commission President Barroso commented: "What we have achieved in economic history is incomparable. We said what we would do, and now we will do what we say." President Sarkozy of France gave the interpretation an anti-American twist: "Since Bretton Woods, the world has been living on a financial model, the Anglo-Saxon model—it's not my place to criticise it—clearly, today, a page has been turned." Germany's Angela Merkel spoke about an opportunity to create a new "capitalism with a conscience."[55] It still looked, as it had in November, as if the U.S. administration was trying to evolve a coordinated response to the financial crisis. Indeed, U.S. weakness and vulnerability were themes of much commentary and analysis, including from participants.

President Obama acknowledged that the United States was no longer the sole or dominant great power: "You know, there's been a lot of comparison here about Bretton Woods, the last time you saw the entire international architecture being remade. Well, if it's just [Franklin] Roosevelt and [Winston] Churchill sitting in a room with a brandy, you know, that's an easier negotiation. But that's not the world we live in. And it shouldn't be the world that we live in." He added at the press conference, "I would like to think that with my election, we're starting to see some restoration of America's standing in the world. I think we did OK."[56] The reference to Bretton Woods is telling: the 1944 conference had been an Anglo-American moment, and there were elements of the 2009 meeting that recreated the old dynamic. It was, after all, very much a British event, which Gordon Brown saw in missionary terms as rescuing the world. At the preconference dinner, when Sarkozy said that this was a crisis where "none of us have a plan," Obama immediately leapt in with the putdown "Gordon has a plan."[57] Obama and Brown were reprising the roles of Harry Dexter White and John Maynard Keynes.

Brown was keen to emphasize the fiscal stimulus as the centerpiece of international coordination. At the postsummit press conference, he explained that the $5,000 billion global fiscal stimulus was the largest "the world has ever seen," and in addition a new $1,100 billion program would "restore credit, growth and jobs in the world economy." One obvious criticism was that this was an exercise in producing big-headline numbers that might not reflect a real policy commitment.[58] The large figure combined discretionary spending with the automatic fiscal stabilizers that were the built-in response in every major country (but especially in continental Europe) to the economic shock. The amount was meant to impress markets and, perhaps more, voters; but the details lay elsewhere. The building up of the IMF, by contrast, looked as if it was a more tangible achievement of the meeting. In advance of the summit, Japan and the European Union pledged an additional $100 billion of IMF funding. The summit communique included the pledge to "treble resources available to the IMF to $750 billion, to support a new SDR [Special Drawing Rights, the IMF's currency] allocation of $250 billion, to support at least $100 billion of additional lending by the MDBs [Multilateral Development Banks], to ensure $250 billion of support for trade finance." That calculation could be cast as a commitment to stimulus of over $1 trillion.

China, by contrast, like the European leaders, did not want simply to bail out the existing order, in which—as the Chinese leadership saw matters—financial instability had been generated by Anglo-Americans. Its pushback against the U.S. proposals looked like yet another element in the campaign against globalized antirecession spending. Yu Yongding, an economist at the Chinese Academy of Social Sciences, explained that China should lend only a symbolic amount to the IMF. "If we do so [lend a large amount], it will seem like the poor rescuing the rich," he said, adding that the Chinese public would not stand for it.[59] In an interview with the *Financial Times*, Prime Minister Wen Jiabao, when asked about

China's ability to ride to the rescue, stressed that it remained a poor country. It was not yet ready to play the commanding role that some now expect of it, he suggested, saying: "I don't see it this way. China remains a big developing country with a 1.3bn population."[60]

At this point, China was in an in-between position. For a long period of time, China's stance was summed up by Deng Xiaoping's famous twenty-four-character reflection on the lessons of the 1989 Tiananmen Square massacre: "Observe unfolding events with equanimity; remain secure in our stance; remain unperturbed in the face of challenges; hide our capacities and bide our time; avoid claiming leadership while advancing our cause." The central concept, "Bide our time" (*Tao guang yang hui*), seemed to apply to the financial crisis: wouldn't the unraveling of capitalism eventually lead to a reconsideration of the position of China? The full reversal would come only with Xi Jinping. In October 2017, in an epochal speech, he explained: "It is time for us to take centre stage in the world and to make a greater contribution to humankind." There was a new world: China was "standing tall and firm in the east."[61] But already in 2009, a speech of President Hu Jintao marked a turning point, in that he explained that China now needed to "actively accomplish something."[62] In July, at a meeting of Chinese ambassadors, Hu urged China's diplomatic envoys and foreign policy officials to make efforts to give China "more influential power in politics, more competitiveness in the economic field, more affinity in its image," and "more appealing force in morality." The Chinese media quickly dubbed these four areas the "four strengths." Hu concluded: "The prospect of global multipolarization has become clearer."[63]

The longer-term focus of the U.S. administration in addressing the international situation lay largely on payments imbalances (Mervyn King's sudoku economics), an issue that set up a conflict with China. "We hope to reach agreement on a framework for balanced growth, for agreeing on how to address the imbalances that led to this crisis and on some process for holding each other accountable," Michael Froman, U.S. deputy national security adviser for international economics, explained in the lead-up to the Pittsburgh G20 summit, the next iteration of the summit process (September 24–25, 2009).[64] The draft Pittsburgh communique stated that G20 members with sizeable current account surpluses "pledge[d] to implement policies that will boost domestic demand-led growth." China immediately pushed back: Zhou Wenzhong, China's ambassador in Washington, stated: "People should not focus on only one thing, that is balancing the economy." He argued that the IMF's fundamental emphasis should be on doing a better job of monitoring the build-up of financial risks.[65] Yu Jianhua, director general for international trade and economic affairs in the Chinese Commerce Ministry, told a news conference: "I'm not sure that one country's leader calling on another to import more represents market economic practices."[66] German officials warned of a "widening of differences" ahead of the G20 summit, as U.S. proposals attracted criticism in Europe for concentrating too heavily on global imbalances instead of reforming financial regulation.[67]

Thus the Pittsburgh meeting produced skepticism and disenchantment: the outcome was quite a striking contrast with the London conference six months earlier. The former IMF chief economist Simon Johnson noted: "if you ask people in a month what was accomplished in Pittsburgh, you'll get a blank stare. . . . the summit made things worse, by making it more likely that financial reform—in particular, moving towards more demanding bank capital requirements—will proceed at the pace of the most reluctant reformers." It would be better, he argued, for the United States to press on alone in remaking financial rules.[68] The mood surrounding international cooperation was souring.

But this 2009 stalemate was nothing like the deadlock a year later, at the G20's Seoul summit, November 11–12, 2010. On the eve of the meeting, the controversy between the United States and the rest of the world was given additional fuel by the Federal Reserve's announcement, after the policy meeting on November 3, of an additional $600 billion purchase of longer-term Treasury securities (Quantitative Easing, or QE) "to promote a stronger pace of economic recovery and to help ensure that inflation, over time, is at levels consistent with its [the Fed's] mandate." One of the concerns raised in the meeting was that the major mechanism through which QE might be expected to work was through depreciation of the exchange rate—was that not a declaration of currency war? The criticism was further fueled by an interview in the *Financial Times* by former Fed Chair Alan Greenspan, a large part of which was aimed at China, which "has become a major global economic force in recent years.

But it has not yet chosen to take on the shared global obligations that its economic status requires." But Greenspan added the critical comment, which quickly drew more attention than the China-bashing: "America is also pursuing a policy of currency weakening."[69]

The expectations of Seoul were thus low to begin with. British prime minister David Cameron played down expectations: "I'm not saying the G20 is in its heroic phase." German chancellor Angela Merkel reiterated her opposition to any U.S. plan to set broad targets for current account deficits and surpluses. José Manuel Barroso lamented: "We have picked up speed but not all engines are working on full power."[70] Ironically perhaps for a country controlled by a Communist Party, Beijing complained that the U.S. proposals were a return to "planned economies."

The Brazilian leaders were now especially emphatic. Finance Minister Guido Mantega said, "It's no use throwing dollars out of a helicopter. The only result is to devalue the dollar to achieve greater competitiveness on international markets." At a joint press conference with president-elect Dilma Rousseff, outgoing President Lula da Silva said that he would go to the Seoul G20 summit with Rousseff, ready to take "all the necessary measures to not allow our currency to become overvalued" and to "fight for Brazil's interests." Rousseff added: "The last time there was a series of competitive devaluations . . . it ended in world war two."[71]

The United States was caught in a trap: to its critics, especially in emerging markets, U.S. monetary policy looked like a nationalistic or selfish strategy of export promotion; on the other hand, if Washington were to reverse course with a policy tightening, the cost of dollar funding would rise, the world would be hit by increased interest and the need to repay dollar loans, and the emerging markets would suffer. Barack Obama hit back at critics of the Fed stimulus, saying that the higher U.S. growth rates it could bring would be "good for the world as a whole. . . . We can't continue in a situation in which some countries are maintaining massive surpluses and other countries are maintaining massive deficits." In other words, China and other emerging markets needed to generate more demand. It was in nobody's interests for the United States to "end up being stuck with no growth or very limited growth."[72] Treasury Secretary Timothy Geithner told CNBC television: "I have enormous respect for Greenspan, had the privilege of working with him for a long period of years, but that's not an accurate description of either the Fed's policies or our policies. We will never seek to weaken our currency as a tool to gain competitive advantage or to grow the economy." He blamed the decline of the dollar on a reversal of "safe haven" capital flows.[73]

Apart from the U.S. monetary action, tension before the summer was fired up by the announcement of new trade figures: China's trade surplus surged in October from $16.9 billion to $27.1 billion, one of the largest increases recorded by China in a single month and the second-highest level for the year, putting new pressure on Beijing. Chinese policy-makers inevitably tried to deflect attention by pointing to the Fed's actions.[74] And Japan announced a 24 percent rise in its own current account surplus.

Germany, Japan, and China formed a powerful bloc opposed to the U.S. call for the G20 to limit current account surpluses and deficits of 4 percent of GDP. Yoshihiko Noda, Japan's finance minister, said each country had "its own circumstances." At that point, Japan's surplus was forecast to hit 3.1 percent of GDP for the year, compared with China's 4.7 percent and Germany's 6.1 percent (these assessments were too high for China and Germany: the eventual figures were 3.9 and 5.7 percent).[75] In Europe, the response to the G20 was overshadowed by accusations that Germany was pushing the Eurozone into ever deeper crisis, and specifically by the charge that Ireland was being tipped over a financial precipice.[76] Fiscal policy had become a tinderbox for international tensions.

It was the frustration with conventional multilateralism and its limits that made China rethink its engagement with the world and promote a different kind of institutional framework for globalization. A new leader, Xi Jinping, signaled the most decisive break with China's thirty-year-old strategy of working within the system. In 2013, visiting Astana in Kazakhstan, he announced the first part of what would become the Belt and Road Initiative: an initiative to build the infrastructure for land globalization (the "Belt") to bring in the territories in the center of the Eurasian landmass that had been at the heart of the old Silk Road. Later, in Indonesia, he would explain the oceanic equivalent (the "Road"). There would be a new geopolitics. In poetic terminology, in Astana he explained that he "could almost hear the camel bells echoing in the mountains and see the wisp of smoke rising from the desert." Xi wanted a new currency arrangement, built on a basis of previous cooperation between Russia and China.

Something new was taking the place of the old dollar system. As Xi put it, quoting the nineteenth-century Kazakh poet and visionary Abay Qunanbayev (Abai Qunanbaiuly), "The world is like an ocean and our time is like strong wind. Waves in the front are the older brother while those behind are the younger brother. Driven by wind, the waves from behind constantly press on those in the front."[77] A new wave of globalization was beating on the old American construct.

Monetary Policy

Coordinated fiscal expansion had failed; multilateralism had run into the sands; all that was left was monetary action. In a turn of phrase that became famous, Federal Reserve Governor Jeremy Stein explained that money got into all the cracks.[78] It did not look as precisely targeted as fiscal action, where the identification of beneficiaries prompted a push-back. However, exactly that feature proved to be the long-term problem: filling the cracks meant pushing up asset prices, and that of course also had redistributional consequences, both domestically and internationally. The central banks of what was sometimes called the G4—the United States, the Eurozone, Japan, and Britain—started to act in very similar ways: but there was no need for explicit coordination (see Figure 6.2). Instead, the Fed set a particular model, derived from Japanese responses to that country's early-2000s malaise, that could in turn just be imitated in other parts of the world, including Japan. One striking feature was that there was some protectionist edge to the new monetary regimes, in that they were expected to produce currency depreciation and hence gains for exporters and for manufacturing employment.

After March 2001, with the Japanese economy in recession and prices falling at faster rates than before, the Bank of Japan (BOJ) had cut its policy rate to zero. Along with this move, the BOJ announced a "quantitative easing policy," built on three pillars: first, to make the operating target the outstanding balances held by financial institutions at the BOJ; second, to adhere to the new policy until the core consumer price index (excluding food prices) stopped falling; and third, to increase purchases of long-term Japanese government bonds. At the beginning of the experiment, a striking aspect was the sharp increase in M1, the money supply

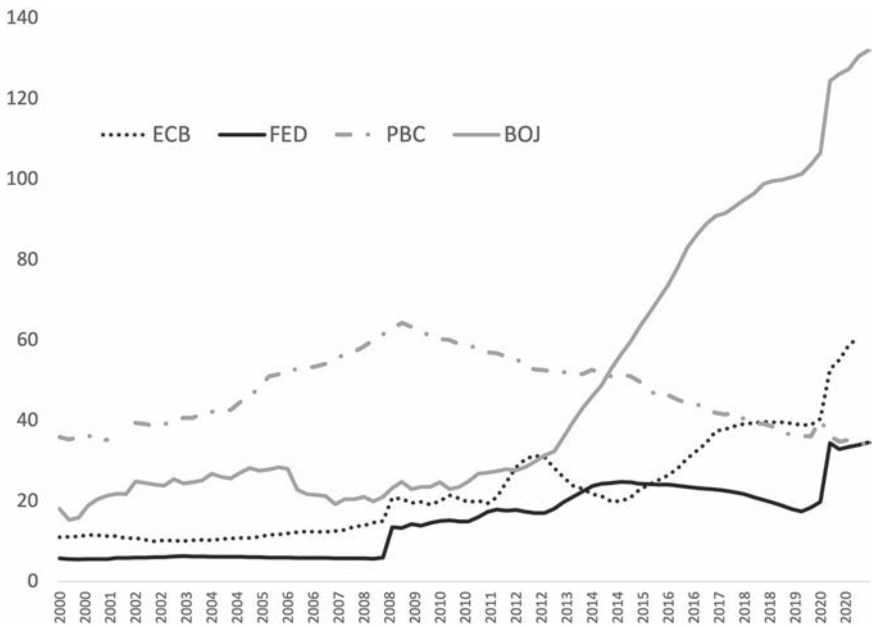

Figure 6.2. Central bank asset purchases in China (PCB), Japan (BOJ), the Eurozone (ECB), and the United States (FED) (Source: Yardeni Research, Inc.)

measure that includes notes and demand deposits, but not broader definitions of money that include time deposits and money market mutual funds.[79] In the Great Recession, Japan would revert to this approach, in a much-expanded version after 2012 that was popularly dubbed "Abenomics," intended to reverse two decades of deflation through "aggressive monetary policy" while at the same time maintaining fiscal discipline, and pushing a growth policy.[80] Japan was by far the most aggressive country in responding to the crisis by expanding its asset purchase program.

The Fed first announced large-scale purchases of longer-term assets in November 2008. It would buy $600 billion of agency bonds and agency mortgage-backed securities (MBS), an action explicitly aimed to "reduce the cost and increase the availability of credit for the purchase of houses." At their next meeting in December 2008, the Federal Open Market Committee released a statement that took the federal funds rate target down to what it believed to be the lower bound of 0–0.25 percent. In March 2009, the Fed expanded the asset purchase program to "up to"

$1.75 trillion, including purchases of $1.25 trillion of MBS, $200 billion of agency debt, and $300 billion of Treasuries. The purpose of this action, which subsequently became known as Quantitative Easing 1 (QE1), was formulated more broadly as "to help improve conditions in private credit markets." Total QE1 purchases were equivalent to 12 percent of GDP. In addition, Fed policy statements in December 2008 began to include explicit references to the likely path of the federal funds interest rate, a policy that came to be known as "forward guidance."

The measures were explicitly motivated by the impossibility of taking interest rates deep into the negative territory that standard models would have recommended given the amount of economic slack. At the March 2009 FOMC meeting, simulations showed that the optimal path of monetary policy should have taken the policy rate (the federal funds rate) to an impossible minus 6 percent. The $1.75 trillion asset purchase program of QE1 was intended as a substitute for a dramatic but impossible cut in the policy rate.

In November 2010, the Fed announced additional measures (QE2) that involved purchases of $600 billion of long-term Treasury securities, amounting to 4 percent of GDP, to be completed by June 2011. In September 2011 it moved into new territory with what it dubbed "Operation Twist," or the Maturity Extension Program (MEP), selling short-term paper and buying longer dated securities, with the aim of increasing the appetite for risk and reducing long-term borrowing costs. Specifically, the Fed initially proposed to purchase $400 billion in Treasury securities with maturities greater than six years and to sell an equal amount of securities with maturities of less than three years, with implementation taking place over a period of nine months. In June 2012, the Fed extended the program through the end of 2012, so that it ultimately took $667 billion (or 4 percent of GDP) of long-term securities from the market. By that time, the yield on the ten-year Treasury bond had fallen to 200-year lows, and there was a considerable stimulus to the housing market. The Fed also announced that it would keep the federal funds rate at current low levels through 2014.

QE3 began even before Operation Twist was over. In September 2012, the Fed decided to start purchases of MBS of $40 billion per month, with no set end date. In December 2012, the Fed decided to continue Treasury purchases at the MEP rate of $45 billion per month indefinitely and to stop selling off shorter-term Treasury securities. Only in December 2013 did the Fed slow the pace of purchases to $35 billion in MBS and $40 billion in longer-term Treasuries per month, with further reductions until the program ended in October 2014. In all, the Fed's purchases amounted to $1.5 trillion of Treasury debt and MBS under QE3, or 9 percent of GDP.

The most plausible empirical estimates suggest that around $300 billion of purchases (1.5 percent of GDP) should have an effect roughly equivalent to a 0.25-percentage-point cut in the policy rate.[81] The purchases were designed to spur economic growth, but the recovery remained frustratingly sluggish, slower than previous recoveries from recession. A major effect, inevitable since monetary policy was working through asset purchases, was to push up asset prices generally. In consequence, the asset price boom of the so-called Great Moderation of 2001–2007 continued, with substantial rises in the value of stocks and real estate, especially in major global hubs. There was a politically dangerous side effect, then, that appeared to be pushing up wealth inequality in many countries.

The amount of central bank activity was staggering. The Bank of England from 2009 bought mostly government securities, but also increasingly private-sector securities. From 2011, it imposed a limit, so that no more than 70 percent of any issue of government stock would be bought up. Economic uncertainty produced by the outcome of the 2016 Brexit referendum required another large round of QE to support the economy. Japan, the original pioneer of QE, from October 2010, when it announced a ¥5 trillion asset purchase program, explicitly aimed at lowering the exchange rate of the yen.

The European dynamic followed the Fed example with a lag. In July 2009, the European Central Bank (ECB) introduced a nonstandard measure to revitalize the European covered bond market, which at the time financed about one-fifth of mortgages in Europe. Direct purchases in both primary and secondary markets amounted to a total of €60 billion of covered bonds for a year. A second program began in November 2011, but over the course of a year the ECB bought only €16.4 billion, well short of the targeted €40 billion. From October 2014 net purchases of covered bonds under a third covered bond purchase program (CBPP3) amounted to €290 billion.

The main attention of the ECB in the early stages of the European debt crisis, however, was more specifically focused on purchasing debt issued by the crisis countries, Greece, Ireland, and Portugal, and later as well Italian and Spanish debt under the Securities Markets Program (SMP). The purchases occurred in the secondary market to avoid contravening the rule against monetary financing of governments by the ECB (Article 123 of the Treaty on the Functioning of the European Union). In September 2012, the ECB also announced a conditional Outright Monetary Transactions (OMT) program, though in fact no purchases were ever made under that program. Europeans, in part because of the contentious character of a regional debt crisis, were in a greater hurry to exit the program than the Fed. In 2011, the IMF and ECB were broadly in agreement on the need for "gradual withdrawal of monetary stimulus" while continuing unconventional liquidity policies for some time. The IMF at this point put considerable emphasis on concerns about rising inflation.[82]

In July 2013, the ECB started to use forward guidance, stating that it expected policy interest rates "to remain at present or lower levels for an extended period of time." It introduced negative interest rates on its deposit facility in June 2014, as well as targeted long-term refinancing operations, with the aim of easing private-sector credit conditions and stimulating bank lending to the real economy.[83] For Europe, a substantial attraction of monetary action was that the distributional costs were not as evident or as clearly calculable as they were for the fiscal bailouts that had in 2010 been the initial official response to Europe's debt crisis. The contingent character of the claims that built up made it impossible to really assess the costs to national taxpayers. In the creditor countries, the lack of transparency provoked the argument that the creditors were being lured into a trap that would necessarily, although unpredictably, involve large fiscal costs.[84]

There was a fundamental change in stance announced by ECB President Mario Draghi in a speech at the Fed's annual monetary policy conference at Jackson Hole, Wyoming, in 2014. Draghi echoed the thinking that was widely imputed, especially by foreigners, to Fed policy—that one lever of the QE action was on the exchange rate: "We have already seen exchange rate movements that should support both aggregate demand

and inflation." But the major point was that monetary policy or central bank action alone was insufficient. There needed to be more coordinated fiscal action, which was becoming easier because of the reassuring effects of monetary policy on financial markets: "it would be helpful for the overall stance of policy if fiscal policy could play a greater role alongside monetary policy, and I believe there is scope for this, while taking into account our specific initial conditions and legal constraints."[85] The ECB started an equivalent program (Expanded Asset Purchase Programme) for buying €60 billion per month in March 2015, for eighteen months or "until a sustained adjustment in the path of inflation towards the ECB's objective of lower but close to 2%" was attained. The purchases rose to €80 billion from April 2016 to March 2017, and were then reduced until the program ended in December 2018.

The central banks looked like rock stars, or the only grown-ups in the room—especially after the big political disputes about fiscal policy that marked the turning away from stimulus in 2010. But were their actions effective? On the whole the policy-makers were quite reserved. Bernanke engagingly explained: "the problem with QE is it works in practice, but it doesn't work in theory."[86] His colleague Donald Kohn was more cautious: "I think it's fair to say that, although these [steps] were effective to some extent, people—even the Fed—were somewhat disappointed. It's been a slow recovery from a very deep recession."[87] The Fed governors noted in 2014, at the ending of the QE program, that "there has been a substantial improvement in the outlook for the labor market since the inception of the current asset purchase program."[88]

The post hoc investigations confirmed this very muted optimism. In 2014, researchers from the Bank of England found that asset purchases have a statistically significant effect on real GDP, with purchases amounting to 1 percent of GDP leading to a rise of 0.36 percent in real GDP and of 0.38 percent in the consumer price index for the United States, and a rise of 0.18 percent in real GDP and of 0.3 percent in the consumer price index for the United Kingdom.[89] Academic research was mostly skeptical about the magnitude of the impact of QE on U.S. long-term interest rates.[90] Japan's large-scale experiment stabilized the country but did not secure a return to higher growth, which remained at the lower end for the G7 countries, above only the dismal Italian performance.

