FINANCE-LED CAPITALISM

SHADOW BANKING, RE-REGULATION, AND THE FUTURE OF GLOBAL MARKETS

ROBERT GUTTMANN

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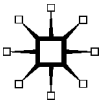

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Contents

CHAPTER 1

From Subprimes to Global Meltdown

On June 22, 2007, the US investment bank Bear Stearns announced that two of its hedge funds, both heavily invested in so-called collateralized debt obligations (CDOs), had to be bailed out. While not exactly a surprise, this announcement caused considerable consternation in the financial markets, as it shed light on a new, highly complex, and opaque financial instrument that had come under considerable pressure in recent months. If Bear Stearns were obliged to liquidate its large portfolio of CDOs, the markets worried, there could be massive contagion affecting other investors exposed to CDOs. As it turned out, it was too late to save these two funds, both of which were declared bankrupt on July 31.

Ten days later, on August 9, 2007, France's leading bank, BNP Paribas, halted withdrawals from three of its investment funds because it could no longer reliably calculate their respective net asset values. Not only had the value of mortgage-related components in the portfolios of these funds dropped sharply in recent weeks, but some of these assets had become impossible to value as trading in them had ceased altogether. Confronted with such a shocking acknowledgment of deep trouble in an important segment of the bond market with considerable global reach, the markets panicked. At the end of that day, the European Central

Bank had pumped 95 billion euros into the overnight lending market as many banks had refused to lend to each other while demand for cash surged. The so-called subprime crisis, which would morph into one of history's greatest financial crises and bring the world economy to the edge of the abyss a year later, was on.

The Rise of Private-Label Securitization

How did we get to this point of no return? Roll back five years, to the autumn of 2002. While most Americans were still reeling from the 9/11 attacks on the Twin Towers and the Pentagon, the financial world was then also preoccupied with the fallout from the Enron scandal. Much attention was paid to the veracity of financial statements, to the quality of the accountants' work, and to a call for greater transparency about the bottom line. This heightened focus would soon turn to the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac, both charged by Congress with providing support to housing finance and so facilitate access to home ownership. These financial giants had each reported smooth earnings through a period of extraordinary expansion in the late 1990s with sharp volume declines during the recession of 2000/01. That raised suspicions, which were later reinforced by additional data Fannie and Freddie were obliged to publish. Several investigations subsequently brought to light considerable accounting manipulation by both Fannie and Freddie, manipulation that was aimed at smoothing out volatile earnings and hiding losses. Once again, as had been the case with the spectacular failures of Long-Term Capital Management in 1998 and of Enron in 2001, complex derivatives trades in the context of unexpected turns in market conditions had caused massive losses.[1]

That accounting scandal weakened Fannie and Freddie considerably, at a time when political foes on the right controlled the Senate and the White House. Until then Fannie and Freddie had single-handedly taken over US housing finance by pioneering the issue of mortgage-backed securities (MBS) whereby

similar mortgages would be pooled together to back the issue of bonds and then have the income generated from within that pool of loans passed on to the investors holding those bonds (minus a service fee going to the issuer for managing the securitization of loans). The invention of MBS, starting in the early 1970s, had gradually transformed funding of home ownership, one of America's most cherished social-policy goals, by turning a hitherto highly illiquid loan into a more liquid security. In the process, considerable (credit, interest, and liquidity) risks were transferred from lenders to a larger group of investors. Both advantages made banks willing and able to boost their volume of mortgage lending greatly, and so they did.

When a combination of more rapid growth and falling long-term interest rates in the mid-1990s created the necessary conditions for a housing boom, the issue of MBS rose from about $350 billion per year in 1995 to over $1 trillion each in 1998 and 1999. Much of that tripling in volume was the work of Fannie and Freddie, but a steadily growing portion of MBS was at that point issued by banks (so-called non-agency or private-label MBS), which had pushed their market share to 15 percent of the total by the end of the decade. Banks wanted to get into the business of issuing MBS themselves not least to earn the steady stream of service fees in lieu of the (more volatile) interest income given up in the wake of securitization. But in that effort banks were still marginalized by Fannie and Freddie; besides having the advantage of implicit government support, Fannie and Freddie also set the (rather stringent) underwriting standards with which banks had to comply.[2]

Now, in the early 2000s, the banks finally had a chance to fill the vacuum created by the scandal-induced retrenchment of Fannie Mae and Freddie Mac and to boost their share of the MBS market. While the overall volume of MBS issues stabilized during that period at around $2 trillion, the share of so-called nonagency MBS rose rapidly from 24 percent of the total in 2003 to 57 percent in 2006. The largest private-label issuers included well-known commercial banks such as Wells Fargo and Bank of America, leading investment banks such as Bear Stearns,

Lehman Brothers, JP Morgan, or Goldman Sachs, and a host of rapidly growing thrifts or finance companies specializing in new types of higher-risk mortgages (notably IndyMac, Washington Mutual, and Countrywide). All these private lenders sought to use mortgage securitization as a means of transforming their modus operandi into what would ultimately come to be known as the originate-to-distribute model.[3]

Rather than holding on to loans as in the traditional intermediation process of "indirect finance" (i.e., taking deposits and making loans), banks now sought to rebundle their loans with the intent of selling them off as soon as possible to other investors. This practice would make the banks less dependent on inherently volatile interest income and more capable of generating lucrative and stable sources of income instead, such as commissions (from loan origination), underwriting fees (from securitization), and service fees (from managing the asset-backed securities). At the same time the new model also allowed banks to transfer the risks associated with loans—the risk of default (credit risk), the risk of a yield curve inversion pushing short-term deposit rates above long-term loan rates (interest-rate risk), and the risk of financing long-term commitments with short-term funds (liquidity risk)—to third parties. There was also a lot more growth potential in the new business model, as banks would get their funds back much more rapidly to launch a new round of lending. An additional advantage arose in the context of new global banking regulations, known as Basel I and Basel II, that required banks across the planet to calculate their risks and then set aside more capital for higher-risk assets. In the originate-to-distribute model, banks would generate assets they then did not keep on their books and therefore did not have to back with additional capital, even though they could still earn income from these off-balance-sheet operations. This manipulation typically involved the setting up of supposedly independent special purpose entities (SPEs) through which the securitization operation would be conducted as if it had nothing to do with the originating bank.

Nontraditional Mortgages

Mortgage securitization could move to a much higher level of operation and accommodate an aggressive push by private lenders during the decade preceding the crisis because there was so much investor demand. Rooted in an extraordinary expansion of the financial services sector overall, a plethora of nonbank institutions arose, notably mutual funds (often spawned by the banks themselves), finance companies, and hedge funds. All these new players were looking for assets with higher yields at a time when interest rates on traditional government or corporate bonds were declining to historically low levels. And MBS offered higher yields than traditional bonds with seemingly little additional risk, considering that credit-rating agencies like Standard & Poor's or Moody's had given many of these MBS triple-A ratings. In effect, the demand for American MBS was global, taking account of the fact that in the 2000s half of the world economy still conducted its cross-border operations denominated in US dollars. Hence, a large number of foreign investors sought higher-yielding assets for their dollar reserves.

This large demand assured the rapid expansion of the MBS market, which in turn deepened and widened the use of mortgages in the United States. By incorporating the prepayment risk of mortgages being paid off before maturity, the MBS were structured to accommodate a good deal of refinancings. This made it much easier for lenders to allow mortgages to be refinanced, especially when prices of the underlying homes serving as collateral rose, as they did in accelerating fashion once the housing boom took root. Homeowners could simply get a larger mortgage, a second mortgage, or a home equity loan to draw additional cash from the rise in the value of their real estate assets, thus increasing the use of mortgage loans. This practice had obvious macroeconomic consequences that were already manifest in the late 1990s but became much more important during the 2000s in the run-up to the crisis. Consumer spending in the United States could increase significantly even in the face of relatively stagnant wage incomes. And capital gains replaced

savings as more and more US homeowners began to treat their homes like an ATM to draw cash from. Amid this powerful "wealth effect" the US savings rate, always comparatively low, collapsed in the 2000s and even turned negative toward the end of the boom.[4]

When the banks broke the market hold of Fannie and Freddie, they did so by loosening the underwriting standards of new MBS in pursuit of aggressive volume expansion. In the process, the banks not only promoted more and more mortgage lending (through refinancings and home-equity loans), but they also sought to widen the pool of mortgage users. Part of that market expansion strategy involved coming up with new mortgage products to give traditional borrowers a greater variety of choices, such as five-year fully amortized adjustable-rate mortgages or interest-only mortgages. Banks began pushing so-called deferred-interest (also known as negative-amortization) mortgages; with these mortgages borrowers made monthly payments below the interest charged over the period so that the outstanding balance of the loan steadily grew. The banks liked this product, because they could offer very attractive initial "teaser" rates (typically 1 percent) without necessarily explaining to unsuspecting clients the consequences of negative amortization (NegAm). NegAm mortgages often came with an additional source of deception, making it look as though monthly payments could increase only by a small amount. However, in reality, according to clauses in the contract, payments could increase dramatically once certain of those conditions had been met.[5] Such loans were also in great demand among professional real estate investors who intended to resell their properties before the NegAm period expired; in the meantime, they carried really cheap loans, thereby fueling purely speculative demand for real estate assets as is typically the case when booms turn into bubbles.

The most important expansion strategy pursued by private lenders, however, concerned nontraditional mortgage products offered to those previously denied any access to home ownership. Among these new products were "piggyback mortgages," where a borrower takes out a second mortgage or a home-equity loan

at the same time as the first mortgage is started or refinanced. The initial justification for such an arrangement was to reduce the loan-to-value ratio of the first mortgage to less than 80 percent and so avoid expensive private mortgage insurance. But in the euphoria of a speculative bubble piggybacks soon became a means to acquire homes with no down payment. Other nontraditional mortgages gaining ground in the 2000s were the so-called Alt-A mortgages (short for Alternative A-paper), which carried a higher risk that made them ineligible for purchase by Fannie Mae or Freddie Mac. Among these higher risks were borrowers with less than full documentation, lower credit scores (below 650), higher loan-to-value ratios, or multiple properties. In any case, Alt-A loans carried higher interest rates than the traditional prime mortgages eligible for repurchasing or securitization by the GSEs.

A third, and by far the biggest, category of nontraditional mortgages arising between 2002 and 2006 in the US housing boom were so-called subprime mortgages that were offered to borrowers with poor credit histories and the resulting low credit scores (typically less than 600) at correspondingly higher yields. While the spread of these subprimes offered marginalized groups a chance of homeownership for the first time, that social benefit was to last only a very short time. Private lenders, especially a new generation of aggressive mortgage lenders such as IndyMac or Countrywide, faced the problem of how to get inherently vulnerable borrowers willing and able to pay more for their loans than stronger debtors would have to. Thus, they offered subprime mortgages typically as interest-only loans, increasingly also with very low initial teaser rates of 2 or 3 percent, which would reset to fully amortized interest-plus-principal loans after, say, two years. Both the lenders and their borrowers could always tell themselves (and each other) that rising housing values would surely allow refinancing of such subprimes before the reset date arrived. Thus, the borrowers would avoid such a drastic payment hike indefinitely. For those refinancings to be possible on a large scale, subprimes had to become part of the securitization process.

As it turns out, much of the aforementioned expansion of the banks' market share in MBS issues between 2003 and 2006 came about in the wake of their lowering of underwriting standards to include a rapidly growing proportion of these nontraditional mortgages. Data from *Inside Mortgage Finance* shows that the share of prime mortgages in the newly issued mortgage-backed securities amounted to 52 percent in 2003, but then declined precipitously to just half of that, 26 percent, in mid-2006.[6] During the same period, the market share of Alt-A mortgages rose from 14 percent to 30 percent and that of subprimes from 34 percent to 44 percent. In other words, just before the crisis hit, below-investment-grade mortgages of the nontraditional kind made up three-quarters of the newly issued MBS. While the inclusion of risky mortgages in still-top-rated MBS could be accommodated by means of various credit enhancements (e.g., additional collateral, insurance, or bank-provided letters of credit as well as other third-party guarantees), those measures designed to improve the creditworthiness of the debtors did not suffice given the scale of Alt-As and subprimes issued and securitized by the banks. Another means had to be found to facilitate the massive securitization of higher-risk mortgages and concomitant relaxation of underwriting standards among private lenders, and this facilitator arose with the successful launch of CDOs by the same institutions pushing the issue of higher-risk mortgages and MBS.

Structured Finance

As private lenders began a concerted push to issue and securitize nontraditional mortgages in 2002/03, they soon ran into the problem of how to maintain high credit ratings for MBS containing many risky loans. Their answer was so-called *structured finance,* which would apply the logic of risk diversification by splitting MBS into different "tranches" distinguished by their respective ranking in a hierarchy of payoff priorities. In that multitiered payoff structure the bonds in the highest rated tranche would be paid off first, thus making

them safer to the point of deserving an AAA rating. Then the bonds in the second-safest tranche would have their interest and principal paid off next, allowing those to be rated AA, followed by the bonds in the A-tranche, the BBB-tranche, the BB-tranche, and finally an unrated (so-called equity) tranche as the first one to absorb any losses. The lower the rating of the tranche, the higher its yield to compensate for its intrinsically greater default risk (even though the tranches may all contain exactly the same mixture of mortgages). Typically, the MBS were structured so that the highest-rated (AAA) tranche would absorb at least half of the total issue, with the other half comprising three or four higher-risk tranches of, say, 10 to 15 percent each.

The problem with that setup was trying to sell the lower-rated tranches. While there was no shortage of demand for the most senior (AAA) tranche, MBS issuers soon realized that they had a much more difficult time finding enough buyers for the less senior tranches rated AA to BB. This was especially true for the BB-rated bonds, since those were below investment grade and therefore could not be bought by the traditional institutional investors, such as mutual funds or pension funds. But without selling off those higher-risk ("mezzanine") slices of their MBS, they could not hope to launch the MBS in the first place. Their solution to this barrier was to go one step further in the securitization process by taking mezzanine tranches out of the MBS and repackaging them into a new securitization instrument known as collateralized debt obligations (CDOs).[7] Even though they were made up of higher-risk collateral, these CDOs could be rated highly by assuming that the underlying real estate assets were regionally diversified and hence supposedly "uncorrelated." That assumption had its roots in the notion that the US housing market comprised distinct regions and had never experienced a nationwide downturn, with prices falling and foreclosures rising everywhere at the same time. Hence, the senior tranche of any CDO, typically comprising 70–80 percent of the total issue, could be given an AAA rating, since it was historically unprecedented to have anywhere near a 20 percent or 30 percent loss

on any combination of housing assets spread across the nation. The lower-rated tranches of any CDO could be sold to less risk-averse investors, such as hedge funds, or be rebundled a third time for further securitization into what came to be known as CDO-squared.

