Bi-weekly Random Bits from the Internet

2015-04-18

(HEY, JONY, I HAVE A DOPE IDEA!)

The Next Epidemic — Lessons from Ebola

Bill Gates, The New England Journal of Medicine Vol 372 No 15

Perhaps the only good news from the tragic Ebola epidemic in Guinea, Sierra Leone, and Liberia is that it may serve as a wake-up call: we must prepare for future epidemics of diseases that may spread more effectively than Ebola. There is a significant chance that an epidemic of a substantially more infectious disease will occur sometime in the next 20 years; after all, we saw major epidemics during the 20th century, including the Spanish influenza epidemic of 1918–1919 and the ongoing pandemic of human immunodeficiency virus. In fact, of all the things that could kill more than 10 million people around the world, the most likely is an epidemic stemming from either natural causes or bioterrorism.

Ebola is far from the most infectious known disease. Other disease agents (measles and influenza, for example) are far more infectious because they can be spread through the air, rather than requiring direct contact. People may not even be aware that they are infected or infectious. Since a person carrying one of these pathogens can infect many strangers in a marketplace or on an airplane, the number of cases can escalate very quickly.

As the Ebola epidemic fades from the world's attention, we risk missing the opportunity to learn from it. Even if the system we have today had worked perfectly for Ebola, it would fail to contain a more infectious disease.

It's instructive to compare our preparations for epidemics with our preparations for another sort of global threat — war. The North Atlantic Treaty Organization (NATO) has a mobile unit that is ready to deploy quickly. Although the system is not perfect, NATO countries participate in joint exercises in which they work out logistics such as how fuel and food will be provided, what language they will speak, and what radio frequencies will be used. Few, if any, such measures are in place for response to an epidemic. The world does not fund any organization to manage the broad set of coordinated activities required in an epidemic. The last serious simulation of an epidemic in the United States, the Dark Winter exercise, took place in 2001. And few countries have met their commitments under the International Health Regulations, which were adopted by the United Nations after the 2002–2003 outbreak of the severe acute respiratory syndrome (SARS) and were intended to improve the world's ability to prevent and contain outbreaks.

Because there was so little preparation, the world lost time in the current epidemic trying to answer basic questions about combating Ebola. In the next epidemic, such delays could result in a global disaster.

The problem is not the fault of any single institution — it reflects a global failure. The world needs a global warning and response system for outbreaks. (Though the World Health Organization [WHO] has a Global Outbreak Alert and Response Network, it is severely understaffed and underfunded.) Such a system could enable us to manage not only a naturally occurring epidemic, but also one ignited by a bioterror attack. Although I have not seen a rigorous estimate of the cost of building such a system, World Bank projections give a sense of the cost of inaction: a worldwide influenza epidemic, for example, would reduce global wealth by an estimated $3 trillion.

I hope the following sketch of what such a warning and response system might look like will spark action to prepare for an epidemic that could have global consequences (see Recommendations for Preparing for Future Epidemics).

Health Systems and Surveillance

First, there is a critical need to reinforce basic public health systems, including primary health care facilities, laboratories, surveillance systems, and critical care facilities, among other components. As many commentators have noted, Ebola has spread much faster and more widely in countries whose health systems — and especially whose primary care systems — were severely weakened by years of armed conflict and neglect.

Strengthening health care systems not only improves our ability to deal with epidemics, but it also promotes health more broadly. Without a functioning health system, it is very hard for a country to end the cycle of disease and poverty. Health is so fundamental to development that even if there were no chance of another epidemic, building and improving health systems would be a worthwhile — and lifesaving — investment. The fact that they also bolster our ability to confront epidemics is all the more reason to invest in them.

In addition, there is no systematic disease-surveillance process in place today in most poor countries, which is where a naturally occurring epidemic seems most likely to break out. Even once the Ebola crisis was recognized last year, there weren't resources to effectively map where cases were occurring and in what quantity.

We need to invest in better disease-surveillance and laboratory-testing capacity, for normal situations and for epidemics. Routine surveillance systems should be designed in such a way that they can detect early signs of an outbreak beyond their sentinel sites and be quickly scaled up during epidemics. They should be linked with national public health laboratories to enable robust monitoring and response. And the data derived from such testing need to be made public immediately. Many laboratories in developing countries have been financed by the polio-eradication campaign, so we will have to determine what capacities will be needed once that campaign is over.

Human and Other Resources

Once it became clear that a serious emergency was under way in West Africa, many local clinicians should have been recruited, and trained personnel should have flowed rapidly into the affected countries. That didn't happen. Some countries stepped forward with volunteers within 2 to 3 months, but they were needed within days. It was fortunate that Médecins sans Frontières could mobilize volunteers more quickly than any government.

We need trained personnel ready to confront and contain an epidemic quickly: incident managers; experts in epidemiology, disease surveillance, and other relevant fields who can provide surge capacity; respected community leaders who can lead local engagement efforts; and community workers who speak local languages. Ideally, we would have updated lists of such personnel indicating their availability and capabilities. There would also be standby training centers and an explicit understanding regarding compensation and insurance for volunteers. Each country could commit to managing a pool of volunteers and to sending a certain number of people with various skills and equipment within a week after an emergency began, with plans for evacuating any who were exposed to the epidemic pathogen.

Transportation and equipment are also key. When an epidemic strikes, roads and airports in affected areas are overwhelmed by people trying to get out. Volunteers will be more likely to sign up if they know they will be able to leave if they get sick or when their duty is done. Few organizations are capable of moving thousands of people — some of them infected — to various locations around the world at a week's notice. The Ebola epidemic might have been much worse if the U.S. and U.K. governments had not used military resources to fly people in and out of the affected countries. All countries could identify trained military resources that would be available for epidemics; in a severe epidemic, the military forces of many or all middle- and high-income countries might have to work together.

During severe epidemics, responders also need tents, portable power sources, medical supplies, and other materials. A list of the supplies that would be needed to stop an epidemic affecting 10 million people — 100 times the population affected by the

Ebola epidemic — could be developed, and experts could determine which items would need to be stockpiled or be subject to commandeering.

It is also critically important to have good data about what's going on. Unfortunately, during the Ebola epidemic, the case database has not always been accurate or up to date — partly because of the chaotic situation, but also because good technology and training have not been available and there are no clear rules regarding making data accessible. For future epidemics, it should be possible to have a system in which information on suspected cases, locations, survivors, and other key elements was entered into a digital database that was instantly accessible to the relevant organizations and agencies. The groups working on the Ebola data — including the WHO, the U.S. Centers for Disease Control and Prevention, and others — could recommend specifications, and some combination of foundations and technology companies could build such a system within the year.

Experts will also need computer models to predict what might happen and which interventions should be prioritized. With access to satellite photography and cell-phone data, they could understand the movement of populations and individuals in the affected region. But Internet and cell-phone capacity need to be improved. We should be able to use cell-phone systems to contact the public and to poll people about what they are seeing and experiencing. Key centers should have high-bandwidth Internet capacity through satellite, and Wi-Fi capacity should be added in key areas so that digital tools can help with reporting data and coordinating personnel.

Medical and Public Health Tools

It should be possible to make diagnostic tests, drugs, and vaccine platforms that could be adapted for use against various pathogens. Today, with the possible exception of influenza vaccines, we do not have nearly enough capacity for developing adaptable platforms, partly because there are opportunity costs for private-sector organizations in shifting resources away from more commercially viable projects to work on tools for epidemics that may not happen. We may need an international funding system that factors in these opportunity costs.

Other than watching for symptoms, the diagnostic approach used during the Ebola epidemic has involved sending blood samples for quantitative polymerase-chain-reaction (qPCR) analysis. But qPCR machines are expensive and not widely available, so on average it has taken 1 to 3 days to get test results. For the next epidemic, an adequate number of qPCR machines should be made available while novel diagnostic methods are rapidly developed. We also need a clear process for developing and manufacturing accurate diagnostic tests rapidly. A focused effort to accelerate this process and establish a rapid approval and procurement process would be worthwhile.

On the therapeutics front, there are drugs that work against viruses similar to Ebola, and some of them have been shown in test assays to have an effect against Ebola. Unfortunately, they were not tested in patients with Ebola until after the epidemic had peaked — in part because there was no clear process for approving a novel trial format or for providing indemnity against legal liability. We will need to develop a clear set of guidelines (and testing and regulatory pathways) for determining whether existing drugs could be repurposed to help stop a particular epidemic.

We also need to invest in more research on antiviral drugs, antibody treatments, and RNA-based constructs. We should have either stockpiles or manufacturing capacity for therapies that might be effective in an epidemic.

Plasmapheresis should have been used in the Ebola epidemic, but its application wasn't approved and scaled up until it was too late for this intervention to have a large impact. Plasmapheresis is quite effective for a number of diseases (including smallpox and viral hemorrhagic fevers such as Lassa fever) and has a reasonable chance of working for Ebola as well. The Gates Foundation started working to establish plasmapheresis units in early September 2014 and quickly found partners ready to take them into the affected countries. Unfortunately, the effort was hampered by the lack of a clear process for approving new approaches. We should develop rules now to expedite drug approvals in future epidemics and establish clear guidelines for approving studies and treatments, including experimental ones. A global epidemic-drug–approval process could avert long delays by indemnifying companies working on new approaches.

Three different Ebola vaccine constructs were being developed in the summer of 2014. Although all were in early stages, this work made us more prepared for Ebola than we would be for an entirely new pathogen, for which vaccine development could take 2 or more years. Moreover, it is not clear how quickly vaccine developers could or would move or who should finance the final research and manufacturing of a new vaccine.

Among known pathogens, influenza is the one most likely to cause a large epidemic; even seasonal influenza variants probably cause several hundred thousand excess deaths each year. So it's disappointing that we don't have a vaccine for all influenza strains. There is work being done toward this goal, but it has garnered nowhere near the resources that it deserves.

Ideally, vaccine research would be funded in such a way that during an outbreak, a vaccine could be designed, tested for safety, and ready for manufacture at scale within a few months. There is no guarantee of success, but I believe that given enough time and resources, such efforts could produce an invaluable contribution for epidemics and overall health.

Given Ebola's limited infectiousness in the early stages of the disease, most of the quarantine policies that were proposed would have been counterproductive. But when a far more infectious agent comes along, quarantine may be one of the few tactics that can reduce its spread in the early stages of disease. Because democratic countries try to avoid abridging individuals' rights to travel and free assembly, they might be too slow to restrict activities that help spread disease.

Part of the process should include a plan for effective public communications, including coordination of the messages conveyed by all the different voices people will hear, from governments, to United Nations agencies, to news media, to bloggers. Digital communication can be used to great advantage, but unless a plan is in place, it will only spread confusion and panic faster.

A Global Call to Action

Despite efforts by the United States and a few other countries, there are still big holes in the world's ability to respond to an epidemic. Other countries may be more likely to step up if they see an overall plan and understand their role in it. We need a rigorous study of the cost of building a global warning and response system and a plan for contributions from various countries.