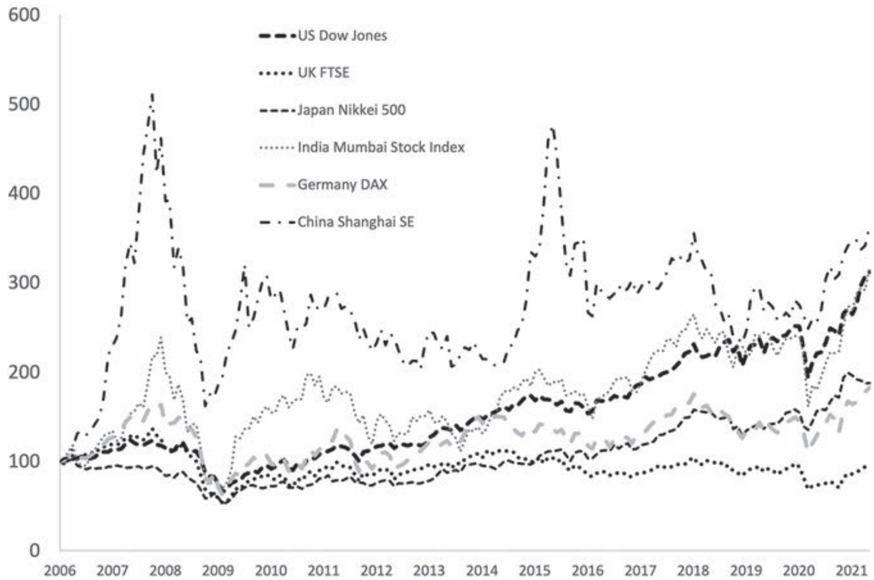

Figure 6.3. Stock market indices, 2006–2021 (2006 = 100) (Source: Global Financial Data)

The effect of central bank action on asset prices was much clearer, triggering renewed discussions of bubbles (see Figure 6.3). The November 2010 FOMC meeting started a long upward movement on U.S. stock markets. European stocks started to recover after 2015. The wildest rides occurred in large emerging markets, with speculative surges in 2014 in India, and most spectacularly in China. The latter collapsed in 2015 and then set off a blame game in which Chinese authorities blamed speculators and made some dramatic arrests. Xu Xiang ("Big Xu") of Zexi Investment was seized after a car chase on the Hangzhou Bay Bridge. It was easier to scapegoat individuals than to reverse the monetary policy that had driven the market frenzy.

A New Economic Nationalism

Nationalism lay in the logic of stimulus packages funded out of tax money, which were intended to preserve national prosperity and national jobs. From this perspective, money spent would be less effective if it leaked out to other countries. Countries thus tried to ensure that increased purchasing power would be spent on local goods. France's President Sarkozy urged the automobile producers Renault and Peugeot-Citroën to repatriate production from foreign suppliers and production sites. State-funded scrapping incentives encouraged drivers to trade in old cars in many countries, including Germany, France, Italy, the UK, and the United States (where they were celebrated as "cash for clunkers"). But the schemes often backfired. The German bonus, of €2,500 per car, launched in January 2009, seemed to benefit producers of cheaper cars in France, Spain, the Czech Republic, and Poland rather than Germany's domestic and more luxury-oriented manufacturers. And the Central European producers fought back. Czech prime minister Mirek Topolanek, for instance, argued that "[a]ttempts to use the financial crisis to introduce forms of protectionism risk slowing and endangering the recovery of the European economy and the confidence of consumers and investors."[91]

Governments also did not want to finance bailouts in other countries. This applied at first especially to banking rescues, where the most problematical cases were multinational enterprises, such as the Franco-Belgian Dexia or the Belgian-Dutch Fortis. Bailouts in these cases involved weighing up and then allocating the fiscal liabilities for two states. This consideration is what makes the European move to a banking union in the summer of 2012 so startling (it was the much-needed solution to the European sovereign debt crisis), but also explains why its implementation was so slow.[92] The resistance to bailouts poisoned the whole discussion of European rescue mechanisms. Germany dragged its heels because of regional elections as well as court challenges; then small northern and eastern countries complained that money was being diverted to German or French banks, or to feckless Greek consumers and politicians, and that anyway the formerly communist economies were much poorer and should not be sending support to richer Greece.

Countries desperately needed new investment, but at the same time were allergic to selling enterprises to foreigners. Chinese investment in Greece, for instance in the port of Piraeus, was sometimes felt as an intrusion rather than a rescue. Germans were outraged by the sale of high-tech companies, such as the robot manufacturer KUKA. Sarkozy proposed the establishment of a European sovereign wealth fund to ensure that leading European companies that were suffering from depressed share prices would not be taken over by foreign state-owned funds.[93]

Countries also resorted to old-fashioned trade protectionism. The World Bank published a report on March 2, 2009, showing that seventeen of the nineteen developing and industrial nations (plus the EU) had introduced restrictive trade practices, despite pledging repeatedly at international meetings to avoid protectionism. The St. Gallen think tank Global Trade Alert published details on the large number of harmful trade measures, which rose year by year to 2013: the largest category lay in subsidies, but there were also many straightforward tariff increases.[94]

As old-style globalization, in financial services and trade, receded after the Global Financial Crisis, a new type of globalization took its place. Electronic communications continued to rise, and indeed the pace became more rather than less intense. The years of financial crisis were also the age of major innovation. The iPhone was unveiled in 2007; it revolutionized personal interactions and consumer behavior, as well as the transmission of news. As Steve Jobs put it at the unveiling of the iPhone, it was "a leapfrog product that is way smarter than any mobile device has ever been and super-easy to use."[95] At the beginning, the most attention was given to the culture or the fun—the accessibility of music and entertainment—but the device was a commercial one, and it produced a revolution in financial access. That was evident even in much less sophisticated mobile phones, which could be repurposed. M-Pesa (*pesa* is Swahili for money), the mobile phone–based money transfer and payments service, was launched in 2007 by Vodafone Group PLC and Safaricom, the largest mobile network operator in Kenya. So the world's globalization shifted from trade and finance to data and communications; but that revolution would in turn affect how trade and financial services could be supplied. The crisis at the same time accelerated dramatically the rise of emerging markets, in particular China, and in some part that was the consequence of technology offering an easier way of catching up. Trade fell back while the weightless world of electronic interchange surged forward to much greater integration. Money could also be thought of as part of the weightless world, and one that central bankers were actively pushing.

Bernanke's Remedies

Ben Bernanke is the first and only central banker to have been awarded the Nobel Prize in Economics. A southerner, born in Georgia in 1953, he grew up in the small town of Dillon, South Carolina (population 6,500). The son of a pharmacist and a mother from a deeply religious Jewish family, he was an exceptional scholar. The Great Depression left a traumatic scar on his family: the U.S. Depression hit his grandfather, an immigrant from the Austro-Hungarian Empire, Jonas Bernanke, who worked as a pharmacist in New York and then moved to South Carolina to escape from the big city of the Depression era. There the business succeeded, and his son, Ben's father, continued the family business. Ben's maternal grandparents fled Nazi and Croat fascist persecution, first to Italy, then to the United States. His family background might make it unsurprising that he worked for a very long period of time on understanding the Great Depression, the catastrophe that destroyed the U.S. economy and pushed Europe's slide into barbarity, racial persecution, and violence.

Bernanke did not intend to become an economist when he began at Harvard, and took an introductory economics class taught by Martin Feldstein rather haphazardly, but then realized that economics was a way of combining his interests in math and history. He went on to the Ph.D. program at MIT, studied with Stanley Fischer, and read Milton Friedman and Anna Schwartz's *Monetary History of the United States*, the analysis of which focused on the U.S. Great Depression. Bernanke was never a Friedmanite, but regarded himself as part of the broad New Keynesian movement which provided what he saw as "the best framework for practical policymaking."[96] His work on the interwar Depression modified Friedman's lessons in an important way, moving away from the unrealistic assumption that Fed-controlled base money was the principal driver of the U.S. plunge into the Great Depression. Friedman and Schwartz had looked at the collapse of the money stock and renamed the Depression the "Great Contraction," but they had not penetrated into the way that banking lending and credit decisions were made. Bernanke was thus filling an important gap in Friedman's argument. His critics sometimes derisively dismissed this theory as "creditism," but his work pointed to how important an understanding of the institutional mechanisms that create money would be for any policy application.[97]

One way of presenting his theoretic innovation was through discussion of a "financial accelerator." This is a mechanism familiar to many historians: apparently small-scale events can produce worldwide effects. This is Ian Goldin's "butterfly defect." It used to be conventional to point to debates about how the shape of Cleopatra's nose influenced history: it led Mark Antony to abandon Rome for Egypt, and thus made possible the establishment of the Roman Empire by Octavius Caesar. There is an economic-history counterpart: relatively small impulses or disturbances can cause large fluctuations in aggregate economic activity. But then there is an interest in identifying the linking mechanism that might drive causation and lead to big consequences from a small event: there needs to be rather more than an exploration of the anatomy of the queen of Egypt's nasal cavities.

Bernanke, together with his long-standing coauthor, NYU professor Mark Gertler, developed an approach that looked at the effects of imperfect information in finance through a concept of agency costs, the operations needed to assess the value of a particular enterprise or individual in order to commence a lending operation. In an economic downturn, uncertainty and fear of bankruptcy increase. Potential borrowers who face significant costs of borrowing—consumers and small firms, for example, or firms with weak balance sheets—will see those costs rise and may thus be excluded from borrowing, or only be able to borrow on much harsher terms. As Bernanke and Gertler put it: "To the extent that negative shocks to the economy reduce the net worth of borrowers (or positive shocks increase net worth), the spending and production effects of the initial shock will be amplified." The "debt overhang leads to the possibility of a low-output expectational equilibrium."[98] Sometimes it is helpful for noneconomists to imagine a practical example: a pharmacy in the Great Depression, such as that operated by Jonas Bernanke, would find it harder to borrow because the risk of bankruptcy was assessed higher by potential lenders. As an result, he could not hold so much stock. The store consequently appeared less attractive and lost customers. The possibility of bankruptcy, weighed up by the bankers, could thus become a reality. This was a logic that had been influentially analyzed by

Irving Fisher, a major figure in the development of the quantity theory of money, who termed the process debt-deflation.[99] Bernanke built the insight into a formal model.

In the 1990s it was hard to find examples of the insidious damage caused by deflation that might stand alongside the trauma of Depression-era America—except Japan after the bursting of the bubble in 1991. Japan looked like a case study of an economy weighed down by the combination of debt and demographics. Like the interwar Depression, the problem originated from a policy mistake that might have been avoided. Bernanke, together with Gertler, argued that if Japanese monetary policy after 1985 had "focused on stabilizing aggregate demand and inflation, rather than being distracted by the exchange rate or asset prices, the results would have been much better."[100] It would have been better to focus on one key indicator: consumer prices. As they put it, "Our reading of history is that asset price crashes have done sustained damage to the economy only in cases when monetary policy remained unresponsive or actively reinforced deflationary pressures."[101] This exercise required only attention to national price signals; there was no need to pay attention to international price developments or exchange rates.

At first, for the period 1991–1994, Bernanke showed that monetary policy had been too tight in the aftermath of the asset price collapse. But then Japanese policy-makers pulled down interest rates and thought that this constituted a loosening of policy. Here the lessons of the Depression kicked in. In a deflation, very low or even zero interest rates still amount to a positive real rate and impose a brake on economic growth. There were other, better ways of expanding demand. The analysis applied to Japan alone in the 1990s: but after 2008 it would be the right approach to understand the policy dilemmas of the industrialized world.

Bernanke's suggestions appeared to Japanese bureaucrats as impossibly aggressive. One concerned the possibility of simply creating more money: "Money, unlike other forms of government debt, pays zero interest and has infinite maturity. The monetary authorities can issue as much money as they like. Hence, if the price level were truly independent of money issuance, then the monetary authorities could use the money they create to acquire indefinite quantities of goods and assets. This is manifestly impossible in equilibrium. Therefore money issuance must ultimately raise the price level, even if nominal interest rates are bounded at zero. This is an elementary argument, but, as we will see, it is quite corrosive of claims of monetary impotence."[102] In other words, monetary policy could never be paralyzed. Central banks always had the possibility of pushing inflation up.

The most obvious move would be to adopt a formal inflation target, which the Bank of Japan resisted. Bernanke thought of the objections, that "announcing a target that they are not sure they know how to achieve will endanger the Bank's credibility; and they have expressed skepticism that simple announcements can have any effects on expectations."[103] In this context, Bernanke invoked a famous (he called it "hoary") thought experiment of Milton Friedman's, the "helicopter drop" of newly printed money. "I think most economists would agree that a large enough helicopter drop must raise the price level."[104]

This approach meant that asset price concerns were relegated to a less important place in monetary policy-making. Bernanke in this regard was a central maker of the consensus of the Great Moderation period: that it was hard to identify bubbles as they were forming, because the price rises might reflect "real" considerations, and that they could simply be dealt with after a bubble burst (when it would be possible to know that it had been a bubble).[105] This was often described as "cleaning" after the event rather than "leaning" against the wind of the bubbles.

He also had a theory of how globalization drove asset prices. A "savings glut" in emerging markets, notably China, was explicable in terms of the growth of a new middle class that needed to save for later spending on health care, education, and housing. Corporate savings were also high because of uncertainties. The resultant financial flows drove down interest rates worldwide, and consequently would be expected to raise asset prices. There was thus a rational explanation for a worldwide boom. This is the interpretation that also underlay the sudoku presentation of Mervyn King, and King had shared an office with Bernanke at MIT in the 1990s.[106]

A second recommendation for a solution to the Japanese predicament concerned the management of the exchange rate: the centrality of the price of a currency looked like a return to the issues at the center of interwar debates, when the UK's return to gold at the pre-1914 parity had appeared an obvious mistake. The 1990s predicament raised an issue of enormous political sensitivity in Japan, where the conventional wisdom was that the bubble had arisen out of the exchange rate regime of the second half of the 1980s. Specifically, the Reagan administration had been alarmed by the surge of Japanese imports and urged on Tokyo a combination of monetary and fiscal expansion: Americans wanted to drive the dollar down against the yen, or reverse the undervaluation of the yen. After the collapse, Bernanke argued that "a policy of aggressive depreciation of the yen would by itself probably suffice to get the Japanese economy moving again."[107] The suggestion was probably the main reason why Japanese officials thought of his urging as so dangerous: it seemed to be undoing the conventional framework for international currency cooperation. Bernanke added: "I am not aware of any previous historical episode, including the periods of very low interest rates of the 1930s, in which a central bank has been unable to devalue its currency."[108] There were indeed famous and very obvious examples of how devaluation could boost economic expansion: the UK in 1931, the United States in 1933, or Nixon's unilateral closing of the gold window in 1971. Bernanke could draw on a rich literature, to which he had contributed an important paper, on how in the interwar years abandoning the gold standard freed monetary policy and thus laid a path to recovery.[109]

He also thought about nonstandard open-market operations, which might contain some fiscal component. The analytical barrier between monetary and fiscal policy actions, which had been an essential element in the Great Moderation thinking that emerged from the 1970s debates, would thus become partly blurred. Central banks would be moving into a territory long thought to belong to finance ministries. "By a fiscal component I mean some implicit subsidy, such as would arise if the BOJ purchased nonperforming bank loans at face value, for example (this is of course equivalent to a fiscal bailout of the banks, financed by the central bank). This sort of money-financed 'gift' to the private sector would expand aggregate demand for the same reasons that any money-financed transfer does."[110]

Bernanke concluded this stunning and radical paper with the observation that "Japanese monetary policy seems paralyzed, with a paralysis that is largely self-induced. Most striking is the apparent unwillingness of the monetary authorities to experiment, to try anything that isn't absolutely guaranteed to work. Perhaps it's time for some Rooseveltian resolve in Japan."[111] Japan indeed, as it engaged in more and more policy experimentation in the 2000s, would deliver a striking analytical puzzle: how a country with such a high level of government debt could still have a market assessment that saw a positive value of the government's balance sheet. Japan seemed to suggest that at least some governments could live with permanently elevated, and rising, debt levels.

The case for inflation-targeting that Bernanke developed with an economist who had studied the Japanese disaster in great detail, Adam Posen, analyzed price stability and financial stability as highly complementary and mutually consistent objectives, to be pursued within a unified policy framework. Such a framework would encourage "both public and politicians to focus on what monetary policy can do (maintain long-run price stability), rather than on what it cannot do (create permanent increases in output and employment through expansionary policies)." The prices that were relevant were consumer prices, and the doctrine urged the benign neglect of asset prices, so that a housing boom or a stock market surge was not in itself worrying and should not trigger central bank action: "focusing on the traditional goals of monetary policy—the output gap and expected inflation—is the more effective means of avoiding extended swings in asset prices and the resulting damage to the economy."[112]

The focus on Japan proved to be of enormous value in dealing with issues that arose for monetary policy after 2008. Japan was a model for a "shrinkonomics" that would grip the world as Japan's demographic stagnation was repeated elsewhere.[113] On the other hand, the Japanese lessons were less relevant to dealing with the issue of handling the specific financial sector issues in mortgage securitization that led up to the 2008 U.S. collapse. These were issues that did not really appear in Japan, for though the economic contraction was actually more severe in Japan than in the United States after 2008, there were no large Japanese bank collapses. In any case, the government had made it clear that it would not allow big banks to fail.

No longer a Princeton academic but now a governor on the Federal Reserve Board, Bernanke repeated the essential themes of the Japan paper in a 2002 speech on the threat of deflation, which earned him the sobriquet "Helicopter Ben." His presentation started with a Fed study warning of the lessons of the Japanese experience, namely that the persistence of deflation there was almost entirely unexpected, by foreign and Japanese observers alike. And then Bernanke set out the same remedies: "By increasing the number of US dollars in circulation, or even by credibly threatening to do so, the US government can also reduce the value of a dollar in terms of goods and services, which is equivalent to raising the prices in dollars of those goods and services. We conclude that, under a paper-money system, a determined government can always generate higher spending and hence positive inflation." The Fed could aggressively act on the long end of the market, enforcing interest-rate ceilings by committing to make unlimited purchases of securities up to two years from maturity at prices consistent with the targeted yields. That was in effect, as Bernanke noted, a revival of the policies followed immediately after the Second World War which ultimately led to a bitter dispute between Fed governor and former Chairman Marriner Eccles and the Truman administration.[114]

Later, Bernanke would defend the 2002 speech: "Using unrealistic examples is often a useful way at getting at the essence of an issue. The fact that no responsible government would ever literally drop money from the sky should not prevent us from exploring the logic of Friedman's thought experiment, which was designed to show—in admittedly extreme terms—why governments should never have to give in to deflation."[115]

Bernanke had been appointed by President George W. Bush as a member of the Fed Board of Governors, and was then nominated as chairman in 2006. He self-consciously wanted to normalize central banking and mark a break with the cult of personality that had accompanied the Greenspan years, when the star Watergate journalist Bob Woodward wrote a fawning biography of the "Maestro."[116] A young artist who appeared on CNBC to do a live painting of Alan Greenspan stated that the successor would be more difficult: "His beard is covering his face, and I don't think he has the same facial expressions."[117] The historian Adam Tooze unfairly describes Bernanke as a "placid and undersized persona."[118] In fact, Bernanke was mostly dry and laconic. As chair of the Princeton Economics Department he was both admired and (by some) disdained for his capacity to break off long-winded discussions and end debate with a few pithy words.

His appointment was part of a general international move to have academics, rather than bureaucrats or figures well connected in the financial world, as central bankers. In the UK, the academic economist Mervyn King could never have been appointed as governor of the Bank of England in the pre-1997 environment, in which the Bank's major activity lay in interacting with—and regulating—the London City. King occasionally manifested his contempt for bankers; Bernanke, more restrained, did not go so far, but also later explained that he found it difficult to deal with Hank Paulson's "relentless energy."[119] The obvious lobbying of financial interests he found repellent. There was plenty of criticism from the financial community that then echoed back against the central bankers: the financial journalist Brian Wesbury said, "I wish the Fed would just go away." The investor Jim Rogers in Singapore noted, "Ben Bernanke couldn't manage a corner lemonade stand let alone the US financial system."[120]

The logic of the academic approach to central banking, which called for more transparency and predictability, might indeed have been to dispose with a human central banker altogether. Milton Friedman sometimes spoke of abolishing the Fed and replacing it with an algorithm that could generate a stable rate of money growth. A more sophisticated version of the same approach lay behind the Stanford economist John Taylor's elaboration of a monetary policy rule, which became widely discussed in the 1990s and 2000s. But in fact it is possible that following a rule-based approach may lead to excessive confidence in the appropriateness of the models underlying the rule. Federal Reserve historian Alan Meltzer contrasts unfavorably the more academic approaches of the Fed in the 2000s with the stabilizing but "atheoretical" policies of the 1950s and the "eclectic" regime of the 1980s and 1990s.[121]

Bernanke was not a machine or an algorithm. But his philosophy and his policy options had been spelled out in advance with unusual clarity. As a policy-maker, he drew strongly from his academic work, and his policy concerns derived from a particular historical experience. In the weekend when it was clear that there was no institution—not Bank of America, not the British bank Barclays—that would buy Lehman Brothers, he thought of the parallel with the Austrian Creditanstalt in 1931.[122] Lehman was not a large bank, but in 1931 the failure of a bank in a small, far-away country sent out ripple waves that brought down the whole of the world economy.

Should Lehman have been rescued? Lehman's management claimed that the bank was not insolvent, and subsequent research shows that this interpretation may be correct.[123] The literature on bank rescues conventionally applies the analysis developed by the nineteenth-century editor of the *Economist*, Walter Bagehot, writing about the Bank of England's rescue of the banking system in the panic of 1866, when it also refused to help the insolvent bank that had originated the run, Overend Gurney. Bagehot's famous formulation was that the lender of last resort should extend facilities to illiquid but not to insolvent institutions. Lehman was certainly illiquid, as the rest of the banking system cut off funding in the week before September 15, 2008. Subsequent calculations reveal considerable uncertainty about its fundamental solvency: with assets valued at panic ("fire-sale") prices, Lehman clearly was insolvent, but if financial markets returned to normal, the bank may well have been solvent.[124]

Bernanke repeatedly insisted that the Fed was just following Bagehot's advice—to lend freely on good collateral at a penalty rate. "The Federal Reserve, responding in the way that Bagehot would have had us respond, established special programs. Basically, we stood as backstop lenders. We said: 'Make your loans to the—these companies, and we'll be here ready to backstop you if there's a problem rolling over these funds.'"[125] In fact, the notion of high penalty rates was quickly dropped. In restoring financial normalcy, the Fed in fact had the opposite problem: that financial institutions were afraid of using the Fed's discount window because of the imputation of stigma. The banks might damage their credibility by looking as if they were dependent on central bank support.

In the early stages of the Global Financial Crisis, on August 17, 2007, after a day of panic as banks could not access the interbank market, and only ten days after declaring that inflation was still its predominant worry, the Fed declared that "downside risks to growth have increased appreciably" and hinted that it might soon cut its target for short-term rates. Bernanke encouraged banks to borrow directly from the Fed and made such loans more attractive. The day before, JPMorgan Chase & Co., Citigroup, and Bank of America had discussed with the Fed the possibility of borrowing a total of $75 billion to be used to buy asset-backed commercial paper, mortgage-backed securities, and other instruments. The move was explicitly designed to overcome the stigma issue.[126] Bernanke now explained that the Fed's 2008 lending facilities would "greatly reduce the risk that a systemically important financial institution will fail."[127]

The task that the Fed set itself was to increase liquidity in the system as a whole. The parallel with Japanese-style deflation was constantly present. The Fed started to apply those lessons: in effect, the gradual application of Bernankism. The threat of too low inflation was the major policy challenge once the Great Recession had hit the United States, and the Japanese lessons were now highly relevant. As Bernanke put it, "it became clear that low inflation was not an unalloyed good. In combination with historically low real interest rates—the result of demographic, technological, and other forces that raised desired global saving relative to desired investment—low inflation (actual and expected) has translated into persistently low nominal interest rates."[128] The trick was to make exceptional measures a near-permanent policy tool. That was the great turning point. It would give, Bernanke reasoned, greater clout to monetary policy that otherwise would be constrained by the inability to cut interest rates much—if anything—below zero. Some European central banks experimented with negative interest rates, but the practice would always be limited by the possibility of banks, companies, and individuals moving to physical cash.

In the critical and highly controversial discussion as the Fed moved to its own QE in November 2010, Bernanke started with the warning against deflation, by talking of the "risk—which could be somewhat greater than some might think—that the recovery could actually stall. . . . Although I think actual deflation is not that likely, this adverse spiral can happen even if you have just disinflation, because disinflation, of course, raises real interest rates. So, again, the risks are somewhat asymmetric in that it's difficult to address those downside risks, whereas the upside risks of too rapid growth or too high inflation within limits can be addressed by raising interest rates."[129] The move to QE implied a much closer coordination between the Fed and the Treasury, in practice a partial reversal of the assertion of central bank independence that had figured so prominently in the anti-inflation mentality generated as a consequence of the experience of the 1970s.