That strategy worked and so fueled the US housing boom to the point of turning it into a bubble. AAA-rated CDOs were considered safe even though they consisted entirely of higher-risk MBS tranches. Trust in those ratings was essential, since investors buying those CDOs had no way of knowing what these inherently opaque instruments contained in terms of collateral. Given their high ratings, CDOs offered very attractive yields exceeding those of similarly rated Treasuries, corporate bonds, or MBS. Between 2003 and 2006 Wall Street issued over $700 billion worth of CDOs containing mezzanine tranches of MBS as collateral, and the overall global market for CDOs rose to $1.5 trillion. Banks got hooked on issuing CDOs, not least because they did not have to show those on their books (and hence hold capital against). The CDOs were actually set up as special purpose entities, so-called orphan companies, that could thus be treated "off-balance-sheet" with respect to the sponsor of such a structure. The CDOs themselves would typically take on debt to fund their securitization operations, using in the process leverage to boost their returns further. Bankers also liked the issue of CDOs as a source of hefty fees for themselves, their orphan structures, and above all the rating agencies with whom they worked closely together in the launch of new CDO issues and whom they paid handsomely for the service of obtaining high ratings that assured steady investor demand.[8] At the peak of the bubble, in 2005 and 2006, CDOs were increasingly buying up the lower-rated "mezzanine" tranches of other CDOs, thus collectively assuring the rapid-growth capacity of this new, highly profitable funding mechanism. And the extraordinary growth of the CDO market during those years facilitated in turn the dramatic expansion of Alt-As and subprimes, which now had a steady supply of assured funding for their speedy securitization.

Synthetic Finance

We can see already in this story the crucial role financial innovations play in the promotion of speculative bubbles. The funding pipeline linking a new generation of nontraditional mortgages, MBS, and CDOs experienced an additional acceleration at the peak of the bubble, in 2005 and 2006, by means of so-called credit default swaps (CDS). These CDS serve normally as protection against defaults and other "credit events" putting the proper servicing of existing debt at risk (e.g., bankruptcy, restructuring, moratorium). In such an arrangement an investor holding debt from, say, a company, may want to buy a hedge against default of that debt (known as the "reference" security) by engaging a third party to pay out an agreed sum in case of such a debt-servicing disruption. In exchange for this hedge the investor pays his counterparty regular premiums for the duration of the contract between them. While in effect serving as a sort of insurance against defaults and other debt-servicing disruptions, the CDS do not have to comply with prevailing insurance regulations. This exemption from regulatory restrictions has made CDS easy to issue and given the parties involved great flexibility in designing highly customized contracts meeting each side's specific needs. In contrast to insurance companies, counterparties selling CDS do not have to put up any reserves or initial collateral with which to cover their exposure to potentially large payouts. In addition, parties with no "insurable interest" are also allowed to buy CDS as a pure bet on the default likelihood of the "referenced" debt. These so-called naked CDS are a perfect vehicle for speculators placing bets on the creditworthiness of all kinds of debtors.

It is this last feature of CDS that has turned them into a tool for speculative bets on portfolios of securities that one does not own. Usage of naked CDS became more widespread at the peak of the US housing bubble. At that point, in late 2005 and early 2006, it had already become more difficult to issue new MBS and CDOs as the market for mortgage lending had finally begun to show signs of saturation. At the same time, investor demand for the higher-yielding MBS and CDOs remained

strong, prompting their issuers to figure out how best to maintain the fast pace of securitization even in the face of a slowdown in the generation of loans to be securitized. What they came up with was a new use of naked CDS with which to replace the traditional CDOs, an example of so-called *synthetic finance*. Apart from the normal group of investors typically buying CDO tranches and earning interest and principal payments in return, there would now be a second group of unfunded investors who would effectively enter into a swap agreement with the CDO to take a "long" position on the referenced securities agreed to. That meant that these investors would receive regular premiums from the CDO in exchange for paying out cash if the referenced securities did not perform or the CDO ended up with insufficient funds. At the same time, a third group of "short" investors would enter into swap agreements with the CDO on the other side of the equation, paying the CDO swap premiums while committing the latter to pay them if the referenced securities failed to perform.

In this complex arrangement known as synthetic CDO, in which CDOs served as intermediaries between short and long investors in CDS, swap premiums replaced a significant portion of interest and principal payments usually found in cash CDOs. Many of these synthetic CDOs involved setting up special purpose entities (SPEs), which would administer these arrangements by packaging and holding the underlying assets, picking the securities to reference, and managing the swap agreements. Those SPEs would also use excess cash inflows from bondholders and short investors to amass separate collateral securities with which to meet their payment obligations. Such synthetic CDOs could be set up much more easily and rapidly than cash CDOs because there were no mortgage assets to collect and finance. Hence their use exploded when cash CDOs became more difficult to issue, jumping from $15 billion in 2005 to $61 billion in 2006. Between 2005 and 2007 a total of $108 billion in synthetic CDOs were issued.[9]

We now know that there was a lot of abuse in how those synthetic CDOs were actually set up. For one thing, they involved

highly leveraged bets that did not require any cash up front but might involve large payouts by the unfunded investors far in excess of the swap premiums they received. Moreover, in synthetic CDOs only the highest-rated ("super senior") tranches were fully funded while the riskier tranches were not. The super senior tranches were never considered at risk at all, and many of the issuing banks kept them on their books or insured them with undercapitalized "monoline" bond insurers. That haphazard architecture of inadequately funded commitments was not going to survive a shock to the system. And sooner or later there was bound to be such a shock, not least because of an intrinsic bias toward greater use of synthetic CDOs just as the cycle turned from boom to bust. When signs of trouble began to appear in the US housing market in the second half of 2006 amid rising interest rates and increasingly unaffordable housing prices, subprime mortgage origination basically ran out of risky borrowers to make questionable loans to and so slowed the pace of cash CDO issues. Synthetic CDOs could then easily fill that vacuum inasmuch as those same signs of trouble made investors holding short positions, mostly investment banks and hedge funds, more willing to use CDS for bets against repayment of bad home loans and continued performance of referenced securities tied to those. The fact that the same portfolio of securities could be referenced for any number of synthetic CDOs might have helped meet this boost in short-investor demand, but it also amplified the collective risk created by those complex and opaque arrangements. The perverse nature of such a market bias in favor of greater use in the face of impending trouble is perhaps best exemplified by investment banks, such as Goldman Sachs, issuing synthetic CDOs and simultaneously taking a short position on them while hiding that fact from unsuspecting long and funded investors who were convinced that they were buying into an AAA rating.[10]

The Collapse of the Securitization Infrastructure

All speculative bubbles burst eventually. There has been plenty of historical evidence from economist Charles Kindleberger and

others suggesting that the longer and/or stronger the bubble, the greater the destructive force of its violent end.[11] This conclusion surely has been confirmed by the collapse of the real estate bubble in the United States, which began as a boom in the mid-1990s and then resumed with increased force in 2003, after a short pause during the recession of 2000/01. This boom's intensification into an outright bubble from early 2005 onward was fueled by a series of intertwined, mutually reinforcing financial innovations attracting an ever-growing number of investors seeking to profit from the rapid price appreciation of the underlying assets, another hallmark of bubbles. With bubble-induced euphoria prompting a generalized underestimation of risk and greed accentuating recklessness, all these innovations were pushed to the limit, perhaps even beyond that. Fraudulent behavior became the norm, as often happens near the peak of booms when the bubble is about to burst. All this rendered the inherently fragile financial innovations fueling that bubble even more vulnerable, leaving them deeply exposed to a destructive shock about to arrive. We need to appreciate this excessive fragility of the securitization infrastructure to understand why it could disintegrate so rapidly and thoroughly once the crisis hit.

In retrospect, the collapse of America's real estate boom could have been predicted quite easily even though very few forecasters did at the time. Any speculative bubble exhausts itself when asset appreciation has gone so far as to price marginal buyers out of the market and/or leverage has become so excessive that the pace of indebtedness needs to slow down. Add to these microfoundations of its burst the bubble's macroeconomic destabilization effects of excessive consumption fueled by capital gains and easy credit, a collapsing savings rate, and growing current account deficits—the precise constellation of the US economy in 2006/07. Already by mid-2004 the Federal Reserve, America's central bank, had decided to "lean against the wind" of bubble-fueled growth with a policy of gradual tightening. Its 17 consecutive quarter-point increases from June 2004 onward pushed the Federal funds rate from its cyclical low of 1 percent to 5.25 percent two years later. At that point the policy began to take its

toll, causing the prices of US homes to reach their peak pretty much across the entire nation. And with prices stopping to rise, the creaky securitization infrastructure began to crack.

The crisis trigger was almost preprogrammed. With the volume of subprime mortgage lending exploding in 2004 and 2005, one could expect a massive resetting of the initially low "teaser" rates at double or triple the rate about two years later. At the time neither borrowers nor lenders thought they would have to face that reality, because rapidly rising home prices would surely make it easy to refinance the mortgage before it reset to much higher monthly payments. With US home prices rising by a national average of 14 percent during 2005 alone, this was not an unrealistic assumption at the time. But when a lot of subprimes came due for their reset during the second half of 2006 and first half of 2007, they could no longer be refinanced as home prices had stopped rising nationwide. As those vulnerable borrowers suddenly faced much more expensive debt they could not afford to service, many went into default and eventually foreclosed on their home. Between mid-2006 and mid-2007 the share of subprimes seriously in default (with nonpayment of monthly interest payments exceeding 90 days) jumped from 6 percent to 9 percent of all subprimes, and the foreclosure rate almost doubled during the same period.

This deterioration had an immediate, thoroughly negative impact on the MBS and CDOs that had funded the boom in nontraditional mortgages. Suddenly, those securitization instruments no longer looked so attractive, as became evident when the ratings agencies started downgrading many of the MBS and CDO during the first half of 2007. At this point two major points of vulnerability came to the fore that stressed the whole infrastructure of securitization to the breaking point.[12] For one, nervousness about potential losses from MBS did not confine itself to the lower-rated mezzanine and unrated equity tranches, which were the first buffers to bear any losses and so disproportionately at risk. The relatively sudden and unexpectedly strong spikes in subprime-related losses shook investor faith in even the better-rated tranches, since investors could not know how

many subprimes were distributed in the aggregate of any MBS across its different tranches and what proportion of those would eventually default during an impending downturn in the housing sector. Such loss of faith was even more pronounced in the case of the CDOs, because those represented more concentrated risk to the extent that they were made up entirely of lower-rated MBS tranches. The opaque nature of these securitization instruments, which made it basically impossible to estimate or pinpoint losses as they arose, prompted investors to overreact in the other direction. Once euphoria was gone, surely by early 2007, it did not take long for outright panic to set in.

The spreading change in sentiment revealed yet another point of great vulnerability in the securitization infrastructure embedded in the very structure of the markets for MBS, CDOs, and CDS. All of these instruments were traded in so-called over-the-counter (OTC) markets. These consist of bilateral transactions between dealers (i.e., the institution "dealing" with this particular security) and their customers for which neither the prices nor the volumes of any trades are publicly disclosed. In contrast to public exchanges (e.g., New York Stock Exchange), where enough information is publicly available for transparent price discovery, OTC markets lack this essential market mechanism. When they come under stress, there is no way to find out what the prevailing market price would or could be. If panic hits a public exchange, its prices may tumble, but they are always accessible to the public. And if they have fallen far enough, buyers will at some point reenter the market to pick up the pieces and thereby possibly launch a recovery. If on the other hand panic hits an OTC market and investors do not know what their prices are, they will just stop trading, and in that case market activity simply ceases. OTC markets also do not have the surveillance capacity of public exchanges to identify where large and vulnerable positions have accumulated. Hence, they cannot intervene proactively and are more vulnerable to bad surprises. Unlike the designated market makers in public exchanges (so-called specialists), the OTC markets lack third parties whose major function it is to assure orderly market conditions and

provide liquidity under pressure. Finally, the bilateral nature of OTC deal-making also preempts clearing and settlement mechanisms common in public exchanges where they intervene as intermediaries to make sure that any deal is carried out as contractually prescribed. In other words, OTC markets at the center of the securitization pipeline MBS <-> CDO <-> CDS lacked all the market mechanisms—transparent price discovery, market makers, clearinghouses—that would have given them needed resilience in the face of the subprime default shock. And so they just crumbled, simply disintegrated, when euphoria turned into panic.

That spectacular collapse of the securitization infrastructure actually occurred at several spots at the same time, and each of these ruptures reinforced disintegration pressures elsewhere. Think of the whole thing as a web of interdependent affiliations, with the banks in the middle. Each actor in that web contributed to its ultimate demise by acting irresponsibly so that chickens were coming home to roost all over the place. Hence, that web was getting torn apart simultaneously in all four of its corners. Let us start with hedge funds, a good number of which ended up as crucial yet also very obscure actors near the center of the web. Those players, known for demanding from their clients extraordinarily high management fees (2 percent) and a large share of their profits (20 percent), also stand out for not disclosing their assets, liabilities, and trading positions—not to their clients and not to the public. They were highly leveraged, having taken on a lot of debt (typically from banks via broker loans) to boost their returns from any correctly anticipated price movement.[13] This leverage magnified their market impact. Let us assume that a hedge fund operated with a leverage ratio of 1:5, a conservative assumption. If it then invested $100 million of its own capital, it could buy $600 million worth of mezzanine tranches of a CDO, which in turn, assuming that those make up 20 percent of the total issue, financed a $3 billion CDO. Thus, if hedge funds got into trouble and stopped trading, they were bound to have a huge negative impact on the MBS or CDO markets overall. And into trouble they surely got! When the wave of subprime

defaults hit the high-risk tranches and depressed their values to who knows what, hedge funds faced margin calls from their brokers just when their key assets, those mezzanine tranches, had become illiquid.[14] It did not help that nobody knew exactly what those tranches were worth or would be worth the next day. No longer able to adjust and trade out of losing positions in the face of margin calls, many hedge funds went bankrupt. Even those still alive took big losses and stopped buying MBS- or CDO-tranches, thus bringing these markets literally to a halt from one day to the next. While there were $738 billion of private-label MBS issued in 2007, there were only $37 billion issued in 2008. The collapse of the CDO market was even more pronounced, especially in terms of its price impact. While the senior tranches of MBS may have halved in value at the peak of the crisis in 2008, pretty much all of the (even top-rated) CDO tranches had become worthless junk by the end of that year. Striking here also was that, notwithstanding regional differentiation of the American housing market, the collapse of MBS and CDO issues was a nationwide affair.

When the MBS <-> CDO <-> CDS funding channel broke down, it also had immediate consequences at the other end of the pipeline where the mortgages originated. The so-called mortgage banks specializing in nontraditional loans, such as subprimes, were actually for the most part thinly capitalized finance companies or aggressive thrifts. Both types had to fund themselves by borrowing in the money markets and so had an incentive to get rid of their loans rapidly by having them securitized as quickly as possible. But once trading and issuing of mortgage-related securities stopped, these lenders could no longer get rid of their mortgages and so had to take the brunt of losses on those while also getting squeezed out of the money markets. It is not surprising then that all the major mortgage banks, notably IndyMac or Countrywide, bit the dust fairly early on in the crisis. To the extent that mortgage origination slowed to a trickle, it exacerbated the housing crisis, especially in the high-risk segment of subprimes where refinancing had become impossible and sticker shock on interest resets exploded during the second

half of 2007 and the first half of 2008. A nationwide housing depression was on.

At the center of the collapsing securitization infrastructure, banks too suffered huge losses; even worse, these were losses they had no way of measuring with reasonable accuracy. Those losses appeared along all the lines of the web they had constructed. Their loans to hedge funds were at risk. At the peak of the bubble proprietary trading desks of key banking institutions had bought up many mezzanine tranches of CDOs from each other that now were worthless. To the extent that the banks had ended up keeping many of the senior tranches on their own books, especially during the final-phase push into synthetic CDOs, they faced rapidly accumulating capital losses from the downgrade avalanche hitting even the best tranches of MBS and CDOs. That problem grew worse when many banks had to step in and take over the assets as well as liabilities of the now-collapsed special purpose entities (SPEs) they had initially sponsored as off-balance-sheet entities for their securitization operations.[15] No matter what the reason, mortgage-related securities on the books of banks rapidly became "toxic" in the sense that no one else wanted them at any price so that banks were condemned to keep them on their books indefinitely. Finally, banks also faced massive losses on their mortgage-related lending amid what ultimately would turn into the deepest real estate downturn in the history of the United States, both in their financial support to mortgage lenders specializing in subprimes and also with regard to their direct lending to households. The huge losses suffered by the banking sector cumulatively included also foreign banks many of which had joined the US housing bubble relatively late and hence that much more aggressively in order to catch up.