Through the United Nations, some global institution could be empowered and funded to coordinate the system. The United Nations and the WHO are studying the lessons from the Ebola epidemic and ways to improve international crisis management; these evaluations can provide a starting point for discussions of ways to strengthen the WHO's capacity and about which parts of the process it should lead and which ones others (including the World Bank and the G7 countries) should lead in close coordination. The conversation should include military alliances such as NATO, which should make epidemic response a priority. The final arrangement should include a reserve corps of experts with the broad range of skills needed in an epidemic.

An epidemic is one of the few catastrophes that could set the world back drastically in the next few decades. By building a global warning and response system, we can prepare for it and prevent millions of deaths.

Recommendations for Preparing for Future Epidemics

The world needs to build a warning and response system for outbreaks. This system should

- be coordinated by a global institution that is given enough authority and funding to be effective,
- enable fast decision making at a global level,
- expand investment in research and development and clarify regulatory pathways for developing new tools and approaches,
- improve early warning and detection systems, including scalable everyday systems that can be expanded during an epidemic,
- involve a reserve corps of trained personnel and volunteers,
- strengthen health systems in low- and middle-income countries, and
- incorporate preparedness exercises to identify the ways in which the response system needs to improve.

China's Growth Problems

Roubini Monitor April 14, 2015

China's Q1 GDP will decelerate to 7.1% y/y from 7.3% in Q4 2014, with drags from sluggish industrial production growth partially neutralized by the development of the non-manufacturing sector. The decline on a q/q basis will likely be sharper (to 1.4% from 1.7%, the lowest rate since March 2009).

While officials have put in place policies to stabilize growth they will likely await their macroeconomic impact before moving further and despite the pressure of decelerating growth, we believe that the people's Bank of China (PBOC) is unlikely to depreciate RMB against USD materially.

A weak RMB would be at odds with efforts to rebalance the economy and could potentially undermine financial stability. A large current account surplus does not justify depreciation and intervening against the RMB may hamper adding the currency into the IMF's Special Drawing Right (SDR) basket.

GDP growth is likely to be the slowest China has seen since early 2009 and helps explain the series of policies that have been rolled out lately to boost GDP.

We continue to think that more easing will come, but after the authorities have time to assess the consequences of what they have already put in train. In that regard, the March credit and activity data will be especially important.

Given the momentum of economic rebalancing, fixed asset investment growth will likely stabilize, while retail sales will edge up to 9.4% from 9% in February on a quarterly sesonally adjusted annualized basis (QSAA).

On the back of low inflation for the time being and buoyant consumer confidence in Q2 2015 (3.8% QSAA in February, the highest since September 2014), we expect retail sales to carry on with modest acceleration).

The services sector's share of GDP has increased to 48.2% in 2014 from 42.9% in 2008, while that of secondary sector dropped to 42.6% in 2014.

Thanks to improved import growth resulting from RMB real appreciation, the trade surplus will narrow from the historic high in February. Moving past the distortions of the Chinese New Year will also help.

Following the announcement days ago of lowering minimum down payments for home buyers, China has deployed more policies to reverse the GDP growth slowdown, although it could take at least a month for these policies to materialize.

The Ministry of Finance (MOF) meanwhile has clarified the issuance procedure of local government special bonds, which will provide an extra RMB100 billion into local governments' coffers.

The PBOC has hitherto kept tight-lipped about any potential coordination with the MOF to put such bond issuances in place.

And despite pressure from weakening GDP growth, we reiterate our view that the PBOC will not depreciate the RMB against the USD for the following reasons: A weak RMB would be at odds with efforts to rebalance the economy; a large current account surplus does not justify depreciation; depreciation may spark capital outflows and undermine financial stability; significantly weakening RMB would likely spark charges of FX intervention, undermining China's efforts to make the currency part of the IMF's Special Drawing Right (SDR) basket.

Finance as Understood by General Park

Joe Studwell, How Asia Works: Success and Failure in the World's Most Dynamic Region, 2013

Japanese financial sector policy in the golden years of development – roughly 1950–1980 – held financial institutions in check, but it was fairly orthodox. Central bank rediscounting kept banks on the hook but it was not sufficient to create high inflation; also, there was not much overseas borrowing and interest rates, although lower than in other industrial countries, were consistently positive. This contrasts with Korea, where a souped-up and, to many contemporary observers, crazed approach to financial management was pursued. Despite its gainsayers, however, Korea showed more than any other country in east Asia that so long as funds are invested in the acquisition of technological capacity – with export discipline providing a quality benchmark – a state can take considerable risks with financial propriety. Park Chung Hee went down to the financial wire in the 1970s with his super-charged heavy and chemical industrialisation drive, but in the end the multi-billion dollar investments paid off handsomely. On the other hand, in south-east Asia several governments showed that, in the absence of the right approach to agriculture and manufacturing, any form of financial loosening can see an economy's wheels spin off completely.

The dirigiste tone of Korea's financial sector management during its fast-development phase was set by Park Chung Hee when he renationalised the banks. These had been privatised in 1957 on the insistence of advisers from the US Federal Reserve to the businessmen Park temporarily incarcerated in 1961. Government control plus total attention to the funding needs of heavy industrialisation were Park's idea of an appropriately run financial system. In 1962 a new Bank of Korea Act turned the central bank, in effect, into an arm of the Ministry of Finance. Thereafter, the Bank of Korea used rediscounting of loans extended by the nationalised banks to exert day-to-day control, just as happened in Japan. The difference was that in Korea the policy was much more aggressive. Rediscounting of export loans was unlimited. In other words, any bank that lent against exports – as proven by a letter of credit from a foreign customer – got almost as much money back from the central bank in order to further expand its loan book. There was also unlimited rediscounting of policy loans to other favoured, government-approved projects.

Of course, by creating new money, rediscounting tends to lead to inflation. But Park's government, having never seen the high inflation of Japan pre-1949 or the hyper inflation of China in 1946–50, worried much less about rising prices than did other countries' governments. So long as Korean firms were following the developmental plan and could sell their goods abroad, the banks were told to lend to them. It was in this funding context that exports rose an average 40 per cent a year in the 1960s and over 25 per cent a year in the 1970s, increasing from 3.4 per cent of GDP in 1960 to 35 per cent by the 1980s. Meanwhile, inflation averaged 15–20 per cent annually.

Not only were funds for favoured borrowers abundant, they were effectively free, or very cheap. The cheapest loans went to exporters, typically carrying real interest rates of −10 to −20 per cent. So long as exporters could raise their prices to reflect domestic inflation, they were in effect being paid to borrow. Other favoured industrial projects that were not yet ready to export also received low-cost funds. All this necessarily meant that the interest paid out to depositors was minimal or non-existent. However, there was still money in the banks. The savings of a parsimonious government were kept there. The working capital accounts of large businesses remained there because otherwise they would not be eligible for cheap lending. And a part of household and small business savings was also deposited in the banking system on lousy terms, because the system was the only formal one available. The remaining chunk of private savings found its way into illegal, but tolerated, non-bank financial institutions and freelance lenders known as the 'kerb market'.

From 1974 to 1980, at the height of Korea's heavy and chemical industrialisation drive, the average real borrowing rate in the banking system was −6.7 per cent, versus an average of 18.5 per cent in the kerb market. The loans of the banking system were reserved for exporters, and for larger firms that were leading the technological learning process. As a reflection of the role bureaucratic oversight played, there were 221 different types of preferential loan by the end of the heavy industrialisation period. It was a two-tier system in which any business which could not access funds in the formal banking system had to go to the kerb.

The IMF, the World Bank and the US government – the last of which provided vast amounts of aid to South Korea – did not like General Park's approach to financial management, and their economists tried repeatedly to push him towards more orthodox policies. They had some temporary success in the second half of the 1960s when the government in Seoul agreed to raise real interest rates substantially. However, as the Korea specialist Alice Amsden noted: 'In all, liberalisation amounted to nothing more than a footnote to the basic text of Korean expansion.'18 In practice in the late 1960s, the single most important financier of industrialisation, the Korea Development Bank (KDB), increased its borrowings of cheaper funds offshore; the KDB also increased guarantees for chaebol to borrow internationally, turning a blind eye to the exchange rate risk.

When this risk came home to roost in a major crisis that began in 1969, General Park forgot his promises to US advisers to reward savers and price capital according to the market, enforcing a three-year interest moratorium on kerb lenders that in effect made the general public bail out industry. Ordinary Koreans provided most of the kerb market's funds, while chaebol sourced marginal loans there that they could not obtain from banks. By stopping payments on this high interest debt, Park freed up chaebol funds to pay their bank debts, and prevented bank collapses. The public lost its interest income from the kerb market, while bank interest rates were cut again.

Such conditions contributed to Korea having a somewhat lower rate of household saving than Japan or Taiwan. But there was not the kind of collapse in individual saving that many economists predicted. In part this was because savers were less sensitive to deposit interest rates than the mathematical models favoured by economists assumed; savers focused instead on the need to hold money against future liabilities in a state with little welfare. In part, savings also held up because it was not easy to consume, especially if this involved using foreign exchange. Imported consumer goods were either banned or enormously expensive due to high tariffs, while stringent capital controls meant that in the 1980s it was still illegal to take a holiday abroad.

Korean families, along with their government and businesses, continued to save, and the shortfall in funds for investment – which remained acute until the first sustained current account surpluses in the late 1980s – was plugged with international borrowing. In the late 1960s and 1970s, Korea had the fastest rate of foreign debt accumulation in the world, even as Latin American states were borrowing heavily. By 1985, Korea was the second most internationally indebted developing country after Brazil, and with a much smaller population; overseas loans amounted to 53 per cent of GNI. However, because of its emphasis on exports, Korea's foreign debt payments relative to its foreign exchange earnings actually declined from 1970. Payments of interest and principal as a share of exports were 28 per cent in that year and only 20 per cent in the early 1980s, even though debt and debt payments increased as a share of GNI. Export discipline was Korea's financial get-out-of-jail card.

The Steamroller Approach

In the most investment-intensive era of industrial growth, from approximately 1965 to the early 1980s, there developed a pattern in which each time Korea hit a road block in the form of an external economic shock and/or a domestic financial crisis, government did whatever was financially necessary to maintain developmental momentum. In the early 1970s, in addition to the kerb market interest moratorium, General Park's government forced state banks to swap loans for chaebol shares and abandoned the high domestic interest rate policy begun in 1965. It met each crisis with cheaper money. With the first global oil shock, and a deep world recession, from late 1973 until 1975, the government massively increased domestic credit, while foreign debt rose from 31 to 40 per cent of GNI. With the second international oil crisis of 1979, plus increased US interest rates that helped trigger a world recession from 1980, Korea cranked up foreign debt again; the level, which had been pulled back to 30 per cent of GNI before the crisis, was increased to 50 per cent.