What is striking about the suggestion is the willingness to think that one of the channels through which the operation would succeed was the weakening of the dollar.[130] To critics, especially in other countries, this looked like an aggressive act of economic nationalism, a return to the currency wars and competitive devaluations of the interwar Depression. The dollar depreciation might be interpreted as a currency war, but actually it would be a mechanism to push other countries—especially China—to adopt a policy regime less harmful to U.S. interests:

> these so-called spillover effects are more a function of deficiencies in the international monetary system than they are a function of US policy. In particular, there is a group of emerging market economies that are trying to play by the rules, trying to let their currencies appreciate appropriately, and they are caught between easy policies in the advanced economies and the propensity of some other emerging market economies to undervalue their currencies or to peg their currencies. That puts those countries in a terrible bind—on the one hand, they have to deal with the capital inflows, but, on the other hand, if they let their currencies appreciate, then they're not competitive with the countries that are undervaluing their currencies. The answer there, really, is that we need to continue to work with China and with other emerging market economies to get a better system and, in particular, to allow more flexibility in the renminbi.[131]

A benevolent view might thus hold that the exchange rate was a weapon in the attempt to find a better international monetary system, but that did not really emerge in the Great Recession and its aftermath.

A few days before the November FOMC meeting Thomas Hoenig, the hawkish president of the Kansas City Fed, had talked about the possible move as a bargain with the devil. That language was repeated by another regional Fed president, Charles Plosser of Philadelphia. Another critique raised the issue of coordination with fiscal policy. Richard Fisher of the Dallas Fed suggested that the Bank of England was right to push QE as a compensation for exceptional fiscal austerity: "Governor King is offsetting the QE with an announced fiscal policy tightening that out-Thatchers Thatcher. That is not the case here—here, we suffer, just to stay with my diaper analogy, from fiscal incontinence. If this were to change, then I would make a case for accommodation, but that is not yet happening. . . . Quantitative easing is like kudzu for market operators—you're familiar with this analogy because you're a southerner, Mr. Chairman—it grows and it grows and it may be impossible to trim off once it takes root in the minds of market operators." Fisher then attacked the idea behind the plan, "to devalue the dollar to stimulate demand for our exports—and I don't think we should ever say that publicly."[132]

One of Bernanke's closest allies, Kevin Warsh, voted for the measure but made his opposition very clear (and would later write it up for the *Wall Street Journal*,[133] in a move that Bernanke and others saw as undercutting the chairman's position): "I would still encourage you to put the burden where it rightly belongs, which is on other policymakers here in Washington, and to do so in a way that is respectful of different lines of responsibility."[134] Warsh was also focusing attention on the dangers of fiscal overactivism.

The key to the argument for QE was a projection by the Fed staff that "the $600 billion purchase with no follow-up leads to an increase of real GDP at the end of 2012 of 0.7 percent, and $1 trillion would raise output by 1.1 percent." The move was promptly denounced by other countries, meeting in Korea for the G20 summit. Germany's blunt finance minister, Wolfgang Schäuble, said that the Fed's stance was "clueless": "What the U.S. accuses China of doing, the U.S.A. is doing by different means."[135] And in the United States, there was also a frenzied Republican attack. Glenn Beck ranted on Fox News, "I've been telling you that it would be a Weimar Republic moment. It is largely untested and unconventional. I mean, I'm sure Zimbabwe has tried it. It's a huge gamble." Paul Ryan, the Republican chair of the House Budget Committee, complained: "Look, we have Congress doing tax and spend, borrow and spend. Now we have the Federal Reserve doing print and spend."[136] These criticisms were misplaced. The inflation risk was an illusion—as it was in Europe, where critics, especially in Germany, responded in a similar way to ECB bond purchases.

Bernanke rejected the multiple attacks as "crude monetarism."[137] He tried to reassure that the lessons of the Great Depression had been learned. The outcome was a rather precarious balancing act. Had the lessons perhaps been learned too well? Was capitalism really dangerous enough when institutions were rescued rather than failing? And on the other side, were the new instruments really effective? In 2013, the IMF's chief economist, Olivier Blanchard, an ally of the new approach to central banking, wrote that "it remains a fact that compared to conventional policy, the effects of unconventional monetary policy are very limited and uncertain."[138]

Another policy choice was more central. The moment that financial confidence fully returned to the United States was in 2011. There had been an important move in May 2009, when the first stress tests for nineteen bank holding companies were released, and it was clear that the weaker banks would be recapitalized. The threat of bank failure seemed to be banished; but that was not enough to remove the obstacles to recovery. Bernanke later endorsed an interpretation that suggested that the early rounds of aggressive monetary policy action had been ineffective because a large number of influential market observers had assumed that the policy would be reversed.[139] The actions of late 2010—and the hullaballoo they provoked—in effect finally convinced markets that the Fed was serious and that the commitment to new policies would be a long-term, binding engagement. It rapidly became styled "Odyssean," because Odysseus in the Greek legend had tied himself to the mast to resist the calls of the Sirens. From August 2011, in addition, the Fed moved to forward guidance, an explicit commitment to maintaining its policy stance for a predictable, longer time period. By 2020, Bernanke could conclude that there was no going back to the old world of central banking: "On one point we can be certain: the old methods won't do. . . . Simulations of the Fed's main macroeconometric model suggest that the use of policy rules developed before the crisis would result in short-term rates being constrained by zero as much as one-third of the time."[140]

This was a mirror image of the old model of central bank behavior, where the same classical analogy had been frequently used as the rationale for central bank independence, and policy made by a "conservative central banker." Now the central banks needed to be tied—or to tie themselves—in order not to be too conservative.

The result of the support operations across the globe was that there were—outside the limited cases of Ireland, Iceland, and Spain—no massive bank collapses. Financial institutions became larger—despite the perception that one root of the problem lay in a "too big to fail" dynamic, in which banks took on too much risk because they knew that they had a safety net by the fact of their centrality to the economic process. Nor were many bankers subject to any criminal proceedings. Fred Goodwin, who was CEO of Royal Bank of Scotland until 2009, after its effective nationalization, was merely deprived of his knighthood ("for services to banking") by the queen. Across the world, the *Financial Times* later calculated, forty-seven bankers were jailed worldwide for their role in the financial crisis, and mostly in just three countries: twenty-five in Iceland, eleven in Spain, and seven in Ireland. In Iceland, as a consequence, bankers represented a substantial part of the prison population of around 120.[141] In the United States, by contrast, only one banker was imprisoned for a part in the financial crisis, and he worked for a foreign bank, Credit Suisse, and had operated primarily in London: Kareem Serageldin. Thus, only one banker was added to the U.S. prison population of 2.3 million as a result of the Global Financial Crisis. It looked like a crisis without either major failures or major criminal penalties. But large fines were imposed: across the world banks paid about $321 billion in fines, with almost two-thirds of these penalties levied on North American banks.[142]

Bernanke had made central banks—and in particular the U.S. Federal Reserve—into the only game in town. He made the management of money—or perhaps more accurately credit—central to the fortunes and the future of the economy. Increasingly, central bankers, including Bernanke, pleaded for government spending, fiscal policy, to take up more of the burden. They realized that making the central bank so central in managing a demand shock carried the risk of a powerful backlash. By 2021, there was considerable skepticism about the outcome of the Japanese strategy that had been the response to stagnation: large-scale fiscal expansion and the expansion of the central bank balance sheet. A new Japanese prime minister, Fumio Kishida, pledged to steer the country away from Abenomics, whose emphasis on monetary expansion accompanied by deregulation was now castigated as "neoliberal."[143]

The logic of undoing central bank independence (CBI) is appealingly, perhaps also unappealingly, obvious: if harmful levels of inflation require the remedy of CBI, do not dangerous deflationary tendencies require the reversal of CBI, more politely known as more fiscal-monetary coordination, and perhaps also a return to multifunctionality of central banks? Central banks need to experiment with pulling more and more levers to restart economic activity in the wake of a deflationary shock.

After the Global Financial Crisis, central bankers saw the institutional dangers and frequently expressed their frustration at being at the center of the effort to shore the system up against economic collapse. They wanted then to refocus attention on what governments rather than central banks should do: more fiscal effort was required. Nowhere was the demand articulated more insistently than in Europe, where the Maastricht Treaty had constructed the world's most independent (or, in the eyes of its critics, least accountable) central bank. Mario Draghi in particular pushed insistently for more fiscal coordination, but his predecessor, Jean-Claude Trichet, had made the same kind of argument, though less emphatically. Leaving the ECB, Draghi concluded: "Monetary policy can still achieve its objective, but it can do so faster and with fewer side effects if fiscal policies are aligned with it."[144] Europe is again the guinea pig for the development of a theory of central banking that fits with current policy concerns. The ECB standpoint is not, however, singular: Fed Chair Bernanke made very similar arguments to those of Draghi.[145]

The logic of eroding CBI was also pushed as the role of central banks again became more complex and varied. The background to the extraordinary range of criticism of central banks in the 2010s was that policy had become more complicated, and that many of the practical steps to combat the crisis involved elements where distributive spillover effects were much clearer than in the case of monetary policy. Rescuing banks obviously involved a fiscal element, and the major initiatives came from the government, from treasuries and particularly from prime ministers and presidents. Policies that required buying certain classes of assets on the central bank balance sheet also changed relative prices. As central banks moved back more into financial regulation, and made judgments about what sorts of lending might be desirable, their actions were clearly also favoring and disadvantaging specific sectors of the economy. When distribution is at stake, the choice looks political and the logic of delegation weak.[146]

By the end of the 2010s, and on the eve of the Covid pandemic, this view had become a practical policy consensus. In the immediate response to Covid, there was more uncertainty about future inflation trajectory: the forecast range has increased. Were there inflation dangers that might lead to a push for more CBI, or deflation risks in a crisis that would indicate a need to continue on the post-2008 course?

In this uncertainty, and especially as the inflation risks may appear greater, some of the old arguments *against* CBI began to appear again. In the aftermath of the First World War, central banks that continued a monetary accommodation of fiscal dominance had justified their policy as a patriotic necessity. Central banks fundamentally controlled the cost of government debt, and hence they were subject to irresistible pressure. The language of patriotism was also enunciated as the Truman administration sought to persuade the Fed to keep rates low in the midst of the Korean War. When Truman received the entire FOMC, he started with an amazingly explicit explanation of U.S. foreign policy. He "emphasised that we must combat Communist influence on many fronts. He said one way to do this is to maintain confidence in the Government's credit and in Government securities. He felt that if people lose confidence in Government securities all we hope to gain from our military mobilization, and war if need be, might be jeopardized."[147] It is striking that former chairman of the Fed, Marriner Eccles, the major dissident who was now very hawkish on inflation, also laid out an alternative view of foreign policy: he did not like the Korean War and worried that the United States "was stumbling into an uncharted Asian morass without reckoning the costs."[148]

What is the modern equivalent of that argument about national security? In some countries the language of Rudolf von Havenstein or of Truman about defense and national interest appears. That is dramatically evident in the statements of Turkey's President Recep Tayyip Erdoğan about high interest rates as "the mother of all evil," orchestrated by "Turkey's enemies, who are hiding behind currency rate speculators, the interest rate lobby, or credit rating agencies."[149] The push to control interest rates—the motivation of Havenstein or Truman—is evident in the dismissal of Turkey's central bank governor Naci Ağbal in March 2021, after he put interest rates up by 2 percent.

Most European countries and politicians would not have argued in Erdoğan terminology about national needs before the 2022 Russian attack on Ukraine. But they did point to a further set of policy desiderata—the twenty-first-century equivalent to overriding national interest—in making the case that the existential threat of climate change requires a new orientation of the central banking framework, and a new element of fiscal-monetary interaction. The ECB was especially innovative in this regard, but also ran into the difficulty that some of the bonds taken in the asset-purchasing program (from airlines and other carbon producers) did not look climate-neutral. On the other side of the Atlantic, the Fed thought about policy measures that might counteract racial inequalities. In both cases, the priorities of central banks in tackling pressing policy questions cannot be isolated from more general orientations of government policy.

Central banks have taken on many new roles, on the basis of a model initially generated in respect to the long period of Japanese stagnation after 1991. The new orientation drove a campaign to bring down interest rates to a natural rate of interest (r*) . The major beneficiaries were not only the holders of financial assets and real estate, but also governments that saw a way to free themselves from spending constraints. That included many populist leaders. The vision of a helicopter drop appeared to give new opportunities to governments. The lesson was only rubbed in by a new wave of central bank action in the Covid crisis. Thus, for instance, Italy's Matteo Salvini announced that he had renounced his former opposition to the Euro, and now wanted to see money being spent: "Covid has forced European institutions to listen to us. We hope that Covid has taught everyone that austerity doesn't work." Since central banks were so powerful, everyone now wanted to ensure that central bank action worked on their behalf. These institutions thus appeared to be at the center of disputes about distribution, domestically and internationally. And that was a highly uncomfortable position. A central mechanism of global connectedness—of globalization—was thus placed under increasing strain.

Globalization at this point was fragmenting into competing visions, with a new alternative to the mid-twentieth-century, United States–dominated version of opening multilateral trade. Instead, a focus on the infrastructure of land and sea routes as promoted in China's Belt and Road Initiative saw the logistic of supply as the key to controlling globalization and projecting a new sort of political power. That vision could be extended in a new crisis, in which a supply shock would shape the crisis response.

7

The Great Lockdown: 2020–2022

The Great Recession was widely blamed on globalization, as was the new shock of 2020. The Covid-19 crisis was very obviously a product of globalization—of the web of global interconnections—and the challenge was managed through a combination of technology, politics, and interconnectedness: or, in other words, genius, government, and globalization. And of course, the way in which these elements mixed together generated controversy.

Some deglobalizers liked to make the connection between Covid and globalization very explicit: thus President Trump's trade adviser, Peter Navarro, called globalization the "original sin" that had been punished by the pandemic.[1] The intuitive idea that globalization might produce contagious diseases had already been mooted in popular culture in 1993, in an episode of *The Simpsons*, in which Homer Simpson became a superspreader for "Osaka flu" carried on packaging from a Japanese-produced consumer product delivered by mail. Shortages appeared everywhere in the aftermath of the Covid disruption: the absence of medications, protective equipment, oxygen, vaccines, then of toilet paper, semiconductor chips, transportation facilities, fuel, exercise equipment, in short anything anyone could want in a lockdown. Vulnerability was obvious and ubiquitous. Chance events—a container ship stuck in the Suez Canal or a Covid outbreak in a Chinese port—disrupted supply chains, with ripple effects all over the world. Small incidents underlined the fact of global interconnectedness and the substantial vulnerability of globalization. Then, in 2022, Russia invaded Ukraine, unleashing the most serious conflict in Europe since the Second World War, with new and menacing disruptions of supply chains.

When originally tiny impetuses like a virus unleashed uncontrollable processes, what frameworks and methods were best suited to analyze the threat, and then produce solutions? Could, as in previous crises, the many technical and organizational possibilities that had already been developed be unleashed again to save the world, and could globalization be reinvented? Nanotechnology offered a medical answer to Covid: could a new sort of economics (perhaps nanoeconomics?) deal with the challenge?

At the beginning, in the winter and spring of 2020, Covid appeared as a temporary shock; two years into the pandemic, as it spread across the world in unpredictable waves, and as the virus developed mutations and variants, it looked more like a semipermanent phenomenon. In December 2020, a new and more contagious variant, Delta, appeared in India and within months became the dominant form of the disease. In late 2021, Omicron emerged in South Africa as an even more contagious variant and spread quickly across the world. As more people were vaccinated against the disease and became infected, and in some cases had a low level of antibody resistance, it became more likely that resistant forms of the virus would evolve. Initially, schools and businesses thought that they might be closed for three or four weeks in order to protect hospitals from being overwhelmed by an initial surge: the phenomenon is the equivalent of the belief in the summer and fall of 1914 that the war would be over by Christmas. It was simply difficult to imagine the long duration of the disruption because it appeared so unprecedented.

As with wars, Covid initially produced impressive displays of solidarity. Health-care workers, the frontline soldiers in the new conflict, were cheered in many countries. As the war on the coronavirus went on, that solidarity disintegrated, with fierce clashes in many countries between opponents of lockdowns, vaccines, and tests and groups that endorsed official policy. Adding to the confusion was the sharp variance between governments in their handling of Covid, with some imposing very strict lockdowns, while other countries adopted a more laissez-faire approach and shutdowns there followed from the voluntary actions of citizens who tried to reduce their exposure to the virus. Experts were divided on the effectiveness of the various antipandemic measures, and ordinary people turned themselves into armchair strategists. Weariness, disillusion, and cynicism set in. The already precarious social fabric was strained further.

Some boosters of globalization argued that entrepreneurship, in particular in the obvious case of biotech, showed the way out of the crisis. There were new heroes, who were often characteristically internationally mobile figures: the Hungarian-born Katalin Karikó of the University of Pennsylvania, who worked on RNA-mediated mechanisms for therapeutic use; Stéphane Bancel, the French-born CEO of Moderna; or Uğur Şahin and Özlem Türeci, the German Turkish-born husband-and-wife team of oncologist and immunologist who founded the startup BioNTech in 2008. They developed a successful mRNA (messenger RNA) vaccine against Covid-19 within days of Chinese scientists releasing the genetic sequencing of the coronavirus on January 10, 2020: that was also the day on which the first fatality was ascribed to the virus in Wuhan. Moderna and BioNTech each looked like highly speculative companies. BioNTech had begun with a funding program (GoBio) of the German Federal Ministry of Research and an initial investment from the founders of a large German generic pharmaceuticals producer. It went on to register a large number of patents and in 2019 listed on the US NASDAQ, but it was not a major drug producer. Moderna in 2018 had launched the biggest-ever IPO for a biotech company and had a valuation of $7.5 billion, even though it had never secured regulatory approval for any drug or vaccine. With that amount of money secured on the capital markets, Moderna could research vaccines for viruses such as Zika and Cytomegalovirus, and build a large-scale production facility in Massachusetts in 2018. In the face of Covid, it raised $1.3 billion to scale up manufacturing. This was a triumph of inventiveness, but also of venture capital. In the UK, the appointment of Kate Bingham, a venture capitalist from SV Health Investors, as chair of the UK Vaccine Taskforce, where she managed the infrastructure and trials needed to obtain 350 million doses of six vaccines, was one of the few unambiguously successful decisions taken by the UK government.

But maybe it was government that was decisive in pushing medical and vaccine development? Back in 2013, the U.S. government via its iconic research incubator DARPA (Defense Advanced Research Projects Agency) had given grants to private companies to research medical solutions for rare diseases: Moderna received $25 million to work on an mRNA drug to fight the tropical mosquito-borne disease chikungunya. On May 15, 2020, in the face of the pandemic, the U.S. government launched Operation Warp Speed, a $10 billion program to accelerate vaccine production and development. It provided $1.53 billion to Moderna, and substantial amounts to AstraZeneca and Johnson & Johnson, but nothing to Pfizer, which worked with BioNTech. BioNTech received a much smaller amount, €375 million, from the German government to scale up its production as it embarked on Phase III trials. Warp Speed was a dramatic success for an administration much of whose response to the pandemic was characterized by willful downplaying of the health threat, advocacy of quack cures, and nationalist rhetoric. The results came too late, though, to produce any reelection boost for Donald Trump: Pfizer submitted its request for emergency approval of the vaccine by the Food and Drug Administration (FDA) on November 20, 2020, a fortnight after the election, and Moderna on November 30 (the approvals came on December 11 and December 18, respectively).

The underlying technologies that offered solutions were not completely novel. Nanotechnology, the process used to deliver a genetic sequence of viral proteins to host cells, was probably inspired by a rather whimsical lecture by the later Nobelist Richard Feynman in 1959, titled "There's Plenty of Room at the Bottom." A decisive instrument, the scanning tunneling microspore, was pioneered in 1981, and in the 1990s research on nanotechnology exploded. In 2020 there was a clear problem, the question of vaccine delivery, that the technique addressed.

The amounts spent by governments in promoting the rapid development of the vaccine, and in buying the products in advance, were probably the most effective government program ever measured in terms of the resulting savings for society, but also for the government. It is not surprising that the vaccine generated a general euphoria about the transformative potential of public spending. Vaccines and medical equipment were not the only contributions of the state: politics was also expected to mend a social fabric already riven by acute strain. Political systems had been riven by the populist revolts that culminated in the 2016 Brexit vote and the election of Donald Trump; the outcome was a general push for bigger government. Trump's substantial popularity even in the bleak circumstances of 2020 relied heavily on large government payments ("stimulus" checks or "stimmies," mailed out and printed under the president's name). The British Conservative (Tory) prime minister Boris Johnson won a spectacular election success by campaigning on a promise to revitalize declining northern English industrial areas: elect a Tory, it was said, and you will get a factory. This was an electoral model that was globalized—widely repeated over the whole world. It also represented a rather belated response to the logic of interest rates and debt during the 2010s, when it appeared that the low level of interest made government spending in effect free.

The pandemic was clearly a global challenge that required and should have produced an internationally coordinated response, not only in restricting movement but also to develop vaccines and medical treatments. The G20 had delivered an impressive response to the 2007–2008 Global Financial Crisis, and in Covid also generated much rhetoric about coordination. There was a similar concern with big headline numbers. Johnson announced, in anticipation of the June 2021 G7 meeting at Carbis Bay, Cornwall, that "[v]accinating the world by the end of next year would be the single greatest feat in medical history." He promised one billion additional doses of vaccine.[2] But delivering vaccines is harder than simply generating more money. There was thus plenty of money creation, but a shortfall in the physical products—medications, vaccines—needed to combat the virus. In a crisis originating in a collapse of demand, it is important simply to spark more activity, as any sort of demand will have an impact and revive confidence. The Covid crisis was not primarily about a random absence of effective demand. No magic can simply create effective vaccines or dramatic cures (or for that matter the military equipment that corresponded to quite precise needs); and fiscal expansion might be catastrophically misdirected if the products and services it purchases are ineffective.

The Link of Disease and Economics

Covid had hit out of the blue. On January 4, 2020, the World Health Organization (WHO) announced a cluster of pneumonia cases "of unknown cause" in Wuhan, China. On January 21, the Department of Health in Washington State reported the first confirmed case of Covid-19 in the United States in Snohomish County, Washington, in a patient who had traveled from Wuhan. On January 30, the WHO announced a "public health emergency of international concern" regarding the outbreak of novel coronavirus, and the following day the U.S. Secretary of Health and Human Services proclaimed a public health emergency. On February 21, the first Italian case was detected near Milan. On February 29, the governor of Washington revealed the first confirmed death in the United States from Covid-19 and declared a state of emergency. On March 1, the governor of New York detailed the first case there, in a medical worker. We know after the event that all these announcements came much later than the first outbreaks: California had cases long before Washington, the virus was circulating in Wuhan in the last months of 2019, and Italian medical authorities screened blood samples from cancer screenings and found evidence of the virus in Lombardy from September 2019. On March 11, 2020, the WHO classified the outbreak as a pandemic.

Evidence quickly emerged of how contagion occurred through "superspreader events." This was the butterfly flapping its wings and creating a worldwide tempest. On February 19, 2020, a football match of Valencia against Atalanta (the local team of Bergamo), held in Milan, drew around 44,000 Bergamese and produced a surge of cases two weeks later. Luca Lorini, the head of the intensive care unit at Bergamo's hospital, explained that "I'm sure that 40,000 people hugging and kissing each other while standing a centimetre apart—four times, because Atalanta scored four goals—was definitely a huge accelerator for contagion."[3] There were other big gatherings in Lombardy, such as Brescia's folk festival of San Faustino, involving around 100,000 people celebrating in the streets. A Biogen conference in Boston on February 26–27 created more than 100 cases directly tied to the meeting, but was later calculated to have led to between 200,000 and 300,000 coronavirus cases across the country.[4] On March 7, a barkeeper in the Austrian ski resort of Ischgl showed symptoms; nothing was done by the Austrian authorities for a few days, except that the bar (the Kitzloch) was closed down; and then on March 13, the whole resort was closed abruptly and the tourists sent home, often in very crowded buses and trains. The Ischgl outbreak then produced outbreaks in forty-five countries.[5] A choir practice in Skagit County, Washington, on March 10, attended by sixty-one people of whom one was symptomatic, produced fifty-three infections, even though the mostly elderly choir members stayed well away from each other. The catastrophic second wave of 2021 in India was driven by exaggerated confidence that the virus had been conquered. In January 2021, Prime Minister Narendra Modi told the Davos World Economic Forum: "Predictions were made that India would be the worst-affected by the coronavirus in the world. Today India is among those countries that have succeeded in saving the lives of its citizens." His party then announced that India had "defeated Covid."[6] But then large election rallies and the Hindu religious festival Kumbh Mela turned into superspreader events.