Money Market Spillovers

The fact that so many banks suffered such large losses so rapidly when mortgage-backed securitization seized up would have been a big enough hit to create tensions in the world's money markets. But that crucial segment of our financial system, where banks

as well as nonbank financial institutions tap short-term funds for their operations, had another paralyzing stressor to face as fallout from the sudden demise of securitization: a full-scale panic hitting so-called asset-backed commercial paper (ABCP). The ABCP involves issuing and selling commercial paper, in essence a short-term bond with maturities ranging from 1 day to 9 months (with an average of 30 days), which is backed by a pool of different assets. Such collateral may include commercial loans, student loans, credit card debt, or a variety of asset-backed securities. Most of those assets were AAA-rated, thus rendered acceptable to risk-averse money market mutual funds, which soon emerged as the main buyers of ABCP. The funds provided by those investors would allow the ABCP issuers, typically special purpose entities known as conduits acting on behalf of their sponsoring institutions without showing up on their respective balance sheets, to buy up longer-term assets whose returns were usually higher than the yields paid to investors. In that sense ABCP provided maturity intermediation (using short-term liabilities to fund long-term assets) much like banks, except that they did not benefit from deposit insurance as the banks do.

The issue of ABCP grew steadily during the 1990s and early 2000s, but then saw a sharp acceleration in the mid-2000s when it turned into a short-term funding source for the longer-term (MBS and CDO) securities underpinning the US housing boom. That change rendered ABCP more vulnerable for two reasons. First, such short-term paper came to include more and more mortgage-related products in its collateral pool (e.g., MBS tranches). And second, it came to be issued by a new type of bank-sponsored conduit known as structured investment vehicle (SIV), which was ultimately more vulnerable to any market shock. Unlike the more traditional ABCP conduits, notably multiseller conduits or security arbitrage conduits, the SIV did not contain any third-party credit enhancements as protection against losses. And while all ABCP is vulnerable to any market disruption affecting its collateral pool, SIVs were even more prone to paralyzing shocks due to heavier exposure to mortgage-related products and the need for weekly mark-to-market valuation of

their assets. That is why the aforementioned announcement by BNP Paribas on August 9, 2007, admitting its inability to value three of its funds with heavy exposure to US mortgage-securitization instruments had such a devastating impact on the ABCP segment of the funding chain. Suddenly investors could no longer reliably value the underlying collateral of SIV issuing asset-backed commercial paper, and so the (typically very risk-averse) money market mutual funds buying that paper refused to do so from one moment to the next.

The BNP announcement triggered an indiscriminate panic, paralyzing the entire ABCP market for the next six weeks, followed by slightly more selective "flights to quality" all the way to the end of 2007.[16] In all, the ABCP market, which had reached $1.2 trillion just before the BNP announcement, contracted by $350 billion during the last five months of 2007. Much of this decline was due to an inability to refinance ABCP programs when they came due. While this 30 percent contraction spread over the entire ABCP market, it was devastating to its segment related to SIVs mortgages, which collapsed entirely. Rules for the protection of investors obliged SIVs to liquidate their collateral once its value had fallen by half. Hence, a number of those conduits dumped their mortgage-related products at the same time, one of the main reasons why the market for those products ceased to exist. There was an intense negative feedback interaction between the simultaneously collapsing MBS/CDO (asset) and ABCP (liability) pillars of the securitization machine. Amid this dual panic the banks, serving as sponsors of ABCP conduits, came under enormous pressure when their SIVs fell apart. Not only did they have long-standing credit-line support commitments to the ABCP market in general, which now came massively due, but they also faced severe reputational risks. A sponsor might not have any legal responsibility for the conduit it set up. But it would simply look terrible if a large well-known bank refused to repay the investors of its SIVs, who had thought that their money was safe in a cash-like asset. Cognizant of this danger, ten of the largest American banks and the US Treasury Department reacted swiftly to the ABCP panic by trying to set

up a rescue fund, in effect a Super SIV provisionally referred to as Master-Liquidity Enhancement Conduit (M-LEC), which would buy up the assets of their SIVs. But disagreements over loss-sharing and funding allocations among prospective consortium members led to the failure of this M-LEC proposal in late October 2007. Now it was up to the banks to resolve their SIV-crisis individually. Just before Christmas 2007, Citibank, the bank with the largest exposure to SIV-related losses, set aside $48 billion to take the combined assets and liabilities of its three principal SIVs onto its own balance sheet. This enormous sum highlighted the extraordinarily costly challenge facing US banks having to bail out their destroyed SIVs.

Even before Citibank's charges for its SIV debacle, US banks knew that they were facing potentially huge losses from the disintegration of their mortgage-securitization machine. The ABCP panic during the second half of 2007 only reinforced their fears of worse to come, highlighting the fact that they had engaged massively in high-risk activities for which they purposefully had not set aside any capital. Bankers reacted to this realization by hoarding cash and refusing to lend to other banks on favorable terms, knowing that those too were surely in deep trouble. Already at the very onset of that panic, triggered on August 9 by the fateful announcement of BNP Paribas, the global interbank market simply froze and so deprived all kinds of banks and other financial institutions of needed access to short-term funds to support their longer-term assets. Despite the immediate intervention of central banks pumping additional liquidity into the interbank market, the money markets stopped functioning smoothly from that point onward. Worried about their losses and needing a lot of cash to meet margin calls, the banks simply preferred to hoard their cash rather than loan it out to each other. This reaction, while rational from the point of view of an individual bank, proved disastrous for the banking system as a whole. In its milder form the money market freeze pushed short-term interest rates for the riskier borrowers up, possibly above the rates earned on their longer-term assets and creating thereby a negative spread as an additional source of operating losses. In

its more intense form, however, the money market freeze pushed riskier borrowers out of the market altogether, and this deprived them of the oxygen they needed to stay alive—they suffered a sort of death by asphyxiation. When troubled financial institutions suddenly found themselves shut out of the money markets, they had to liquidate their (better) assets at any price or go under. In addition to creating massive sell-off pressure on bond and stock markets and consequently sharply falling prices there, the panic in the money markets thus had the potential of pushing the more overextended banks, hedge funds, thrifts, and finance companies over the cliff. By early 2008 the crisis had become systemic.

Bear Raids

In March 2008 Bear Stearns, America's sixth-largest investment bank, collapsed. Like many of the subsequent bank failures, Bear Stearns was a second-tier institution trying to catch up to the market leaders with aggressive and innovative tactics that relied heavily on leverage and off-balance-sheet operations. This rapid-growth strategy worked very well during the boom years, but left those institutions (e.g., Lehman Brothers, Royal Bank of Scotland, Northern Rock, Fortis, IKB) extremely vulnerable to any downturn. Not only were they severely undercapitalized relative to their size and hence not in a position to take large losses, but they were also very dependent on continuous access to the money markets in their buildup of leverage. When the money markets stopped working smoothly in the wake of the ABCP panic, that group of overextended banks faced an especially dangerous combination of insolvency (i.e., depletion of their thin capital layer amidst excessive losses) and illiquidity (i.e., inability to access money markets). The highly leveraged Bear Stearns (with a leverage ratio peaking at 35.5:1) had become exposed to this double whammy early on, in July 2007, when two of its hedge funds with heavy exposure to CDOs collapsed—a blow from which the firm never managed to recover. It thus became the first of several large financial institutions facing a

devastating stock market attack in what famous speculator and inventor of hedge funds George Soros has characterized as *bear raids*.[17]

The decline of Bear Stearns' share prices, starting slowly in August 2007, took on a dizzying speed from late February 2008 onward and then turned into an avalanche-like phenomenon by early March 2008. While much of that price collapse came in response to the firm's genuine troubles with funding in the money markets, forced asset sales, and mounting losses, there were clearly other factors involved as well in this first massive bear raid. Of crucial importance in this context was the emergence of CDS as a measure of market sentiment about troubled financial institutions. As shareholders, short sellers, and other speculators began to weigh the prospects of Bear Stearns more negatively, its CDS premium shot up. Such an instant signaling device only reinforced market worries about the company's survival chances, accelerating share sell-offs. Since CDS could be bought and resold without owning the underlying reference security, speculators rushed into buying up CDS on Bear Stearns in the hope of gaining a profit from the rising CDS premiums. They were helped in that strategy by increasingly intense rumors concerning Bear Stearns' impending liquidity crunch whose impact on CDS premiums and short-selling reinforced the sell-off of Bear Stearns' shares even more. That negative feedback loop, establishing a deadly interaction between rising CDS premiums and falling share prices, became a self-fulfilling prophecy once Bear Stearns shares had fallen into the single digits. Rules governing institutional investors forbade mutual funds and pension funds to hold shares whose price was below $5 per share, thus establishing a threshold of death for failing financial institutions like Bear Stearns.[18]

When Bear Stearns finally reached that threshold on March 13, the Federal Reserve used its Section 13(3) emergency powers for the first time since the Great Depression to arrange for the company to be bought up by J. P. Morgan for $2 per share, giving the former Wall Street highflier a market capitalization that was less than the real estate value of the skyscraper serving

as its headquarters in midtown Manhattan. The Bush administration, concerned as all political conservatives with the moral hazard problem of government bailouts encouraging excessive risk taking, wanted to send a clear message that shareholders could be expected to be wiped out in any government-mediated rescue operation of institutions "too big to fail." Even though the Morgan takeover of Bear Stearns was subsequently repriced by the courts to a more reasonable $10 per share in response to investor lawsuits, that message surely sank in. Ironically, it convinced investors to jump off sinking ships faster and so had the perverse effect of making subsequent bear raids on other troubled financial institutions even more virulent.

There were many more spectacular failures in the six months following the Bear Stearns collapse. The nation's leading subprime lender Countrywide was sold to Bank of America in June 2008 while the FDIC seized the second-largest mortgage lender IndyMac a month later after an 11-day run on its bank deposits. Then, still in July 2008, both Fannie Mae and Freddie Mac were given special funding access by the US government having to make good on its implicit support promise, the first step in what ultimately ended up in early September 2008 as a quasi-nationalization of the two GSEs. Both entities had been obliged to step into the mortgage mess as lenders of last resort and so had accumulated a large amount of toxic assets from private lenders, a loss socialization effort that ultimately destroyed whatever little capital cushion they had left at the onset of the crisis. The cost of this de facto nationalization of the nation's second and third largest financial institutions respectively (based on asset size) came to an amazing $238 billion. Regarding the situation abroad, revelations of large losses in September 2007 triggered a classic bank run on Britain's mortgage lender Northern Rock, made worse by initial hesitation of the Bank of England to provide emergency support. The long lines of Northern Rock customers trying to withdraw their funds were reported worldwide, evoking already early on in the systemic crisis dramatic memories of the Great Depression. And the messy failures of Belgium's leading banks Fortis and Dexia in late September

2008 demonstrated how difficult it was for EU policy makers to coordinate their crisis management actions in a trans-European financial space.

The Lehman Debacle

While the six months following the collapse of Bear Stearns had been eventful, to say the least, nothing had prepared the world for the historic events of mid-September 2008. First, it was the turn of Merrill Lynch, America's second-largest investment bank, to need a bailout, which was arranged through a takeover by Bank of America.[19] By now it had become clear that the crisis would end up creating even more gigantic institutions "too big to fail" by forced mergers and so add to the already considerable concentration in banking. A couple of days later, the US government had to come up with $90 billion in a hurry to save American International Group (AIG), the world's largest insurance company, by taking a 80 percent majority stake in that company and providing it with emergency funds to make good on its commitments. AIG had gotten into trouble when its London-based subsidiary AIG Financial Products had decided to make a bundle from serving as counterparty to many of the synthetic CDO deals described above. When those fell apart, AIG suddenly faced gigantic payout commitments for which it had neither reserves nor capital set aside. Had AIG been let go under, it would have destroyed the insurer of last resort for the worldwide mortgage-securitization machine and so have had a devastating impact across all segments of global finance. And finally, the US government then also had to face the imminent collapse of Lehman Brothers, America's fifth-largest investment bank, which had been rumored to be in deep trouble ever since the Bear Stearns debacle six months earlier. This, as it turned out, was going to be the climax of the systemic banking crisis of 2008.

As the bear raid on Lehman gathered speed, the Bush administration had already become quite concerned that its numerous government-aided rescue operations during the preceding months

had aggravated the so-called moral hazard problem. According to that argument, banks were induced to take excessive risks to the extent that they had reason to expect a government bailout in case of failure. In the minds of bankers a high-risk strategy might very well pay off with commensurately better returns; if it did not, they would be aided by the government. Thus shielded from the pain of market failure, they could suspend any prudent weighing of risks and returns. The very disintegration of the securitization infrastructure had provided ample evidence that banks indeed were chasing high returns in a very irresponsible manner. When many of them ultimately ended up failing, they were simply "too big to fail" and so obliged the government to intervene. Under pressure from the conservative wing of the Republican Party and also facing mounting public anger about taxpayer bailouts of irresponsible bankers, Bush officials were eager to draw a line in the sand and use the impending failure of Lehman to teach the finance sector a lesson about the need for restoring market discipline. Officials were optimistic that any fallout from a Lehman bankruptcy would be limited, since investors had had nearly six months to prepare for such an eventuality. There were, to be sure, frantic last-minute negotiations to have Lehman acquired by Barclays, but the British bank could not secure shareholder and regulator approval in time. And so Lehman was let go under during the weekend of September 14.[20]

The collapse of Lehman Brothers, a company with $639 billion in assets at the time of its demise, was the largest bankruptcy in the history of the United States. Any corporate failure of that size was bound to have major repercussions for the domestic economy. But this was after all an investment bank, a financial institution deeply embedded in a complex web of affiliations and payment commitments across the globe to whose demise already jittery markets would surely react very strongly. The intertwined nature of modern finance is such that no one, neither banker nor politician, could foresee with any degree of accuracy what would happen when Lehman declared itself bankrupt.

In the immediate aftermath the public, as well as Bush administration officials, were distracted by the forced acquisition of

Merrill Lynch by Bank of America and the AIG rescue, which coincided with the Lehman collapse. There were even positive signs right from the beginning that the much-feared CDS payout commitments in the wake of Lehman's bankruptcy could be unwound in fairly orderly fashion (as ultimately transpired). But a couple of days later Reserve Primary Fund, the nation's oldest money market mutual fund (MMMF), announced unexpectedly large losses on its Lehman holdings that made it impossible to maintain its net asset value at the promised level of $ 1 per share. The public had come to regard uninsured MMMFs to be as trustworthy as insured banks precisely because of this supposedly ironclad dollar-per-share promise. When Reserve Primary Fund "broke the buck," there was an immediate run on MMMF, which in turn froze the world's money markets. What followed was an extremely severe credit crunch, which pushed the US economy into a free fall (with a depression-like decline of GDP (gross domestic product) at an annualized rate of minus 6.3 percent during the last quarter of 2008 and minus 6.1 percent in the first quarter of 2009). Since the United States had served until then as buyer of last resort for a large number of European and emerging market economies pursuing export-led growth strategies, its sudden and violent contraction had an immediate impact of pushing the rest of the world into a steep recession as well (with the volume of world trade contracting by 30 percent during the six months following the Lehman failure).