Korea grew through a cataclysm which, in 1982, brought similarly indebted Latin American countries, and then the Philippines, to their knees. And Korea kept borrowing through the mid 1980s, when a localised Asian recession saw Mahathir's Malaysia flip-flop away from its infant industry policy to one of dependence on foreign-invested export processing. Korea's determination to stay the industrialisation course was writ large in its attitude to finance. Government invested its way forward, using temporary devaluations to spur exports in slack periods. Throughout, underperforming chaebol subsidiaries were culled and merged.

This approach was successful so long as the government had the financial whip hand. Eventually, however, the scaling-up of the chaebol into bigger and bigger groups – the level of corporate concentration in Korea was higher than in Japan or Taiwan – meant that the biggest borrowers ceased to fear their lenders. Once the HCI drive was complete in the early 1980s, the chaebol were very powerful beasts. In 1983, the three biggest groups, Hyundai, Samsung and Daewoo, were each consuming 10 per cent of credit. With the chaebol both huge and heavily leveraged (average debt was more than five times equity in the fifty biggest firms) the state banking system could no longer impose its will on businesses whose failure would bring down the banks themselves. The banks were increasingly compelled to lend whatever the chaebol wanted. In the 1980s the chaebol started to buy up smaller rivals rather than compete with them. They also began to use their cheap bank funds to speculate more heavily in real estate. They themselves lent money to the kerb at high interest. And they used domestic oligopolies to crush smaller competitors they did not buy, and to squeeze consumers ever more effectively. From a force for technological progress, the chaebol began to morph into economic bullies whose developmental contribution was much less clear.

The IMF, the World Bank, the US government and a group of Korean economists trained in the US (who had begun to gain influence under President Chun Doo Hwan in the 1980s) all argued that it was time to deregulate finance in order to curb chaebol power. This was a view which gained considerable public support after three decades in which ordinary savers had been forced to subsidise big business.

In the early 1980s, deposit and lending rates in the banks were raised to positive real levels. The banks were privatised, with a maximum 8 per cent shareholding by any one investor, which ensured some independence from chaebol influence. However, the central government continued to set banks' credit quotas and interest rate ceilings, and to appoint senior managers.

Other pro-market reforms did not turn out as the economists predicted. The development of the stock market failed to discipline chaebol. When firms listed, the controlling families invariably retained board and management control and a booming late 1980s bourse simply provided additional funds without any shareholder discipline; and the banks' ability to influence large firms' behaviour was thereby further weakened. There was also considerable liberalisation of non-bank financial institutions (NBFIs) – smaller deposit-taking institutions without full banking licences – which had been sanctioned in the 1970s as an alternative to the kerb market. Allowed to multiply, these institutions offered higher interest rates than banks and increased their share of deposits from 25 per cent in 1976 to a dominant 63 per cent in 1989. Unlike with the banks, however, the chaebol achieved direct control of many NBFIs – a dangerous development. It was no coincidence that throughout the 1980s and early 1990s the chaebol leaders invariably lobbied in favour of financial deregulation.

The situation did not run out of control until 1993, when Kim Young-Sam's government was persuaded by the IMF and its own pro-free market economists to lift capital controls and deregulate short-term offshore borrowing. It was this that led to a flood of short-maturity foreign debt coming into Korea between 1994 and 1997. Overall – and contrary to what is popularly believed – Korea's foreign debt level was not particularly high on the eve of the financial crisis; as a proportion of GNI it was less than half the 1970s and 1980s peaks. But when panic spread from south-east Asia in 1997, and short-term loans were called in rather than rolled over, the liquidity shock was sufficient to trigger a major crisis in Korea.

Despite this, the fact that a relatively smaller proportion of credit in Korea had been directed to non-productive activities like real estate meant that the country began to recover strongly in 1999. As with earlier crises, government orchestrated mergers and business unit swaps among the chaebol in order to pare underperforming subsidiaries. It was in this shake-out that Chung Ju Yung's Hyundai obtained control of Kia and, with it, unassailable dominance of the automotive sector. What was different to every preceding crisis was that on this occasion the Korean government heeded IMF advice about structural changes to the financial system. The country acquired north-east Asia's most 'orthodox' financial system, with an independent central bank, wholly independent commercial banks, large foreign-controlled banks and much increased rights for independent investors in stock and other markets. Despite a financial sector wobble over increased consumer debt in the early 2000s, so far the deregulated system has not produced another crisis. However it remains to be seen precisely how well timed Korea's transition to an Anglo-Saxon financial system was.

An Education in Crisis

Timothy F. Geithner, Stress Test: Reflections on Financial Crises, 2014

The Constitution didn't grant the executive branch much direct power over the domestic economy. But the Treasury has more influence in foreign economic affairs, and its international division, a group of about two hundred civil servants when I joined, was known as a great place to work on issues that mattered. My first assignment was to write an analysis of what European financial integration could mean for the United States, a topic I knew nothing about at the time, though I would grapple with its consequences two decades later. It was interesting stuff for a twenty-seven-year-old kid.

My boss in the International Trade Office, a career civil servant named Bill Barreda, was my first really inspiring professional role model, a leader who made us feel connected to a mission larger than ourselves. He was smart and funny, without pretension. He rode his bike to work. He gave us economics tutorials on a blackboard in his office overlooking the East Wing of the White House. He was a talented manager, too. Whenever we produced briefing books for Secretary Nicholas Brady, Barreda brought our entire team together over beers to do the hole punching as well as the proofreading, administrative staff alongside PhD economists.

Barreda had an unstated technocratic code that I tried to adopt as my own: Focus on what's right. Tell your bosses what you really think. Understand the politics, but don't let it get in the way of figuring out the best policy on the merits. And never forget that our work affects the world. I worked for Barreda for only a year, but his get-the-right-answer ethic had a deep influence on me.

My next job at Treasury was working for the U.S. negotiator in the first international trade talks on financial services, flying to Geneva once a month to help design a new set of rules for global markets. This felt like the next frontier in economic policy, as more powerful rivers of capital were starting to flow across borders, and unlikely countries were opening their markets to foreign investment. And I was the guy with the "pen," keeping the drafts of the agreement on my IBM PC. I liked the feel of creating something new, starting from a blank slate. I also enjoyed the dance of diplomacy, the consensus building with foreign negotiators as well as the U.S. financial regulators whose support we would need for a deal.

In June 1990, Carole and I moved to Tokyo, and I started an even more interesting job as the assistant U.S. financial attaché in Japan. We stopped in Hawaii for a few days on our way to Tokyo, and a Salomon Brothers economist later told me I had looked like a kid who had just gotten off a surfboard when I arrived. In Japan, the Ministry of Finance is the most powerful and venerated government agency, and civil servants spend decades climbing its hierarchy. I was twenty-nine, definitely not what they expected from the U.S. Treasury. Although I had covered Japan for Kissinger, and I could read a newspaper in Japanese with some difficulty, I knew enough to know that I didn't know that much about Japan. And only a month after we arrived in Tokyo, the attaché unexpectedly left for a new job in Washington, leaving me in charge with almost no help at a fraught moment in U.S.-Japanese economic relations.

I felt like a foreign correspondent, trying to figure out another new place, sending dispatches home to a distant Washington. Japan was a challenge for any outsider to grasp, and much of the economic substance of my job was new to me. One of my tasks was producing Treasury's quarterly forecast for the Japanese economy. This was a useful education, mostly in making me skeptical of forecasting. I talked to economists and executives. I studied the data. But how on earth were we supposed to predict Japan's growth rate over the next two years? Even the best forecasts, I learned, were just educated guesses. They could tell a story about how the economy might evolve, but they couldn't predict the future.

Washington seemed to appreciate my work anyway. I remember when we were trying to get the Japanese to help defray the costs of the first Gulf War, I rode in a motorcade from the Tokyo airport with a senior delegation from Washington. Hollis McLoughlin, Secretary Brady's chief of staff, asked me what the Japanese police officers were yelling into their megaphones as they cleared our path. I didn't know the direct translation, but I replied: "They're saying: 'Get the fuck out of the way!' " I don't know if it was my limited Japanese or my fluent profanity that impressed him, but he told that story around the department to mark me as a young man to watch.

* * *

One of my main responsibilities in Tokyo was helping to open up Japanese markets to U.S. firms, especially U.S. financial firms. The George H. W. Bush administration, like its predecessors, was concerned about Japanese trade barriers. It was also concerned about the anti-Japanese protectionist fever growing on Capitol Hill. The hope was that if we could get Japan to provide a more level playing field, Congress might be less inclined to enact legislation that would restrict Japanese access to U.S. markets. The dominant view of the time—and I shared this view—was that freer trade would benefit both countries.

In those days, the Japanese were seen as our main economic threat, making our camcorders and VCRs, buying Rockefeller Center. In the four years before I arrived, the Nikkei stock index tripled and Japanese real estate values tripled; Japan's land, an area the size of California, was worth nearly four times as much as the land in the entire United States. Publishers churned out books predicting that Japanese capitalism, with its cozy relations between government bureaucrats and huge corporations, would bury the American model. Politicians vowed to stop Japan, Inc., from stealing American jobs. Hollywood movies featured Japanese corporate villains.

But shortly before I moved to Tokyo, Japan's stock bubble burst, followed by its real estate bubble. The tide began to recede, and as Warren Buffett says, that's when you see who's swimming naked. Japan, Inc., no longer looked unbeatable. I got to watch the early stages of Japan's response to its financial crisis, which began deftly, as some failing banks were merged into stronger ones, but later became a case study in what not to do, as the government propped up weak banks and left them undercapitalized, helping to usher in a "lost decade" of stagnant growth. Inside the U.S. government, the pendulum swung back toward triumphalist demands for Japan to be more like us. I had never understood the hype about Japan's supposedly superior economic model, but I wasn't wild about the strains of arrogance in our reaction, either.

I mostly agreed with the substance of our push for open access. Many of Japan's trade practices were unproductive and unfair. Wal-Mart couldn't build stores in Japan, and U.S. financial firms were effectively shut out of Japan's mutual fund and pension fund markets. The specter of U.S. retaliation was also a legitimate fear. Even if it didn't spark an all-out trade war, it would have hurt American consumers as well as American manufacturers who depended on imports of Japanese parts. And our external pressure—the Japanese call it gai-atsu—strengthened the hand of Japan's reformers in their domestic debates, giving them an excuse (the danger of protectionist fervor on Capitol Hill) to open doors they wanted to open anyway.

I still felt uneasy about our paternalism. I had inherited some of my father's skepticism about Americans telling foreigners how to run their own countries, and I thought we were risking comparisons to General MacArthur ruling postwar Japan by decree. I was glad to advocate a level playing field, but the difficulties of American firms didn't always stem from Japanese discrimination against foreign goods and services. The Japanese system was rough on any firm, foreign or domestic, that wasn't part of its establishment. Some would say this model served Japan poorly and ultimately contributed to its lost decade, but that wasn't really our problem to solve. There was something ridiculous about the dance of American officials pressuring Japan to restructure its economy in our image, threatening that congressional protectionists might otherwise block its access to the U.S. market.