Paul Krugman's cantankerous obituary of Milton Friedman speculated about the relationship between an extraneous shock and sentiment about the effectiveness and competency of government policy: "Suppose that a flu epidemic breaks out, and later analysis suggests that appropriate action by the Centers for Disease Control could have contained the epidemic. It would be fair to blame government officials for failing to take appropriate action. But it would be quite a stretch to say that the government caused the epidemic, or to use the CDC's failure as a demonstration of the superiority of free markets over big government."[7] Policy was at the center of the response to the crisis—and it was the target against which public criticism reacted most strongly. In fact, the CDC's response was remarkably inept, incapable of dealing with data collected in different ways and on differing computer systems by a plethora of state authorities. It was thus hard to produce an overall view of the crisis or to map out an effective policy response.

The initial U.S. response looked more competent on the economic than on the medical front. The S&P closed at a record high on February 19, 2020, but in the last week of February stock markets across the world fell by the largest extent since the 2008 financial crisis. On March 3, the Fed cut the federal funds rate, and on March 9 the S&P 500 Index fell by 7 percent, triggering a marketwide circuit-breaker trading halt for a quarter of an hour to stop disorderly trading; there was another such incident on March 12. On March 15 there was an extraordinary meeting of the Fed's Federal Open Market Committee, which cut the federal funds rate to zero, urged banks to use the Fed's discount window, and also agreed to swap lines with Bank of Canada, Bank of England, Bank of Japan, the European Central Bank, and the Swiss National Bank. Fed Chair Jerome Powell announced that "we expect that the illness and the measures now being put in place to stem its spread will have a significant effect on economic activity in the near term. . . . In addition, the effects of the outbreak are restraining economic activity in many foreign economies, which is causing difficulties for US industries that rely on global supply chains. . . . Inflation, which has continued to run below our symmetric 2 percent objective, will likely be held down this year by the effects of the outbreak."[8] Business activity closed down, both because of official lockdowns and because many employees withdrew from contagious and dangerous work environments. The "Great Resignation," in which in the summer of 2021 some four million U.S. workers were leaving their employment every month, appeared to be becoming a long-term phenomenon.

There were thus simultaneously an economic and a medical emergency. The immediate and effective financial response, a massive surge of government debt financed by central banks, looked like an immediate miracle, calming the panic, in rather the same way as the effective actions of finance ministries on both sides of the Atlantic in July and August 1914 had immediately contained financial distress. It made it clear that governments and central banks could be very powerful—but powerful enough to fight a virus? As in 1914, financial stabilization could not tackle the root cause of the tension.

The medical emergency could be handled in a variety of different ways: first, travel bans, restrictions, or lockdowns were needed to stop contagion and prevent hospitals from being overloaded. There were soon dramatic television pictures of overwhelmed hospitals in cities like New York, Bergamo, and Milan, with patients in corridors and in long queues of ambulances outside the buildings. Many medical facilities needed to erect tents in order to handle the demand. New hospitals were constructed: in Wuhan, the first emergency hospital, Huoshenshan, was constructed in just ten days. London's new temporary hospital, named Nightingale after the heroic reforming nurse of the Crimean War, was opened in the ExCeL Center in East London, a symbolically interesting repurposing of the conference center that had been used for the landmark G20 meeting in April 2009.

Second, there was an urgent need for medical equipment to deal with the temporary emergency: face masks, other protective equipment, ventilators. The British entrepreneur and innovator Sir James Dyson spent £20 million of his company's money on developing a ventilator—only to be told in April that the British government did not actually need them.

Third came a desperate search for methods of treating Covid patients, with many necessarily untried techniques and medicines being adopted in a quite unsystematic and chaotic way—meaning that it was hard to gauge their effectiveness. Some were moonshine: Dr. Vladimir Zelenko, a family doctor in New York, treated his mostly Hasidic patients with the antimalarial drug hydroxychloroquine, an antibiotic (azithromycin), and zinc sulfate.[9] The experiment attracted the attention of President Trump, who became for some time an enthusiastic advocate of "hydroxy," as did other populist leaders, notably Brazil's Jair Bolsanaro. In France, another wild-looking, long-haired doctor, Didier Raoult, also promoted hydroxychloroquine, developed a cult following, and was visited by President Emmanuel Macron.[10] Remdesivir, authorized in the United States in October 2020, was largely disappointing. The immediate miracle cures were mostly deceptions, but gradually more reliable antiviral treatments emerged: Pfizer's Paxlovid and Merck and Ridgeback's Molnupiravir in 2021. They were easier to produce and distribute than vaccines and thus offered another chance of controlling the virus, but might not be effective against the newly emerging variants of the virus.

Finally, then, the disease might be prevented or made less severe through the development of a vaccine. Most vaccine development takes ten to fifteen years; the fastest previous case was the mumps vaccine in the late 1960s, which took four years. On January 10, 2020, China posted the genetic sequencing of the virus on Virological.org, a hub for prepublication data designed to assist with public health activities and research.[11] BioNTech started its development of a Covid vaccine two weeks after the genetic sequencing was announced, and went on to scale up the product in a partnership with Pfizer. The initial Phase I/II clinical trial data was released on July 14 for Moderna, and on August 12 for BioNTech/Pfizer. On November 9, Pfizer announced that the Phase III trial results had shown its vaccine to be 90 percent effective. On December 2, the Pfizer vaccine was authorized for emergency use in the United States.[12] But the protection was not complete: the volume of antibodies produced became lower after time, the virus mutated, and booster vaccinations were required. Nevertheless, the Pfizer and Moderna vaccines were extraordinarily effective in preventing serious disease and death, and also in reducing the transmissibility of the virus.

Operation Warp Speed was estimated to have cost some $12 billion in 2020.[13] The EU announced in July 2020 that it would spend up to $2.7 billion upfront on Covid-19 vaccines.[14] In December 2020, Belgium's budget chief, Eva De Bleeker, accidentally tweeted the actual prices paid by the EU: Pfizer/BioNTech at €12 ($14.70) per dose; AstraZeneca, €1.78; Moderna, $18; the Dutch-German Curevac, €10; Johnson & Johnson, $8.50; and Sanofi/GSK, €7.56.[15] Curevac lagged in its development largely because it did not have the funding for large-scale trials, whereas the successful breakneck development of the originally German BioNTech vaccine owed its success to the injection of large funding from Pfizer. Curevac was also hit by misfortune in that its founder and CEO, Ingmar Hörr, was hospitalized with a massive stroke at a crucial stage in the vaccine's development. The German government provided €530 million, of which €300 million was in equity; an additional €80 million came in EU loans.[16] Eventually Bayer and Novartis stepped in to support the development of the Curevac vaccine. Pfizer paid BioNTech $185 million, including an equity investment of $113 million, and promised future payments of up to $563 million.[17] The UK expected to spend £11.7 billion ($15 billion) on its vaccination program.[18]

The spread of disease produced an immediate economic and financial crisis, so that the goals of policy looked as if they might be confused: was it necessary to deal with the problems in parallel? The lockdown was making supply more difficult. The extent of the economic downturn might make the pandemic worse, as it impacted especially poorer people, who were more vulnerable to contagious disease because of cramped living quarters, poorer general health conditions, and exposure to pollutants.

Very quickly, however, it also became apparent that this was not a conventional demand-driven downturn, of the kind encountered in the Great Depression or the Great Recession. Demand did not fall across the board.

What fell was the demand for services and goods in particular that might be associated with increased risk of contagion. Even before lockdowns limited travel or restaurant eating, consumption of these products fell off sharply, while purchases of consumer durables increased. Households looked to larger refrigerators and freezers to store food products, automatic cleaning instruments (robotic vacuum cleaners) to replace hired cleaners, and other electronic products to provide entertainment, but also as part of working in a new environment of closed offices and home work. The effect amounted to a radical shift away from many services, while demand for goods remained high and even increased.

Ensuring that global financial markets continued to function was a major achievement of a cross-national policy community that had been worried about the capabilities of responding to financial crisis. The emergency required a large expansion of the central bank instruments that had been developed in response to the 2008 crisis. From March 20, 2020, stock markets staged a rapid climb back, as bargain hunters looked for opportunities, and then as others realized that the new policy orientation would stick. The euphoria looked like previous episodes of stock market froth: money poured into technology stocks, where there might be expectations of permanent gains as consumers and firms modified their behavior, into alternative currencies such as the satirically named Dogecoin, but even into the classic nineteenth-century objects of speculation. Hedge funds drove two rival Canadian railroad companies, Canadian National and Canadian Pacific, into a bidding war for Kansas City Southern.

The trigger for the turning point in U.S. market sentiment was the presentation of a relief plan by Senate Majority Leader Mitch McConnell on March 19. It was signed into law by President Trump as the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) on March 27, 2020. The legislation amounted to a $2.2 trillion economic stimulus, providing "emergency assistance and health care response for individuals, families and businesses affected by the 2020 coronavirus pandemic." There were direct cash payments to Americans below specified income thresholds, with single adults getting $1,200; an expansion of unemployment benefits; the provision of loans to small businesses to pay workers, rent, and other expenses; targeted funding for sectors principally affected by coronavirus pandemic; as well as temporary halts to mortgage foreclosures.

The legislation was necessary, uncontroversial even in an era of extreme political polarization, and widely popular. Some parts were bizarre, such as when the president insisted that his name appear on the stimulus checks. But the result was that this initiative was bound to be repeated as the pandemic wore on and on. The Biden administration adopted the idea of stimulus on a large scale, in part with an eye to future elections.

Some parts of the CARES Act largely missed their objective. There is little evidence that the payroll support for smaller businesses significantly changed hiring practices, as larger firms that were ineligible for the support behaved in the same way as their smaller competitors that were eligible. The personal stimulus payments led to an immediate surge in spending when they were paid out, but largely failed to help the businesses that were most affected by the flights away from services involving personal interaction: they simply encouraged the boom in consumer goods, especially consumer services. Automobiles, including second-hand automobiles, sold well.

The U.S. pattern has been repeated elsewhere. Average overall fiscal deficits as a share of GDP in 2020 reached 11.7 percent for advanced economies, 9.8 percent for emerging market economies, and 5.5 percent for low-income developing countries. Global public debt climbed to 97.3 percent of GDP in 2020: this was 13 percentage points over the estimated level if there had been no pandemic.[19]

As demand picked up, shortages emerged in strategic areas and then rippled out elsewhere. One of the most apparent initial problems that endured and became increasingly severe was the chip shortage, or "Chipageddon": it was generated in the first instance by a surge in demand for electronics—laptops, routers, webcams, tablets, screens—during the initial lockdown as large numbers of office workers changed to home working and upgraded their communications equipment.[20] And then people simply spent more on goods as their spending on services was restricted by lockdowns and reduced personal interaction. The chip shortages continued for a surprisingly long time, into 2022; as did shortages of basic testing equipment for public health control of the virus.

Shortages of goods were then intensified by policy action, and made much more severe by trade wars. Preexisting trade conflicts handicapped the U.S. response to the medical emergency in some key areas. Protectionist measures against a range of Chinese medical products (including protective equipment, CT machines, and patient pulse monitors) made for scarcities.[21] The trade war continued through 2020, and Trump did not attempt any deescalation. Indeed on January 24, as the news of the virus was breaking, Trump imposed new tariffs on almost $450 million of steel and aluminum products, supposedly to help industries suffering from his previous tariffs, affecting imports from allies such as Taiwan, Japan, and the European Union, as well as China. At the end of his term as president, Trump pushed the U.S. Department of Commerce to stop the largest Chinese semiconductor manufacturer, Semiconductor Manufacturing International Corporation (SMIC), from acquiring United States–based parts and tech required to produce chips that are ten nanometers and smaller, and these were central to the manufacture of smartphones and other high-tech products. In a parallel development to the nationalist rhetoric of the Trump presidency, the UK's supply chains in the pandemic were also additionally stretched by the transition to the post-Brexit trade regime with the EU and the bureaucratic complications it brought. As in the United States, the UK government might have welcomed the trade imbroglios as a diversion of attention from the mishandling of critical public health aspects of the crisis.

It was not just computing that was hit by shortages: automobiles also became scarce, as they depended heavily on chips. Many automobile producers thus halted their production lines. Ford produced 1.1 million fewer vehicles than planned.[22] For all companies together, the worldwide shortfall was estimated at 1.5–5 million fewer vehicles.[23] The effects of chip shortages were soon pronounced in completely unexpected areas: for instance, Chipaggedon shut down many electronic dog-washing booths that dispense shampoo, water, and optional fur-drying, which were used extensively on U.S. military bases as well as in civilian life. Extreme weather also produced its own shortages: summer heat in the Pacific Northwest reduced the supply of Christmas trees at the end of 2021.

Global trade was disrupted by a shortage of containers.[24] Even when production of containers rose to 300,000 twenty-foot-equivalent units in September 2020, then to 440,000 in January, the new effort was insufficient to satisfy the demand for containers in the right place.[25] And the production of containers, but also intense construction activity—at first

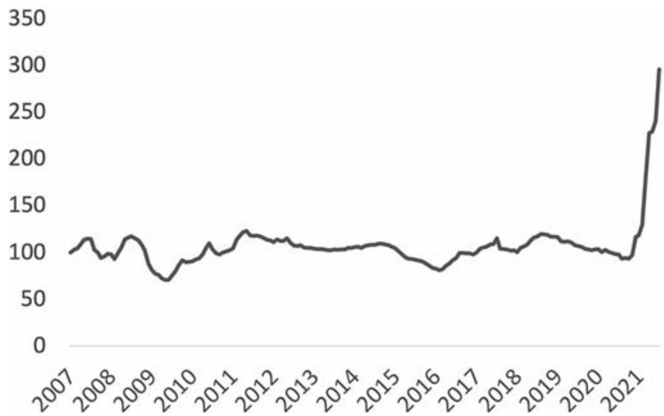

Figure 7.1. Steel price, 2007–2021: cold-rolled steel sheet and strip index (January 2007 = 100) (Source: St. Louis Federal Reserve FRED data)

driven by people relocating from dangerous or shutdown metropolitan centers, and then spurred by fears of a substantial asset inflation—created steel shortages. Hot-rolled steel hit $1,176 a ton in February 2021, its highest level in at least thirteen years; prices for other steel products also soared (see Figure 7.1).[26] In China, the producer price index surged, and in late April 2021, the Politburo pledged to ensure the supply of goods that were key to maintaining livelihoods and price stability, and also imposed measures to curb house speculation. The People's Bank of China used targeted measures to increase the supply of key products in order to stabilize prices.[27]

Raw materials needed for electric vehicle batteries and motors, spanning lithium to rare earths, have also been swept up in the euphoria. Lithium carbonate prices in China soared more than 100 percent in 2021 in response to strong domestic demand, following almost three years of decline. The rare earth neodymium-praseodymium (NdPr) oxide, used in electric motors, rose by almost 40 percent, with a similar development for cobalt, a battery metal.[28]

Substantial price increases appeared patchily, not completely across the board: hotel construction largely halted, as expectations of a long downturn in tourism discouraged investment; business apparel did not sell well, as office workers stayed at home in comfortable clothing. But the effects of demand on prices permeated into more and more areas.

Wood and timber prices soared, in rich countries in large part because of the construction boom; in India, tragically, the increased number of cremations led to a tripling of wood prices.[29]

The effects of shortages immediately pushed measures to protect supplies. The drama was most intense where the supplies were essential to public health or security. Vaccines were the most obvious subject of a new nationalism, even though the production of vaccines involved very complex supply chains. The mRNA vaccines draw on 280 components sourced from nineteen countries.[30] The early months of 2021 were overshadowed by a dispute between the EU and the UK, whose trade agreement with the EU had just lapsed as a consequence of Brexit, over the AstraZeneca vaccine developed at Oxford University. A substantial part of the AstraZeneca production occurred at the Halix plant in Leiden, Netherlands, but AstraZeneca had contracted deliveries to the UK earlier than with the EU, and the EU threatened to block exports. Dealing with the virus thus increased international tensions, but also fanned domestic distributional conflicts.

The original shortages after the outbreak of the pandemic were easy to explain: personal protective equipment, face masks, ventilators. It was also apparent to everyone that attempting to deal with the shortfall in a way indicated by classical economic theory—the price theory—would be horrendously unjust and inefficient. Those who needed protection most would be unprotected; those who could treat protection as a luxury good to brag about would live in islands of complacency.

Within a few months, the causes of the scarcity had become so complex, and so interlocking, that it was hard to imagine a way out. Labor shortages, especially of truck drivers, played a part. So did the absence of containers, or ships' crews, which got stuck in the wrong part of the world—or held in enormous queues outside limited port facilities. Consumers focused on particular scarcities: Britons worried that the shortage of drivers was leading to a shortage of carbon dioxide that limited the capacity for turkey-slaughtering plants. Farmers could not sell their turkeys to the abattoirs, and consumers believed that there would be a shortfall of one million turkeys for Christmas (the traditional British moment to gorge on turkeys). New Yorkers faced an equivalent lack of an iconic food: cream cheese for application to bagels. In Tokyo, McDonald's had to ration potato fries.

Consumers react to shortages like this in a predictable manner: they start to hoard as much as they can. They also start to buy inferior substitutes. Festive British consumers will make multiple purchases of ham, chicken, and duck, just in case their Christmas turkeys don't materialize. They probably won't eat all the alternatives they have bought and hoarded. The phenomenon of how scarcity leads to snowball effects was beautifully analyzed in the case of Communist planned economies by the great Hungarian economist János Kornai: command economies offer by far the best example of long-enduring shortages.[31] If you can't find a shoe that is the right size or the right design in shop, and you believe you are unlikely to do so, you will have a strong incentive to buy the wrong size and the ugly product in the faint hope that in the future you may be able to exchange it informally. Or people will buy clothing of the wrong size and try to alter it, sometimes even unstitching children's clothing to repurpose as wear for grown-ups. There is thus increased wastage at a time of general scarcity, and the shortages are never solved, short of a collapse of the planning system as a whole.

The anxieties of consumers are exactly mirrored in the calculations of producers. Suppliers indulge in the same kind of planning with alternatives and making the second-best. If manufacturers are not any longer certain that just-in-time delivery of parts will succeed, they need to build up extensive stockpiles. They need to have larger warehouses in consequence, and that too adds to the pressure on construction and the resources—labor, supplies—required. All these alterations add substantially to the costs of production, and then get inevitably reflected in new pricing decisions.

Shortages thus have a way of escalating, as supply constraints induce more production problems, and interconnected networks are strained and disintegrate. And countries generally behave the same way as individuals: they hoard unnecessarily—for instance, vaccines in the case of the Covid epidemic. Stockpiles accumulate, when they could usefully be injected somewhere else; and large amounts of a potentially life-saving device are simply wasted because it reaches its expiry date and/or is not stored properly. The perception of an urgent crisis makes dramatic action even more important and politically desirable. For example, countries like to compete in boasting how much vaccine they have as a short version of explaining that they are handling the crisis very well.

The successes of countries are then treated in terms of a language of nationalism: there is vaccine nationalism, supply chain nationalism. The United States and the EU poured $100 billion in subsidies to develop their own chip production. The shortages allowed plenty of opportunities for profiteers to gouge prices. That was not the only kind of malignity. States that think they control a vital supply will try to exploit it for political advantage. Russia, long used to the idea that it could use energy supplies and the threat of disruption to influence world politics, predictably used a gas supply threat to Europe in order to increase its pressure on Ukraine in the lead-up to the attack in February 2022.

The scarcities triggered competitions, bidding wars, between countries for the scarce products. They also focused more attention on geopolitics. As the supply issues increased, Russia's control of gas supplies to Europe looked like more and more of a threat. Chinese access to rare earths needed for battery technologies and energy storage—and for many other purposes—was interpreted as a competitive threat. Thinking about scarcity makes heightened competition, aggressive action, and ultimately war more likely. There is then a vicious cycle as the threat of war, the imposition of retaliatory sanctions, all make supplies scarcer, and the supply disruptions intensify. Consequently, it appeared that not only the global economy but also international politics were trapped in shortages.

When Russia invaded Ukraine on February 24, 2022, the problem of supply-chain disruptions and severe shortages escalated, as it had in the two world wars, or in the 1970s in response to conflict in the Middle East. Russia and Ukraine supplied 30 percent of the world's traded wheat, and prices shot up, affecting other grains which might be thought of as substitutes. EU natural gas prices tripled from February 18 to March 7, 2022. The world's business community was astonished to learn that 90 percent of the neon gas used in the manufacture of semiconductor chips came from Ukraine, and that that neon derived from waste products from Russian and Ukrainian steel mills. There were new shortages, and price spikes, for palladium, platinum, argon, and krypton. German automobile producers had their production halted because of an absence of the simple and low-tech wire harnesses needed to organize wiring in an auto engine. The combination of military conflict and the supply shock amounted to the most serious challenge to the global order since the 1930s.

Inequalities

The pandemic highlighted inequalities, within and between countries. The internal dimensions of inequality were obvious at the outset. Though it was initially globally connected metropolitan centers—Milan, southeast England, New York, California—that were hit, poorer and more marginal workers rapidly appeared as the most vulnerable to disease. The United States has some of the best hospitals and medical facilities in the world, but also some of the least adequate. The United States has some of the best schools and universities in the world, but also some of the least adequate. The United States has some of the most beautiful housing in the world, but also some of the least adequate.

Black and Hispanic Americans were more affected by Covid than whites. Both rates of infection and of lethality were higher. The outcomes reflected initially worse health conditions, with higher rates of long-term conditions such as high blood pressure, diabetes, and less suitable treatment for those conditions. These chronic conditions are not for the most part caused by any genetic factor, but rather by poor social conditions: greater proximity, crowding, the work environment. The impact of contagion increased because of the absence of individual rooms for isolating the sick. Less skilled workers were also overrepresented in occupations where there is inevitable physical contact, such as health care, public transport, and retail. Hispanics and other immigrants constituted the bulk of employees in meat-packing plants, where workers are in close physical proximity and cold temperatures facilitated the spread of the virus. By contrast, many office workers were able to relocate their work quite simply, and sometimes even pleasantly, to home offices. Poorer and more disadvantaged people had less access to testing, and were also more reluctant and slower to be vaccinated. The result was striking: though blacks had roughly the same incidence of Covid cases as white non-Hispanic Americans, the rates of hospitalization were almost triple, and the mortality rate almost double that of whites. Hispanics had twice as many cases as whites, three times as many hospitalizations, and twice as many deaths.[32] Evictions of renters because of arrears also magnified health problems: states without eviction moratoria experienced infection rates twice as high as states which imposed them.[33] One measurement problem, especially in the early stages of the pandemic, was that not all Covid deaths were recorded; an alternative was simply to measure excess mortality, that is, above normal rates. In the UK, all-cause mortality was almost four times higher than expected among black males for the pandemic, almost three times higher in Asian males, but only two times higher in white males. For females, there were the same discrepancies, with slightly less elevated mortality rates in each category.[34]

By 2021, the inequality debate shifted to a global scale. The worst outbreaks occurred in large emerging markets, with particularly catastrophic developments in Brazil and India. In contrast to the rich industrial countries, there were inadequate government resources to attempt to compensate those on lower incomes whose marginality made them frighteningly vulnerable. In India, 230 million people fell below the national minimum wage (around $45 a month) during the pandemic. In January 2020, 4.3 percent of Indians were earning less than $2 a day; one year later the ratio was 9.7 percent. And during the lockdown, 90 percent of India's poor faced food shortages.[35] The World Food Program reported that worldwide the number at risk from famine increased from 27 million in 2019 to 34 million in 2020, with the number increasing further in 2021.[36]

The question of booster vaccines, which began to arise with new infections in well-vaccinated countries, highlighted another aspect of the distributional question. Rich countries could afford to provide vulnerable citizens with a third dose of vaccine, but such use would restrict the number of doses available to poorer countries, where high transmission rates would lead to genetic modifications and virus mutations that might pose a more serious public health challenge to the whole world, including the rich countries.