Countervailing Stabilization Policies

At that point the world faced for the first time in nearly 80 years the prospect of a synchronized depression. To understand the magnitude and impact of the post-Lehman shock to the system, it helps to keep in mind the following equation demonstrating the interaction of an economy's three sectorial (external, private sector, and public sector) macroeconomic balances:[21]

$$(X - M) = (S - I) + (T - G)$$

The shock triggered by the post-Lehman credit freeze triggered a most dramatic reversal of America's private sector balance ($S - I$) from minus 2.5 percent in mid-2007 to a positive 7.6 percent in May 2009. This massive shift came about due to a combination of sharply higher savings S by worried private actors obliged to meet high debt servicing charges without proper access to credit (reversing from minus 3.1 percent to a positive 6.9 percent) and a slashing of investment outlays I. A shift of that magnitude would have contracted total spending so much as to throw the US economy into a depression, were it not for compensating adjustments in the other sectors. While the United States halved its current account deficit (exports X minus imports M) from its prerecession deficit of minus 5.1 percent to minus 2.5 percent nine months later, most of the counteracting adjustment came from the public sector. The latter adjustment would have come about to some degree automatically due to recession-induced declines in tax revenues T and increases in income maintenance programs, which are part of government expenditures G (e.g., unemployment compensation, food stamps). But those so-called automatic fiscal stabilizers were not strong enough to counteract a private sector reversal of that magnitude. They had to be reinforced by discretionary government action, starting already in late September 2008 with the $700 billion Troubled Asset Relief Program (TARP). TARP was originally set up to help banks unload their toxic assets, but it was soon transformed into helping recapitalize the nation's largest banks and, under President Obama, rescue the US automobile industry. In addition, Obama launched a $787 billion stimulus package in February 2009, combining tax cuts, aid to troubled states, and job-creating investment programs (e.g., subsidies for the solar industry). As a result the US budget deficit moved from an annualized level of minus 2.4 percent of GDP in mid-2008 to minus 10 percent a year later, and this immediate net injection of spending compensated in large measure for the decline in private spending so that the economy of the United States could exit its post-Lehman downward spiral relatively quickly (by mid-2009).

Expansionary US fiscal policy was further reinforced by monetary policy efforts under Ben Bernanke. Not only did he slash the short-term interest rates under Fed control (discount rate, Federal funds rate) to just above zero, but the Fed introduced in short order a number of targeted credit-easing programs (e.g., Term Securities Lending Facility, Primary Dealer Credit Facility, Money Market Investor Funding Facility, Commercial Paper Funding Facility) each of which was designed to remove a specific clog in the American credit system and so revive the broken-down credit supply.[22] The US central bank also entered into a series of swap agreements with other central banks to help alleviate a global shortage of dollar reserves that had put enormous pressure on foreign banks facing dollar-denominated margin calls. And in late November 2008 the Fed launched the first of its so-called quantitative easing initiatives, engaging in massive bond purchases to pump additional reserves into the banking system while giving support to the damaged bond markets.

The worldwide impact of the post-Lehman shock was alleviated by concerted action on the part of many governments acting in unison. The key to this effort was the elevation of a hitherto marginal body, the Group of Twenty, to a global policy coordination mechanism. Bringing together the leaders of the 20 largest economies (with a combined 86 percent of the world's GDP), the now semi-annual G-20 meetings drew on a remarkable consensus from November 2008 onward to meet the challenges of a global crisis together. The G-20 leaders agreed in short order to rescue their respective banking systems, initiate reregulation of those systems, strengthen the intervention capacity of the International Monetary Fund, pass fiscal stimulus packages, accept the need for extraordinary monetary policy stimulation, and abstain from unilateral protectionism. This coordinated policy intervention was crucial in reversing the downward spiral, and by late 2009 the world economy began to show signs of sustainable recovery (except for the European Union where the impact of the subprime crisis would trigger its own systemic crisis of historic proportions).

There are some clear lessons to be learned from the story of the subprime crisis recounted here. One lesson is that major crises typically start as financial ones, often with the burst of a bubble. Another is that finance itself has today become something qualitatively new, an innovation-driven facilitator of funding whose largely unrestrained liberty of design by its main actors and their propensity for excess have both created strong ups and downs in the pattern of economic growth. Another quality of modern finance, a degree of interconnectedness beyond any single human's comprehension, has given this cyclical up-and-down dynamic a truly global dimension of contagion. Obviously, government policy has a large role to play in regulating finance and smoothing out the cycles, but this depends increasingly on how well national governments coordinate their responses to the transnational challenges of a fully globalized financial system. We shall analyze this dual challenge of global finance and cycle contagion systematically in subsequent chapters, starting with the notion of "structural crisis" in the next chapter.

CHAPTER 2

Long Waves, Structural Crises, and Credit-Money

The global crisis following the disintegration of the US securitization machine in 2007/08 proved to be a deep decline, from which the world economy has recovered only haltingly and in uneven fashion. These kinds of crises are far more intense and enduring than any normal business cycle downturn known as recession, a passing phenomenon that we experience every five to ten years for a few quarters at most. That recent crisis, tellingly referred to as the Great Recession, is far different from, say, the last several US recessions in 1990/91 or 2000/01. What we have here instead is a far more serious, but also quite rare phenomenon, which the world encountered as well from 1873 to 1879, 1929 to 1939, and 1973 to 1982. In each of these instances the downturn typically lasted for several years, engulfed much of the globe, and only ended with fundamental changes in policy addressing the imbalances underlying that crisis. The Great Recession of recent years fits that pattern as well, prompting the question of what it is that makes us go through such major crises each generation.

It is not a mystery why the crisis of 2007/8 struck the economics profession completely by surprise (with few exceptions such as Wynne Godley or Nouriel Roubini who had dared to predict

such a possibility).[1] This kind of crisis lies outside the purview of what mainstream economists think about; it is a phenomenon that contradicts their fervent belief in self-adjusting markets and balanced growth paths. In that view there is no real room for any kind of crisis other than as an exogenous shock caused by some aberrant forces of interference disturbing the equilibrium propensities of the market mechanism. But we also have a rich tradition of heterodox thinking that views economic crisis as part and parcel of how capitalism operates. We want to draw here from those thinkers to give the events of 2007/08 a wider context and to see where we go from there.

Minsky's Super-Cycle

"Great" crises are a recurrent phenomenon—albeit one spaced decades apart. We had them occur in the 1870s, 1930s, 1970s, and late 2000s. When looking at the specifics of these major downturns, we see that each began with a significant financial crisis. Moreover, these incidents of financial instability were of such force that they derailed the economy and destroyed the prevailing institutional framework that integrated money and banking into the economy. Financial crises of that reach and depth touch the entire system of finance and may therefore be characterized as *systemic crises*.

Financial instability is a factor in nearly every cyclical turning point and has therefore been part and parcel of business cycle theory for quite some time. While most mainstream macroeconomists do not provide any consideration of finance as an active determinant of growth (and its fluctuations over time) in their models, they do allow for the occasional financial crisis to act as an exogenous shock capable of triggering a recession.[2] The Austrian School of economic thought, starting with Ludwig von Mises (1912/1953, 1949) and Friedrich Hayek (1931), emphasizes a credit cycle in the course of which an irresponsibly lax central bank permits a buildup of debt and overspending in the wake of excessively low interest rates to the point where businesses end up making too many bad investment decisions (so-called

malinvestment) and hence find themselves in crisis. When looking at the Federal Reserve's recent record of responding to any recession, even a shallow and short one, by pushing for much lower interest rates and maintaining those long into recovery (as in 1982–87, 1991–94, and 2000–04), there is something to be said for that line of argumentation. This is especially so if we accept that the Fed's accommodating postrecession policy stance had something to do with launching three consecutive bubbles driving the US economy forward after 1982—the bubble of the corporate raiders in the mid-1980s, the Internet bubble of the late 1990s, and the real estate bubble of the 2000s.

But if we truly want to understand financial crisis as a phenomenon endemic to our capitalist system, we must turn to the post-Keynesians. They are the followers of the "true" Keynes, in sharp contradistinction to the various neoclassical reinterpretations that squeezed this original, at times even subversive thinker back into the general equilibrium box.[3] Post-Keynesians have highlighted the importance of financial instability at the cyclical peak as a trigger of downturns. Here we have to look in particular at the work of Hyman Minsky (1982, 1986) whose lifelong focus on financial instability as an endogenous feature of capitalist economies with correspondingly cyclical growth patterns has regained the attention it deserves after the events of 2007/08.

Minsky's principal argument is that business cycles are reinforced in both upswing and downswing phases by a parallel credit cycle whose sharp turning point at the cyclical peak arises in the wake of acute explosions of financial instability of sufficient force to push the economy into recessionary adjustment. In support of this argument the so-called financial-instability hypothesis of Minsky (1992) holds that more and more debtors reach excessive levels of indebtedness during the upswing phase to render them highly vulnerable to any slowdown of income generation. This argument distinguishes between three different financing positions, each one comparing current income generation with given levels of debt servicing charges (i.e., regular interest payments and timely repayment of principal).

- In the *hedge finance* position agents (households, businesses) earn enough income to pay off all of their debts and so face no risk from their indebtedness.
- In the *speculative finance* position agents have enough income to service their debts, but can no longer pay those off all at once. This is obviously a somewhat riskier position to find oneself in.
- Finally, in the *Ponzi finance* position agents have to take on new debt just to service their old debts. This is a very dangerous position that can easily get out of hand, especially when considering that debtors, once fallen into such a downward spiral, will typically be obliged to take on increasingly short-term debt coming due that much faster. Whereas any disruption of normal levels of income creation can easily move a debtor from a speculative position to a Ponzi position, debtors already in the latter position will find that even slight declines in income can have a devastating impact on their debt servicing capacity. Minsky aptly described such a position as one of "financial fragility."

Incidents of financial instability can happen anytime, to the extent that excessively indebted actors default on their debts and so impose losses on their lenders. But such incidents become a financial crisis when there are a lot of such overextended debtors in Ponzi finance positions so that the entire system has become fragile. Minsky argued that such fragilization of the entire system is built into the cyclical dynamic of capitalist economies. During upswing phases, with the economy growing rapidly and generating good income growth, the prevailing optimism drives many actors to borrow more and their lenders to extend credit quite willingly. As investment bets materialize successfully, both borrowers and their creditors are willing to take on a bit more risk in pursuit of still higher returns. It should be noted that Minsky afforded financial innovations an important role in this process to the extent that those make it easier to get more debt and live with higher levels of leverage. As recoveries turn into (debt-fueled and innovation-driven) booms, widely shared euphoria induces systematic underestimation of risks building up, and this in turn prompts many to overextend. This careless pursuit of quick riches leads to many actors finding themselves

eventually in a Ponzi position, often recognized as such only ex post facto when previously rapid income growth has peaked or even started to decline while previously low interest rates have begun to rise. There is definitely that kind of squeeze dynamic near the cyclical peak between sharply decelerating income growth and rising debt servicing costs, as falling profit rates and spreading overproduction begin to manifest themselves at a time when demand for credit spikes and/or monetary policy tightens in the face of accelerating inflation. And it is this squeeze on overextended debtors that then leads to an event of financial instability that, by demonstrating unmistakably the degree to which the entire system has become fragile, changes the general mood swiftly from euphoria to fear, even panic. In the wake of the subprime crisis Wall Street has come to call this brutal turning point the *Minsky moment*.[4]

From that moment on acute financial crisis conditions cause credit to freeze up. Suddenly deprived of access to loanable funds, desperate debtors dump their assets into declining markets in a mad scramble for cash to survive. Creditors suffer major losses to the point where they too may fail. The simultaneous pullbacks by borrowers and lenders alike trigger a recessionary adjustment, which inevitably follows such a credit crunch. In that process overextended producers slash their output levels and production costs. While these reactions lower aggregate supply, they also depress demand—especially when they cause layoffs and lower wage income. Stabilization requires aggregate supply to have been cut faster than aggregate demand so that excess inventories can be eliminated. At the same time, the recessionary adjustment also requires deleveraging across the board, either by writing off bad debts (parallel to the write-down of impaired assets) or getting rid of old debts while abstaining from taking on new debt commitments. At some point these crisis-induced adjustments will have run their course sufficiently to have corrected underlying imbalances and so stabilize the situation for a recovery to become possible. For Minsky these conditions of restabilization will arrive earlier and more surely with the help of what he termed "Big Bank" (i.e., a strong central bank serving

as effective lender of last resort and pumping liquidity into the system in order to stabilize asset prices) and "Big Government" (i.e., an adequately sized government capable of counteracting the shrinking of the private sector with larger deficit spending).[5] He considered those two channels of economic policy particularly indispensable in stopping a possibly self-feeding spiral of forced asset sales, debt liquidations, losses, and cutbacks that may easily get out of control and throw the economy into depression—the famous *debt-deflation spiral* identified by Irving Fisher as the primary mechanism underlying the Great Depression of the 1930s.

While Minsky's work on financial instability has been applied by post-Keynesian economists and Wall Street analysts primarily to a business cycle framework, he himself early on stressed the relevance of his contribution in the context of long waves.[6] The existence of such long waves was first noted by the Soviet economist Nikolai Kondratiev whose studies of long-run price indices (wages, interest rates, raw material prices), foreign trade patterns, and credit indicators led him to conclude that there were distinct phases of rapid growth followed by sustained periods of substantially slower growth over a span of 50 to 60 years. He identified three such long waves—one from 1790 to 1849, another from 1850 to 1896, and a third one starting in 1896 that presumably ended in the late 1940s after the end of World War II.[7] Joseph Schumpeter later named those long waves Kondratieff cycles and gave them a technological interpretation. The Austrian economist, in his pathbreaking study of different types of cycles, identified the presence of bursts of innovation moving in clusters across a large and growing number of sectors to boost overall growth. Long periods of stagnation follow when those technological bursts exhaust themselves.[8]

Minsky gave the long-wave dynamic a financial dimension when observing a supracyclical buildup of leverage and increased risk-taking over several business cycles during the upswing phase. Once again, financial innovations are crucial in this process. But what Minsky was emphasizing here even more is the perverse impact of long periods of tranquility breeding instability.

When things have gone relatively well for a long time, people will be inclined to believe that this will continue to be the case indefinitely. Moreover, the occasional mild recessions during long boom phases (as during the 1950s and 1960s or from the early 1980s to the mid-2000s) are too short to make actors more risk-conscious in a lasting fashion and too shallow to clear out any debt overhang or associated excesses.

Minsky's identification of financial factors underlying long waves stressed not just the rise of debt relative to income over several cycles, but also the ongoing increase in the prices of key assets, notably stocks and real estate, to ultimately unsustainable levels. The two factors are related inasmuch as these assets serve as collateral for broker loans and mortgages, thus feeding the aforementioned increase in leverage. The balance sheet interaction between increased accumulations of liabilities (as a result of greater debt levels) and higher-priced assets prompts, according to Minsky, gradual changes in the composition of different payment types whereby the safer income-based payments are increasingly crowded out by the more vulnerable balance sheet payments in the form of fixed debt servicing charges and asset sales. Finally, Minsky also noted that over longer periods of expansion there is a tendency for the stock of ultimately liquid assets (e.g., Treasury bills) to grow more slowly than other assets, a trend that ultimately undermines financial stability inasmuch as it shrinks a cushion with which to absorb eventual manifestations of crisis producing events. The combination of these trends creates an environment in which the financial system becomes more prone to the kinds of panic that trigger the aforementioned deflationary spiral toward depression.