I played my modest part in all this. I was a civil servant responsible for executing the policies of the United States, including the ones I had mixed feelings about. And those policies ended up doing some good. We helped persuade Japan to relax some restraints on trade and investment. Congress refrained from enacting new ones in the United States. While our work didn't make big news at home—the only major story that broke on my watch was President Bush vomiting on the Japanese prime minister—I felt like we were making a difference.

My most enduring memory of Japan is becoming a father, although even that wonderful experience supplied a reminder that my work was taking over my life. I had promised Carole that I would learn some childbirth-related Japanese, in case there was no English-speaking obstetrician on duty when we had to go to the hospital. But I was preoccupied with work, so I started the lessons late, and had only three sessions with an embarrassed tutor before Carole's water broke at an embassy reception three weeks before her due date. I can't say I understood much of what the doctors and nurses said that night before they put my daughter, Elise, in my arms. Carole and I can laugh about my lousy ob-gyn Japanese now, but that wouldn't be the last time my work got in the way of my family obligations.

* * *

Treasury asked me to return to Washington in 1992, and we moved into a small house in the same Wood Acres neighborhood of Bethesda where I had attended first grade. I took a front-office job for the assistant secretary of international affairs, reviewing and overseeing the flow of paper, trying to make the trains run on time. My boss's secretary, the venerable Zula Peperis, told me I'd be Treasury secretary someday. That made me laugh. I was still a junior official. No career employee had ever risen to lead the department. All the senior jobs were political appointments, serving at the pleasure of the president, typically recruited from outside the government. But I was fortunate to be in that D.C. staff job after Bill Clinton defeated President Bush, because one day I was assigned to brief Larry Summers, Clinton's nominee for undersecretary for international affairs. Larry would see more in me than I saw in myself.

Even more than graduate school and my early Treasury years, Larry opened my eyes to the possibilities of economics as a lens for thinking about the world and a tool for improving people's lives. Before that first meeting—which was at the World Bank, where he was chief economist—I read a paper he had written examining the appalling fact that infant mortality was higher in New York City than in Shanghai. It got me thinking in new ways about what determines whether countries are rich or poor, what governments can and can't do. That article stuck with me. After I became secretary, when speaking about our own national debates about the safety net for the poor, I would occasionally mention that an infant in St. Louis was more likely to die before her first birthday than an infant in Sri Lanka.

Larry had been tenured at Harvard at twenty-eight, and he had earned a reputation for brilliance, if not for concealing it. He was a former college debate star who would tell you why you were wrong, how you should have made your argument, and why your improved argument still would have been wrong. But he didn't mind being challenged, as long as you didn't mind being challenged back without excessive courtesy. He had an inspiring sense of possibility when it came to public policy, an assumption that evidence-based analysis could always produce a better way. We hit it off, and he made me his special assistant. He seemed to like that I wasn't afraid to speak my mind with him. Years later, when the chairman of the New York Fed asked him if I was tough enough to run the place, Larry said I was always willing to tell him he was full of shit. I remember thinking that was not a particularly impressive credential. It was just what you were supposed to do when you thought your boss was wrong.

Larry seemed to recognize that while I didn't pretend to offer him much in the way of economics insight, I knew some things he didn't, like how Treasury worked, how diplomacy was conducted, and how to get things done. I remember at Dulles International Airport before his first meeting with his fellow Group of Seven deputies, Larry reviewed all the positions he was going to take, and all the impeccable arguments he had on his side. I tried to explain that it's not enough to say what you're for, that you have to know how to achieve it. You've got to move others to your side, and you can't just convince them with your superior logic; you've got to figure out where you have leverage over them—something they need from you or fear from you. Larry teased me sometimes—after I made a substantive comment while taking notes for him at a later G-7 deputies meeting, he dubbed me "the noisy scribe"—but he listened to me, at least occasionally. Larry once said he could envision me as the managing partner of a law firm, or running some big institution, if only my credentials weren't so thin.

"I just don't know how you'd get hired in the first place," he said.

I planned to help Larry for only a few months; before we met I had accepted a new job elsewhere in the Treasury. But Larry wouldn't let me leave. A year later, he decided to promote me from noisy scribe all the way to deputy assistant secretary, one of the top career jobs in the department. It was an honor, but it was a big jump for me, and I knew it would take a toll on my family. I was already working fourteen-hour days, not including late-night calls from Larry, and Carole was pregnant again. We were on a short beach vacation when I got a congratulatory fax from Larry saying Secretary Lloyd Bentsen had approved the promotion. I sent back a fax saying I had decided to stay on the beach and teach tennis instead.

In my new job, I would help oversee our dealings with the G-7 and the International Monetary Fund, as well as any other global financial issue that arose. Once again, I felt underprepared. I was replacing a well-respected official who was retiring after working at Treasury since before I was born. I was not confident that I could live up to Larry's expectations; there was too much about the job that was unfamiliar to me. I remember once after Haitian protesters created an international stir by turning back an American ship, Secretary Bentsen called me to ask what he should advise the President. I had no idea. I didn't know anything about Haiti, and this wasn't about economic policy. I wanted to ask: Why are you calling me?

At least one of my responsibilities was familiar: managing yet another negotiation over Japan's trade barriers in financial services. I still thought helping U.S. firms compete abroad was a legitimate objective. After one Larry-being-Larry session where he challenged a group of Wall Street CEOs seeking greater access to Japanese markets to explain what they were doing to create jobs in the United States, I told him there was no need to be so contrarian. The reforms we were pushing were sensible. Japan's financial sector was still primarily a closed market, and the Japanese finance ministry seemed pretty captured by its financial establishment.

But Washington could be a bit captured, too. When Hank Greenberg, the feisty chief executive of American International Group (AIG), threatened to go to war against the Clinton administration and the World Trade Organization if we didn't extract some insurance concession, I told the Japanese we needed the concession or we would block the entire global agreement—and they conceded. I remember telling Larry that we were spending way too much time and energy on this kind of financial mercantilism, opening markets for Wall Street. I used to joke that our agenda should be more ambitious than making the world safe for hedge funds.

I didn't have a purist's faith in the genius of the free market; I was seeing in Japan what could happen when financial systems fail, and when governments are too captured by the financial sector to clean up the mess. But overall, I believed in our efforts to open foreign markets to competition. And I was comfortable with the broad thrust of U.S. economic policy under President Clinton, who combined a strong commitment to fiscal responsibility and free trade with public investments in areas such as education and scientific research.

I hadn't planned to stay in government for more than a few years, and I felt terribly guilty about neglecting my family. That winter, I was traveling in China when our furnace failed during a blizzard in Washington; Carole, six months pregnant and alone with our two-year-old, had to climb up a ladder to our attic and lug down an electric heater. Our son, Ben, was born in April 1994, and we got to experience again all the anxiety and amazement of parenthood. I loved that stage of life, watching your kids experience the world, but I was missing a lot of it. I put too much of a burden on Carole, and too much of their lives happened without me.

I hated being away so much, never available, always on call, but I was completely engaged by my work. I liked the constant intellectual challenge of working for Larry, who could figure out the flaw in any idea but continued to push for perfection. When the head of President Clinton's National Economic Council, Robert Rubin, replaced Secretary Bentsen in January 1995, I liked working for him, too.

Rubin was the former head of Goldman Sachs, but he was self-deprecating and funny, demanding without Larry's rough edges. He believed in good process. He wanted input from all his advisers no matter where we were in the hierarchy, even if we disagreed with him—especially if we disagreed with him. He was calm, dispassionate, and almost comically deliberate, analyzing problems from every possible angle, scribbling down risks and probabilities on his yellow legal pad, gathering information and "preserving optionality" until he absolutely had to decide. He often reminded us that you can't judge a decision by how it turns out, only by whether it made sense given the information available at the time. His decisions generally did.

Secretary Rubin would guide the department through a series of financial crises, valuable training for the larger crisis still to come.

* * *

One Memorial Day weekend during college, I was driving my family's old Boston Whaler off the Cape when I saw a sailboat capsized in the surf, with a man and a woman hanging on for dear life. I didn't know how long the couple had been in the icy water. I anchored my boat, swam to their boat, and convinced them to swim back to my boat with me. Hypothermia seemed like a greater risk than drowning.

Big mistake. I never should have told them to move. The current was too powerful, and they weren't strong enough swimmers. They thrashed in the waves for a few minutes before giving up and heading back to their boat. Fortunately, they made it, and I made it to my boat, too. Eventually, the waves pushed them toward shore, and the beach patrol picked them up, so my bad advice didn't have tragic consequences. It was a scary but relatively painless way to learn about making judgments under the pressure of a crisis, about weighing the relative merits of various choices with potentially catastrophic outcomes.

* * *

Just over a decade later, I was sitting next to Secretary Rubin in the back of his government car, returning from Capitol Hill during a different kind of crisis.

The secretary had just testified before the House Banking Committee about the Mexican peso crisis, often described as the first financial crisis of the twenty-first century. Mexico was on the brink of defaulting on its obligations, and Rubin had made the case for a $40 billion emergency loan. The reaction was withering. With public opinion running 80–20 against a U.S. government rescue, Republicans and Democrats accused the secretary of plotting to waste tax dollars on foreigners, bail out his Wall Street pals who had speculated in Mexico, and even line his own pockets. Federal Reserve Chairman Alan Greenspan, who was usually treated like the Oracle at Delphi on the Hill, received almost as rough a reception.

It was a troubling spectacle, and I guess it showed on my face.

"What's wrong?" Rubin asked.

"I'm just worried," I said.

There was a lot to worry about. Congressional leaders had initially promised President Clinton that they would back his loan request, but they were clearly running for the hills. We were developing an alternative plan to help Mexico unilaterally if Congress wouldn't back us, but it was starting to look like Congress might try to block us. And if we did manage to get money to Mexico, none of us were sure we'd ever get it back. Not only would that be a political disaster for Clinton and Rubin; it could cripple America's ability to intervene in future crises.

These worries were Rubin's worries, too. He always wanted us to think five moves ahead, to question our assumptions, to imagine worst-case scenarios.

"It's good that you're worried," he told me.

Over the next few years, I would be reminded again and again that during a financial crisis, if you're not worried, you're not thinking carefully enough. I like to say that concern is not a strategy, but it's a prerequisite for good strategy.

* * *

Mexico had been hailed as a model for emerging markets, a fast-growing destination for foreign capital, the first new country invited to join the Organization for Economic Cooperation and Development in more than two decades. But during the country's boom, the Mexican government became far too dependent on short-term borrowing—the kind of money that can easily run when confidence is shaken. Mexico also had a fixed exchange rate, pegging its peso to the dollar—a recipe for instability when confidence goes.