At the beginning, policy-makers made analogies with war and military mobilization. Xi Jinping on February 6, 2020, explained that China was engaged in a "people's war."[37] On March 17, British prime minister Boris Johnson said, "We must act like any wartime government and do whatever it takes to support our economy"; and the chancellor of the Exchequer, Rishi Sunak, claimed: “We have never faced an economic fight like this one.”[38] On March 19, Donald Trump talked of “our big war,” identifying a foreign country as the enemy: “We continue our relentless effort to defeat the Chinese virus.”[39] Trade adviser Peter Navarro, on March 28, said: “We are engaged in the most significant industrial mobilization since World War Two. We have a wartime President fighting an invisible enemy.”[40] Laura Lane of the logistics firm UPS, on March 29, said at the White House that “the way we’re going to win this war is with great logistics.”[41] Harvard economist Kenneth Rogoff noted: “The whole point of having a sound government balance sheet is to be able to go all out in situations like this, which is tantamount to a war.”[42] When Joe Biden became president, he too adopted the military rhetoric, explaining that vaccination constituted a “patriotic duty.”[43]

The response thus looked conceptually similar to age-old reasoning about mobilizing for wars. An exceptional, once-in-a-generation challenge required a massive response, whose outcome would determine future fortunes. Indeed, quite quickly there was clear evidence that a rapid response to Covid cut mortality and hence the cost of the economic impact. In confronting the emergency, it was thus important to spend more now, and then pass on the burden to the future, after a rapid return to normalcy would allow wartime debts to be paid down.

The parallel to wars holds as to the uncertainty about duration. Policymakers and much of the population initially believed that the virus could be contained or limited by quick, effective action to curtail mobility and stem the initial transmission. The belief was the equivalent of the short-war illusion of 1914. Unlike in war, however, the enemy—the virus—was not visible, and could only be identified by developing complex (and initially unreliable) testing procedures. An invisible enemy lends itself to conspiracy theories. The proclivity to develop paranoid stories points to yet another similarity to wartime mobilizations.

The war analogy implied that people hit especially hard by the pandemic—serving on the front lines—should be compensated, as soldiers are in a military conflict, with the costs financed by borrowing and paid by future generations. But as in a war, purchasing power built up. The government paid individuals, who mostly saved their new additional income, as they could not spend it. They put money into banks, which then bought government bonds. In the United States, savings as a percentage of disposable personal income rose from 7.2 percent in December 2019 to a record high of 33.7 percent in April 2020, with the savings rate quadrupling from March to April 2020.[44]

As in the case of the First World War in particular, the mobilization triggered a debate about war profiteering. As poorer countries were hit, statistics on wealth inequality showed a staggeringly quick rise in the fortunes of the very wealthiest. According to research by Morgan Stanley's Ruchir Sharma, the total wealth of the world's billionaires rose from $8 trillion to $13 trillion over twelve months. There were nearly 700 new billionaires (with a total of 2,700): 234 new superrich in China and 100 in the United States. Their wealth as a share of GDP rose in Russia from 23 percent to 34 percent over 2020–2021; in India from 10 to 19 percent; in the United States from 13 to 19 percent; and in China from 8 to 15 percent.[45] Credit Suisse reported that more than 5 million people worldwide became millionaires during the pandemic, and that global wealth rose by $28.7 trillion in the first pandemic year. This development was nothing more than the extreme continuation of a trend that had set in since the millennium, and continued in large part thanks to the monetary rescue mechanisms applied after both the Global Financial Crisis and Covid. Thus the combined wealth of individuals over $1 million net worth grew fourfold over the period 2000–2020 and the share of global wealth rose from 35 to 46 percent.[46]

The capacity of countries to deliver an effective response varied considerably. Rich countries not only experienced a lower impact in terms of the economic cost of the shutdown, but were able to spend more on counteracting the effects of shutdown. Thus by the spring of 2021, the United States had implemented additional spending measures, which, coupled with forgone revenue, amounted to 25.5 percent of GDP, compared to 16.2 percent in the United Kingdom and 11.0 percent in Germany. Emerging economies experienced a sharper fall in revenue and could spend less: for China, the equivalent figure on the new fiscal impulse was 4.8 percent, and for India 3.3 percent (only Brazil was rather higher). The constraints were even greater for low-income countries, where expenditure contracted during the pandemic and rendered populations substantially more vulnerable.

Governments but also individuals in rich countries benefited from a low-interest-rate environment, which meant that debt service burdens were much lower than in the past and did not represent a drag on recovery. In poorer countries, inflation surged more quickly than in the rich countries, with rates of consumer price inflation at the end of 2021 reaching 8.6 percent in Poland, 8.4 percent in Russia, 6.1 percent in India, 10.1 percent in Brazil, 12.6 percent in Ghana, 36.1 percent in Turkey, and 50.9 percent in Argentina. The figures for 2022 are all higher. But the advanced industrial countries saw rising inflation too, with an immediate policy debate about how entrenched the new price increases would be. Obvious echoes of the policy debates of the 1970s sounded, both in respect to fiscal policy (overspending) and in monetary matters (inflation).

Fiscal debates became fraught. The initial instinct of governments everywhere, derived from the experience of the Great Recession, was to generate a maximum impact by big-headline numbers. Then, as in the Great Recession, caution set in. The European Union initially congratulated itself on its bold fiscal response, with an issue of joint debt instruments for the first time, aimed at tackling long-run problems of environmental sustainability. French president Emmanuel Macron described it as a "profoundly unprecedented step," and the president of the finance ministers' committee (Eurogroup), Portuguese finance minister Mário Centeno, described it as "a big step toward fiscal union." His German counterpart, Olaf Scholz, hailed it as a Hamiltonian moment, analogous to the mutualization of debt at the beginning of the American Republic.[47] There was little doubt that the old fiscal rules, built into the Maastricht Treaty of 1992 and the Stability and Growth Pact of 1997, required revision in light of a new interest-rate regime. But then the old struggles resurfaced between a fiscally cautious northern Europe and a south that had lived with fiscal deficits and wanted even more of them.

In the United States, the Biden administration began with a $1.9 trillion American Rescue Plan (March 2021), and in the summer of 2021 set out a $6 trillion budget that would create annual deficits of $1.3 trillion for a decade, with a promise that only high earners (over $400,000 annually) would face tax hikes. That measure ran into difficulties in a Congress in which the Senate was split 50–50 between the two parties. Senator Joe Manchin, a centrist Democrat, spoke of "the brutal fiscal reality our nation faces" and reminded his colleagues that "great nations throughout history have been weakened by careless spending and bad policies."[48] He soon began to present himself as the man who had single-handedly stopped an even more dramatic acceleration of inflation. The blocking campaign eviscerated the Biden agenda and brought back politics as usual—that is, stalemate.

The fiscal debates had their counterpart in a reassessment of monetary policy. In August 2020 the Federal Reserve reformulated its monetary policy framework with an inflation target of 2 percent over time, allowing inflation to be "moderately" higher to compensate for previous undershooting.[49] The new approach also meant defining maximum employment as the highest level of employment that does not generate sustained pressures putting the price-stability mandate at risk. A similar move from the ECB underlined how a "robust new strategy hinges on a thorough understanding of why inflation has been persistently low—and below the ECB's inflation aim—since 2013."[50] These definitions of monetary strategy had been preceded by long, drawn-out reform discussions, and the fact that they occurred a few months into the pandemic was a coincidence. But the long reflection on falling interest rates blinded the central banking community to the whiplash effects produced by the shortages and the government responses: the major central banks remained fixated on the idea that Covid represented a new deflationary shock, even as the supply problems became clear. In June 2020, the Fed concluded that its core inflation measure "would likely run well below the [Federal Open Market] Committee's 2 percent objective for some time" and deduced that "highly accommodative financial conditions" would be needed "for many years."[51]

By 2021, as the surge in prices became apparent, the central banks made another misjudgment, insisting that the disruption was only temporary or transitory. At the ECB, President Christine Lagarde pledged to "ensure that we do not overreact to transitory supply shocks that have no bearing on the medium term." She then said: "We will only react to improvements in headline inflation that we are confident are durable and reflected in underlying inflation dynamics."[52] The ECB's chief economist in the late spring of 2021 was still explaining that it was "important to take decisive action to keep up the inflation momentum, while recognising patience is required," adding that "I don't see any policy statement from any major central bank anywhere in the world saying they are going to deliver sustainable inflation at 2 per cent super quickly."[53]

Toward the end of the year, the language of temporary or transitory shocks had become an embarrassment. In August Fed Chairman Jerome Powell explained: "History also teaches, however, that central banks cannot take for granted that inflation due to transitory factors will fade."[54] On November 30, he told a congressional hearing, "We tend to use [transitory] to mean that it won't leave a permanent mark in the form of higher inflation. I think it's probably a good time to retire that word and try to explain more clearly what we mean."[55] Paul Krugman, who had been the leading light in a self-styled "team transitory," in early 2022 concluded that the word "transitory" should be retired from the economic vocabulary.[56] By 2022 the Fed committed itself to a much more aggressive anti-inflationary promise of interest-rate hikes. In Europe, the response was more tentative. ECB board member Isabel Schnabel called for alertness over upsides of inflation risk.[57] A few weeks later, she was pilloried by the German mass-circulation *Bild Zeitung* for saying on television that inflation was too low.[58]

The problem lay in an inability to determine what was happening when a major shift in relative prices occurred, which coincided with a structural break in the labor market. U.S. employment in February 2021 was 8.5 million less than one year earlier, before the pandemic. There was unemployment in sectors that had been disrupted by the pandemic, but acute shortages where new activities opened up. Some businesses including specialized health care were offering sign-on bonuses of up to $100,000.[59] The sharpest job losses occurred in services, hospitality, tourism, and leisure, but also in education and health-care services generally (the demand for nonemergency medical treatment fell abruptly). Education and health care were risky, face-to-face activities, but were also feasibly shifted to electronic online services: online learning and telemedicine. Much of that move would become permanent. Working from home looked as if it would become, in a partial form, a permanent feature of the new business normal. Fantasies about a completely new working life flourished, but some part of the dream was being realized. Call centers switched largely to complete automation. On the other hand, there was a greater demand for workers in logistics, and many indications that the increased demand would be long-term. Construction also faced shortages and a likely long-term increase in demand from increased infrastructure spending, some of it related to environmental projects.

The withdrawal of workers from some occupations, including many office jobs seen as routine or overdemanding (or both), looked like a long-term shift. In rich countries, some workers, especially older ones, left the labor market in order to pursue new strategies of self-development, often connecting with new ideas and new spiritualities from other countries. Elsewhere, the possibility of remote work allowed individuals to withdraw from crisis-ridden national markets and work internationally and virtually, for foreign currency, rather than in local occupations. Particularly tech workers saw Covid as a new possibility for entering a global labor market. Thus as Turkey hit an inflationary crisis and the value of the currency fell, young Turks shifted to working for foreign companies in a virtual brain drain, or a new form of globalization of the labor market.[60]

Addressing the issue of a permanently transformed labor market as simply one of overall wages and prices, or overall unemployment, made little sense. Fed Chair Powell complained that "there's a tension between our two objectives: maximum employment and price stability. Inflation is high, well above target, and yet there appears to be slack in the labor market."[61] In fact, the slack was a sign of a profound shift: the Great Lockdown and the Great Resignation were producing the Great Dislocation.

Elevating Competence and Control

Covid posed a profound test of competence: what kind of government could deliver most competently? In an interview after the first months of his presidency, Joe Biden said: "We're kind of at a place where the rest of the world is beginning to look to China." He then quoted the Irish prime minister as saying, "Well, America can't lead. They can't even get their arms around Covid."[62] Were there appropriate models elsewhere that could be used as templates in a learning process? The Biden administration sometimes looked to European-style welfare solutions as an answer to the challenge of building greater social cohesion. It also contemplated ways in which applications of technical advance could change the relationship between government and people.

The challenge of Covid coincidentally occurred at the same time as the world was being transformed by new technologies of communications and management. The combination of threat and opportunity meant that the stakes were raised in a crucial battle: who would command the new mechanisms of control? The battle line might be simply drawn: between venture capital that directed the shape of new investment on the one hand, and on the other side the vast resources of an authoritarian state dedicated to dramatic modernization projects. The two opposed visions confronted each other across the East China Sea: Japan, the domicile of the world's most influential venture capital financier, and the People's Republic of China, with a government committed to strategic planning.

In the globalization crises of 2007–2008 and 2020–2021, there were relatively few business failures. That was a consequence of the crisis management of liquidity by the world's central banks. But there were some dramatic collapses during the pandemic of enterprises that were trying to use, or abuse, the new technologies—or the promise and lure of those technologies.

Payments technology was the equivalent of railroads in the globalization surge of the 1870s: it provided the basic infrastructure for a new encompassing of the world, with information and the development of artificial intelligence replacing transport as the instruments that might hold the world together in a new way. As with the nineteenth-century railway routes, it was not at the outset obvious which new payments systems would be profitable and which would simply be white elephants sinking investors' money in the sand. States and investors needed to allow multiple experiments with how payments could be reconstituted.

The unknowability of eventual outcomes is very clear in the story of an iconic firm at the heart of the world's transition to fintech. A crucial part of its success depended on relations with very different kinds of government. SoftBank was founded in Tokyo in September 1981 by twenty-four-year-old Masayoshi Son, the son of Korean immigrants who graduated from the University of California at Berkeley with degrees in computer science and economics. At Berkeley he was a highly entrepreneurial student: he developed an electronic translator that he sold to Sharp Corporation for $1 million, and made another million by importing used video game machines from Japan, and installing them in dormitories and restaurants.[63] Back in Japan, he built up SoftBank as a software distributor and publisher of magazines about computing. From 1996, SoftBank worked in a partnership with one of the earliest internet search engines, Yahoo, which survived the rapid eclipse of Yahoo in the 2000s. Some ventures were even less successful: in 2017, SoftBank invested over $1 billion in shared-office-space company WeWork; and its shares fell sharply after the IPO of WeWork failed in 2019. Son's stated goal was to lay between ten and twenty "golden eggs" a year.[64] The smallest deals were around $100 million, and the biggest in the billions, to be placed in the most successful tech startups in a given category. The vision is grand. SoftBank's website predicts that humans will live to 200 and may coexist with "kind and intelligent robots" that would allow "more affluent lifestyles for all," recognizing and analyzing nonstandard data.[65] It is inevitable that many of the bold transformational projects failed: but those eclipses did not matter if there were spectacular cases of success.

The most successful of Son's engagements was unambiguously Jack Ma's Alibaba. Ma, a poor and initially rather unsuccessful student from Hangzhou, like Son had been inspired by California. Ma likes to tell the story of how he initially tested the name on a San Francisco waitress who thought that Alibaba conjured up "Open Sesame": the unfolding of every imaginable new wish and opportunity. Ma became increasingly audacious. On October 24, 2020, the Chinese entrepreneur gave a speech at the Bund Finance Summit in Shanghai appealing for a bold recasting of the world's financial and monetary order—a recasting of Bretton Woods.

> Just because Europe and the United States have something does not mean that thing is always advanced and worth having ourselves. . . . Basel Accords have put great limitations on Europe's ability to innovate as a whole, for example, in digital finance. . . . China has many big banks. They are more like big rivers or arteries in our body's circulatory system, but today we need more lakes, ponds, streams and tributaries, all kinds of swamps. Without these parts of the ecosystem, we will die when we are flooded,

> and die when we are in a drought. So, today we are a country that bears the risk of lacking a healthy financial system, and we need to build a healthy financial system, not worry about financial systemic risks.[66]

The fundamental vision was that banks should move away from collateral in their lending.

The speech prompted a fierce response from the Chinese government. The imminent $34 billion IPO of Ma's Ant Financial Group was abruptly canceled. Shares in the publicly traded Alibaba fell by 10 percent, Ma's personal fortune was reduced by $10 billion, and Ma vanished from sight. The government started a campaign to rein in the tech giants.

Ma had launched Alibaba after two previous startups that were intended to connect China with the world failed. The first, Hope Translations in 1994, did little business but quickly moved into sales of consumer items. Then came China Pages in 1995, intended to serve as a platform for Chinese businesses looking for American customers. Alibaba in 1999 was initially a business-to-business portal. The new business received a substantial push in 2002, when the outbreak of the SARS virus in southern China gave a big push to texting and to internet usage. At this point, and in response to the entry of eBay into the Chinese market, Ma set up Taobao Marketplace as a consumer ecommerce site; within two years it became the dominant player in the Chinese market. The key to its success was an escrow system, which ensured that suppliers were only paid when customers received and were satisfied with the goods they had bought. Ma also pushed a new payment technology, using QR codes that allowed payments to be made through a smartphone with a service called Alipay, launched in 2004.

Ma's system was unconventional in the sense that he self-consciously rejected both the traditional statist approach—planning—but also conventional financing. His first two ventures had failed because government officials took his ideas and developed them, unsatisfactorily and destructively in his view, with all the power of the state. One of his many aphorisms instructed: "If you plan, you lose. If you don't plan, you win."[67] That looked like a challenge to state-directed planning. But financing was initially a problem: Ma delivered a version of the old saying that a banker is someone who lends an umbrella when the sun is shining and demands it back when it starts to rain: "Raise money when you don't need it. When you need it don't go out to raise money: it's too late."[68] He was a genius at motivation—a brilliant speaker—who also built his business by boosterism and distortion. He made up what later became an iconic quotation attributed to Microsoft's Bill Gates: "The internet will change every aspect of human beings' lives."[69]

An old and tired cliché of communist mobilization pointed to the need to sacrifice for a better tomorrow. Ma delivered a capitalist version that included the beneficent effects of competition: "Today is brutal, tomorrow is more brutal, but the day after tomorrow is beautiful. However the majority of people will die tomorrow night. They won't be able to see the sunshine the day after tomorrow."[70]

The most striking feature of Ma's planning was an attention to the details of logistics and financing: goods could not be sold unless there was an effective delivery system. Above all, the transactions would not exist without an effective payments system. As he explained to Hong Kong investors, "We are almost like a real estate developer. We make sure the space is cleared, the pipes are laid, the utilities work. People can come in and put up their buildings on our site."[71] The mascot of Taobao was the deliberately small-scale worker ant, on the principle that "the ants that unite can beat an elephant."[72] The image was supposed to show the importance of working with many individuals, and not thinking simply of big strategies: that had been the undoing of rival enterprises in China, eBay or Yahoo. There may also have been a jibe at an old western orientalist vision of Asians: in the 1990s French prime minister Edith Cresson had derided the Japanese as working like "ants."[73] In 2015, the parent group of Alipay was rebranded as Ant Financial.

In order to establish Alibaba, Ma ceded financial control, with large participations by Goldman Sachs and then venture capital groups, notably SoftBank as well as Yahoo. It was Goldman that brought SoftBank in, with an initial $20 million investment. Son later explained that he was persuaded by "the look in [Ma's] eye, it was an 'animal smell.'"[74] In 2011 Ma took control of Alipay—it looked like a Chinese victory over foreign shareholders. As part of his campaign to transform China, he started cultivating a domestic audience—an action in image-building that brought him into conflict with the authorities. He was also offering apparently better conditions: Yu'e Bao, an investment product that Ma launched in 2013, gave higher returns than the state-owned banks, and by 2018 it had become the world's largest money market fund, with $244 billion in assets.[75] Ma criticized the Chinese government, and in particular its regulators: "One of the reasons why Alibaba grew so fast [was] because the government didn't realise it. . . . When they start[ed] to realise it, we became very slow." It seemed like a confession that a big private-sector player could not be too innovative, as that would involve a challenge to the state and its capacity. A Hangzhou official commented: "As a private entrepreneur it's very important to find the right degree of publicity and Ma hasn't yet mastered this. It didn't matter before. Now it is necessary to start learning."[76] Alibaba was fined a large amount for market abuse. In April 2021, Ant Financial Group had a $2.8 billion antitrust penalty imposed.

The struggle between entrepreneur and planning authorities was a battle for control of data: the campaign against Ma and Ant Financial was interpreted as a push to force private fintech groups to hand over large amounts of big data to the public-sector banks. China's private tech "BAT" firms—Baidu, Alibaba, and Tencent—received about 67 percent of digital ad revenues in 2018, up from 61 percent in 2015, and accounted for about half of venture-capital investment in China.[77] By the time of the pandemic, it was widely assumed that the power of the tech titans was on the retreat, broken by a trade war between China and the United States that threatened the central connection of ideas from California to Hangzhou and Shanghai. ByteDance founder Zhang Yiming, who had developed TikTok, explained that he was retreating in 2021: "I've spent a lot of time thinking about how to better drive real long-term breakthroughs, which cannot simply rely on steady, but incremental, progress."[78] The pandemic allowed a full-scale war of the state against the entrepreneur.

The campaign of governments to assert themselves looked especially plausible when other iconic SoftBank engagements in Europe plunged into difficulties as the stress of the pandemic revealed long-standing financial irregularities and fraud. Son's $1 billion German venture looked initially as transformative of the stodgy world of traditional German finance as Alibaba had been in China. Wirecard was born in Munich in 1999, in the late stages of the dotcom boom, as a payments processor that collects credit card payments from customers for website operators: a great deal of its business at the outset was designed to make it easier (and more anonymous) for customers to pay for online pornography. The business expanded to encompass a wide range of card payments and processing, as well as the issuing of its own cards. In 2006 it moved into lending by buying the online bank XCOM and renamed itself Wirecard Bank, with a license from the payments giants Visa and Mastercard. From 2011 to 2014 the company raised €500 million from shareholders and bought up a wide range of payments companies across Asia, from a base in Singapore. Even as it was unraveling in early 2020, Wirecard concluded an agreement to be preferred payments processor for Visa's Fintech Fast Track Program in the Middle East.[79] In 2017 Ernst and Young (EY) gave the company a clean audit, reported cash generation increased dramatically, and investors' enthusiasm was fired up. The shares more than doubled in price. The group announced that it would manage Citibank's payments-processing operations across eleven countries in Asia. At the end of the year, Wirecard's CEO Markus Braun borrowed €150 million from Deutsche Bank in a margin loan secured with a substantial part of his 7 percent stake in Wirecard.

In September 2018 Wirecard replaced Commerzbank in the Dax 30 index, and by the end of the year it had overtaken Deutsche Bank, Germany's largest bank, in terms of market capitalization. From January 2019 the *Financial Times* (*FT*) began to run stories on its investigation of Wirecard's Singapore operations, and was immediately attacked by Wirecard. The definitive *FT* story appeared in the print edition on October 15, 2019, claiming that "internal company spreadsheets, along with related correspondence between senior members of Wirecard's finance team, appear to indicate a concerted effort to fraudulently inflate sales and profits at Wirecard businesses in Dubai and Ireland, as well as to potentially mislead EY, Wirecard's tier-one auditor."[80] The German regulator BaFin started to investigate the *FT* on the allegation of market manipulation, accusing the newspaper of being in league with bear speculators and of inside trading on ill-founded rumors designed only to move the market. In fact, as subsequently emerged, a number of BaFin employees held stock in Wirecard. A Deutsche Bank supervisory board member, Alexander Schütz, urged Braun to "do [the *FT*] in!!"[81]

In April 2019 Wirecard announced a €900 million injection of cash from SoftBank. In March 2020, a KPMG audit was supposed to be concluded, but the publication of a report from the accounting firm and full-year results audited by EY were postponed to the end of April, and was indeed then eventually published on April 28. KPMG now said that they could not verify that arrangements responsible for "the lion's share" of Wirecard profits reported from 2016 to 2018 were genuine, and also queried €1 billion of cash balances that were supported only by dubious Singapore documents.[82] On June 5, Munich prosecutors launched a criminal investigation; and on June 18, when Wirecard was to have published its audited results for 2019, the company's management announced that €1.9 billion, supposed to be owed by Philippine banks, was "missing." On June 23, Braun was arrested, and on June 25 Wirecard filed for insolvency. The secretive chief operating officer, Jan Marsalek, who had joined the company in 2000 as a twenty-year-old, fled to the Philippines the day he was sacked, and probably ended up in Russia. He wore an expensive Vacheron Constantin tourbillon watch with exposed gearwork, along with black Ermenegildo Zegna suits; he also handled very large amounts of cash, which his staff moved around in plastic supermarket shopping bags.[83] By 2021, a German parliamentary investigation reported that the EY audits from 2014 had relied on verbal assurances from executives, and that the 2018 audit contained insufficient details to check individual transactions that were purportedly processed by the Asian outsourcing partners.[84]

In September 2019, Markus Braun had been the subject of a double interview, along with Christian Sewing of Deutsche Bank, and radiated optimism. He boasted of "organic growth" in Germany of an average of 20–30 percent annually.[85] Deutsche Bank in fact had an exposure of €80 million to Wirecard as part of a bigger syndicated loan to the group, but because of a hedging strategy managed to limit its loss to €18 million. At the time, Braun was pursuing a "Project Panther" through which Wirecard would take over Deutsche Bank. Sewing later explained that Wirecard "put Germany as a financial centre into a bad light."[86] Braun had engaged in a bold bid to take over the heart of Germany's financial system. In order to do that, he also needed to capture the state. Through the intermediation of a charismatic former defense minister, Karl-Theodor zu Guttenberg, he had secured the attention of Chancellor Angela Merkel, who lobbied for Wirecard on a state visit to China in September 2019. She later acknowledged the mistake, but claimed that lobbying abroad for German companies was part of her job, and that there was "no 100 percent protection against criminal behavior."[87]

There was a UK equivalent to Wirecard in the combination of a promise of transformational finance with the centrality of access to government and the levers of power. A few months after a $7 billion IPO was being discussed, Greensill Capital was no longer in business. The company became insolvent in March 2021, after $4.6 billion insurance cover lapsed and the firm's funding sources, above all from Credit Suisse and SoftBank, dried up.