Later on, Minsky added an important institutional dimension to his analysis of long waves with his collaborator Paulo Ferri when they took note of "thwarting institutions" built into the structure of our market economy. Various institutions, conventions, and interventions can be put into place to constrain the kind of unsustainable excess building up to the point of explosion into crisis. Looking at the postwar boom of the 1950s and 1960s, for instance, Minsky and Ferri noted that nominal wages

in US industry rose in line with productivity gains and inflation, thus yielding a better balance between aggregate demand and supply for much of that period.[9] The authors also pointed to the importance of corporate market power, where large firms are in a position to administer prices so as to avoid price wars and translate rising costs into higher prices. Finally, the central bank acts as "lender of the last resort" to make sure that incidences of financial instability are rapidly stabilized before growing into a systemwide crisis. Long booms come to an end, not least because such thwarting institutions do not remain effective forever and erode over time. In the late 1960s the postwar collective bargaining formula for proportionate nominal wage hikes exploded into galloping inflation while globalization undercut corporate market power gradually to the point of subjecting US industry to a drawn-out profit squeeze during the 1970s and 1980s. In that period we also encounter more frequent lender-of-last-resort interventions by the Fed, which ironically prompt bankers to take bigger risks in anticipation of bailouts when things go wrong—the so-called moral hazard problem I first mentioned when discussing Lehman's bankruptcy.

That theme of "thwarting institutions" was expanded by Tom Palley who referred to the long-wave dimension of financial instability as a "Minsky Super-Cycle." Palley's analysis of these crisis-containing stabilizers and their eventual erosion is quite broad and applies perfectly well to the latest supracyclical boom from 1982 to 2007. He mentions in this context the strategic importance of financial innovations, not only for learning to live with higher levels of leverage, but also for bypassing existing regulatory constraints. This gets Palley to a bigger point about the effectiveness of financial regulations, which often cease to work well after a while or even become counterproductive. We could witness this with the structure regulations of the Glass-Steagall Act in the late 1970s or in how the banks circumvented the global capital adequacy regulations put into place by the Bank for International Settlements over the past two decades. Besides being bypassed by financial innovations, regulatory restraints can also be undermined with the passage of

time by the growing complacency of inattentive regulators who have forgotten what a crisis looks like. And then there is also the problem of regulatory capture whereby financial institutions gain control and influence over the regulators either through effective political lobbying or the so-called revolving door of populating key regulatory agencies with former bankers. The combination of regulatory escape, relapse, and capture undermines the effectiveness of financial regulations so that they no longer prevent crisis-inducing behavior. Add to this the fact that long boom phases, stretching typically over a quarter of century (e.g., 1948–73, 1982–2007), make everyone forget about the dangers of financial crises and the kind of behavior that leads to them. Such collective memory lapse invites careless behavior of the kind last seen in the run-up to the subprime crisis. As Palley remarked, such carelessness may be further aggravated by the kind of culture change we can easily see take hold during long booms when optimism crystallizes into a mad dash for the riches and greed becomes widespread.[10]

The long-wave dimension of Minsky's work on financial instability bears a lot of relevance to the crisis we just went through. It stands to reason that a supracyclical buildup of credit overextension, further fueled by the gradual erosion of thwarting institutions and barely corrected by shallow recessions during the long upswing phase, will at one point have created such broad-based financial fragility that even a relatively minor event could trigger such a devastating chain reaction as to threaten the whole financial system. That, as we saw previously, is precisely what happened with the subprime crisis when problems in a relatively small segment of the bond market triggered a bullet that ricocheted around several layers of global finance to bring the entire world economy almost to its knees. We have earlier examples where long upswing phases ended with major *systemic crises* that started fairly innocently only to deteriorate rapidly into something much bigger and more dangerous. For instance, Vienna's stock market crash of 1873 destabilized German and American efforts to move from a bimetallic to a gold standard, and this in turn triggered a worldwide deflationary shock to burst a

railroad-induced bubble in much of the industrialized world. America's protectionist response to Wall Street's stock market crash of October 1929 (Smoot-Hawley Tariff Act of 1930) disrupted debt repayment flows between Germany, France, Britain, and the United States, which destroyed the gold standard in September 1931 and set off a huge banking crisis thereafter. Overheating of the US economy in the late 1960s made the US dollar's overvaluation untenable, triggering the collapse of the Bretton Woods system in August 1971 and a decade-long stagflation crisis. We can conclude on the basis of historical evidence that long boom phases are brought down by generalized conditions of financial fragility, the result of boom-induced credit overextension, which get laid bare by a trigger event of financial instability rippling through a disintegrating international monetary system.

A Globalized Growth Pattern

Hyman Minsky tied his analysis of financial instability to an underlying business cycle dynamic, both on a macroeconomic level in his marvelous book on Keynes and even more so on a microeconomic level where he superimposed his credit cycle onto Michal Kalecki's cyclical feedback loop between industrial profits and business investment spending.[11] And many past financial crises have born him out in that regard, occurring first in the industrial sector, such as when we faced stock market crashes or a spectacular corporate bankruptcy as the trigger events for a broader credit crunch. This emphasis on corporate debtors as the key source of instability also matches Karl Marx's arguments about capitalism's crisis tendencies. In volume 1 of his magnum opus *Das Kapital,* Marx laid out why our system is prone to recurrent overproduction conditions. With wages mostly determined in the labor market as a private cost and hence kept as low as possible, the rising output capacity of firms pursuing increasingly automated production methods in competition with each other would inevitably outpace aggregate demand. The latter is restrained by the limits imposed on wage income and hence the

consumption capacity of the nation's workforce. And in volume 3 of *Capital* Marx focused on the forces in the system pushing the profit rate lower in the long run. Like Minsky and Kalecki, Marx too saw destabilization primarily originate from squeezes on profit income in the wake of excess supplies. This renders a growing number of corporate debtors vulnerable to credit overextension and financial fragility.[12]

The last major crisis, however, did not seem to fit that pattern at all. This time around destabilization centered on US consumers who, to the extent that they owned homes, were put into a position to turn the equity value of that asset into a steady flow of borrowed cash until they overdid it. When the second shoe of the 2007–09 crisis dropped, it hit the governments on the periphery of the Eurozone (Greece, Portugal, Ireland, Spain, Cyprus). While it is entirely justifiable to argue that any private debtor, even households, can be rendered fragile by excessive indebtedness to the point of finding themselves in the dangerous Ponzi finance spiral, that argument does not apply so straightforwardly to governments. Public debt is not like private debt inasmuch as governments can raise taxes or encourage monetization of their debt when they get banks (including the central bank) to buy up their securities. Of course, the weaker members of the Eurozone did not have sufficient powers of tax collection or debt monetization when the asymmetric shock of the Lehman bankruptcy hit Europe, because the arrangements of that single-currency zone lacked provisions for fiscal federalism or active monetization of public debt.

Be that as it may, we have to assume that major financial crises, those with sufficient force to have a negative impact on production and employment, break out in strategic areas of vulnerability where the debt excess has been particularly pronounced and crisis-induced retrenchment is inclined to affect the rest of the economy greatly. For much of the time this will be the corporate sector, as Minsky highlighted. But at times the onset of a systemic financial crisis may touch other strategic pillars of our debt economy. When that happens, we have to ask ourselves why and how these particular actors could have become so

strategically placed that they could have such a great impact on the rest of our economy. What made a small slice (i.e., subprime mortgages) of America's bond market so important that global finance almost choked to death on its travails in September 2008? And how could the budget deficits of Greece, a country representing less than 2 percent of the European Union's total GDP, almost destroy the Eurozone in 2010/11?

The answer to these questions requires us to identify a global growth pattern that emerged over the past three decades, corresponding to the upswing phase of the latest long wave (1982 – 2007), which came to center on the American consumer becoming the "buyer of last resort" for the rest of the world. This is a long and complicated story, which begins with a set of dramatic US policy changes at the onset of the 1980s in the face of stubborn stagflation conditions that had to be overcome. First, in October 1979 the Fed abandoned its long-standing low-interest policy in favor of a tough anti-inflation stance that saw short-term interest rates triple (to more than 20 percent) and broke the inflationary spiral by means of a double-dip recession from October 1979 to August 1982. Massive tax cuts and increases in military spending in Reagan's first budget, the so-called Economic Recovery Tax Act of 1981, provided substantial fiscal stimulus to pull the US economy out of that long recession and launch a noninflationary recovery. High real interest rates kept inflationary pressures at bay, further helped by substantial appreciation of the US dollar during the first half of the 1980s (by over 60 percent against other key currencies), which rendered US imports much cheaper.

US industry, deprived of its inflation-based nominal accumulation gains (paper profits) by deep recession, faced additional pressures to restructure in the face of high real interest rates and intensifying international competition that came in the wake of a much higher dollar. Its restructuring efforts involved a wave of mergers, spin-offs, divestitures, and hostile takeovers, which crystallized during the mid-1980s into a stock market boom pushed forward by a new group of corporate raiders (Ivan Boesky, T Boone Pickens, Carl Icahn, etc.). They

were able to finance massive attacks on undervalued companies through access to so-called junk bonds, a new financing mechanism for more marginal firms hitherto completely dependent on bank loans. The raiders' takeover bids of many renowned US corporations imposed *shareholder value maximization* as the new norm of corporate governance, a single-minded focus on short-term profits that was further reinforced by changing the remuneration of the nation's chief executives in favor of stock options and performance-based yearly bonuses. The high dollar gave the leading survivors of this shakeout battle a strong motivation to internationalize their production by making overseas assets so much cheaper while foreign firms entered the US economy because of its huge market size and relatively rapid growth. Amid this two-way flow of direct cross-border investments the world's leading companies began to move toward a higher level in the globalization of production in which outsourcing and offshoring became increasingly important profit determinants in their global expansion strategies.[13]

From the very onset of recovery in the early 1980s the US economy began to experience simultaneously rising trade and budget deficits, the product of Reagan's fiscal stimulus and an import-biased consumer boom. The United States financed these twin deficits by borrowing from abroad, turning in 1985 into a net debtor to the rest of the world. As it became increasingly dependent on foreign savings over the next three decades, the nation's growing current account deficits enabled a growing number of other countries to launch and pursue aggressive export-led growth strategies—countries from Germany to China. By 2005 Americans spent nearly $107 for every $100 they produced, waking up every morning to borrow $2 billion to $3billion from the rest of the world. Chronic US trade deficits in the range of 4 percent to 6 percent of GDP absorbed in the late 2000s up to three-quarters of the other countries' trade surpluses. That is, Americans have been put in hock to the rest of the world to the tune of nearly $5 trillion.

But the United States is not like any other debtor nation, thanks to the dominant world-money status of the US dollar, a

status that currency has held since the end of World War II. With twice as many dollars circulating abroad than domestically, the United States is able to borrow from others in its own currency. Unlike any other debtor nation having to earn foreign exchange to service its external debt, the United States can simply create the money it needs to deal with its foreign debt. Technically, it does so by replacing maturing debt with new debt, swapping in the process one stack of old paper with new paper. This so-called *seigniorage* benefit has basically freed the United States from any external constraint, allowing it to run highly stimulating fiscal and monetary policies as during the Reagan years.[14] As a matter of fact, this "iron embrace" linking the United States as the world's buyer of last resort and the surplus countries pushing export-led growth went even deeper than that. Both had a vested interest in gradually growing US current account deficits, which just pumped more dollars into the rest of the world where those were easily absorbed for recycling back into the US economy or other engagements in the dollar-based world economy. And this mutual interest in growing US deficits formed the background for the securitization-driven US real estate boom we discussed in chapter 1, which in turn led to the subprime crisis in 2007.

Having the United States run large and growing trade deficits continuously from the early 1980s on helped absorb a huge demographic shock, which saw three billion people, nearly half of the planet's population, enter the capitalist economy all at once in less than a decade (between 1989 and 1998). We are talking here not only about the collapse of the Soviet Union and its satellites in 1989–92, but about the broader disintegration of a state-dominated growth model in the developing world. Independence had given scores of countries in Latin America, Africa, and Asia one-party states whose interventionist governments pursued import substitution strategies of industrialization that yielded local monopolies or oligopolies of dubious efficiency. Their model was in trouble by the early 1980s when the US-led hike in interest rates made these nations' foreign debt unsustainable at the same time as the worldwide recession was shrinking their export earning potential. From August 1982

on the world was in the grip of the so-called *LDC debt crisis* (Less-Developed Countries) during which Brazil, Mexico, and over a dozen other less-developed countries had to have their foreign debts restructured in exchange for structural reforms. Those basically abolished their state-run growth model in favor of widespread liberalization of their domestic economy and its improved insertion into the world economy by means of drastic currency depreciation. Then came the collapse of the Soviet Union starting in 1989, just when the LDC debt crisis was about to be resolved. In 1994, as Mexico's planned economic integration with the United States and Canada (through the North American Free Trade Agreement) triggered the *Tequila crisis*, several major emerging-market countries took important steps to make themselves more competitive—notably China's massive currency depreciation and Brazil's Real Plan. And then, in 1997/8, many economies of East and Southeast Asia (e.g., Thailand, Malaysia, Indonesia, Philippines, South Korea) were hit by a major financial crisis that obliged them to undertake structural reforms and devalue their currencies.

This crisis-induced opening of much of the hitherto closed developing world pushed the inhabitants of Latin America, South and East Asia, and parts of sub-Saharan Africa into the world economy literally from one day to the next. But these people entered the world economy first as low-wage workers before turning into middle-class consumers. Gaining access to a very large pool of cheap labor, leading firms from the United States and other industrial nations used the revolution in information, communication, and transportation technologies to reorganize themselves into global supply chains serving an increasingly integrated world market. That process, with its concomitant leap in productivity, threatened to create worldwide excess supplies in a significant number of industrial sectors (e.g., steel, cars, construction) had it not been for the debt-financed excess spending by the United States. When a huge country like China can rack up double-digit growth rates for two decades and accumulate $3 trillion in foreign-exchange reserves while having a consumption share of GDP below 40 percent (compared

to a >50 percent norm), it can pursue such an investment- and export-driven growth pattern only with an even larger economy serving as buyer of last resort for its manufactured goods. It helps, of course, when the surplus country recycles its reserves to the deficit country so that the latter can maintain its excess spending for an extensive period of time.

A Meta-Economic View

International macroeconomics treats the world economy as the sum of its parts, connecting the more than 200 national economies to each other via balance of payments (i.e., current and capital accounts) and exchange rates. This linear-aggregation method of summing national economies into the totality of the world economy fails to grasp the globalized growth pattern described above whereby a positive supply shock from three billion people entering the world economy all at once did not create acute overproduction conditions right away thanks to America's unique capacity to run up large foreign debts and so act as the world's buyer of last resort. We can only fully grasp this transnational growth dynamic dominating the upswing phase of the latest long wave from 1982 to 2007 if we move beyond the confines of international macroeconomics, today's mainstream view of international economic relations. We must recognize that the degree of globalization has rendered the world economy more than the sum of its parts; rather, the world economy is a thing with its own dynamic, and national economies are interdependent as never before and connected in new ways to each other (e.g., via global supply chains of the world's leading corporations). What we need, in other words, is an entirely new approach to thinking about the globalized economy, a *meta-economic revolution*. And in this new meta-economic framework finance will have a special role to play, analytically placed at the center of the world economy. Not only is finance the most globalized dimension of contemporary capitalism, but it also plays a determining role in tying national economies together through a multilayered web of cross-border capital flows and

driving whatever globalized growth pattern emerges out of those interactions between countries.