Sure enough, when insurgents assassinated Mexico's leading presidential candidate early in 1994, investors and bondholders and other creditors started to fear the country wasn't as stable—and their money wasn't as safe—as they had believed. Runnable capital began to run. Confidence in the peso began to evaporate. The government tried to buy pesos to prop up their value and defend the peg. But that just drained its dollar reserves and heightened fears that it would default on its debts, especially a pile of short-term bonds called tesobonos that were linked to the dollar. After taking office in December, Mexico's new president, a Yale-trained economist named Ernesto Zedillo, faced reality and abandoned the unsustainable fixed exchange rate. But as the peso plummeted in value, so did confidence in the country.

By the end of 1994, Mexico had clearly lost control of its finances. The government had only $6 billion left in reserves, with $30 billion worth of tesobonos coming due over the next year. And markets no longer considered it creditworthy, so it couldn't raise money to pay its bills. I remember Jeff Shafer, an assistant Treasury secretary, suddenly announcing he had figured out Mexico's problem: "It's a sovereign liquidity crisis!" In other words, it was a run on the country, a national version of the rush to George Bailey's bank in It's a Wonderful Life. Mexico had a modest long-term debt burden and the power to tax, so in theory, it should have been able to pay what it owed over time. It did not have a fundamental solvency problem; it was by no means a hopeless case. But it had an immediate liquidity problem. Without cash on hand, it couldn't meet its obligations. Like George Bailey, it needed help in a hurry.

Default would have been a nightmare for ninety million Mexicans, a potential prelude to hyperinflation and mass unemployment. It also would have been a problem for us. Mexico was our third largest trading partner, and the Fed staff calculated that a messy crisis could affect hundreds of thousands of American jobs, reduce U.S. growth by an entire percentage point, and increase illegal immigration 30 percent. We also feared that investors unnerved by Mexico might abandon other emerging economies that seemed to have similar vulnerabilities. Brazil and Argentina were already experiencing this "Tequila Effect," as their markets slumped in sympathy with Mexico's. Finally, we knew that if Mexico cratered a year after the North American Free Trade Agreement eased its barriers to foreign capital, protectionists at home and abroad would claim a propaganda victory. It would build momentum for trade restrictions in Congress, while encouraging developing nations to wall themselves off from the world.

Larry recognized that a typical International Monetary Fund loan, which would be limited to Mexico's "quota" of $2.6 billion, would be woefully inadequate to stop the run. It would be up to the United States to fill the gap. He suggested that Colin Powell's doctrine for U.S. military intervention—deploy overwhelming force, but only when American interests were at stake, and only with a clear exit strategy—should also apply to U.S. financial intervention. At an early meeting to discuss options, Greenspan suggested that $20 billion would be a "wall of money" large enough to overwhelm the tesobonos and reassure the markets, a figure we ultimately decided to double. The chairman was a free enterprise Republican, reluctant to meddle in markets, concerned that rescuing Mexico (and its bondholders) would embolden future Mexicos (and future creditors) to take similarly irresponsible risks. But we all agreed the potential moral hazard cost of a bailout paled in comparison to the actual cost of default. It was, as Greenspan said, "the least-worst option."

We called that plan Mexico One. But after the politics soured in Congress, we needed a Mexico Two. That's when we turned to the Exchange Stabilization Fund, a pot of money that Treasury was authorized to use to reduce volatility in currency markets and promote financial stability. It had never been used on a scale like this, and I thought it would be imprudent to commit the bulk of our foreign exchange reserves to this cause. But Ted Truman, who ran the international part of the Fed in Washington, figured out a way for the Fed to help us make $20 billion available for loans to Mexico and still preserve some firepower for other contingencies. It wasn't the $40 billion we had requested from Congress, but it was the only way we could act without legislation. And IMF director Michel Camdessus pledged $18 billion, by far the largest package in the fund's history. So we were pretty close to Larry's Powell Doctrine goal.

Several of our European allies, especially the Germans, were furious with the IMF's commitment—partly because of moral hazard fears, partly because they felt inadequately consulted. Members of Congress were also furious about our use of the ESF—again, partly because of substantive concerns about putting taxpayer money at risk to save Wall Street speculators and a reckless neighbor, partly because we had just authorized the largest U.S. aid package since the Marshall Plan without their approval. And we were still negotiating terms with the Mexican government, so Mexico Two was not a done deal.

We thought the deal had to include some tough conditions, including credible government commitments to get its finances under control and to raise interest rates high enough to keep private money from fleeing the country. Ultimately, the rescue wouldn't work unless Mexico's leaders proved they were worthy of investor confidence, and as Larry liked to say, we couldn't want reform more than they did. But we didn't want to impose conditions so punitive that they would weigh down the Mexican economy and depress confidence even further—or force Mexican leaders to resist to prove they weren't helpless supplicants to the United States.

It was a delicate tightrope, and investors—uncertain about the Mexican government's appetite for reform, and rattled by the political opposition in the United States—were skeptical that we'd make it across. Capitol Hill leaders were pushing to block us from using the ESF, or at least tie our hands with restrictions governing everything from Mexican labor standards to Florida tomato exports. Internally, even after we signed the deal in late February, Rubin kept playing devil's advocate, asking us to persuade him we weren't dumping tax dollars into a lost cause. News of those discussions seeped out of the Treasury building, fueling rumors that we were reconsidering the loans, which further unnerved the markets.

Rubin liked to say that nothing in life was certain, and none of us felt highly confident of success. Every blip of bad news—a rebel advance in Chiapas, a drop in the peso's value—made us fear for the program. But we went ahead with our rescue plan. And President Zedillo and his team of technocrats kept their promises to raise interest rates while imposing tax hikes and budget cuts, which helped persuade investors they were committed to getting Mexico's finances under control. After a few months of lurches, markets stopped running.

By the end of 1995, capital was trickling back into the country. By 1997, Mexico's economic output had returned to pre-crisis levels, and its government had repaid all its loans early, netting U.S. taxpayers $1.4 billion in interest. Markets in South America, Asia, and eastern Europe that had suffered from Mexico comparisons all rallied after Mexico stabilized. The rescue worked. By that time, though, Mexico had fallen out of the news, and neither the success of the rescue nor the fact that we recovered our investments plus a profit got much attention—certainly not enough to offset the political hit that Clinton and Rubin took around the initial decision.

Mexico was a bracing lesson in the terrible politics of crisis response. I had never worked on something so controversial before, and it was searing to watch the abuse showered on Rubin and Greenspan—then near the peak of their public credibility—for taking a risk that seemed so compelling to me. It was instructive to contrast Clinton, whose support for the Mexican rescue never wavered even though his aides warned it could make him a one-term president, with congressional leaders who were with us until the public was against us. Senate Banking Committee Chairman Al D'Amato, a Republican from New York, actually urged us to expand the Mexico package before becoming one of its most vehement critics. That kind of congressional opportunism made it harder to restore confidence in Mexico, because it damaged confidence in our ability to keep our commitments.

In fact, once the crisis was over, Senator D'Amato pushed legislation through Congress that temporarily restricted our ability to use the ESF to fight future crises. And we knew there would be future crises. Globalization had unleashed enormous sums of "hot money" that could instantaneously flow across borders, while the aspects of human psychology that had helped produce financial booms and crises for centuries remained unchanged.

* * *

We didn't think the global community was ready to navigate this perilous new world of mobile capital. My colleagues at Treasury and the Fed believed the IMF needed more money for when the next Mexico exploded, plus the capability to deploy the money quickly and forcefully enough to contain a run. It had to be able to provide countries in crisis with sufficient cash to overwhelm the crisis as well as tough conditions to restore confidence in the markets.

But while the United States was the most powerful force at the IMF, we weren't a controlling force. The U.S. founded the IMF, and it was still based in Washington, but we provided only about a quarter of its total funding. As Camdessus once observed, we could block things, but we couldn't make things happen unless we persuaded our partners that they made sense. Even before Mexico was resolved, we began a major international effort to create a stronger global architecture for dealing with future financial crises.

Part of our work was promoting preventive medicine to help countries avoid becoming the next Mexico. We helped forge consensus in international communiqués for what we saw as best practices, urging countries to avoid excessive short-term debt in foreign currencies, to let their own currencies float freely, and to make sure their banks had plenty of capital to cushion against sudden losses. But those recommendations were purely voluntary. We couldn't force sovereign nations to follow them, and our ideas didn't get a lot of traction in those days.

Alongside our crisis prevention efforts, we also worked to improve our crisis response options for the next Mexico. I came up with the idea of a new $50 billion IMF reserve fund, which seemed like a lot of money at the time. We wanted to make sure that in future crises, the world wouldn't be dependent on the United States as the dominant funding source, especially now that the D'Amato restrictions limited our ability to offer bilateral loans. We also proposed an interesting design for the new fund. Instead of raising the money exclusively from the traditional group of advanced economies, we proposed that emerging markets should help finance it and help govern it. This was partly to reflect the new global balance of power; the rising Asian and South American economies deserved a more influential presence alongside rich establishment nations at the IMF. But it was partly to dilute the power of more conservative European countries; we didn't want their occasional parochialism and moral hazard fundamentalism to paralyze future crisis responses.

I flew around the world to make the case and negotiate the arcane details, often with Ted Truman from the Fed. I liked the challenge of the substance and the diplomacy—long flights to long meetings in windowless rooms, sometimes back and forth across the Atlantic without spending the night. I once did five countries in Asia in five days. I built relationships with a new generation of finance ministry and central bank officials. It was interesting, sometimes even exciting.

Many foreign officials were initially skeptical of our proposal for a new crisis fund, thinking we were just trying to find a way to deploy other people's money to finance our own interests. Some of my European counterparts called me "the smiling hegemon." And it's true that I tried to maximize U.S. influence. I remember asking Truman and another Fed economist, Lew Alexander, if we could somehow structure the fund to give the United States the power to force action as well as veto action. They laughed and said they didn't know any math that would give us all the power for just 25 percent of the funding. We settled for a veto. And our counterparts eventually realized the fund made sense for everyone.

By 1997, we had the framework of a deal. But before Congress would authorize this new arsenal for attacking the next crisis, the next crisis had arrived.

* * *

Thailand had ignored the IMF's warnings about the dangers of fixed exchange rates and short-term borrowing in foreign currency. So had many of its fellow "Asian tigers." That didn't matter until their economies stopped growing rapidly. Then it mattered a lot.

Throughout the nineties, Thailand's banks enjoyed easy access to dollars and yen, which they used to finance an investment boom, much of it in real estate. But a lot of the investment was not productive. When the bubble popped in 1997, the banks were overloaded with nonperforming long-term loans, and their creditors cut back their short-term access to dollars and yen. Confidence in the Thai baht flagged. Instead of letting it adjust, Thai leaders followed Mexico's bad example, draining their foreign exchange reserves to defend an indefensible peg to the dollar, hoping the storm would blow over. It didn't. In July 1997, they gave up and devalued the baht. Panic ensued. Thailand was less connected to the United States than Mexico, but we knew there was a chance its crisis could drag down other Asian economies. And Asia was an increasingly vital part of the world economy.