The UK fintech company had been created in 2011 by Lex Greensill, an Australian farmer turned banker. An expert salesman, he delivered a smooth patter about how watermelon producers were suffering because of delays in payments, and how financing could transform their situation, but also generally raise market efficiency. In May 2020, for instance, Greensill suggested that conventional banking "will be replaced with a newer model that is based on big data, and I think that tectonic shift is going to impact all players in the market. We're just at the very earliest stages of that."[88] He looked like a financial Wizard of Oz. Greensill engaged in a particular apparently niche activity called supply-chain finance. Historians of finance see this business as the oldest application of finance. Merchants buy and then ship goods, but they do not have the money to pay for those products until they have sold or distributed them. Financing the transaction, giving the merchant a credit on the security of an invoice or a promise to pay, is thus an activity that can lead to otherwise unmet needs being satisfied. The basic process was already familiar to the civilizations of ancient Mesopotamia.[89]

Above all, supply finance was the centerpiece of late medieval and early modern finance. The decisive innovation, and a foundation for subsequent financial development, was the bill of exchange, a document requiring payment of a specific amount at some point in the future. Merchants would buy such a document and send it to the country from which they wanted to import, where it could be used to secure the ownership of a product—say, a bale of wool—by another merchant, who would then present the bill to the agent of the original issuer. Bills of exchange avoided the need to transport physical cash, which would have been risky, and also acted as credit instruments. The issuers of bills often worked with large customer deposits, as they did with other banking transactions. From a modern point of view, the particular attraction was that companies could use access to supply credit without appearing to be building up debt.

Greenhill obtained access to venture capital first from General Atlantic, then from Facebook and Alibaba: and that looked as if it set it up to qualify for access to SoftBank funding. The SoftBank funding—$1.5 billion—came in 2019 and was utterly transformative. A large part of Greensill lending went to a very limited group of companies associated with a trader named Sanjeev Gupta and his Liberty House, which from 2009 appeared to be buying a substantial number of old, outdated steelworks and promising technological regeneration and environmental sustainability. That looked like an attractive proposition to governments facing the social and political challenges of handling a declining industry. By 2020 there were some 35,000 employees dependent on this range of enterprises in some 200 plants all over the world, and $20 billion in annual turnover. Gupta played up the innovative green character of the technology: he told the Davos World Economic Forum in 2020, "Most of the world wants to go to legally-binding carbon neutrality by 2050."[90] The dream faded. In early 2021, two foundries in Poitou and a plant near Châteauroux producing alloy wheels went bankrupt. Greensill's financing went through an old and apparently sleepy institution, Nordfinanz Bank AG in Bremen.

There were plenty of Strousberg-like warning signals that should have given a clue as to the problematic character of the enterprise: the fleets of corporate jets (painted in matching colors) of Gupta and Greensill, or the extravagant mansions. Afterwards, it was all too obvious: the *Financial Times* even commented on Greensill's footwear, with Sebastian Payne, the paper's Whitehall editor, tweeting: "The more I look, the more questions come to mind. Mostly disappointed that I have the same boots as Lex Greensill."[91]

The collapse of Greensill provides a costly warning: about extravagant claims about financial innovation, or lobbying, or lack of transparency, or about inadequate risk diversification. These are all obvious lessons about the least attractive features of the interplay between capitalism and government, and yet they continuously need to be relearned and reemphasized—because they are always being forgotten.

Take just the lobbying. Greensill was trying to use former Conservative Prime Minister David Cameron (who became his employee) to entice the Saudi government to press investors to put more funds into SoftBank, which might then in turn increase its backing of Greensill. And then, with Covid, Cameron was instrumentalized to attempt to obtain access for Greensill to an emergency loans scheme, and at the same time also to advance wages and salaries to desperate National Health Service workers. The former politician repeatedly lobbied both the Treasury, intervening personally with the chancellor of the Exchequer, and the Bank of England. At least sixty increasingly insistent text messages were fired off from Cameron's smartphone. Why was an intermediary needed to help the British government give advances to its own employees? Cameron was turned down because the Department for Business was suspicious of the linkages between the different Greensill companies and feared that the government funding would not stay in Britain. In the runup to the 2010 election, Cameron had attacked the Labour prime minister for his handling of an expenses scandal, and had declared that "lobbying has tainted our politics for too long. We all know how it works. The lunches, the hospitality, the quiet word in your ear, the ex-ministers and ex-advisers for hire, helping big business find the right way to get its way. In this party, we believe in competition, not cronyism."[92] He now lived from the network of influence that previously he had excoriated.

Another lesson concerns the nature of innovation. What did Greensill bring? Why did governments—from the Saudis to Whitehall—want to trust a company the bulk of whose financing activities were limited to a narrowly focused steel business, the GFG Alliance of Sanjeev Gupta? The superficial answer is that there was an attractive business model at the heart of the promise of the Greensill approach, which might modernize Saudi Arabia's handling of the Mecca pilgrimage and Britain's National Health Service. Was that really so new?

When is finance innovative? The great push of financialization from the late twentieth century emphasized apparently new products, delivered through securitization. A range of diverse assets could be made apparently safer or more transparent by bundling them together, and then splitting up the product according to specific criteria so that it could be remarketed. Different elements of risk could thus be separated out and sold to those willing to hold them. After 2007, the euphoria turned, and the process then was blamed for escalating rather than reducing risk. But it still continued.

Greensill—but especially his credulous creditors (above all SoftBank and Credit Suisse)—might have done well to study the story of some of these medieval banks, the most famous and best documented of which were based in Florence. Indeed, the Medici are so famous—also as patrons of the arts, as politicians, even as popes—that some modern fraudulent institutions borrowed the name in order to impress.

The Medici bank has been chronicled by probably the best monograph on a bank of all time, by the great twentieth-century Flemish historian Raymond de Roover.[93] The Florentine bank had branches in Rome, Venice, Naples, and Milan, but also in Avignon, Geneva, Bruges, and London, which were run through partnership agreements. The most distant branches, in Bruges and in London, were the most problematical, in part because of the geographical distance, but also because they needed to operate with constant interactions with strong and unpredictable states. Consequently the local agents of the Medici needed to lobby intensively, and make concessions to rulers in order to obtain favors from governments, such as permission to export the goods (wool) whose trade they were financing. So they lent more and more to governments, which used the money for their own purposes.

The engagement of the Medici bank in financing the English Wars of the Roses brought a crucial financial weakness. The London branch needed to lend larger and larger amounts to the Yorkist monarch Edward IV for wars and dowries to secure political alliances. The first branch agent gave up in disgust and was followed by Gherardo Canigiani, who made himself into a devoted follower of the king instead of his bank, and the whole partnership had to be wound up in bankruptcy.

The bank—which failed completely a few years later—served as an exemplary warning lesson for Machiavelli. His *History of Florence* attributed the downfall of the bank to branch managers who themselves started to act as princes. Adam Smith reengineered the story to show how government enterprises—which the Medici bank became—were corrupt and wasteful: Lorenzo the Magnificent had used "the revenue of the state of which he had the disposal."[94] States in the end had the upper hand, with the consequence that if innovative financiers really wanted to succeed in their transformational dreams, they needed to take over (or "capture," in the language of political scientists) the state. At first it might have looked as if the British or German states were more vulnerable to capture than the Chinese state. But we know more about their operations, and we know it more quickly. The Chinese state may be more resilient against capture, but in building its resilience it may also be cutting itself off from the dynamic of change and of transformational technology.

A Tale of Two Modes of Analysis

The positive supply shock of the 1870s prompted a thinking about relative prices that pushed the marginalist revolution, the shift to microeconomics. In the 1970s, a negative supply shock raised a question about macroeconomic monetary and fiscal responses, and also a pushback against macroeconomic diagnoses and prescriptions, whether Keynesian or monetarist, by Friedrich von Hayek. The pandemic that began in 2020, a supply shock, also raised a question of which tools of analysis could best be used to comprehend the crisis and to assess the most effective remedial strategies. Data, especially highly granular data, appeared to be the key to both the medical and macroeconomic responses, but there was general agreement that the data was very ineffectively handled. The largest and most powerful countries looked particularly problematic: China and Russia keep their information on a global threat highly secret, while the United States had to rely on real-time data from other countries, such as Israel, Britain, and South Africa. Former CDC Director Tom Frieden testified in May 2021: "Our nation had a patchwork of underfunded, understaffed, poorly coordinated health departments and decades out-of-date data systems—none of which were equipped to handle a modern-day public health crisis."[95]

The policy choice may be thought of as a clash of economic methodologies: a clash personified by the differences in vision of the two youngest economists to have been given tenure in the Harvard Economics

Department. Both also had fathers who were prominent economists, but here the similarities end. On the one hand, Larry Summers, born in 1954, was the inheritor of the tradition of big thinking in macroeconomics, a figure whose intellectual inheritance very much resembled that of John Maynard Keynes. On the other hand, Raj Chetty, born in New Delhi in 1979, was someone whose vision was shaped by globalized mobility and the chances that it offered. He wanted to drill down into the details: why life chances and experiences were different in one place than another. This might also be a clash of generations, separated by exactly a quarter of a century, as well as a clash of methods. The Keynesian tradition was often caricatured as being a paternalistic and technocratic top-down approach to policy-making, nanny economics; the new revolution was about nanoeconomics.

Larry Summers was a late-twentieth-century equivalent to Keynes at the beginning of the century: indeed his background might well be described by the words that Keynes's biographer Robert Skidelsky applied to Cambridge, "the arrogance of a place." Like Keynes, he came from an academic dynasty: his parents were both economists, Robert Summers (originally Samuelson) and Anita Summers. Two of Summers's uncles, Paul Samuelson and Kenneth Arrow, also economists, won Nobel Prizes. Summers himself won the John Bates Clark Medal given to the best economist under forty. Like Keynes, he moved easily between academic life and the world of policy, and, also like Keynes, he was constantly enveloped by controversy.

He worked in numerous areas of economics, notably public finance, labor economics, and macroeconomics, and also thought consistently about the discipline, its methodology and orientation. Some of his papers took aim at the efficient-market hypothesis that gained currency in the 1970s and early 1980s; and he made very Keynes-like points about the bounds to knowledge and to rationality. The widely quoted opening of one of his papers warned that "there are idiots. Look around."[96] He pushed consistently for evidence-based economics: "No small part of our current economic difficulties can be traced to ignorant zealots who gained influence by providing answers to questions that others labeled as meaningless or difficult. Sound theory based on evidence is surely our best protection against such quackery."

In 1991 he moved from Harvard and became chief economist at the World Bank. His relatively short tenure was chiefly remembered for the controversy provoked by a memorandum which made the case that there were efficiency gains from siting polluting industries and pollution in low-wage countries. The memorandum made the logically correct, but probably unhelpful, point that this argument was no different from other policy stances on the benefits of trade, or on the liberalization of markets, which was a key part of the Bank's vision. The paper was a focus of discussion and student protests when Summers returned to Harvard as university president after serving as Treasury secretary in the Clinton administration. Summers then simply told the student newspaper, "I think the best that can be said is to quote [New York mayor Fiorello] La Guardia and say, 'When I make a mistake, it's a whopper.'"[97]

As president of Harvard Summers ran into more controversies, and critics drew up charge-sheets of what they saw as scandals. He had resolutely defended the opening of capital markets in the 1990s, even when critics tried to show that the 1997–1998 Asia crisis followed from rapid financial opening unaccompanied by any previous building of a robust domestic financial infrastructure. He tussled with one professor, the African American philosopher, religious thinker, and social critic Cornel West, who later provided a memorable account of the exchange: "I'm afraid, my brother, that you've messed with the wrong brother."[98] He provoked the university and the whole scientific community by telling a National Bureau of Economic Research conference that men might outperform women in mathematics and sciences because of biological difference.

The greatest controversies broke out only after the Global Financial Crisis, when Summers served as an adviser to President Barack Obama. Controversy flared up again when it looked as if Summers would move into a major policy role in the Obama administration—especially when Ben Bernanke came to the end of his term as Federal Reserve chair and Summers looked like the obvious successor, and the details of Summers's 2008 conflict with Christina Romer about the size of the fiscal stimulus were revealed (see above, Chapter 6).[99]

The debates were not fundamentally about personal missteps or failings. To use the Roy Harrod terminology about Keynes, this was not the arrogance of a place but of a country. The United States in the 1990s could be supremely confident about strong growth, a strong fiscal stance in which public debt was run down, and a strong dollar. Economic performance provided a real base for intellectual dominance.

In the 1990s, Summers had been widely celebrated as someone who combated worldwide financial threats, and in particular acted decisively to prevent contagion from the Asia crisis from spilling over and affecting the United States. *Time* magazine produced a famous cover story that depicted Summers, together with Treasury Secretary Robert Rubin and Federal Reserve Chair Alan Greenspan, as the "committee to save the world." These were believers in the power of big economics. As the article quoted Summers, sitting characteristically in an international airport saying, "we start with the idea that you can't repeal the laws of economics. Even if they are inconvenient." Summers as part of this trio

> is invariably called the Kissinger of economics: a total pragmatist whose ambition sometimes grates but whose intellect never fails to dazzle. What holds them together is a passion for thinking and an inextinguishable curiosity about a new economic order that is unfolding before them like an Alice in Wonderland world. The sheer fascination of inventing a 21st century financial system motivates them more than the usual Washington drugs of power and money. In the past six years the three men have merged into a kind of brotherhood, with an easy rapport.[100]

The trio was right to be confident when everything seemed to support a triumphant world view.

That was the world that was picked apart after 2008. The autopsy of the crisis turned into a critical examination of both the American way of doing business and the American way of doing economics. Summers had been in favor of deregulation, and critics presented that stance as not just an intellectual mistake but a self-interested one. The core of the critique was that economists had been captured by interests. Joseph Stiglitz, a major critic of the U.S. government and the IMF during the Asia crisis, explained that Summers was possibly corrupt: "He has been seen to be, and probably is, captured." The accusation led to a quick counter, articulated very forcefully in particular by Ken Rogoff, and a defense of economists (such as Summers or IMF Deputy Managing Director Stanley Fischer) as acting on the basis of sound analysis and not ideology.[101] But the debate put the worm in the policy economists' apple: was analysis objective, or might it be distorted, perhaps even unconsciously, by interests?

Thus Summers was claimed to have produced—or at least bore a responsibility for—American hubris and the 2007–2008 financial crisis. He had eulogized Milton Friedman on his death in 2006: "Any honest Democrat will admit that we are all now Friedmanites."[102] As the debate over who should run the Fed raged, Senator Jeff Merkley, a Democrat from Oregon, said, "I have serious doubts that Mr. Summers, who as a committed deregulator drove policies that set the stage for the Great Recession, is the right person for a key regulatory position."[103] And in addition, there was Summers's large-scale engagement in the private financial sector. He had worked for Citigroup and the hedge fund D. E. Shaw, and was on the board of two Silicon Valley startups that were claimed to be encouraging risky borrowing from online investors.[104]

In the aftermath of the Global Financial Crisis, and with a recovery that was more sluggish than from any prior postwar recession, Summers set out a startling diagnosis of how the world had changed. It self-consciously revived the approach and the terminology of Keynes and Keynesians from the 1930s, in particular the American Keynesian Alvin Hansen, who had coined the term "secular stagnation."[105] Hansen saw the phenomenon in the late 1930s as "sick recoveries which die in their infancy and depressions which feed on themselves and leave a hard and seemingly immovable core of unemployment."[106] Population growth was declining and would in the absence of technical progress produce a large fall in investment and hence growth. Earlier, during the Great Depression, Hansen had examined the "three faucets" through which purchasing power might enter the economic cycle: business spending, consumer spending, and government spending.[107] This was the framework which Summers now updated.

In a speech at an IMF conference, Summers examined how "in the four years since financial normalization, the share of adults who are working has not increased at all and GDP has fallen further and further behind potential, as we would have defined it in the fall of 2009." The core of the analysis was the hypothesis that "the short-term real interest rate that was consistent with full employment had fallen to –2% or –3% sometime in the middle of the last decade." That thought experiment appeared

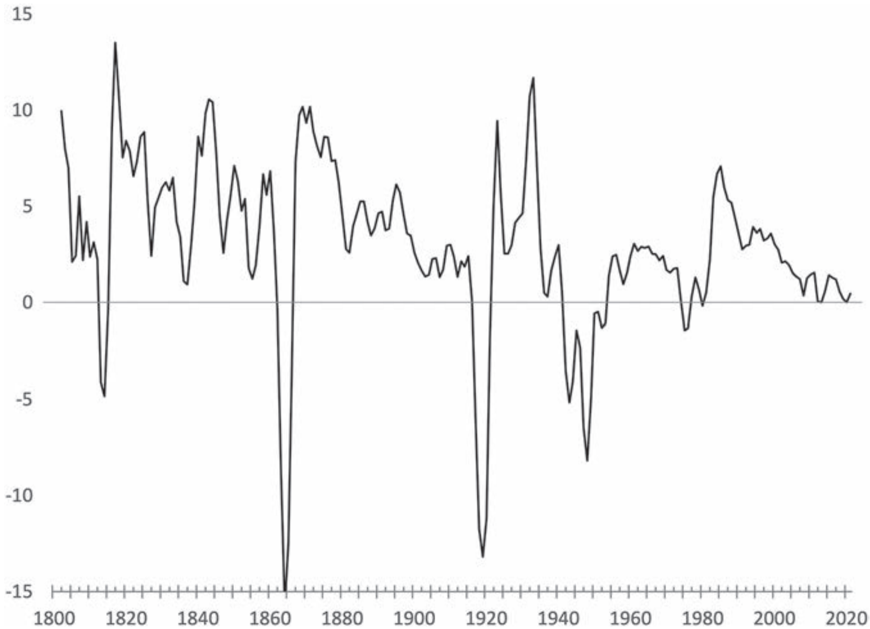

Figure 7.2. U.S. ten-year real bond yield (percent) (Source: Calculated from Global Financial Data)

to generate quite precisely the postrecession environment: "Then, what would happen? Then, even with artificial stimulus to demand coming from all this financial imprudence, you wouldn't see any excess demand. And even with a relative resumption of normal credit conditions, you'd have a lot of difficulty getting back to full employment."[108] The analysis provided a powerful explanation of the weakness of the Obama recovery. But the problem could be described not as a momentary conjuncture, but as a development over very long time periods: there was a long-run tendency of real interest rates to decline over centuries (see Figure 7.2).

The core of Summers's analysis was "sluggish growth in the face of hyper-expansionary policies and rapid acceleration in private sector credit growth."[109] There were four interrelated problems: an apparent change in the long-run potential growth rate, a temporary deviation of actual growth from its potential, a fundamental shortfall of demand, and, finally, at the heart of the demand problem, too much flexibility of prices and wages. A financial crisis alone, even an exceptionally severe one, could not explain the feebleness of the recovery. "If a financial crisis represents a kind of power failure, one would expect growth to accelerate after its resolution as those who could not express demand because of a lack of credit were enabled to do so."[110] And there would have been a problem in an alternative precrisis scenario: "Imagine that US credit standards had been maintained, that housing had not turned into a bubble, and that fiscal and monetary policy had not been stimulative. In all likelihood, output growth would have been manifestly inadequate because of an insufficiency of demand."[111]

The novelty that distinguished this diagnosis from the interwar Keynesian analysis was that the problem did not lie in price and wage rigidities that did not allow costs to adjust rapidly. Deflation came about not for monetary reasons—there was obviously a large growth of the money supply, both pre- and postcrisis. Instead, the core of the problem lay in a modern open and globalized economy that was too adaptive, and hence not producing enough demand to generate growth and full employment: "The more flexible wages and prices are, the more they will be expected to fall during an output slowdown, leading to an increase in real interest rates. Indeed, there is the possibility of destabilising deflation, with falling prices leading to higher real interest rates leading to greater output shortfalls leading to more rapidly falling prices, and onwards in a vicious cycle."[112]

The key insight was that the Full Employment Real Interest Rate (FERIR) levels "may have declined." The key to the analysis given by Summers depended on a historical analysis of trends of long-term interest rate movements. If the developments were taken as guides to the future, then conventional thinking about fiscal policy should be completely transformed.

Slower-growing or even declining population, and possibly also reduced technological growth, both led to a reduction in the demand for new capital goods to equip new or more productive workers. The price of information technology was declining rapidly, and at the same time accounted for a larger share of total capital investment. Lower-priced capital goods meant that a given level of saving could purchase much more capital than was previously the case. As a result large leading-edge companies no longer needed to go to the market to borrow for new investment;

replacement costs for capital were lower. A rising profit share would operate to transfer income to those with a lower propensity to spend. The tendency of central banks and governments to accumulate reserves coupled with conservative investment strategies raised the demand for safe assets, driving down safe interest rates. And the effect was reinforced by prudential requirements after the financial crisis that pushed pension funds and insurance companies to hold their assets in safe bonds so as to best match liabilities.[113]

The story that Summers proposed appeared to fit well the development of the U.S. labor market. The number of working-age Americans rose by an average of 1.2 percent a year in the 1990s, and by a mere 0.4 percent in 2013. The proportion of them actually in the workforce has fallen from over 67 percent to less than 63 percent.[114]

The most radical logical extension of the diagnosis of secular stagnation was presented in an elegantly mathematized presentation by Olivier Blanchard, the former chief economist of the IMF, as the Presidential Address to the American Economic Association in 2019. It was formulated in terms of a deceptively simple relation between interest rates (r) and the rate of growth (g). As long as growth was higher than the interest rate ($g > r$), debt would be reduced. That seemed to be the historical pattern: "While interest rates on public debt vary a lot, they have on average, and in most decades, been lower than growth rates. If the future is like the past, the probability that the US government can do a debt rollover, that it can issue debt and achieve a decreasing debt to GDP ratio without ever having to raise taxes later, is high." Spending thus cost less: public debt might have no fiscal cost: "the intertemporal budget constraint facing the government no longer binds." And the welfare cost, in terms of reduced investment in other areas, had also in Blanchard's formulation been exaggerated. In fact, fiscal spending was useful in preventing resources of capital or labor being wasted in a suboptimal equilibrium. Unused capital would become technologically obsolete. Workers who did not work would rapidly lose skills, and perhaps also the inclination to work.[115] There was a double issue: secular stagnation pushed down the natural rate of interest on safe assets, and central banks faced limits to their policy options because of the effective lower bound, their inability to reduce rates to much below zero. The conclusion was unmistakable: there needed to be more government.

The one area of uncertainty that Blanchard left was the question of multiple equilibria. Was it conceivable that nervous bond investors would demand a higher price for lending to governments, drive up the cost of government debt, and change the relationship between r and g? There would then be a self-fulfilling destabilization, governments would be pushed to spend less, and their debt would be less credible, or more risky, because future growth would be cut. That would then raise borrowing costs again dramatically. Something like this phenomenon describes the response of crisis countries in the course of the Eurozone debt crisis that Blanchard had had to deal with at the IMF. Blanchard's answer was that this objection was "relevant and correct as far as it goes, but it is not clear what it implies for the level of public debt." Even with quite high government debt levels, he worried about the effect of a fiscal correction. It was clear that central banks could act effectively against a panic: that was the lesson of the 2007–2008 crisis in the United States, and also of the European debt crisis in its intensive phase, to 2012; but they could not be effective in responding to more fundamental risk. There was then a cognitive challenge in ascertaining whether and when that fundamental risk existed.