In such a meta-economic framework we would also give Minsky's financial instability hypothesis its international dimension that today's global finance has rendered indispensable. This extension of Minsky's approach would make it clear that the US-centered globalized growth pattern could not sustain itself forever. Being freed from any external constraint by supplying the world's international medium of exchange by means of external deficits that were automatically financed by the rest of the world, the United States ended up pushing this privileged position to its limits when its "bubble economy" engendered growing US deficits and rising debt levels among US homeowners using their homes like an ATM machine.

The subprime crisis described in chapter 1 served in this context as the trigger of a much larger systemic crisis, because its implosion of the US housing bubble impaired America's excess spending capacity and so exposed global overproduction conditions that had been allowed to build up. Not only did European banks suffer steep losses from their heavy exposure to the US securitization machine, but the global credit crunch following the Lehman bankruptcy also disrupted local credit access in Europe and elsewhere. The result of these pressures was a steep, almost depression-like decline in economic activity across the globe. This was made worse by a very sharp contraction of world trade and massive capital flight to quality (see the recurrent phenomenon of negative yields for US Treasury bills) or back to the home base. In that sense it is fair to say that the systemic financial crisis of 2007–09 was part and parcel of a deeper global downturn, a phenomenon we may best characterize as a *structural crisis* because it affects the very structure of our economy.

Another indication that we have been dealing with a structural crisis is that it came with a one-two punch, a pattern we have also seen in previous instances. The structural crisis of the 1870s, fueled by the collapse of the railroad boom in the industrial world, moved from Central Europe to the United States. The Great Depression of the 1930s—which was the result of

underlying overproduction conditions when the spread of Taylorist work management techniques and Fordist mass production technology led to a decade of productivity gains outpacing real wage growth during the 1920s—started in the United States but then spread to Europe in the wake of the gold standard's demise in 1931. The stagflation crisis of the 1970s, triggered initially by the overheating of the US economy in an inflationary acceleration fueled further by a collapse of productivity growth, destroyed the Bretton Woods system in 1971. It then spread to the rest of the world through the dislocations caused by a sharply falling dollar and enormous commodity price hikes. In the latest structural crisis, that of the late 2000s, the credit crunch impact of the Lehman bankruptcy in September 2008 served as an asymmetric shock to the Eurozone, a shock that drove a sharp wedge between the chronic deficit countries at the zone's periphery and the surplus countries at its center. The result was a serious Eurozone crisis in 2010–12 when that second shoe finally dropped. I conclude that one way to characterize a structural crisis, in addition to it being triggered by a systemic financial crisis and to the depth of its downturn in economic activity, is its supranational propagation. That is, in a structural crisis crisis-induced fissures arise in the international monetary system and spread financial instability to other regions.

Théorie de la Régulation

How do we deal with this phenomenon of structural crisis? The mainstream of the economics profession is not helpful here because its approach is so wedded to the notion of equilibrium that it has a hard time even conceding capitalism's inherent propensities to grow in a cyclical fashion and engender occasional explosions of financial instability, let alone face such a major challenge of destabilization as a structural crisis. We need to go elsewhere then! One way to address the topic of structural crisis is to go back to the long-wave approach of Kondratiev and Schumpeter and presume that this phenomenon would typically occur during the downswing phases of such waves, either as their

trigger (when it occurs near the long-wave peak) or as the vector for massive reorganization (near the long-wave trough), which sets the stage for a new upswing phase. The Great Depression of the 1930s is an example of the former, and the double-dip US recession of 1979–82 is an example of the latter.

Luckily, we have a theoretical approach that can help us make better sense of long waves and the role of structural crises in the transition from one wave to the next. A French heterodox approach, known as *la théorie de la regulation*, and emerging in the late 1970s, provides us with the most complete tool kit to analyze the historic evolution of our capitalist system and make sense of its long-wave dynamics. Its principal protagonists—Michel Aglietta, Robert Boyer, Bernard Billaudot, Benjamin Coriat, Alain Lipietz, Jacques Mazier, and Dominique Plihon—have attempted to periodize capitalism in terms of distinct phases while at the same time shedding light on key differences in the evolutionary paths of specific countries (e.g., United States, Japan, France).[15] It is important not to confuse the French term "*régulation*" with the English term "regulation," which refers usually to government intervention in the marketplace. While that aspect plays an important role in the French "*régulation*" approach, it is only one of several forces coming together to guide the capital accumulation process and its prevailing growth dynamic. Régulationists are interested in identifying the institutional dimensions underpinning the modus operandi of our capitalist system; they want to analyze how those, each on their own and in their interactions together, normalize the system so that it can reproduce itself in stable fashion while also expanding. In that context the Régulation school has focused on five institutional pillars of our system through which essentially contradictory and conflict-ridden social relations at the heart of the system can be regularized to give it a semblance of balance and coherence:

1. Forms of competition that depend on the degree of concentration of capital, shape the mechanisms of price formation and ultimately apply also to the labor markets where they play a big role in setting wage levels

2. The wage relation determining both the wage structure and terms of employment, but extending beyond those to include unions, the social wage components (e.g., pensions, health insurance), labor law, working conditions, and the division of labor
3. The type of state, as expressed by its capacity for economic and social intervention and the mechanisms it uses to maintain that capacity in the face of crisis and conflict
4. The monetary regime comprising money and its management, monetary policy, and the financing of economic activity
5. The international dimension by which national economies get inserted into the global economy through a complex web of commercial, monetary, financial, and political relations with the rest of the world

These institutional forms are not a static given. They are historic products, subject to change in response to social pressures, adoption of new conventions, and administrative innovations. In the same vein, they can also lose effectiveness over time, become outdated by changing circumstances, and in their obsolescence they can hinder progress. Apart from being modified over time, they also differ from each other in their national specificity. We can therefore distinguish different types of capitalism at the same time—say, the Anglo-Saxon model of a free market economy with limited government involvement, Germany's social market economy model giving unions a strong say in industrial management and providing a solid safety net for workers, and France's dirigiste mixed economy organized around a large, centralized, and interventionist state. While these five key institutional forms—competition, wage relations, money, state, and international dimension—coexist more or less autonomously, they interact together to form a system in forward motion. Régulationists have conceived of these interactions as a "mode of regulation," by which they mean an ensemble of procedures and norms that structures our social relations (e.g., labor and capital, debtors and creditors, private and public) and organizes our economic activities (e.g., exchange, production, finance) in a given context of time and space. This concept enables them to identify distinctly different phases in the evolution of our capitalist system:

- In the "ancient" mode of regulation before the Industrial Revolution, agriculture and craft guilds dominated at home while merchants organized trade routes linking competing empires to their colonies.
- The early industrial capitalism of the nineteenth century was a "competitive" mode of regulation rooted in brutal market regulation of small-scale industrial producers and (largely unorganized) wage labor under the deflation-prone constraints of the gold standard where the state was mostly not involved.
- The rise of large firms administering prices and employing mass production technologies gave rise to a "monopolistic" mode of regulation in the first half of the twentieth century when large productivity gains translated into proportionate wage increases while an activist state assured that strategic balances in the economy were preserved.
- Since the 1980s we have arguably become subject to a "transnational" mode of regulation whereby accelerating globalization of economic activities and markets imposes a new type of competition in which superlarge firms manage to extract extra profits at the expense of other actors.

To the extent that any given mode of regulation determines a specific path of growth, it yields what the Régulationists have called a "regime of accumulation." Here we can distinguish between an "extensive" accumulation regime, whose growth depended on using more machinery and labor, and an "intensive" accumulation regime rooted in more automated production methods yielding faster productivity growth. The former coincided with the competitive mode of regulation during the second half of the nineteenth century.[16] From that perspective, the interwar period (1918–39) could be characterized as a transition period during which the emergence of an intensive accumulation regime with its mass production technologies (Taylor's "scientific management," Ford's assembly line) was not yet matched by social norms of mass consumption so that there was not yet an adequate mode of regulation in place. The Great Depression was a crisis expressing this disconnect, and the policy reforms associated with the Keynesian

Revolution (i.e., New Deal) were needed institutional adjustments to match accumulation regime and regulation mode. These reforms (e.g., collective-bargaining agreements tying increases in real wages to productivity gains) refined the intensive accumulation regime and gave it a new monopolistic mode of regulation to embed in, creating what the Régulationists have called the Fordist accumulation regime. In its empirical analysis of the rise of the Fordist accumulation regime, the Régulation school finally saw a long wave whose upswing phase was tantamount to the remarkable postwar boom of the 1950s and 1960s. This phase was followed by a structural crisis in the early 1970s and a downswing phase that lasted over a decade into the mid-1980s.

Régulationists also fit into our long-wave framework in terms of how they analyze the phenomenon of crisis. They distinguish between "small" and "great" crises of capitalism.[17] The former are cyclical in nature, necessary to rebalance disequilibria that have built up in the course of business cycle upswings. They resolve themselves without transforming the mode of regulation or the accumulation regime, hence are transitory phenomena. On the other hand, great crises are explicitly recognized by Régulation theory as structural in nature, caused by a lack of coherence between the institutional forms that undermines the functioning of the prevailing mode of regulation or, even more profoundly so, they are caused by the disintegration of the accumulation regime then in place. In either case, such a structural crisis can only be overcome through major institutional reforms that transform the mode of regulation adequately or, if need be, guide the economy toward a new accumulation regime. In this context we can see the resolution of the stagflation crisis in the early 1980s, with its far-reaching policy reforms of Reaganomics across the globe, as the emergence of a new "transnational" mode of regulation and a finance-led accumulation regime dominated by finance and globalization.[18] The crisis of 2007–08 would then mark the structural crisis of that finance-led accumulation regime. This theme will be developed in the rest of the book.

Monetary Regimes

If we are to capture the full thrust and force of finance-led capitalism as a distinct accumulation regime, we need to anchor it in the Régulationist context of a monetary regime—the institutional pillar dealing with money and banking. This is by no means an easy or straightforward task. Mainstream economics has kept the phenomenon of money largely separate from the real economy by defining it as an exogenously determined stock variable. The orthodoxy's treatment of exchange as barter and of production in terms of purely physical production functions is designed to yield equilibrium conditions, which can only be defined in money-less terms. That same focus on equilibrium is also inclined to reduce finance to a passive residual, with no bearing on the growth dynamic of the system. In reality, however, money is deeply embedded in what is after all a cash flow economy where all economic activities take the form of monetary circuits interwoven in space and time. In that web of cash flows money has the characteristics of an endogenous flow variable.[19] And it is intimately tied to finance, especially since the demise of the gold standard in 1931 in the aftermath of which money became *credit-money* issued by the banking system in acts of credit extension. Those acts could take the form of bank loans or security purchases; in either case money was linked to debt, hence finance.

There exists a profound contradiction in modern capitalist economies regarding money (and its ties to finance in a system of credit-money). Money possesses a contradictory double nature. On the one hand, it is a *public good* inasmuch as its proper functioning yields enormous social benefits. We are richer and have greater opportunities living in an economy using money compared to one that does not. When we talk of its "proper functioning," we have three qualities of money in mind. The first is adherence to strict rules guiding the process of money creation. For instance, money should not be created by anyone other than the government's monetary authorities or specially licensed banks (see the controversy surrounding bitcoin, an online currency issued by nonbanks). The second is that

money must circulate smoothly in a well-functioning payment system. And the third quality is that money must have a stable valuation and not be subject to excessive inflation or deflation. But these three qualities of money as a public good are by no means assured, because money is at the same time also a *private commodity* whose creation and circulation is a source of gain for its issuers. When banks turn zero-yielding (excess) reserves into interest-bearing loan assets, they profit from the money creation process. And banks also gain from money's circulation in the payments system when they impose all kinds of fees and charges (e.g., user fees for writing checks or for withdrawing cash from ATMs outside their own network). If money itself is a source of profit, then its issue is very likely to be procyclical as banks create too much money in their pursuit of income gains and then retrench in the face of financial crisis. Moreover, banks will also be inclined to discriminate as to whom they give access to credit and other useful financial services under what terms. These propensities for instability and inequality undermine, of course, the qualities of a public good of money's proper creation, smooth circulation, and stable valuation.

The contradiction resulting from money's dual nature, with its capacity as a public good being put in question by its biases as a private commodity, needs to be managed carefully, lest it get out of hand and destabilizes the economy. And that management has come to be carried out by none other than the state, the only institution able to act as a nonmarket agent and hence typically the enforcer of public goods such as health care, education, and protection of the environment. The state has vested its monetary authority in a central bank and possesses the legal force to regulate banks as well as other financial institutions. Issue of currency and control over the nation's payments system provide the government with additional levers of influence over matters of finance.

State management of money and banking has typically involved four different pillars of regulatory control, all of which are necessary to contain money's contradictory nature:

- monetary policy, whereby the central bank seeks to influence the process of money creation and interest rates;
- financial crisis management, which requires effective lender-of-last-resort interventions by the central bank or other bodies to stem crisis-induced panics;
- a framework of safety and structural regulations pertaining to the whole array of financial institutions and markets so that these may operate properly;
- participation in international monetary arrangements (e.g., exchange rates, cross-border capital flows), the precise modalities of which determine a nation's insertion into and standing in the world economy.

To the extent that these four dimensions of state management pertaining to money and banking form a coherent whole, we can characterize them as a *monetary regime*. Let us recall (from our discussion of the Régulation school in the previous section) that money is one of the institutional pillars defining an accumulation regime and its mode of regulation. Hence, we need to consider the notion of a monetary regime in that context as a determinant factor of any accumulation regime. When an accumulation regime gets transformed by a systemic crisis, its existing monetary regime collapses and needs to be replaced by a qualitatively different alternative for that transformation to run its course. This is precisely what happened in the aftermath of the Great Depression with the transition to the Fordist accumulation regime and then again in the wake of the stagflation crisis of the 1970s, which gave rise to finance-led capitalism.

Rise and Fall of the Postwar Monetary Regime

The global depression of 1929–39 saw in short order a stock market crash, the collapse of thousands of banks, and the demise of the gold standard. In other words, that crisis simply destroyed the prevailing monetary regime of commodity money. Faced with a collapsed economy weighed down by paralyzed credit and unsustainable debts, President Franklin Delano Roosevelt launched a spectacular series of monetary and banking reforms

between 1933 and 1935, which he extended later (in 1944) to the global arena with the creation of a new international monetary system. Among these reforms were the following:

- The Emergency Banking Act of 1933 recapitalized banks deemed worthy of revival and expanded the lending facilities of the Federal Reserve to make it a more effective lender of last resort (which it had miserably failed to be until then).
- The Glass-Steagall Act of 1933 set up a new lender-of-last-resort mechanism known as the Federal Deposit Insurance Corporation (FDIC) to provide deposit insurance as well as orderly removal of failed banks, separated the deposit-taking and loan-making activities of commercial banking from the market-making activities of investment banking, and restricted price competition among commercial banks by allowing the Federal Reserve to set maximum rate ceilings on bank deposits (so-called Regulation Q).
- The Gold Reserve Act of 1934 prohibited private ownership of and dealing with gold, devalued the US dollar by almost 70 percent, and introduced the Exchange Stabilization Fund to intervene in currency and government bond markets whenever volatile conditions in those markets warranted stabilization efforts.
- The Securities Act of 1933 and Securities Exchange Act of 1934 regulated the nation's financial markets by outlawing certain market manipulation practices (e.g., insider trading), requiring registration of securities and broker-dealers to assure higher quality standards for either, imposing extensive information disclosure requirements on issuers of securities for greater transparency, and setting up the Securities and Exchange Commission as a powerful regulator of the financial market.
- The Banking Act of 1935 recalibrated the monetary policy tools and powers of the Federal Reserve by centralizing its decision-making powers in the hands of a newly constituted Board of Governors (and away from the regional Federal Reserve banks), which made the Fed more independent from government interference; the act also set up the Federal Open Market Committee to turn the hitherto chaotic, sporadic, and controversial open market operations into a much more effective policy tool.
- At the Bretton Woods conference in July 1944 the United States introduced a new global payments system based on a gold-backed US dollar as international medium of exchange with an

automatic convertibility guarantee at an exchange rate of $35 per ounce of gold; this provided a value anchor for fixed exchange rates between convertible currencies based on their respective gold weights. Two new multilateral institutions (International Monetary Fund, World Bank) were set up to manage that system.