Thailand was also less prepared for financial shocks than Mexico, which had experienced repeated crises in the past, and had attracted a lot of financial talent to serve in government. I remember calling a senior Thai finance ministry official from my parents' house on the Cape early in the crisis to ask what was going on. He didn't seem to know much, and didn't seem to want to share what he did know. The Thais were so reticent it was hard to get a sense of what they were thinking, and none of us really understood their country. My colleagues sometimes assumed I'd have a feel for the place after spending my high school years there; Larry teasingly called me "Mr. Asia." But my time in Thailand gave me no relevant insight into the country's crisis—empathy, maybe, but no additional knowledge that could help us help the Thais.

Our inclination at Treasury—and the IMF's inclination, too—was to try to replicate what had worked in Mexico. We hoped to put a lot of "money in the window," enough to look big compared to the liabilities that could run. We would loan the money at a fairly expensive rate, to make sure it would be repaid as soon as possible once the crisis passed. And we would attach other conditions designed to prevent Thailand from repeating mistakes that had led to the crisis, with the goal of restoring investor confidence in the country.

But in the Thai crisis, unlike the Mexico crisis, the United States couldn't take the financial lead, so we wouldn't be calling the shots. Senator D'Amato's restrictions on the ESF blocked us from providing the large long-term loans we thought were needed. That left the IMF as the only large-scale source of finance. At a meeting of finance officials in Tokyo that August, after Japan pledged to lend $4 billion to the Thais, I had to explain that the United States could not make a direct commitment, even though our economy was in stronger financial shape than Japan's. "How does it feel to be a superpower?" I said to my Japanese counterpart. It was a deeply uncomfortable situation for me—and, I thought, for the United States.

Despite resistance on its board, the IMF leadership committed about $4 billion and cobbled together another $13 billion worth of other commitments. But the package didn't look as generous as Mexico's, and the Thais felt betrayed that none of it came directly from us. Other Asian countries were offended, too, and the Japanese tried to exploit our perceived weakness, quietly floating the idea of an Asian Monetary Fund that would supplant the IMF's role in Asia. We thought this was a bad idea for the global financial system and for Asia; a regional fund model would be more susceptible to being overwhelmed by a regional crisis. I warned Bob and Larry that we were suffering huge damage to our credibility in Asia. Even with one hundred thousand troops stationed on the continent, our influence was waning.

We risked making the problem worse with a fight about transparency. The Thais were publicly claiming they still had $20 billion in foreign exchange reserves, but we knew the real number was closer to zero; the Thai central bank had sold its dollars in the forward markets to conceal the depth of its problems. Chairman Greenspan felt strongly that as a condition of any IMF assistance, Thailand should have to reveal the truth. Bob and Larry agreed. I expressed doubts. I thought full disclosure could shatter confidence and accelerate the run.

I was wrong. Allowing the Thai government to withhold information might have avoided some near-term pain, but it would have risked a lot of damage to their credibility and the IMF's when the truth came out. In a financial crisis, uncertainty is the enemy of confidence. The markets didn't trust the Thai numbers anyway, and the absence of reliable information already encouraged investors to assume the worst. At the time, though, it looked like my fears were coming true, like America was messing up an intervention it wasn't even funding. After the IMF announced the loan in late August—and revealed Thailand's lack of reserves—the baht resumed its swan dive and capital continued to flee.

That fall, I was promoted to assistant Treasury secretary for international affairs, my first political appointment after a decade as a civil servant. At Larry's suggestion, I had switched my party registration from Republican to unaffiliated, to make it easier to get the White House on board. I had voted for President Clinton twice, anyway. But I was too busy worrying about Asia to savor my promotion; Rubin had to administer my oath of office in a hotel in Hong Kong. There was a lot of excitement in those days, but what I mostly remember was a constant feeling of dread. The crisis was spreading to Indonesia, Malaysia, and Korea, as pressure built on their fixed exchange rates. Markets in Brazil, Argentina, and Mexico were falling in sympathy with Asia's, as investors tried to get ahead of the spreading contagion. The United

States was enjoying strong growth, wages were rising, and the federal budget was on the verge of its first surpluses in decades, but the Asian crisis still hit home in late October, when the New York Stock Exchange had to suspend trading after a sudden 7 percent drop in the Dow.

I was getting a remarkable education from talented colleagues—such as Rubin and Greenspan, celebrated in those days as the magicians behind the U.S. economic boom; Larry, who was our leading international economic strategist and now deputy secretary; David Lipton, a former IMF economist and experienced "country doctor" who had Larry's old undersecretary job; and Truman, the veteran Fed crisis-fighter who traveled with me around Asia. President Clinton supported our strategy, and we didn't feel constrained by politics. If anything, we took a perverse pride in the unpopularity of our work. We just focused on finding the best option among a mix of bad choices, debating and arguing and brainstorming at rolling meetings that never seemed to end. I dubbed them "clusterfucks," which became standard Treasury lingo, to the point that Larry would announce we needed a CF on Thailand.

We were feeling our way, refining and relitigating our strategy, painfully aware of our inadequate information and the limits of the tools at hand. We always felt a few steps behind the crisis. We kept rushing to catch up, hoping that each moment of calm we purchased would mark the turning point, the end of the cascade of interconnected problems. Those hopes were usually betrayed.

* * *

Indonesia was the next domino to fall.

Its currency was collapsing, its banks were overextended, and its corrupt government—led by the aging dictator Suharto—seemed helpless to respond. By early November, Suharto had reluctantly signed a $23 billion IMF loan agreement, but it wasn't clear that he was committed to the program or that his government would be able to restore confidence. The day after the IMF board approved the loan, Truman and I met with Indonesia's top economic officials in Jakarta. The finance minister entered the room and asked the central bank governor what was happening with interest rates. The central banker cheerfully said they were up. The finance minister responded: "I thought you told me the program would bring them down!"

Truman and I shot each other looks that said: This isn't going to work.

Indonesian execution was a problem, but the IMF made mistakes, too. The most damaging may have been forcing Suharto to shut down troubled banks—including one owned by his son—with a very limited deposit insurance system in place. That triggered a run on deposits in the rest of the banking system, as depositors feared these bank closures were the first of many and understandably concluded that if their money wasn't safe with favored insiders, it wasn't safe anywhere. And Suharto's son simply bought a new bank a few weeks later, shifted many of the same assets into it, put it in the same location, and gave it a new name—a stunning signal to potential investors that reform hadn't arrived in Indonesia.

In any financial rescue, many of the toughest decisions involve how to set conditions, the policy changes required in exchange for financial support: what kind of medicine will help, what's the right dose, what might kill the patient. In Thailand, for example, the IMF demanded sharp increases in interest rates, to try to stop the fall of the currency and keep capital in the country, as well as some modest budget cuts to cover the costs of the repair of the banking system. That was a standard IMF prescription for an economy caught in a mess like Thailand's, designed to assure investors that the country was creditworthy and wouldn't simply squander its financial aid. But Thailand's fiscal deficits were already low, and painful measures such as tax hikes and spending cuts would further weaken its economy during a downturn. The IMF later reversed course on fiscal austerity in Thailand after new data showed that the economy was in recession, the first of many revisions to the program.

The IMF imposed more sweeping conditions on Indonesia—not only the conventional fiscal austerity and interest rate increases, but a comprehensive dismantling of the economic privileges that Suharto had granted to favored elites. We didn't design these conditions—they mostly came from the IMF, the World Bank, and reformers within the Indonesian government—but we had some sympathy for them. It would have been hard to justify risking billions of dollars to support the kleptocratic status quo, and we thought foreigners would be reluctant to invest in Indonesia as long as Suharto and his inner circle controlled major industries.

But these conditions went too far. It wasn't clear how ending the cashew and clove monopolies would be vital to restoring confidence. Corruption wasn't the root cause of the crisis, and there was no way we could plausibly eliminate it while the crisis was still raging. Expressing concern about the scope of the conditions during our internal debates, I joked that Lipton was playing General MacArthur, trying to reshape the Indonesian economy. But I didn't present a credible alternative. My concern was not a strategy.

In any case, the program was a mess. The rupiah lost over 80 percent of its value in a couple months. Suharto repeatedly committed to reforms he had no intention of implementing, and probably no ability to implement. The crisis broke the political system that had held Indonesia together for decades, and the IMF's money couldn't repair the damage.

* * *

The fire spread next to South Korea, a significant economic power and a vital geopolitical ally. We feared that if South Korea burned, investors would conclude that no emerging-market investments were safe. We didn't even want to imagine how totalitarian North Korea might try to exploit a collapse of its democratic neighbor.

Like the other Asian tigers, Korea had enjoyed years of impressive growth. Like Mexico, it had recently joined the Organization for Economic Cooperation and Development. But its banks had taken out big short-term loans in foreign currency, while making big long-term loans in Korean won to sprawling, state-subsidized conglomerates called chaebols. Now chaebols were in trouble, banks were facing runs, and the government was draining its foreign exchange reserves to prop up the won. When Truman and I arrived in Seoul in mid-November, Korea's lame-duck president had replaced his finance minister merely for proposing to seek IMF help, exhibiting the same kind of denial we had seen in Thailand and Indonesia. And Korea's central bank governor told us the situation was again even worse than it seemed; almost all the country's reserves were gone. I asked him why the new finance minister had even agreed to take the job.

"Because he hasn't seen the books," the central banker told us.

A few days later, Korea agreed to seek IMF help.

This time, we were determined to put enough money in the window to stop a run. We wanted to contain the contagion before it infected the world; I remember telling Rubin we simply couldn't stand by and let Korea burn. He didn't respond well to assertions of imperative or appeals to necessity. If we couldn't devise a plan with a plausible chance of success, he said, then standing by and letting Korea burn would be a perfectly appropriate response. He liked to remind us that just because there was a problem didn't mean there was a solution. But as I liked to point out, the absence of a perfect solution didn't mean there wasn't a problem. Korea had a bigger economy than Thailand and Indonesia combined. The stakes were getting higher. Korean banks had creditors banging on their doors, and Korean businesses and individuals had substantial savings in the banks that could rush for the exits at any time.

“Everything can run,” I said to Rubin.

With the crisis escalating, and the D’Amato restrictions expired, we took a much more direct role in shaping the international response to Korea. We helped the IMF put together an unprecedented $55 billion rescue package, including a $20 billion “second line of defense” from the U.S. Treasury and other countries in case the IMF’s portion was fully drawn down. Mexico had received almost seven times its IMF quota, uncharted territory at the time. Korea got nineteen times its quota. This was Larry’s inspiration. He basically changed the rules in the middle of the game, convincing the IMF to lend much more and much faster. In the early months of the Asian crisis, the United States had been unable to commit our own resources and deferential to the preferences of the IMF. In Korea, Larry put the Powell Doctrine into action.