The objection to this line of reasoning about the surehandedness of central banks in the face of panic derived from a political economy calculation. Was it really likely that an emergency one-off fiscal response would be followed by normalization, in which debt could be paid off? Or was it likely that if the trick worked once, it would be repeated again and again, as politicians discovered more and more pressing emergency challenges, whose solution might guarantee better future growth? Would the crisis not become permanent? Was there not too much reliance on extrapolation from safe normal times, without sufficient thinking about the intrusion of the unexpected and the unpredictable? A critic, the economist John Cochrane, recalled moments of past financial turbulence, when interest rates rose and bond prices fell. He made an analogy between a trader agreeing to buy the underlying bond at the strike price if the contract were exercised, in effect betting that the asset would continue to rise in price, and being damaged by a sudden fall, and a government that committed itself to spending that might be unaffordable when growth falters, debt outstrips consumption, and the debt-to-GDP ratio rises. In those conditions, there would be a need to repay a massive debt with taxes at a bad time because the economy was slowing or collapsing. He concluded that "[t]he $r < g$ opportunity is like the classic strategy of writing put options, which fails in the most painful state of the world."[116]

The obvious answer in the Keynesian tradition to the post-2008 predicament was then to push government expenditure on infrastructure, as a way of adding to demand and also raising the longer-term potential growth path. In an article cowritten with Jason Furman, Summers set out the view that the old balanced-budget approach of "deficit fundamentalists," the "Treasury View" of interwar Britain or the Clinton approach to fiscal stability, was outdated. Disasters such as the Eurozone debt crisis were the result not so much of deficits but of inadequate growth. "Long-term structural declines in interest rates mean that policymakers should reconsider the traditional fiscal approach that has often wrong-headedly limited worthwhile investments in such areas as education, health care, and infrastructure. Yet many remain fixated on cutting spending, especially on entitlement programs such as Social Security and Medicaid. That is a mistake. Politicians and policymakers should focus on urgent social problems, not deficits." Uniquely low real longer-term interest rates were not "manufactured by the Federal Reserve," but derived from "a set of deeper forces, including lower investment demand, higher savings rates, and widening inequality." But there might be a longer-term issue: "The deficit fundamentalists are right that the debt cannot be allowed to grow forever. And the government cannot set budget policy without any limiting principles or guides as to what is and what is not possible or desirable."[117]

Another coauthored Summers piece explained the malaise in terms of the declining "power" of the American worker. That power was what gave workers the ability to take a larger share of the rents generated by companies operating in imperfectly competitive product markets, and might act as a countervailing power to the monopsony power of firms. "Our focus on the decline in worker power as one of the major structural trends in the US economy is in line with a long history of progressive institutionalist work." Measures to restrict monopoly or monopsony power alone—or indeed, to restrict globalization or technological change—would do little to reverse the trend.[118]

Summers was skeptical of aspects of the Trump fiscal package, in particular of discussions of raising the amount paid in stimulus checks that would boost consumption but ran the risk of overheating the economy. The checks were a "pretty serious mistake." They were the product of a merging of the thought of Trump and left-wing Democrats, and in particular the Democratic Socialist Bernie Sanders: "When you see the two extremes agreeing, you can almost be certain that something crazy is in the air. . . . When I see a coalition of Josh Hawley, Bernie Sanders and Donald Trump getting behind an idea, I think that's time to run for cover."[119]

In February 2021, at the beginning of the Biden presidency, Summers continued that run for cover: it looked as if there was another Summers U-turn. In an op-ed for the *Washington Post* he began saying that Biden's $1.9 trillion Covid-19 relief plan would "represent the boldest act of macroeconomic stabilization policy in US history. Its ambition, its rejection of austerity orthodoxy and its commitment to reducing economic inequality are all admirable." The 2009 stimulus had been too small: an incremental $30–$40 billion a month for 2009, or about half the output shortfall. By contrast, the Biden measures amounted to $150 billion a month, or at least three times the size of the output shortfall.[120] The key tools of analysis for thinking about the appropriate response were thus classically Keynesian: an assessment of the output gap in this case, to gauge the amount of stimulus required, and then a theory of the multiplier in order to think of the effects of spending on raising production. And there would be further measures still to come. There was thus

> a chance that macroeconomic stimulus on a scale closer to World War II levels than normal recession levels will set off inflationary pressures of a kind we have not seen in a generation, with consequences for the value of the dollar and financial stability. This will be manageable if monetary and fiscal policy can be rapidly adjusted to address the problem. But given the commitments the Fed has made, administration officials' dismissal of even the possibility

> of inflation, and the difficulties in mobilizing congressional support for tax increases or spending cuts, there is the risk of inflation expectations rising sharply. Stimulus measures of the magnitude contemplated are steps into the unknown.[121]

The warning became ever more insistent. Thus, for instance, Summers warned on CNN: "Policymakers at the Fed and in the [White House] need to recognize that the risk of a Vietnam inflation scenario is now greater than the deflation risks on which they were originally focused."[122] Many Democrats were outraged and pronounced Summers to be "irrelevant."[123] But increased uncertainty about the path of future inflation led to a general reassessment of the virtues of stimulus. By the spring of 2022, the Summers view had become the general consensus.

In describing Keynes, his biographer Roy Harrod placed him as "a splendid afterglow of a civilisation fast disappearing." The description applies to Summers: he was in fact acutely aware of the problem of relative American decline, and of threats to the long-persisting supremacy of the U.S. dollar. U.S. international leadership was waning as a result of the powerful economic forces he described as secular stagnation. What could be done to shore up the weary titan? Did the renewal of the United States not require attention to microeconomic incentives and policies?

In the early stages of the 2007–2008 financial crisis, the Nobel Prize winner Robert Solow complained about the macro approach as expounded by Summers and the academic mainstream. As he put it, "In fact 'modern macro' has been notable for paying very little rigorous attention to data."[124] It is not surprising that there was a new counterrevolution. Summers thought in terms of problems that might be solved by using large aggregates, as in the important debate about how much fiscal stimulus was appropriate. An alternative was to use micro information to allow finely tuned policy responses, responses intended to alter particular and individual reactions that would increase general welfare.

Raj Chetty is one of the foremost pioneers of techniques that use big data. In 2007, he started to work with the IRS, with a plan to reorganize anonymized data so that it could be used to answer precise research questions. Then he, together with Nathan Hendren (Harvard) and John Friedman (Brown University), worked with the U.S. Census Bureau to construct the Opportunity Atlas, "a comprehensive Census tract–level dataset of children's outcomes in adulthood using data covering nearly the entire US population."[125] The data could then be linked to tax data from the IRS, as well as to the Census Bureau's American Community Surveys.

Chetty's work cast a harsh light on the fading of the American dream of mobility. Children growing up in low-income families have very different social mobility outcomes depending on where they are growing up. The result was expressed in stunning visualizations: above all in maps that could be expanded and honed in on the computer screen. The most famous product was a series of maps published in 2013. There were international comparisons of locational advantage and disadvantage: "Your chances of achieving the American Dream are almost two times higher . . . if you are growing up in Canada than in the United States." But above all the comparisons were between different areas, even different parts of the same city. For instance, in the Washington, D.C.–Baltimore region, a child growing up in a low-income family (25th percentile) in Fairfax County would earn 15.4 percent more than the average child, while children from blighted central Baltimore would have over 8.8 percent lower earnings than the average.[126] Neighborhoods matter at a very granular level: as Chetty put it in a 2020 paper, conditional on characteristics such as poverty rates in a child's own census tract, characteristics of tracts that are one mile away have little predictive power for a child's outcomes.[127]

It turned out that this kind of analysis was vital in showing the differential impact of the pandemic on preexisting patterns of inequality. That had become *the* central social policy question in managing the aftermath of the pandemic.

The goal was still a technocratic one, but one that came from below and that was data-informed: of prompting micro-innovations—such as nudging people to move from one place to another, so as to improve their life chances, or building better and more supportive and resilient family networks. This was a fundamentally optimistic message. As Chetty put it: "The big-picture goal is to revive the American dream. We are not trying to do something that is unimaginable or has never happened. It happens just down the road."[128]

One of the most obvious issues raised by the possibility of utilizing big data is the question of privacy. If locations are pinpointed on a map—I can see my street in Princeton, New Jersey, on Chetty's maps—isn't it possible to misuse the data to derive specific knowledge, rather than knowledge that is generally applicable in the cause of social amelioration? The answer is to camouflage the data by inserting "noise" that muffles the precise origins of a piece of information: that approach permits the release of statistics in arbitrarily small samples by adding sufficient noise to the estimates to protect privacy.[129]

If economics is going to provide effective, policy-focused solutions to the fissures and tensions of globalization, it will have to shake off a deeply anchored obsession with seeing the world only in terms of large-scale abstracted aggregates. Both states and businesses need to adopt a more variegated and sophisticated approach to social phenomena (as summed up in data) in order to raise their competence. The world and its interactions are more complex than the big aggregates conventionally used to understand and make policy—and also potentially richer.

Conclusion: The Next Great Globalization

Supply shocks make and then remake globalization. They teach lessons. Negative shocks over the past 200 years revealed profound shortages—not of what we might possibly want, but of what we really need: food in the 1840s; food, fuel, and munitions in the great twentieth-century world wars; petroleum and energy in the 1970s; and then medical security in the age of Covid and military security in the age of Putin. It wasn't that such problems had not existed in the past: hunger and famine following from bad weather and harvest failures were regular occurrences in the premodern world. And wars were endemic. But by the nineteenth century, technologies and methods of communication existed that could be harnessed in providing solutions. In each case of meeting the supply shock, a large part of the task was a logistical one: how people in acute difficulties could be supplied with necessities. That raised challenges for every sort of organization: the way business was conducted (and financed), and the way governments delivered services. A radical rethink of communications and connections was required.

The dislocations immediately create apparently contradictory responses, in part because people, classes, and regions are affected so disparately, in part also because there is so much that is unknowable. The awareness or even a supposition of different chances and various outcomes leads to suspicion and loathing of the profiteers of shortages, wars, inflations, and pandemics. Unknowability can also generate the belief that a severe disruption must be temporary, that business as normal will resume soon, that the war will be over by Christmas, that pandemics will fizzle quickly and be contained, like SARS or Ebola. On the other hand, the immensity of the challenge suggests that only the most fanciful of outcomes will bring relief: wonder weapons, armies of robot workers, applications of machine or artificial intelligence.

In the first instance, the response to the challenge of finding new supplies, a reaction to the signals generated by price increases, stimulated a further development of technology. Karl Marx, commenting on the disasters of the 1840s and their political aftermath, when Europe seemed to stabilize and new polities were created, saw this point very clearly. Large-scale technical changes, involving the replacement of fixed equipment by improved machinery, were "mainly enforced through catastrophes or crises."[1] That enforcement was almost always not a question of inventing completely new technologies, but of applying and developing existing methods. The steam engine and its applications to transport were well known by the 1840s, the container ship and the computer by the 1970s, or nanotechnology, mRNA vaccines, and artificial intelligence applications by 2020. Suddenly, however, these techniques became much more relevant, and their transformative potential could be realized. The crisis generates a new thinking about how the world and human technologies fit together; and some older ways of thinking (for instance about monetary stability and how it may be readily achieved) look obsolete. But the vision of the new is often painful.

Shortages produce higher prices; they do not intrinsically generate inflation. But governments, faced by shortages, initially see inflation as a way of absorbing the shock of the new, of helping to protect momentary losers in the process of change, or even of promoting more production and productivity in order to overcome supply bottlenecks. The assumptions that the policy response is based on can lead to the compensation mechanism becoming deeply entrenched and producing high inflation, as in the 1970s, or even hyperinflation, as in the aftermath of the First World War. A general boost to prices helps to paper over cracks and reduce the immediate possibility of financial distress. Later the insight sets in that a structural break requires an adjustment of relative prices; and perhaps that too is easier when all prices rise.

The crises that shocked globalization were in practice always major learning opportunities, though the chances were not always realized. The changes should be seen as jolts to complacency. Recall Schumpeter's question, "How do things become different?" and the answer: "when something fundamentally new occurs in the world we are confronted by an enigma."[2] The learning, however, is not just about particular techniques, but about ways of going about business and government. Other countries and cultures often provided a model. The 1851 Great Exhibition taught even self-assured Britons that they might profit from ideas and methods of the apparently cruder or more "backward" United States or Germany. The 1970s brought home to self-satisfied American automobile producers that their cars were not as efficient as ones made in Japan, a country that in the 1960s had been ridiculed as making knock-off products that were crude, colorful, and cheap. And the 2020s? The Covid crisis exposed deep fissures and tensions in many societies. There were questions about who suffered and how burdens were distributed. Generating an effective vaccine response required tackling profound inequalities and differences of outlook, which were directly reflected in differing rates of vaccine uptake. The challenge highlighted the attractions for the United States of previously derided European social security systems. But it also shed a new light on the potential offered by use of personalized data on smartphones in China to combat public health crises.

Learning is often associated with mistakes, humiliations, and defeats. Germany and Japan were twice remade as a result of a perception of military inadequacy: in the nineteenth century, after Napoleon's victories and the appearance of Commodore Matthew C. Perry's black ships in Tokyo harbor, and then again after 1945. Russia's major nineteenth-century reforms, starting with the abolition of serfdom, were triggered by defeat in the Crimean War. After another defeat in the war with Japan (1904–1905), a new wave of reforms started. Will the humiliation of Russia in its brutal and mismanaged attack on Ukraine in 2022 launch a similar reform process? Military defeat shows up the importance of thorough reform and intelligent emulation, in order to catch up with and surpass strategic rivals. Conversely, it is often argued that British inflexibility and the inability to achieve effective constitutional reform were a consequence of not losing wars.[3] The mechanism of how defeat prompts learning may not just be a psychological one: the economist Mancur Olson argued that the post–Second World War German and Japanese miracles were a result of the destruction after defeat of inefficient institutions that had advanced particular sectional interests and stood in the way of a pursuit of an overarching national good.[4]

Learning is not always popular, especially when it involves assuming or appropriating solutions from other cultures. An influential analysis of the malaise of the post-1989, post-Soviet world suggests that Central Europeans and Russians felt that an "age of imitation" devalued their own emotional and historical experience. Stephen Holmes and Ivan Krastev developed a model of how imitation poisons the political culture.[5]

The Covid shock gave a lesson of a different and specific sort across the world. The world's two largest economies were hit. The internal growth model of the mid-twentieth-century United States and China's Great Leap Forward looked less attractive to other countries that necessarily depended on complex supply chains. China had the opposite lesson, which it had already begun to learn in the Global Financial Crisis: it could not rely on being a dynamic exporter driven by export-led growth, and Xi Jinping had already moved earlier with the Belt and Road Initiative to political control of trade and economic linkages. European countries were taught harsh lessons about the difficulties of coordinating vaccine supply and public-health provision. Emerging markets, and even more the world's poorest countries, saw how the lack of fiscal space constrained the ability to give an effective crisis response.

Economists often respond to demand shocks by thinking in large aggregates: the titanic figure, who set the model for the economist as doctor or healer, was John Maynard Keynes. Larry Summers is his modern equivalent. But supply shocks work differently, and economists responding to supply uncertainties are a rather different breed. Like Jevons, Walras, Menger, or Hayek in the late twentieth century, but also Chetty today, they are concerned with minutiae, disaggregating information, and decentralizing policy responses. Prices are needed to provide individuals—consumers but also entrepreneurs—with information on how to respond to shortages: the unavailability of grain in the 1840s, or of carbon energy in the 1970s, or of computer chips today. Sometimes, as in the First World

War, political authorities tried to respond to market prices by simply suppressing them, but that made the information they contain useless as a guide to future action. The environment of shortages is an uncomfortable one for economists who think in terms of aggregates, as those aggregates are incapable of telling anyone how scarce resources can be distributed. Boosting overall demand just makes distributive conflicts more intense. To take an obvious example from the pandemic: monetary and fiscal stimulus have no capability to increase the supply of vaccines, or of the technologies required to develop and deliver them.

Precise counting (nano-economics) is thus required in order to release creativity: to unleash the productive capacities that will overcome the supply challenges. Globalization thus becomes a story of crashes, calculating, and creation.

The crises were also about reimagining politics and political order. It would be a mistake to think of the new political figures as simple "globalists." The reaction to the crisis in the first place was cast as strengthening the nation, but it succeeded in introducing globalization as it were through the back door. In the aftermath of the 1840s crises, Emperor Napoleon III, German chancellor Otto von Bismarck, as well as Bismarck's Japanese equivalents, the statesmen Ōkubo Toshimichi and Itō Hirobumi, remade politics, with a new insistence on the way in which the state could guide—but not control—the forces that made for economic development. They all developed a strong sense of the way in which national identity—in Japanese, *kokutai*—laid the basis for a successful practice of government. Napoleon III thought in terms of his uncle's *gloire*, Bismarck of Germany's self-assertion as a great power. The First World War produced a new style of government interventionism, best described as war socialism, in order to make a complete patriotic mobilization.

In response to the malaise of the 1970s, Ronald Reagan and Margaret Thatcher remade politics too. They were not really globalists either, rather aiming at national strengthening, but they also saw the importance of latching onto global opportunities. The driving idea was to focus on what governments could do effectively, and to slough off inessential tasks that made government less effective (because too interventionist). They wanted strong governments, and thought that previous governments had been weak because they tried to do too much in too many areas of life.

They also thought that foreign-policy assertiveness, in the Cold War or over the Falkland Islands, was a convenient and demonstrative way of signaling competence and resolve.

All these attempts at remodeling government were inevitably flawed, and they needed to be undone by successor governments. The remodelers were inherently quite autocratic, and many people quickly tired of the autocracy or the authoritarianism. In the nineteenth-century case, there were repeated assassination attempts against Napoleon, Bismarck, and Prince Itō. Their politics soon looked outdated. That was true also of the aftermath of the First World War, when many people tried to find a way back to "normalcy." Also after the Reagan and Thatcher revolutions, many political figures began to look for a lighter and less heavy-handed, but perhaps even more globalized, version of the same approach: Clintonism and Tony Blair's New Labour were versions of this modified and democratized approach, and were subsequently derided as "neoliberal" in a new wave of backlash.

There are circumstances in which, perhaps uniquely, in a big and technically well-developed country, state efforts at coordinating research and productivity produce a surge of productivity growth. Such was in particular the case in the unique circumstances of the mid-twentieth-century United States, whose productivity development followed an inverse U to the shape of globalization: American productivity surged as globalization waned, producing circumstances in which, from the 1950s, globalization could be seen simply as imitating the United States. But that set-up is not a usual rule, and it followed from the peculiar circumstances of the world's interwar deglobalization.

Crises push more, and more technically transformed, globalization not simply because of a need for commodities or goods that are complex and produced a long way off. Given the urgency of the supply question, that challenge might be answered by an attempt—at least in big, technically sophisticated countries—to make production more autarkic. The deeper attraction of the globalization process lies in the offering of large numbers of different experimental fields: how can particular challenges be mastered? Borrowing or appropriation of technologies and management approaches helps to ensure that knowledge is tweaked and used in new ways: and then there is more borrowing.

The capacities of technology to transform will push up productivity and raise growth (g). That should make public expenditure more affordable—but only when it is directed efficiently and effectively. The transformation directly raises the question of whether governments can deliver services competently: there is a need for a revolution in government.

Entrepreneurs are also attempting to institute new methods of control, using or devising new forms of property, using legal forms often derived from foreign templates: the joint stock corporation in the mid-nineteenth century that made possible the realization of the railroad and the steamship revolution; or the offshore financial corporation in the 1970s. Political power will be a critical issue in reshaping views of property at the same time as entrepreneurs try to use extended notions of property and control in an effort of transformation. Is there today a "need" to break holds on intellectual property? Is an assertion of authority—a new authoritarianism and compulsion—required? We can see that issue in Xi Jinping's rediscovery of Mao Zedong's 1950s advocacy of "common prosperity," the Chinese state's bid to rein in Jack Ma, or Vladimir Putin's pledge that "the Russian people will always be able to distinguish true patriots from scum and traitors [i.e., westernized oligarchs] and simply spit them out like a gnat that accidentally flew into their mouths."[6] But it is the same dynamic that drove governments to try to control the excesses of a Jay Cooke or a Bethel Strousberg.

Past campaigns and historical sensitivities find continual echoes in the present. For instance, the Chinese government campaign against the tech giants criticizes an entertainment culture that destroys physical and psychological well-being. Young people are addicted to gaming, which produces an intellectual blunting as well as a physical myopia. Tencent is peddling "spiritual opium."[7] The government's mobilization explicitly evokes the destruction of China's social and political order in the nineteenth century by imported opium in the century of humiliation. History can be used here, as it is in Putin's Russia, to spread distrust and to create the impression that the past—and the future—is inexorably and inevitably a story of conflict between nations, in which a gain for one necessarily comes at the expense of losses for the other.

Such claims may be tested by analysis and data. Welfare criteria may thus provide a test of how government control is exercised, by whom, and for whose good. The general good is also at the heart of the discussion of whether patent protection restricted the capacity of countries all over the world to raise their production of Covid vaccine. The counterargument was that producing the vaccine did not just depend on the right formula, which could be easily copied, but on a much more extensive set of practices and interactions. There may, for instance, be an excessive protection of intellectual property, in particular as a consequence of U.S. legal development since the last years of the twentieth century, which interpreted computer programs as patentable products rather than generally true algorithms.[8] Thinking about reform, or a better dissemination of ideas, immediately raises the issue of how to learn. Learning is the major outcome of the crises of globalization, and we need to think of ways in which we can learn more effectively.

The major social and economic issues that were put at the forefront in the latest challenge, the 2020 Covid shock—the initial fear of further deflation and then the alarm at surging inflation—were not really immediately concerned with the globalization process. For decades, citizens in rich countries had worried about rising costs of education, health care, care for old people (a rapidly rising demographic), and housing. Each of these areas was put under great strain by the pandemic, with both short- and long-term consequences. Education was disrupted, with schools and universities closed because of the danger of contagion. Learning moved into a digital format, but some (more disadvantaged) students found access impossible or problematic. Inequalities of life circumstances were thus amplified. Health care was immediately overwhelmed by the levels of severe infection and mortality. There were also likely long-term consequences of the crisis-related neglect of other conditions, undertreatment of chronic conditions, and the absence of diagnosis of new morbidities. Old people in care homes were infected as patients were moved out of hospitals. The crisis shone a fiercely critical light on the management of old-age care and made many aging people reluctant to think of such homes as their future. Cramped and poor-quality housing facilitated the spread of disease. Large numbers of more prosperous people fled from inner cities and looked for more space in new locations where they might work remotely.

In these areas of crisis and challenge, technology offered possibilities of improvement or escape. In each case, the solution is not restricted by national frontiers. For education, there was wider access to electronically available high-quality instruction. For health care, there were telemedicine and the application of AI to assess public-health challenges. Education and health care, if delivered digitally, could come from the opposite side of the world. For the care of the elderly, there was more discussion about how IT (and robots) might be used to help more people stay in their own homes. And for housing, new prospects opened up for digital nomads, who could work remotely from across the world. Technology, and globalization, in combination gave powerful answers, as they had in past crises. The lesson then was as simple as it is now: globalization improved lives.

The combination of technical and geographic change always required competence, and that demanded adaptation and learning: looking to a future, by learning from a dismal past. In the gloom of 1919, Keynes had feared that "[a]ll this makes it increasingly probable that things will have to get worse before they can get better."[9] But we learn most when the present is most dismal.