Bretton Woods paved the way for other countries to adopt their own reforms after World War II, reforms that, apart from interesting differences in structure regulations pertaining to banking, went pretty much in the same direction as Roosevelt's. In this way a new monetary regime was created on a global scale to launch the postwar period. This new regime can be characterized as one of *nationally administered credit-money*. Roosevelt's reforms completed the transition from commodity-money to credit-money to give the monetary production economy an elastic currency. As a result, money was turned into an endogenous flow variable capable of responding to the public's financing needs. At the center of this regime was the domestic payments system run by the central bank on the basis of reserve transfers between banks and automatic convertibility between all acceptable forms of money. With Roosevelt's reforms the Fed gained powers to manipulate the level of bank reserves in the desired direction and so influence the pace of money creation as well as credit extension by commercial banks. Toward that objective the Fed could alter the conditions under which it lent reserves to banks (discount loans) or change the level, if not composition, of its open market operations.[20] Aside from using these two policy tools to determine the level of total bank reserves, the Fed also had the power to set reserve requirements and thereby decide what proportion of those reserves had to be set aside (required reserves) as opposed to being available for credit extension (excess reserves). In this way the Fed could also speed up or slow down the money multiplier, which related inversely to the reserve requirement ratio under its control. The Fed reinforced its generally accommodating stance of monetary policy by setting low deposit rate ceilings under Glass-Steagall's Regulation Q.

During the postwar boom commercial banks in the United States were active lenders. They were well capitalized, less prone to risk taking due to their separation from investment banking, immunized against destabilizing bank runs by deposit insurance, and profitable due to adequate spreads between their deposit rates and loan rates. These favorable conditions were propitious for credit-financed growth. This growth was further helped by proportionately declining public-sector debt (from its historic peak during the war) and the low debt levels of the private sector at the start of the boom, lows that followed a decade and a half of deleveraging in the wake of depression and war. Solid banking made it possible for the postwar regime of credit-money to support the key pillars of the Fordist accumulation regime one by one:

- In contrast to the gold standard era, now governments could run chronic budget deficits, especially the United States whose Treasury securities came to be demanded all over the world as the favorite vehicle to park international dollar reserves accumulating in the Bretton Woods system. The Fed's open market operations, involving more buying than selling by the central bank to let the money supply expand steadily (see above, note 20), monetized a portion of these budget deficits. This relaxation of the public sector's budget constraint facilitated construction of the welfare state (with its income maintenance programs, such as pensions) and state-run enterprises providing material inputs cheaply for private industry (e.g., energy, transportation).
- Corporations had enough loanable funds on hand to invest heavily in mass production technology, with banks providing ample and affordable loans at reasonable prime rates. Equity shares and, even more spectacularly, corporate bonds saw good volume growth in their respective securities markets to give firms additional funding options for large-scale investments. In the 1960s the stock market became a vehicle for corporate mergers, and these fostered the spread of multiproduct conglomerates and increased concentration in many industries.
- Increased bank lending also helped support the emergence of social norms of mass consumption centered on home ownership and cars both of which remade American middle-class life

and (sub)urban space. Mortgage lending became the domain of thrifts, depository institutions that were smaller, more local, and more specialized than the banks. Banks as well as finance companies provided car loans and other types of consumer lending, of which the spread of credit cards was the most noteworthy development. The introduction of student loans supported a postwar education boom. Between 1968 and 1977 the US government tackled inequality, the other bias in the private commodity dimension of money, by passing a number of important consumer credit protection laws that helped make personal debt more accessible to many households.[21]

- The international monetary system known as Bretton Woods (1945–71) helped spread boom conditions from America to Western Europe and beyond. Faced with a global dollar shortage, the United States was willing to organize massive capital exports in excess of its chronic trade surpluses to assure regular US balance of payments deficits for net outflows of dollars. These capital exports took the form of aid and assistance programs (e.g., Marshall Plan), overseas military expenditures in the context of the Cold War (e.g., stationing large numbers of US soldiers abroad), and direct investment by US multinationals. Each of these capital export channels helped recipient economies boost their growth rates while also augmenting American power abroad. An overvalued dollar facilitated the catching-up process of many other economies once they had been successfully rebuilt after the war by allowing those nations to pursue export-led growth strategies (especially Germany and Japan, the two big losers of the war). In addition, the strong dollar also lent support to keeping global commodity prices quite low for a sustained period of time, especially oil, which assured cheap energy as well.

The postwar monetary regime propelled growth forward at an accelerated pace for nearly a quarter of a century, creating a sustained global boom that evidently corresponded to the upswing phase of a long wave and marked the heydays of the Fordist accumulation regime. Those favorable growth conditions lasted until the late 1960s when overheating of the US economy started to fuel inflationary pressures at home while the generation-long

balance between nominal wage growth and productivity gains fell apart amid a marked slowdown of the latter.[22] From then on, starting with the US recession of 1969/70, we experienced a new type of structural crisis commonly referred to as *stagflation*, a combination of stagnant growth, rising unemployment rates, and gradually accelerating inflation we had never experienced before to that extent and saw grow in intensity over the subsequent decade.

Throughout the postwar boom the Federal Reserve and other like-minded central banks had kept the interest rates they controlled (e.g., deposit rate ceilings, discount rate, rate of the interbank market for reserves) low in order to spur faster growth. During a period of accelerating inflation this policy stance meant repeatedly negative real interest rates in the banking system as occurred in the United States in 1972, then again in 1974/5, in 1979, and last in 1981. At that point, more depositors would withdraw more money from banks in response to a negative rate of return on their savings (disintermediation), and the banks themselves slashed lending that by then had turned unprofitable. The resulting credit crunches got worse from cycle to cycle, only to subside with a recovery that was more inflation-prone than the previous one. After early 1978 this acceleration of inflation was fueled even more intensely by a rapidly falling US dollar. The dollar fell to the point where its world-money status became threatened, as is evidenced by the Europeans introducing the European Monetary System, OPEC discussing to be paid in a basket of currencies rather than just dollars, and the IMF preparing to introduce a substitution account to replace global dollar reserves with a currency basket on demand. It was against this background that newly elected Fed chairman Paul Volcker decided on October 6, 1979, to stop targeting interest rates and instead slow the growth of the money supply. Within three weeks short-term interest rates in the United States had tripled to above 20 percent, and the nation's economy was plunged into a deep recession. This dramatic change in monetary policy was followed by further deregulation of interest rates through two key banking laws in 1980–82.[23]

The deregulation of the price of money in the 1970s was followed by broader structural changes in banking amid the information revolution; these changes were further fueled by more intense global competition among the world's leading banks and squeezes on their traditional bread-and-butter business of taking deposits and making loans. Commercial banks tried to invade investment banking services and vice versa. Both sides exploited regulatory loopholes to do so and then also began to eye offering insurance as another expansion strategy. After more than a decade of lobby wars between commercial banks, investment banks, and insurance companies, the Congress of the United States finally managed to pass the Gramm-Bliley-Leach Financial Services Modernization Act of 1999, which repealed Glass-Steagall in order to allow for fuller integration of these different financial services activities.

We can conclude that the key pillars of the postwar monetary regime were destroyed by the financial instability dynamic of the stagflation crisis. Fixed exchange rates become much more difficult to maintain in the wake of widening inflation rate differentials between national economies, an inevitable phenomenon when inflation accelerates worldwide in uneven fashion as happened between 1968 and 1982. Countries with lower inflation would have a strengthening currency (further keeping imported inflation in check) while the opposite would happen with countries that had higher inflation. Nor could low interest rates be sustained when negative real interest rates triggered disintermediation and credit rationing among banks. Finally, stagflation-induced squeezes on both sides of a commercial bank's balance sheet—the one on the liabilities side arising from a shrinking savings pool and the one on their asset side associated with worsening creditworthiness of debtors amid widespread stagnation conditions—prompted those institutions to seek greener pastures elsewhere. In particular, they moved into the lucrative financial markets from which they had hitherto been excluded (as in the United States) or which they had themselves kept consciously repressed (as in Germany or Japan). Structure regulations, such as Glass-Steagall's separation of commercial

and investment banking, were thus bound to come under considerable pressure.

The structural crisis of stagflation, with its concomitant destruction of the postwar regime of nationally administered credit-money on which the Fordist accumulation regime had been built, paved the way for the fundamental policy reforms I already alluded to at the beginning of this chapter (e.g., the Fed's switch to a tight money policy in 1979, Reagan's supply-side budget of 1981). In the resolution of the stagflation crisis and the monetary reforms that process gave rise to we can identify the origins of finance-led capitalism, the new accumulation regime emerging during the 1980s.

CHAPTER 3

The Foundations of Finance-Led Capitalism

Taking our cue from the conclusion in the preceding chapter that structural crises transform modes of regulation and/or regimes of accumulation in the Régulationist sense, we have to ask ourselves how and why the stagflation of the 1970s and early 1980s ultimately fostered the emergence of a new accumulation regime. Elsewhere I have characterized this new regime as "finance-led capitalism," a term that has also found some use among European post-Keynesian economists.[1]

The notion of a capitalist system driven and shaped by finance would even today find only few adherents among mainstream economists. From their perspective, finance is a self-balancing mechanism with which to channel savings into investments and thereby help assure macroeconomic equilibrium. Before the 2007/08 crisis at least, the average economist paid scant attention to the intricacies of finance, considering those of marginal importance to individual decision making (microeconomics) or the performance of the economy at large (macroeconomics). Now, however, it is beginning to dawn on economists that finance has become a decisive (and often destabilizing) driver of the economy. Finance has been transformed over the past quarter of a century to the point where it dominates growth patterns and distribution channels. We obviously need to rethink

the contemporary role of finance. Presenting such an alternative view of finance means to develop a different approach than the one put forward by mainstream economics, a point already alluded to in the previous chapter when discussing the heterodox notions of long waves and structural crises. This is a question of properly positioning finance as a vital force in the contemporary capitalist economies, a theoretical challenge that must start with connecting finance to money and then putting the two at the center of what is after all a cash flow economy. In mainstream theory finance is disconnected from money, and money itself is marginalized by being presumed to exist separately from the real economy of exchange and production. That double separation (of finance from money and of money from the real economy) prevents mainstream economists from coming to grips with today's central role of finance. For that a more integrative approach is needed. Before returning to the notion of "finance-led capitalism," I shall therefore briefly lay out the essential properties of such an integrated approach to clarify the role and meaning of finance in modern capitalist economies.

What Is Finance?

The standard neoclassical approach divides the economy into "real" and "monetary" spheres and keeps finance reduced to a passive residual connecting savings to investments via a process of intermediation organized by financial institutions and/or markets. Financial economics, the mainstream's microeconomic view of finance, focuses on portfolio decisions by rational investors under conditions of uncertainty, the pricing of tradable financial contracts (securities), the behavior of (informationally) "efficient" securities markets, and the modeling of risks. While this subfield has seen several Nobel Prize winners in recent years (William Sharpe, Franco Modigliani, Merton Miller, Harry Markowitz, Eugene Fama, Robert Shiller, and others) as proof of its strategic importance, it lacks the coherence needed for a unified approach to capture fully the phenomenon of finance in all its complexity. On the macroeconomic level finance has an

even skimpier presence in mainstream economics whose dominant models, such as the AD-AS (aggregate demand-aggregate supply) or the dynamic stochastic general equilibrium (DSGE) models, have no place for any consideration of finance as an active determinant of growth. The absence of finance from the standard models is matched by its equally pronounced absence from the national income and product accounts. There finance shows up only as a tiny slice of national income in the form of net interest payments and is otherwise confined to a very limited notion of financial services. We barely notice finance in standard theory or official measures.

In contrast, heterodox approaches, starting with Karl Marx and John Maynard Keynes, have afforded finance a crucial role by connecting it directly to money and placing both at the center of the economy. Ultimately, these approaches seek to analyze what Keynes characterized as a *monetary production economy*, which he described as in essence a cash flow economy in which all economic activities are organized as interdependent monetary circuits.[2]

- In contrast to barter, monetary exchange $C - M - C$ separates the acts of buying and selling in space and time: I can sell a marketable product (commodity C) to someone now (C_t -> M_t) and use those funds (money M) to buy from someone else later (M_{t+1} -> C_{t+1}).
- In the production circuit $M - C \ldots\ldots C' - M'$ producers have to buy inputs, such as labor or machinery, first (M -> C) before combining those to produce the marketable products ($C \ldots .C'$) they wish to sell ($C' - M'$). If profits are to be made, then the later cash inflow from the sale (M') will have to be larger than the initial money outlay (M). In other words, producers must spend money now in order to make more money later.
- The credit circuit $M - M'$ has lenders offer borrowers funds in exchange for a claim (i.e., IOUs, bonds, stocks) on the borrowers' future income. Once again $M_{t+n}' > M_t$.

When looking at those monetary circuits a bit more closely, it becomes obvious why finance plays such a crucial role in

advanced capitalist societies. The temporal separation of buying ($M - C$) and selling ($C - M$) in monetary exchange gives rise to savings whenever economic actors (e.g., firms, households) spend less than they are earning in income. It is one of the principal functions of finance to collect those savings and put them to good use, mostly by transforming them into loanable funds that can be made available in credit circuits to actors spending more than their current income would permit. That intermediation process, which connects savings to investments, has traditionally been the most studied aspect of mainstream finance theory.[3]

Monetary exchange, however, confronts economic actors with an even more pressing reality. It obliges every market participant to sell something they have in order to buy something they want. You have to have earned income before you can spend it. We all face this *monetary constraint* of having to sell before we can buy, if only our labor services. Finance allows anyone of us to relax that monetary constraint by making available spendable funds before those have been earned, so that we can actually buy something without having had to sell earlier. Such access to credit is especially useful for the production circuit, where producers face a particularly stringent monetary constraint inasmuch as they have to spend money now ($M - C$) in order to make more money later ($C' - M'$). While firms try to generate sufficient revenues to cover operating expenses such as wages, their large-scale expenditures on capacity expansion will often require external funds they may obtain through bank loans. Larger firms may also have the option of issuing bonds or equity shares.