But even this commitment of what we thought was overwhelming force didn’t stop the run. The markets weren’t sure the commitment was credible, or large enough to cover all the bad debts that South Korean banks were hiding. The IMF’s initial payments quickly flowed out of the country as the foreign creditors of Korea’s banks rushed for the exits. The won depreciated 40 percent in three weeks, and the government essentially ran out of foreign currency. We were starting to doubt that we could save the country; we seemed to have no good options. Frustrated and exhausted during one late-night conference call, I suggested we could buy some time by simply accelerating payments to Korea from the next tranche of the IMF loan. Larry scoffed that I was suggesting a Vietnam War strategy, a recipe for defeat.

“Gradual escalation isn’t going to work,” he said.

Part of Korea’s challenge was a collective action problem. Creditors were refusing to renew short-term loans to Korean banks they thought were at risk of default. But by demanding repayment as these loans matured, they were making default more likely. Because Korea’s government had plenty of resources and its economy was very productive, the best outcome for the creditors would be if they all kept financing the Korean banks to avoid a more chaotic collapse. But they all worried that if they didn’t take their money and run, other creditors would, so they were all trying to beat one another out the door. This is a common dynamic in crises, where rational individual decisions can create disastrous collective outcomes. We had to break the cycle if the broader package was to have any chance to work.

Truman and I came up with a relatively simple idea to address this critical part of the run. We proposed to try to persuade Korea’s major private creditors—a group of American, Japanese, and European financial institutions—to extend the maturity of their loans to Korea's banks. We couldn't force the creditors to agree, but we thought we could convince them that a voluntary "standstill" would be in their mutual interest, since we could credibly say the likely alternative was a government default that would produce deep losses. We convened all the CEOs of the major global banks on a series of conference calls with their finance ministers, where they were all given the same message: If you all agree to convert short-term loans into longer-term loans, we will accelerate the IMF's payments to Korea, and you'll all have a good chance of getting paid back in full. But if you won't come together to stabilize the situation, we can't be sure the IMF will continue to lend, and you'll all face much greater losses.

The banks were a bit stunned at first, but Rubin made a compelling case, and they came around, agreeing first to a temporary standstill, and later to a broader debt refinancing. The panic subsided. And South Korea's new president, a lifelong democracy activist named Kim Dae-jung, made it clear that he was committed, as President Zedillo had been in Mexico, to doing whatever was necessary to restore confidence in his country. Korea's economy contracted severely over the next year, but by 1999 it was growing again at an impressive 11 percent rate.

It took Thailand longer to reverse its slide, but after a new prime minister showed a real commitment to reform, its economy rebounded as well. Indonesia was a harder case. Its gross domestic product fell 13 percent in 1998, one of the worst drops anywhere since the Great Depression. There were riots over rapid price increases, and physical attacks on ethnic Chinese businessmen blamed for Indonesian hardships. Suharto was forced to resign after thirty years in power, creating new uncertainty without ending his country's battles with the IMF. Indonesia's loan had to be renegotiated twenty-three times. Eventually, though, the economy began a slow recovery. Indonesia's government has had several peaceful democratic transitions, and the country has enjoyed a long run of healthy growth.

The IMF, despite its weaknesses, was a vital institution, designed to be as detached as possible from the politics of its member nations. And while we didn't control it, as some claimed, we cared a lot about its ability to defuse crises around the world. So even in the midst of the financial firefighting, I encouraged opposition to the Japanese proposal for an Asian Monetary Fund. This wasn't a difficult feat of diplomacy, given the ambivalence in China and other Asian nations about a more assertive Japan. We made the case that a regional fund would leave Asia worse off, because the rest of the world would have less of an incentive to respond to a future crisis on the continent, and the regional political influence over loan conditions would make the Asian fund's programs less credible in the eyes of investors. Of course, we didn't want the United States to be excluded from future crisis responses, and neither did many Asian countries that still viewed the U.S. security presence as an important part of regional stability.

We thought these were pretty compelling arguments. But ultimately, Japan's weakening economy doomed its plan for the Asian fund, forcing its finance ministry officials to withdraw their proposal. It was a humiliating episode for them. We took no pleasure in Japan's economic struggles, which hurt the United States and the global economy by reducing growth in Asia and exacerbating the crisis. But we were pleased to protect the IMF's role as the sole international lender of last resort.

When I left Treasury at the end of the Clinton administration, my colleagues put together tongue-in-cheek recommendations for my next job; for instance, Rubin suggested I could be Larry's biographer. Greenspan proposed "first assistant to the deputy to the managing director of the Asian Monetary Fund," his wry way of celebrating its nonexistence.

* * *

There was a lull in the crisis in the spring of 1998. After almost a year of running on adrenaline, I started getting migraines; I began competing in triathlons to compensate for the sharp decline in stress. But financial crises can have an unpredictable rhythm. The Asian crisis was slowly spreading beyond Asia. By the summer, Russia, Ukraine, Brazil, and Turkey were all at risk of default.

Russia was in the most dire straits, and its leaders were threatening not to pay back the IMF or their other creditors. I had little involvement in our earlier efforts to support reforms in Russia, but Rubin did ask what I thought of a rescue plan that Larry and David Lipton were discussing with the IMF as a last-ditch effort to prevent default. I was usually on the aggressive side of our team when it came to intervention—and the permissive side when it came to conditionality—but I thought it would be crazy to throw good money after bad. Russia looked hopeless then, financially and politically. Rubin agreed. As hard as the United States had worked to encourage Russia's transition to a market economy, and as worried as we were about instability in a nuclear-armed state, default seemed inevitable, and additional loans felt like they would be a waste of cash and credibility.

But when the financial world is in a fragile place, defaults can have damaging and unanticipated consequences. The shock waves from Russia's default prompted investors to pull back from risk, triggering declines in the prices of financial securities around the world. And these dynamics helped bring the overleveraged U.S. hedge fund Long-Term Capital Management to the brink of failure, raising fears of broader damage to its Wall Street creditors and other institutions with similar risks. Bill McDonough, the head of the New York Fed, helped arrange a private-sector solution even neater than the one we had arranged in Korea. The major Wall Street institutions—with the notable exception of the investment bank Bear Stearns—agreed to inject cash into LTCM until its trades could be safely unwound. We would revisit the LTCM solution when a much more severe crisis hit the United States a decade later.

The collapse of a giant hedge fund with a risk management strategy engineered by two Nobel laureate economists illustrated the dangers of finance in the interconnected modern era. We got yet another reminder in the fall, when the aftershocks from Russia drove Brazil into crisis. After an initial program withered, we helped the IMF assemble another huge wall of money. And once an initial attempt to maintain the real's peg to the dollar was abandoned, superb economic leadership from Brazil helped turn things around within months.

By 1999, the global financial system had calmed down enough that Time magazine featured Rubin, Summers, and Greenspan on its cover as "The Committee to Save the World." I was now undersecretary for international affairs, Larry's original job at Treasury, and I was part of a group featured inside the magazine as "The Subcommittee to Save the World." It was a welcome affirmation of our work, but it was over-the-top. We had made lots of mistakes. Our interventions didn't always work wonders. Even Mexico, Korea, and Brazil, the clearest successes, had suffered devastating economic contractions, because deleveraging after a credit bubble is always painful. And I knew the triumphalist tone would offend our colleagues around the world. The money we helped deploy to countries in crisis was critical, but money can't compensate for the absence of political will. The choices we made in Washington were important, but they worked only when we dealt with competent and credible leaders in the affected countries. Brazil's central banker, Arminio Fraga, who also has U.S. citizenship, was so impressive that I later mentioned him to President Obama as a potential Fed chair.

As the "Committee to Save the World" article pointed out, the "astonishingly robust U.S. economy" was making all of us look smart. Even though I had nothing to do with our domestic successes, I saw how our economic strength at home enhanced our influence abroad. When other countries thought we were managing our economy well, they were more inclined to listen to us.

But my main recollection from that era was how scary it was, how little we knew, how we struggled to figure out what mix of money and conditions could restore confidence in a particular country. The economic damage was brutal, even when our interventions worked. It was scarring to see how quickly markets could overwhelm even an aggressive rescue program, how debilitating one wrong move could be during a panic, how indiscriminately contagion could spread, how reluctant most politicians were to approve the unpopular actions needed to contain it. The most important thing I learned about financial crises is that they're awful.

* * *

So what caused the Asian contagion? Some of our partners in Europe—and some conservative critics at home—believed that we did, by creating moral hazard. In their view, we were arsonists pretending to be firemen. By bailing out Mexico, we supposedly sent a message to government leaders—and the creditors who financed their risky bets—that they would be bailed out again if their bets went bad again. To the moral hazard fundamentalists, that's why governments continued to make risky bets and creditors continued to finance them.

That story had a lot of power over a lot of people, but it wasn't a very credible explanation. Throughout history, financial crises have always caused tremendous economic and political carnage. A politician might be tempted to borrow too much and leave the consequences to his successor, although the emerging-market crises cost the leaders of Mexico, Thailand, Indonesia, and Korea their jobs. But what foreign bank or investor would finance a weak government or a weak bank in an emerging economy on the belief that the IMF would step in quickly to protect them from losses? Before Mexico, the IMF had lent only relatively small amounts of money to countries in trouble, and the economic and financial damage from their crises was typically extensive. Even in Mexico, there was a lot of pain and losses for ordinary families and investors before and after our rescue began to work. It should have been a cautionary tale, not an attractive model to emulate.

It is true that the overall losses to banks and investors were lower than they might have been without the IMF's rescues, but still they had little reason to feel confident they would be protected again. Before Mexico, plenty of banks around the world had been nationalized or liquidated, often wiping out shareholders and bondholders in the process. Even after Mexico, there was no reasonable expectation of a safety net, no way to know which investments would or wouldn't remain at risk even if the IMF did get involved. When Russia was teetering on the brink of default, some investors did buy its bonds as a "moral hazard play," but their assumption that a rescue was inevitable turned out to be wrong and expensive.

It is possible that at the margin, the success of the Mexico program made investors somewhat more confident about financing the Asian boom, not because they thought it marked the end of crises or they expected protection from losses, but because we had demonstrated a way to reduce the depth of the crisis—the extent and duration of the decline in economic activity. But there's no way to solve a financial crisis without creating some moral hazard, without protecting investors and institutions from some of the consequences of excessive risk taking. They were, in Ted Truman's phrase, collateral beneficiaries of an effective emergency program. It was impossible to design an effective rescue for the intended beneficiaries—the people who lived and worked in those countries—without some collateral beneficiaries.

But the success in Mexico did not produce Asia's boom or the willingness of investors to help finance it. During one meeting in Manila early in the Asian crisis, when some of Europe's finance bureaucrats were invoking Mexico and moral hazard to argue against a generous financial response, Stan Fischer, the excellent American economist who was the IMF's deputy director—I would later recommend him to Obama as a potential Fed chair as well—passed me a note pointing out that condoms don't cause sex. Stan's point was that the IMF loan program didn't cause financial crises. It's hard to believe that the existence of firehouses causes fires.