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Notes

Introduction

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Index

Abramovitz, Moses, 6
Ağbal, Naci, 254
Alexander, James, 145–146
Anderson, Perry, 189
Angell, Norman, 88–89
anti-Semitism, 65, 108, 239
Arendt, Otto, 114
Asquith, Herbert, 94–95
AstraZeneca, 260, 266, 271
Austria: financial crisis (1848), 34; First World War, 87, 90, 104; food shortages in, 90; government reform in, 37; Great Depression (1929–1933), 135–136; inflation, 83; stock market crash (1873), 58, 59–62; World Exhibition, 58–59

Bagehot, Walter, 29, 56, 247
Baldwin, Stanley, 123
Bancel, Stéphane, 259
Bank of England, 30, 31, 33, 35, 47, 49, 233, 235
Bank of Japan, 230
Banque de France, 33, 35, 48, 49, 57
Barroso, José Manuel, 221, 224, 228
Beck, Glenn, 250
Belgium, 28
Beneš, Edvard, 105
Bergman, Carl, 128
Berle, Adolf, 154
Bernanke, Ben, 22, 121, 133, 139, 216, 235, 239–256, 295; 2002 speech, 244–245
Bezos, Jeff, 9
Biden, Joe, 215, 276, 281
Big Short, The, 207
Bingham, Kate, 259
BioNTech, 259, 260, 265–266
Bismark, Otto von, 36, 39, 64, 311
Blanchard, Olivier, 251, 300–301
Bleichröder, Gerson, 64
Bolsanaro, Jair, 265
Bonaparte, Louis Napoleon, 36, 39, 47, 311
bond market, 61, 65, 99, 100, 104, 215–216
Bordo, Michel, 67
Brady, Kevin, 217
Braun, Markus, 287, 288
Brazil, 222
Bretton Woods. *See* International Monetary Conference (1944)
Britain. *See* United Kingdom (UK)
Brown, Gordon, 224, 225
Bruck, Karl Ludwig von, 37
Brüning, Heinrich, 132, 137
Brunnermeier, Markus, 206–207
bubbles, 167, 206–207, 236; railroads, 28, 62; silver, 184

Buchheit, Lee, 214
Burns, Arthur, 176
Bush, George W., 221, 222

Callaghan, James, 13, 179
Cameron, David, 228, 291
Canetti, Elias, 108
Canigiani, Gherardo, 292
Carillo, Alejandro, 160
Carleton, William: *Black Prophet, The,* 29, 40; *Squanders of Castle Squander, The,* 40
Carter, Jimmy, 13, 176, 178
Carville, James, 215
Cecil, Robert, 147
Centeno, Mário, 278
Chase, Salmon Portland, 67
Chetty, Raj, 24, 294, 304–305
Chevalier, Michel, 57
China, 3, 159, 216, 222, 282; Belt and Road Initiative, 229; Global Financial Crisis (2007–2008), 225–226, 227; opening up of, 187–188; productivity of, 207, 212, 229; Qing, 54; technological connectivity in, 284, 286
Chittenden, Russell Henry, 92
Clark, Colin, 143
Club of Rome, 173–174
Clyburn, Jim, 215
Coburn, Tom, 217–218
Cochrane, John, 301
Coe, Frank, 157
competence of governments, doubts about, 19, 177–181, 281–293
Congress of Industrial Organizations Political Action Committee, 160
Cooke, Jay, 58, 65–67
Cournot, Antoine Augustin, 73
Covid-19 crisis. *See* Great Lockdown (2020–2022)
Cripps, Francis, 175
Cuno, Wilhelm, 106
Curevac, 266
Currie, Laughlin, 157
Czechoslovakia, 105

Dallas, Alexander, 42
Danto, Arthur, 24
Darling, Alistair, 220
data, big, 24, 286, 304, 306
De Bleeker, Eva, 266
debts, war, 106, 139–140
Decker, Edward V., 125
deflation, 57, 139, 241
demand shocks, 14–15, 310; negative, 14, 22; positive, 14; supply and demand, 13–21. *See also* Global Financial Crisis (2007–2008); Great Depression (1929–1933)
Deng Xiaoping, 188, 226
Deutsche Bundesbank, 176–177
Draghi, Mario, 234, 253
Drezner, Dan, 224
Dyson, James, 265

Eagleton, Terry, 40
Eccles, Marriner, 254
Economic Stability in the Post-War World, 158
Edward IV, 292
Ehrenburg, Ilya, 129
Ehrenfest, Friedrich, 136
Eichenbaum, Martin, 196, 202
Ellis, Howard, 111, 114
Emanuel, Rahm, 218
Engels, Friedrich, 39, 43, 44, 48
Erdoğan, Recep Tayyip, 254
Erzberger, Mattias, 117, 118–119
European Central Bank (ECB), 233–235, 255, 279

Fahnestock, Harris, 67
Falkenhayn, Erich von, 90
famine, 26, 27–28, 35, 39–40. *See also* Great Famine (1840s)
Favre, Jules, 36
Federal Reserve, 22, 167, 176, 182, 230, 231–233, 245, 252, 279
Feer-Herzog, Carl, 56–57
Ferguson, Niall, 220
Feynman, Richard, 260
Field, Alex, 163, 164
financial innovation, 8, 15, 126, 289–290, 291–292; capital controls, 157–158; joint stock corporations, 26, 313; offshore capital markets, 185

First World War, 20, 83, 84; cost of, 95–105; scarcity in, 16, 18, 85–95
Fisher, Irving, 130, 139, 241
Fisher, Richard, 249–250
Flandreau, Marc, 56
Ford, Gerald, 177
Fordism, 166
France, 36, 133, 220; financial crisis, 33–34; First World War, 94, 100; Global Financial Crisis, 223; grain imports, 26; Great Depression (1929–1933), 139, 140, 142; inflation in, 172, 176
Francqui, Emile, 129
Fried, Ferdinand, 121
Frieden, Tom, 293
Friedman, John, 304
Friedman, Milton, 22, 176, 189, 190, 192–193, 194–195, 203, 246, 297; *Capitalism and Freedom,* 197; "The Methodology of Positive Economics," 194; *Monetary History of the United States,* 148, 196–197, 239; Presidential Address to the American Economics Association, 194–196
Froman, Michael, 226
Fuld, Richard, 209
Furman, Jason, 218, 302

G4, 230
G7, 261
G20 summits: London, 223–226; Pittsburgh, 226–227; Seoul, 227–229; Washington, 222
Galeen, Heinrich, 85
Gallarotti, Giulio, 57
Geithner, Timothy, 228–229
General Agreement on Tariffs and Trade (GATT), 161
George, David Lloyd, 99
Germany, 54, 55, 166, 176, 180–181, 229, 309; Deutsche Bundesbank, 176–177; financial crisis in, 34; First World War, 86, 87, 88–89, 90–93, 100–104; food shortages in, 90–93; Global Financial Crisis, 223; Great Depression (1929–1934), 124, 134, 136–138, 142; hyperinflation, 83–84, 106–109; inflation in, 28, 172, 176, 181; stock market crash (1873), 58, 63; Weimar Republic, 84, 107
Gertler, Mark, 240
Giscard d'Estaing, Valéry, 176
Gladstone, William Ewart, 30, 79
Glagau, Otto, 65
Glass, Carter, 139
Global Financial Crisis (2007–2008), 3, 15, 22–23, 205–256; bank bailouts, 213, 218, 247; causes of, 205, 206; debt as cause of fiscal unsustainability, 215–219; debt crisis, 212–213; economic nationalism, 236–238; monetary policy, 230–236; multilateral responses, 221–230
Godley, Wynne, 13, 175
gold standard, 30, 47, 55, 56, 133–134, 170
Goldin, Ian, 2
Goldschmidt, Jakob, 132, 137
Goltz, Bogomil, 54
Goodwin, Fred, 223, 252
Gorbachev, Mikhail, 109
Gordon, Robert, 163, 164
Gossen, Hermann Heinrich, 73–74
Gouraud, Charles, 38
Graham, Benjamin, 126
Grant, Ulysses S., 67
Great Depression (1870s), 21, 52–82; currency convertibility, 68; euphoria prior to, 52–55; literary representations of, 68–71; monetary systems and, 55–57; railroad stocks, 62–67; stock market crash (1873), 52, 58, 59–62
Great Depression (1929–1933), 13, 15, 16, 121–166; Black Thursday, 127; exuberance preceding, 124–132; financial stress, 132–139; globalization pause, 154–166; international rescue, 139–143; policy-making in, 122–124
Great Famine (1840s), 15, 19, 21, 26–34; disease in, 27; financial crisis, 28–29, 31–34; food crisis, 27–28; government reform after, 35–37; inequities in, 27–28; literary representations of, 40–42; nation-building in, 36, 39; revolt and, 34; speculation in, 30; trade crisis, 31–33

Great Inflation (1919–1923), 105–110; political disintegration and, 108–109; social values and, 108
Great Inflation (1970s), 15, 16–17, 19, 20, 22, 167–204; conquering inflation, 188–204; growth and productivity, 170–188
Great Lockdown (2020–2022), 19, 23, 257–306, 310, 314–315; analysis of, 293–306; competence and control elevated, 281–293; disease and economic link, 261–274; globalization and, 257–258; inequalities in, 274–281, 314; nationalism in, 4, 271, 273; shortages in, 18, 257, 268–273; solidarity in, 258–259; spread of Covid-19, 261–263; vaccine availability, 275; vaccine development, 259, 260, 265–266
Great Men theory, 9–10
Great Recession. *See* Global Financial Crisis (2007–2008)
Great Resignation, 264
Great Revolt (1840s), 34. *See also* Great Famine (1840s)
Great War. *See* First World War
Greece, 214, 219–220
Greensill, Lex, 19, 289–291
Greenspan, Alan, 216, 227–228, 245, 296
Gregory, T. E., 111
Gross, Bill, 216
Guillebaud, Claude, 92
Gupta, Sanjeev, 290
Guttenberg, Karl-Theodor zu, 288

Hajdu, Zoltan, 136
Hankey, Maurice, 88
Hansemann, Adolf von, 64–65
Hansen, Alvin, 297
Hardy, Thomas, 40
Harrison, Austin, 145
Harrison, Frederick, 87–88
Harrod, Roy, 143, 152, 154, 169, 189, 304
Harvey, David, 46
Hasenauer, Karl Frieherr von, 59
Havenstein, Rudolf von, 107, 254
Hayek, Friedrich von, 22, 72, 189, 190–192, 193–194, 198–202, 203, 293; *Constitution of Liberty,* 189, 200–201; *Prices and Production,* 191, 199; *Road to Serfdom, The,* 189, 192
Healey, Denis, 179
Heath, Edward, 179
Hegel, Georg Wilhelm Friedrich, 54
Helfferich, Karl, 21–22, 89, 102–103, 104, 111, 114–120; *Consequences of the German-Austrian Currency Union of 1857, The,* 114; *Das Geld,* 114–117; *State Theory of Money, The,* 111
Hendren, Nathan, 304
Hicks, John, 152, 154
Higginson, Lee, 127, 129
Hilferding, Rudolf, 50
Hitler, Adolf, 109
Hoenig, Thomas, 249
Hollande, François, 220
Holmes, Stephen, 310
Hoover, Herbert, 129–130, 139
Hörr, Ingmar, 266
Hu Jintao, 222, 226
Hugenberg, Alfred, 142
Hungary, 83
Hunt brothers, 184
hyperinflation, 83–84, 105–110

India, 34, 122, 187, 275
inequality, 12, 27–28, 274–281
inflation, 19–20, 83, 105–110, 278, 308; 1840s, 27–28. *See also* Great Inflation (1919–1923); Great Inflation (1970s); hyperinflation
interconnectedness, 2, 9–13, 52
International Currency Experience, The, 158
International Monetary Conference (1867), 47, 55, 56
International Monetary Conference (1944), 154, 158–159, 160–161, 224
International Monetary Fund, 158, 187
International Statistical Conference (1863), 55
International Trade Organization, 161
Ireland, 34, 35; disease in, 27; famine relief, 31–32; inflation in, 28; shortages in, 26

Italy, 180, 181
Itō Hirobumi, 311

Jackson, Jesse, 172
James, Henry, 8–9
Japan, 36, 54, 122, 124, 142, 161, 176, 181, 222, 241–244, 282, 309; automobile industry, 172, 186; Global Financial Crisis, 229, 230–231, 235; inflation in, 172
Jevons, William Stanley, 21, 43, 45, 56, 72, 74, 75–80, 82; *Theory of Political Economy,* 75
Jobs, Steve, 238
Johnson, Boris, 261, 275
Johnson, Elizabeth, 153
Johnson, Harry, 153
Johnson, Simon, 227
Johnson & Johnson, 260, 266
Johnston, Tom, 99
Jones, Gareth Stedman, 44
Jordà, Òscar, 206

Kahn, Richard, 192
Kaldor, Nicholas, 169, 192
Karikó, Katalin, 259
Károlyi, Catherine, 155
Kelton, Stephanie, 112–113
Kendrick, John, 6
Kennan, George, 84
Keynes, John Maynard, 11, 22, 89, 99–100, 123, 124, 131, 140–141, 143–154, 158, 169, 188–189, 310, 315; *Economic Consequences of the Peace, The,* 144, 145, 147; *General Theory of Employment, Interest, and Money, The,* 131, 145, 152–153, 154, 202; *How to Pay for the War,* 189; "National Self-Sufficiency," 151–152; *Treatise on Money, A,* 147, 148
Kindleberger, Charles, 68
King, Mervyn, 206, 208–209, 246
Kishida, Fumio, 252
Knapp, George Friedrich, 111–113, 114
Kohn, Donald, 235
Kornai, János, 2, 170, 272
Krastev, Ivan, 310
Kreuger, Ivar, 19, 126–129, 140, 149–150
Krugman, Paul, 186–187, 189, 197, 263, 280
Kuznets, Simon, 2

Lagarde, Christine, 221, 279
Lane, Laura, 276
Lasker, Eduard, 63, 64–65
Laval, Pierre, 140
Lehman Brothers, 209, 211, 246–247
Link, Stefan, 166
List, Friedrich, 38
London World Economic Conference, 141–142
Lorini, Luca, 262
Lucas, Robert, 203
Lula da Silva, Luiz Inácio, 222, 228
Lumm, Karl von, 114

Ma, Jack, 283–286; Alibaba, 283–284, 285, 286; Taobao Marketplace, 284, 285; Yu'e Bao, 286
MacDonald, Ramsay, 84, 132
Machiavelli, 292
Macmillan, Harold, 150
Macron, Emmanuel, 265, 278
Manchin, Joe, 278–279
Mann, Thomas, 91; *Buddenbrooks,* 110; *Königliche Hoheit,* 110–111
Mantega, Guido, 228
marginalism, 72–82
Mariathasan, Mike, 2
Marsalek, Jan, 288
Marshall, Alfred, 82
Marx, Karl, 11, 21, 43–51, 72, 308; *Capital,* 43–44, 47, 49–50, 51, 52; *Class Struggles in France,* 39, 46–47; *Communist Manifesto, The,* 43; *Contribution to the Critique of Political Economy, A,* 52; *Gesamtausgabe (MEGA),* 44, 48, 49; *Grundrisse,* 46; *Krisenhefte,* 44–45
Mayer, Arno, 51
McAdoo, William, 86
McCain, John, 222
McConnell, Mitch, 267
McNeile, Hugh, 42
Medici bank, 292–293
Meltzer, Alan, 246

Menger, Carl, 21, 72, 74–75, 81–82
Merkel, Angela, 224, 228, 289
Merkley, Jeff, 297
Merton, Richard, 104
Metternich, Klemens von, 37
Mian, Atif, 213
migration, 5, 6, 37–38, 42, 162; German, 36, 37; Irish, 33; Swedish, 37–38
Miki, Takeo, 181
Mill, John Stuart, 56, 79, 82
Minsky, Hyman, 153
Mitchell, Wesley, 197
Modern Economic Growth, 2, 5–9; globalization nexus with, 8
Modern Monetary Theory, 112–113
Moderna, 259, 260, 265, 266
Modigliani, Franco, 196
Moltke, Helmut von, 90
Morgan, J. P., 128, 129, 133
Morgenthau Jr., Henry, 159, 160
Moro, Aldo, 180
multilateralism, 141, 221–230
Mundell, Robert, 203–204
Mussolini, Benito, 119, 129

Naoi, Megumi, 219
Napoleon III. *See* Bonaparte, Louis Napoleon
nationalism, 4, 236–238, 249; oil, 172; supply chain, 273; vaccine, 4, 271, 273
Navarro, Peter, 257, 276
Nelson, Edward, 176
neoliberalism, 189
Netherlands, The, 28
Nettleton, Alvred B., 67
Newmarch, William, 45, 72
Nixon, Richard, 170, 171, 176
Noda, Yoshihiko, 229
Norman, Montagu, 135
Nurkse, Ragnar, 158

Obama, Barak, 215, 216, 224, 225, 228, 295
Ofenheim, Count, 64
Offer, Avner, 92
oil shocks, 13, 17, 168, 171–172, 175
Ōkubo Toshimichi, 311
Olson, Mancur, 310
Organization of Petroleum Exporting Countries (OPEC), 17, 171, 172
O'Rourke, Kevin, 35, 38
Orth, Andrew, 64
Osborne, George, 217, 221
O'Sullivan, Mary, 68
Ottley, Charles, 88

Papandreou, George, 219
Partnoy, Frank, 129
Paulson, Hank, 214, 222
Peel, Robert, 10, 29–30
Peterson, Peter, 170–171
Pfizer, 265, 266. *See also* BioNTech
Phelps, Edmund, 195
Phillips, Judson, 218
Phillips, William, 169
Phillips curve, 169, 195, 197
Pigou, Arthur, 97–98
Pike, Frederick, 159
Piketty, Thomas, 12, 45–46
Playfair, Lyon, 39
Plosser, Charles, 249
Polak, Jacques, 158
Poland, 83
Pompidou, Georges, 176
Posen, Adam, 244
potato blight, 27–29, 35
Powell, Jerome, 264, 280, 281
Prebisch, Raúl, 123
productivity, 6–7, 163–165, 166, 312; growth and, 170–188
Putin, Vladimir, 19, 307, 313
Pym, Barbara, 155

Quantitative Easing (QE), 227, 230, 232, 233, 234, 235, 248, 249–250
Quetelet, Adolphe, 45, 73

r and r*, 11–12
Radowitz, Joseph Maria von, 39
Ramsden, David, 220
Raoult, Didier, 265
Rašín, Alois, 105
Rathenau, Walther, 106, 119
Read, Charles, 35

Reagan, Ronald, 178, 187, 202, 311
Reinert, Robert, 85
Reinhart, Carmen, 214; *This Time Is Different,* 216–217
relative prices, 17, 188, 191, 253, 280, 293
reparations, war, 103, 106, 139
Ricardo, David, 96–97
Rippert, Otto, 85
Robbins, Lionel, 78, 154
Robinson, William, 35
Rochau, August Ludwig von, 39
Rogers, Jim, 246
Rogoff, Kenneth, 208, 214, 220, 276, 296; *This Time Is Different,* 216–217
Romania, 64
Romer, Christina, 214, 295
Romer, Paul, 6
Roosevelt, Franklin, 142, 165–166
Roover, Raymond de, 292
Rothschild, Anthony, 34
Rousseff, Dilma, 228
Rowland, Tiny, 179–180
Rubin, Robert, 296
Russell, John, 29
Russell, John Scott, 59
Russia, 3, 34, 309; First World War, 86–87, 93–94; food shortages in, 93–94; Revolution (1917), 94; Ukraine, invasion of, 4, 258, 273. *See also* Soviet Union
Ryan, Paul, 250

Şahin, Uğur, 259
Salvini, Matteo, 255
Sargent, Thomas, 203
Sarkozy, Nicolas, 221–222, 224, 237
Schäffer, Hans, 128
Schäffle, Albert, 60, 62
Schäuble, Wolfgang, 250
Schmidt, Helmut, 13, 180–181
Schnabel, Isabel, 280
Scholz, Olaf, 278
Schularick, Moritz, 206
Schumer, Chuck, 215
Schumpeter, Joseph, 155–157; *Capitalism, Socialism and Democracy,* 156
Schütz, Alexander, 287
Schwartz, Anna, 67; *Monetary History of the United States,* 148, 196–197, 239; *Money in Historical Perspective,* 68
Scorsese, Martin, 71
Second World War, 165–166
secular stagnation, 23, 164, 297, 300
Serageldin, Kareem, 252
Serbia, 109
Sewing, Christian, 288
Sharma, Ruchir, 277
shortages, 5, 18, 85, 257, 268–273, 307; energy, 17, 168, 171–172, 273; food, 16, 18, 26, 27–28, 90–95; semiconductor chips, 18, 268, 269. *See also* supply shocks
Simonsen, Mario Enrique, 187
Singh, Manmohan, 187
Skidelsky, Robert, 143, 154, 294
Sloan, Alfred, 125
Smith, Adam, 292–293
SoftBank, 282–283, 285, 286, 288, 290
Solow, Robert, 6, 304
Somary, Felix, 135
Son, Masayoshi, 282–283, 286
Soviet Union, 109, 124, 159, 166
Sperber, Jonathan, 27, 44
Spielhagen, Friedrich, 70–71
Stein, Jeremy, 230
Stigler, George, 10
Stiglitz, Joseph, 71, 296
stimulus, fiscal, 214–215, 223, 225
stock exchange, 61–62, 65, 67, 86
stock market panics: 1847, 29; 1873, 52, 58, 59–63, 67; 1929, 127–129; 1987, 50, 71; 2008, 211; 2020, 263
Strousberg, Bethel Henry, 19, 42, 52, 63–65
Sufi, Amir, 213
Summers, Larry, 23, 214, 218–219, 294, 302–304, 310
Sun Yat-sen, 159
Sunak, Rishi, 276
supply shocks, 2, 19, 22, 23, 121, 167, 307, 310; character of, 16; demand and supply, 13–21; negative, 14, 15, 16, 18, 26, 28, 85, 171, 307; positive, 14, 53, 122

Swan, Joseph R., 128
Switzerland, 181

Tanaka, Kakuei, 181
tariffs, 131, 151, 269
Tarnow, Fritz, 50
Taylor, Alan M., 206
Taylor, John, 246
technical change, 7–8, 165, 308; artificial intelligence, 24, 282; communications, 238; containers, standardized, 8, 185–186; nanotechnology, 258, 260; payments, 282; railroads, 7
Tennyson, Alfred, 121
Thatcher, Margaret, 182, 187, 189, 311
Thiers, Adolphe, 36
Toll, Paul, 126
Tooke, Thomas, 45
Tooze, Adam, 245
Topolanek, Mirek, 237
trade protection, 4, 141, 174–175, 238, 268–269; tariffs, 131, 151, 269. *See also* nationalism
Trichet, Jean-Claude, 253
Trollope, Anthony: *Autobiography,* 68–69; *Castle Richmond,* 40–42; *Way We Live Now, The,* 68, 69–70
Truman, Harry, 254
Trump, Donald, 260, 261, 265, 267, 269, 276
Türeci, Özlem, 259

Ukraine, 4, 109, 258, 273
United Kingdom (UK): austerity, 220; Bank Act (1844), 30, 31, 33; Corn Laws, 30; financial crisis (1840s), 29–34; First World War, 86, 87–88, 94–95, 96, 97, 98–100; Global Financial Crisis, 208–209, 220–221, 223; Great Depression (1929–1933), 123–124, 142; Great Exhibition, 38–39, 58–59; Great Inflation (1970s), 172, 176; inflation in, 28, 31, 172, 181; Joint Stock Companies Act, 30, 55; Report of the Royal Commission on International Coinage, 56; shortages in, 26, 94–95; trade protection, 174; war finance, 96, 97, 98–100
United States (US), 3; American Rescue Plan, 278; Centers for Disease Control, 263; Civil War, 36; Congressional Coinage Committee (1866), 56; Coronavirus Aid, Relief, and Economic Security Act (CARES Act), 267–268; Covid-19 crisis, response to, 260, 263–264, 266; deflation in, 57; First World War, 86, 87, 100; Global Financial Crisis, 208–211, 223; Great Depression (1929–1933), 124–125, 129–132, 133, 134, 138–139, 142; Great Inflation (1970s), 167, 168, 170–171, 172–173, 176; inflation in, 172, 181; Joint Board on Interstate Highways, 165; Operation Warp Speed, 260, 266; price controls, 168, 170–171, 172–173; Smoot-Hawley Tariff Act, 131; stock market crash (1873), 58, 60, 67; Tea Party, 218, 219; trade protection, 174, 202

Volcker, Paul, 51, 182–185, 202

Wagner, Adolph, 98
Wagner, Richard, 51
Wallenberg, Marcus, 137–138
Walras, Léon, 21, 72, 80–81; "Un économiste inconnu: Hermann-Henri Gossen," 74; *Of the Nature of Wealth and the Origin of Value,* 80
war finance, 95–105
Warburg, Max, 104
Warsh, Kevin, 250
waves, 71–82
Webb, Sidney, 99
Wegener, Paul, 85
Wehler, Hans Ulrich, 27
Wen Jiabao, 216, 225–226
Wesbury, Brian, 246
West, Cornel, 295
White, Harry Dexter, 154, 157–158, 159
White, Richard, 66
Whitman, Walt: "To a Locomotive in Winter," 53; "The Passage to India," 52–53
Whitney, Richard, 130, 133
Williamson, Jeffrey, 38

Wilson, Woodrow, 144
Wirecard, 286–289
Wirth, Joseph, 119
Wood, Charles, 35
Woodward, Bob, 245
Woolf, Virginia, 144
World Health Organization (WHO), 261–262
World War I. *See* First World War
World War II. *See* Second World War

Xi Jinping, 226, 229–230, 275, 313
Xu Xiang, 236

Yamani, Ahmed Zaki, 174
Yardeni, Edward, 216
Yu Jianhua, 227
Yu Yongding, 225
Yugoslavia, 109

Zelenko, Vladimir, 265
Zhang Yiming, 286
Zhou Wenzhong, 227