I thought a better explanation of the core problem was a set of beliefs, a general overconfidence that a long stretch of calm and stability foreshadowed more calm and stability. Less charitably, you could call this a mania. Years of dramatic growth convinced investors that the Asian tigers and other emerging markets would keep recording dramatic growth, that past was prologue. While we were firefighting in Asia, I read Charles Kindleberger's classic history of financial crises, Manias, Panics, and Crashes, and his explanation of the recurrence of crises over centuries was the most consistent with what I had observed. In Asia, credit nearly doubled in the three years before the crisis. The sustained period of rapid economic growth caused investors to ignore the vulnerability of fixed exchange rates and forget that capital inflows could become outflows in a hurry. They assumed that past performance would indicate future results. As the American economist Hyman Minsky explained in work I would read a decade later, stability can produce excessive confidence, which produces the seeds of future instability.

This penchant for self-delusion is inherently human, but it does not inevitably lead to financial and economic crises. At the time, a similar dynamic was fueling the U.S. dot-com bubble, as investors enthralled by winners like eBay threw cash at losers like Pets.com. But the bursting of that bubble didn't cause a major crisis, because it was financed mostly with equity rather than bank debt. Investors lost their money when their Internet stocks tanked, but the broader economy suffered only a modest slowdown.

To cause a severe crisis, a mania must be financed by concentrated leverage, by excessive debt. When financial institutions or governments get overextended, they become vulnerable to creditors demanding their money back. This is especially dangerous when their borrowing is in the form of short-term debt that can run when the mania ends. The classic example is a bank that borrows short from its depositors, who can demand their money back at any time, and lends long to businesses and homeowners. This kind of "maturity mismatch"—the use of short-term funding to finance long-term investments—is how George Bailey got into trouble in It's a Wonderful Life, and it's why we now have deposit insurance to avoid bank runs. But a lot of short-term loans to financial institutions can look a lot like uninsured bank deposits, and they can run when confidence goes. When creditors call in the loans and the institutions can't recover the money they had lent to finance longer-term investments, they can fail in a hurry. This is unfortunate if it happens to a single bank, but devastating if it happens to the banking system as a whole.

That was the combustible combination in Asia: mania plus leverage in runnable forms. The overconfidence that fuels bubbles can become panic when bubbles pop, as investors who thought certain types of investments were perfectly safe suddenly decide that nothing that even resembles those investments is safe. Markets stop discriminating among loans, among banks, among countries. They become as blind to strengths as they had been blind to weaknesses. The more money runs, the more pressure mounts on other money to run. That's how financial fires spread. And that's when you need a good fire department, with strong leaders and modern equipment.

We eventually managed to set up the IMF's new firefighting fund, which wasn't easy. We had to negotiate for months with congressional Republicans, who held up the U.S. contribution by attaching completely unrelated abortion restrictions on U.S. foreign aid to our funding bill. I also helped lead a push to create the Group of Twenty, an expanded international forum for financial cooperation, including emerging economies such as China, India, and Brazil alongside the more advanced economies. In the Obama administration, we would go a step further and make the G-20 the main arena for global economic issues, eclipsing the outdated G-7.

Just about every debate we had during the Asian crisis would recur in the global crises a decade later: tough love versus unconditional love, Old Testament justice for arsonists versus pragmatic concern for innocents, transparency versus reassurance, austerity versus stimulus, liquidity versus solvency. In every country, we debated how long to let the fire burn before we should intervene aggressively, what the likelihood was that it would spread, and whether the people we wanted to save could be trusted to do what they promised. We learned it could be costlier to offer too little money than too much; as President Zedillo put it, when markets overreact, policy should overreact, too. We also learned that while no one wants to hand out money without strings attached, too many strings could strangle.

There was no foolproof formula for crisis response. It was more art than science, more shades of gray than black and white. It required flexibility and creativity and humility, not unswerving principle. I liked to paraphrase the boxer and philosopher Mike Tyson: Everyone's got a strategy until they get punched in the face.

* * *

I didn't go into government to be a reforming crusader. I just wanted to do interesting and consequential work. I wanted to be part of something larger than myself. At Treasury, I had the great privilege to help craft policies that would shape the fortunes of nations and improve millions of lives. And when the emerging-market crises were over, I got to turn my attention to a new set of challenges that didn't involve rescuing investors or enraging the public, the kind of challenges that had first drawn me to public service.

As the end of the millennium approached, Pope John Paul II and other religious leaders were calling for rich nations to forgive the debts of poor nations, where nearly three billion people were living on $2 a day or less. This "Jubilee" movement had a powerful moral case, and I had seen the evidence growing up abroad. Globally, one in three kids was malnourished, and their leaders routinely mortgaged their futures to finance wars and villas and Swiss bank accounts. In many countries, interest payments exceeded health and education budgets. I believed—as did Larry, who became Treasury secretary after Rubin stepped down in 1999—that there were also economic and strategic reasons to help poor countries escape crushing debts that hurt their people and destabilized their regions. So we proposed to substantially reduce the loans of the IMF and the World Bank to the poorest countries, and to write off the U.S. government loans entirely over time. We also proposed some creative conditions. To qualify for debt relief, governments would have to divert the money they saved on interest payments into health care and other services for their people.

There was strong resistance among some Treasury staff and from finance ministries around the world, where forgiving debt was seen as an expensive gesture and a moral hazard-inducing precedent. The IMF had never forgiven debts; it raised money from member countries by assuring them its loans would always be senior and paid back in full. The same was true of the World Bank. And some Europeans argued that relief would only encourage irresponsibility in developing countries.

But we didn't think the rich countries that had provided the corrupt dictators of those developing countries with money and weapons had the moral or economic high ground. When I met the U2 rock star and debt relief activist Bono, he did a funny impression of moral hazard fundamentalists lecturing the poor. I told him it was weird to hear a Scottish guy speak in a German accent. Bono, of course, is Irish, but he apparently forgave my faux pas; when I left Treasury, his suggestion for my next job was drummer for his band.

I handled most of the global negotiations over debt relief. I also did much of the political negotiating on Capitol Hill, which I thought would be even harder. Republicans had just impeached the president over an extramarital affair. They had held up a routine increase in the U.S. debt ceiling to try to get President Clinton to slash domestic spending, and when Secretary Rubin had taken a series of creative financial measures to avoid a catastrophic government default, they had threatened to impeach him, too. Republicans tended to view the IMF as a U.S.-funded welfare program for the world. And many liberal Democrats were just as hostile to the IMF, seeing it as a tool for imposing laissez-faire economics and austerity in the name of "structural reform." I hired an excellent Oxfam activist, Lydia Williams, to help design our strategy and reach out to the left. But after the trauma of impeachment, the partisanship on the Hill seemed too nasty to overcome.

Implausibly, though, the cause of global debt relief brought together an extraordinary coalition of evangelical Republicans and liberal Democrats who wanted to do the right thing for people in need. We worked successfully with southern conservatives such as Dick Armey of Texas as well as northeastern liberals such as Barney Frank of Massachusetts. On November 6, 2000, the day before an election that would inspire a month of partisan litigation, I was part of a bipartisan group that watched President Clinton sign legislation forgiving loans to twenty-two poor countries.

"I believe this will put our country squarely on the side of humanity for a very, very long time to come," he said that day in the East Room of the White House.

It was a cool thing to celebrate. In my twelve-year initial stint at Treasury, I caught many glimpses of Washington's pettiness and dysfunction, but I also got a somewhat unrealistic view of the positive impact that public servants could have on the world. That debt relief legislation, for example, included a $50 million U.S. contribution to a global vaccination fund that Sheryl Sandberg, Larry's chief of staff, and I had championed. These were good causes, and we were able to do something valuable for countless people we would never meet.

* * *

I had started at Treasury as a civil servant, but I was now an appointee in a Democratic administration. So when President Bush took office, it was time for me to leave. The Council on Foreign Relations graciously offered me a position at my government salary while I tried to figure out what to do with the rest of my life.

I talked to a few financial firms, but I still felt no attraction to that work. One friend who had left Treasury for an investment bank advised me that if I wanted a finance job, I should decide where to go solely according to which firm would pay me the most, because that would be the best measure of how much they valued me. It sounded like a bizarre way to think about work. I never considered trying to get rich, and it never really occurred to me to choose a job based on what I would make rather than what I would do. We lived very comfortably, and even as a public servant, my salary was higher than the vast majority of American paychecks. Carole never put pressure on me to earn more. She just wanted me around more.

I ended up right back in the world of financial crises. When my friend Stan Fischer stepped down as the IMF's number two, a job traditionally held by an American, Horst Koehler, the German head of the fund, proposed me for the job. But John Taylor, a Stanford economist who had replaced me at Treasury, blocked my appointment. I was now considered part of the Clinton crowd; Taylor thought we had created too much moral hazard in the emerging-market crises, and the Bush administration wanted to signal a departure in policy. They proposed a Republican from Stanford, Anne Krueger, instead. Koehler then asked me to take another senior job, as head of policy and review. I accepted. Larry and some of my other friends thought it was a step down in prestige, but the job came with real responsibility. My department was the arbiter of policy, and had to sign off on every commitment of financial resources. I was pleased to have the chance to keep doing compelling work.

The IMF was a more formal and less fun place to work than Treasury. The meetings were endless, with crushing bureaucracy, an intrusive and fractious executive board, an appalling amount of paper, and a lot of factional conflict among various fiefdoms. The salaries were exceptionally generous for the public sector, which was awkward given the public mission of the institution and our interventions in poverty-ridden and crisis-stricken countries. The pace was much slower than I was used to. And I was not that good at sitting still.

The IMF was full of smart and dedicated people, but not many had experienced the burden of making policy decisions as government officials. There was a lot of paper and bureaucracy and talking. I once asked my colleague Ken Rogoff, the IMF's excellent chief economist, how he made it through all the long meetings with senior officials. Rogoff, who had been a chess prodigy as a kid, told me he survived by playing a dozen games simultaneously in his head.

Still, I got to work on some consequential issues. I helped design a set of principles to guide lending decisions in future financial crises, to better distinguish when we should force countries to restructure their debts and when we should help them meet those obligations. I helped define a set of limits for IMF assistance, an effort to mitigate moral hazard while preserving room for aggressive actions in truly systemic crises. I helped call more attention to the vulnerabilities that come from risky forms of financing, alongside the IMF's traditional focus on large fiscal deficits and inflation. And while the Bush team liked to criticize the bailouts of the Clinton era, they ultimately supported large IMF rescue packages for Brazil, Uruguay, and Turkey with the familiar wall-of-money strategy. That was what the IMF was for.

Years later, Mervyn King, the governor of the Bank of England, joked at a farewell dinner that I was a textbook proof of the difference between correlation and causation. "Tim was present at all the crises," he said. "But he didn't cause the crises. The crises caused him." Again and again, I got to see how indulgent capital financed booms, how cracks in confidence turned boom to bust to panic, how crisis managers could help contain panics with decisiveness and overwhelming force, and how the kind of actions needed to defuse crises were inherently unpopular and fraught with risk.

That turned out to be valuable experience.