But rather than seeing the credit circuit $M - M'$ just tied to the production circuit which it helps to finance, we can also look at that circuit as an alternative investment opportunity in lieu of production activities. Investors can spend their cash reserves M now to acquire financial claims (IOUs, bonds, stocks, etc.) that earn them future income flows M'. There are many reasons why this activity has exploded in volume under finance-led capitalism, of which this activity has become a defining feature. As more households across the globe become better off and so

turn into surplus savings units, they are more able and willing to turn into financial investors. The phenomenon of accumulating financial assets for additional income generation has today become anchored even among the West's middle class with the proliferation of pension plans and tax-advantaged mutual funds (e.g., America's 401k accounts). Producers may pursue financial assets more actively whenever industrial stagnation and excess capacities render production activity temporarily less profitable and financial investments correspondingly more attractive. Over the past century firms have increasingly looked at this option also as a means to grow through mergers and takeovers. It may often be cheaper to acquire additional production capacity by gaining control over other firms in the stock market than building that capacity from scratch by oneself. As globalization has decentralized production across many sectors of the economy, the world's leading (and globally organized) firms sought to centralize control over their far-flung cash flows and so ended up turning themselves increasingly into large-scale financial investors seeking to preserve their cash holdings.

In finance-led capitalism this activity becomes central, with finance organizing the proliferation of such financial investment channels. While many of these circuits yield income (interest, dividends, etc.) as deductions from industrial profit, this is not the case with price movements in financial markets generating capital gains. Those have a relative autonomy from the so-called real economy of production and exchange. Asset price bubbles, such as a bull market in stocks, cannot be shielded forever from degradations in underlying economic conditions as we have seen in chapter 1 with the collapse of America's housing bubble in early 2007. But they can last long enough to earn aggressive investors a lot of capital gains if those get realized before the bubble bursts.

This distinction between different forms of financial income harks back to an important, albeit aborted discussion of finance by Karl Marx that centered on the notion of *fictitious capital*.[4] Unlike loans (or what Marx would call "interest-bearing loan capital") that are more or less directly tied to the production process, fictitious capital involves trading of claims in financial

markets especially created for their circulation. Their value has no material basis in production (hence is "fictitious") and rests instead on the capitalization of future income their holders anticipate.[5] Marx's discussion of fictitious capital focused above all on equity shares traded in the stock market, government bonds financing budget deficits, and the process of money creation in the banking system.

- With regard to equity shares, those represent titles to property ownership but do not engage money directly in the production process. Corporations, whose shares are listed and traded in stock markets, thus have two values: the book value of productive capital under their control for the creation of profit, and their market value of ownership titles that investors evaluate on the basis of anticipation of future income flows associated with the capital the titles represent.
- In addition to corporate equity shares, Marx also considered public debt to be fictitious capital. Even though the budget deficits financed by government bonds may be necessary for maintaining sufficiently high levels of aggregate spending in the economy or provide needed support for the nation's productive apparatus (e.g., transportation, education, health care), they do not directly fund for-profit production activities in the private sector. Holders of government bonds have a claim on the future tax revenues of the nation, but not on its economy's surplus value as would be the case, for instance, with interest earned on corporate bonds.
- Finally, there are several passages in which Marx referred to the process of banks creating money ex nihilo ("out of nothing") as fictitious capital. Obviously, he was thinking here about the banks' growing propensity, within their practice of fractional reserve banking, to create and circulate more paper tokens representing money (e.g., deposit certificates, notes) than were backed by gold reserves.[6]

The demise of the gold standard in 1931 opened the way for full implementation of credit-money, a process facilitated further by the establishment of checking accounts (demand deposits) as the primary form of private bank money. No longer constrained by tight gold-coverage requirements, banks could now push their

practice of fractional reserve banking to its logical conclusion. Knowing that the public would withdraw under normal circumstances not more than a predictably small percentage of its bank deposits, banks would set aside only a fraction of their reserves to meet withdrawal requests, and they loaned out the rest to willing borrowers. To the extent that these loans were given to the borrowers in the form of new demand deposits to write checks against, such acts of credit extension created new money. Once a loan got spent, the check clearing process would move reserves from the bank against which the check was drawn to the bank in which the check was deposited, giving that bank a chance to gain excess reserves and use those to extend credit. In other words, this kind of payment system that transfers reserves in the wake of clearing checks set up a *money multiplier*, a chain reaction of reserve transfers and credit extension within the banking system as a whole. As a result of this system, the total amount of new money created would end up being double or triple the original excess reserves at the start of the chain.

The implementation of credit-money following the collapse of the gold standard in the early 1930s tied money and finance inexorably together like never before. For one thing, the two got connected by means of a bank-centered *payment system* through which economic actors (e.g., firms) could easily access funds and pay each other. That payment system allowed automatic convertibility between all accepted forms of money (government-issued currency, bank-issued demand deposits, etc.), cleared checks by transferring reserves between banks for crediting and debiting of funds in customer bank accounts, and enabled the central bank to manipulate the level of bank reserves for money creation in the system. The organization of the payment system gave banks a crucial role in the modus operandi of the economy as the institutions transferring the cash needed for completion of the various monetary circuits that make up the nation's cash flow economy. In addition, credit-money also made money creation contingent on credit extension by banks so that money and debt became two sides of the same coin; this was yet another aspect of the institutionalized tie between money and finance.

Enabling banks to use their (excess) reserves for credit extension and create new money in the process changed the very quality of money. Whereas it had predominantly been an exogenous stock when it was commodity-money, it gained a strategic flow dimension as credit-money. Not only did the payment system circulate funds between the different parties engaged in exchange transactions to make the money truly flow in the cash flow economy, but now banks could respond to the external financing needs of the public by extending more credit and creating new money with which to back those debts. This capacity to provide an *elastic currency*, that is, of providing endogenous money creation in response to the public's need for bank credit, depended on accommodation by the central bank at the top of the payment system pyramid. That central bank could create whatever amounts of bank reserves it wanted in the system.[7] Under normal circumstances most central banks have been willing to support the money creation and credit extension activities of banks with sufficient reserves.

While the notion of "fictitious capital" dates back a century and a half, it has not lost its relevance today. In the era of finance-led capitalism we have witnessed an amazing proliferation of tradable financial claims, which investors trade for capital gains—money market instruments, loan securitization, derivatives, even money itself in the currency markets. All of these are objects of speculation by investors seeking to profit from their trading without direct connection to the underlying monetary production economy; hence arguably this is "fictitious capital." Equally dramatic is the fact that nowadays much of the money creation by banks is directed toward feeding these new financial markets rather than toward supporting productive activities, and this gives rise to exploding transaction volumes and recurrent asset bubbles.[8]

In light of these crucial financial aspects of contemporary capitalism, notably the money creation capacity of banks and the importance of financial markets attracting so many investors seeking a quick buck through speculation, it does not make sense to keep finance on the sidelines as happens in much of

mainstream economics. Mainstream models do not have much to say about real-world phenomena, such as crisis or inequality, if they do not give due consideration to finance's strategic importance in today's capitalist economies. How then to proceed toward a more realistic alternative? The answer to this question must start with clarifying what finance is.

When we look at what finance does in a cash flow economy—covering gaps between outflows and inflows, funding increased spending levels with more credit, monetizing such debts with new money creation, providing alternative investment opportunities for investors preferring to speculate—we can easily see that this activity occupies a special place in our economy. We may usefully characterize finance as the *mesoeconomic* dimension of a modern monetary production economy.[9] As such, it connects the microeconomic level of the economy (i.e., spending and financing decisions of individual actors) to its macroeconomic level (e.g., whether we have inflation or deflation, the rate of growth, its cyclical fluctuations) by organizing interwoven webs of money circuits into markets and sectors that comprise the architecture of our economy (mesoeconomic level). While finance plays an important role on the micro level (and in every actor's daily life), it also has dramatic consequences for the economy's behavior on the macro level in terms of growth patterns and income distribution. Yet, it barely shows up in the national income and product accounts tracking economic activity on the macro level; there finance is relegated to a very limited notion of financial services and a tiny slice of national income in the form of net interest payments. The flow-of-fund accounts (or financial accounts) provided by central banks, which measure financial flows between a national economy's different sectors as well as their respective stocks of financial assets and liabilities, implicitly recognize finance's strategic position as the economy's mesoeconomic dimension. However, if we want to capture that mesoeconomic level fully, we need to think of finance as a system of interconnected financial institutions, markets, and instruments. It is only by taking such a systemic view of finance that we can begin to understand the money multiplier (and how

it supports the parallel income multiplier identified by Keynes in the form of a chain reaction of spending), or the formation of bubbles (and their collective wealth effect of boosting aggregate demand), or systemic financial crises (threatening to throw the economy into a debt-deflation spiral). And it is in the end only at the mesoeconomic level that we can come to grips with such a phenomenon as "finance-led capitalism."

Financial Innovation

Financial innovation is very different from industrial innovation. True, much of it is tied to technological change, from the omnipresent automated teller machines (ATM) to high-frequency trading transforming the world's stock markets. But, unlike innovation in industry, which can be very time-consuming and may not work as planned, financial innovation carries relatively low sunk costs. Centered mostly around changes in contractual arrangements, it is comparatively easy to arrange and can be implemented quite rapidly. And it can also be copied easily, often not even affording the innovator any intellectual property rights, such as patents or copyrights. The first-mover advantage is thus relatively minor. This easy copiability creates two profound tendencies that move in opposite directions. One is the desire to spread the innovation rapidly to the greatest extent possible by creating a large market for the new product; this is best achieved by making it as standardized as possible. The other direction is to make the product more difficult to copy by rendering it more opaque, more customized, and/or more complex. Asymmetric information advantages as a source of monopoly rents—which means excess profits based on market power—add to this tendency. These two tendencies have led to distinctly different types of modern finance competing with each other for dominance: *market finance* rooted in a variety of large financial markets for the trading of securities (bonds, stocks), standardized derivatives (options, futures), and currencies versus *network finance,* which circulates highly customized financial instruments bilaterally through various types of insider networks (e.g.,

CDOs, credit derivatives). We will return to this distinction in more detail later, since it has played a crucial role in the long-wave evolution of finance-led capitalism that led to the crisis of 2007–08.

For now we want to focus on yet another central aspect of financial innovation, its thrust toward evading regulations. Much of that activity has in effect been designed to bypass existing restrictions and so free financial institutions (as well as their customers) from regulatory constraints. This dynamic has set up a *regulatory dialectic* in which financial institutions innovate to escape prevailing regulations and to gain more room to expand; they then use the freedoms gained in this way excessively to the point of crisis, only to find themselves subject to governmental reregulation efforts. This then sets off a new cycle of regulation, circumventing innovation, excess behavior, and financial instability.[10]

Eurocurrency Market

This regulatory dialectic first emerged around 1960, and at that point already in extremely dramatic fashion. Prompted by fears of having its dollar-denominated assets confiscated if those were placed in the United States amid a rapidly intensifying Cold War, the Soviet Union's leadership convinced London-based banks to accept those assets instead. The government of the United Kingdom turned a blind eye to this unusual request, fully aware that its leading banks needed that enticingly lucrative business opportunity to regain London's fading position as the center of global finance (a position it was ceding at the time to New York). Thus was born the *Eurocurrency market* (or Euromarket for short), today also often referred to as offshore banking. In its original and simplest form a "Eurocurrency" is a bank deposit denominated in a currency that is located outside the country of its issue. For instance, Eurodollars are dollar-denominated deposits outside of the United States, Euroyens are yen-denominated deposits outside of Japan, and so forth.

This innovation is not really a "market," but instead comprises a network of transnational banks, which thereby created an alternative payment system among themselves to operate beyond the reach of any national central bank. Privately owned computer networks (e.g., SWIFT, CHIPS) serve as the technological pillars of this global payment system and enable banks from all over the world to transfer funds across borders and between currencies with great ease. The Eurocurrency market thus has served from its very inception more than half a century ago as the vector of a relentless financial globalization process, growing on average 20 percent per year to reach today's size of an estimated $20 trillion.[11] Its rapid evolution over those past six decades took it from an initially pure intermediation channel of deposits and loans to a variety of new marketable securities, notably floating-rate notes, sovereign bonds, and futures, all of which are traded globally. About half of this network consists of a borderless interbank market in which banks shuffle funds to and from each other, with the LIBOR (London Interbank Offered Rate) as its key benchmark rate on which the world's entire interest rate structure has come to rest. The Euromarket has served many functions, above all as a strategic funding source for the world's major debtors, a centralized cash management channel for multinational firms, and as a convenient tool for widespread speculation on currencies and interest rates.

Without regulatory restrictions banks operating in the Eurocurrency market can earn larger profit margins (spreads) while at the same time offering higher deposit rates and lower loan rates than would be the case with domestic banking. That very absence of regulations also enabled Eurobanks from the very beginning to bypass domestic banking regulations and so undermine those to the point of rendering them useless. Take, for instance, the Fed's deposit rate ceilings under Regulation Q; US banks evaded this by encouraging their corporate clients to deposit their funds abroad in order to earn current market yields and then borrowing that money back from their Euromarket affiliates. In that context it is easy to grasp the extent to which the Euromarket played a very large role in destroying the postwar

monetary regime while also spreading stagflation conditions from country to country. Its facilitation of regulatory bypass and speculation prompted the collapse of Bretton Woods in 1971, the imposition of flexible exchange rates in 1973, the end of the Fed's low interest rate policy in 1979, and the accelerating erosion of Glass-Steagall's structure regulations in the 1980s.

Even though barely discussed as such in the media and hardly known by the public, the Eurocurency market is today the nerve center of the global economy. It has been one of the principal forces behind the amazing globalization drive of the past 30 years, providing its increasingly numerous participants from all corners of the world the means to move funds at will across the globe. Representing an integrated financial system that functions on a worldwide scale as an alternative to its domestic counterparts to which it is connected in countless ways, it has made our economy in essence borderless from the point of view of capital. The result has been an explosion of short-term cross-border movements of capital with such funny names as carry trade, round-tripping, or sweeps, and in many instances these have become the largest category in a given country's balance of payments. Today the daily volume of foreign exchange transactions exceeds on average $5 trillion, and 85 percent of these consist of (typically short-term) portfolio investment flows. Three and a half days' worth of foreign exchange trading is equivalent to the entire annual output of the US economy.

This dominance of "hot money," as insiders call it, is driven by a global chase for higher returns to be realized over the shortest possible time while at the same time escaping the burden of national taxation and regulation. Hotmoney flows steer themselves toward perceived differentials of risk-adjusted exchange rates, interest rates, or asset prices that a sizeable community of traders, analysts, and commentators spends a lot of time and money to interpret. Thanks to the Internet this guessing game has become at once truly global and instantaneous, making for potentially great volatility in financial markets and between currencies. Countries, no matter how large, can gain or lose huge sums in a very short period of time, and even under normal

conditions there is no greater variable affecting national economies than financial cross-border flows of short-term portfolio investors. In such a hyperconnected world dominated by truly globalized finance we can no longer think of the world economy as just the sum of its parts, the aggregate of some 200 national economies connected to each other through balance of payments and exchange rates—this is still the basic view of international economics today. We need a better viewpoint, a kind of *metaeconomic* revolution like the one Keynes offered eight decades ago with his macroeconomic perspective that showed that the national economy was a lot more than just the sum of its markets.

Money Markets

The rise of the Euromarket as the vector of global finance is intimately connected to yet another profound structural change in finance over the past half century: the central role of money markets (also known as wholesale funding). During the 1960s US banks introduced a series of new money market instruments with a maturity of less than a year and often much shorter than that. These included commercial paper (a short-term bond), negotiable certificates of deposit (jumbo-sized corporate bank deposits that can be resold before maturity), federal funds (an interbank market for bank reserves), banker's acceptances (bank guarantees issued in support of international trade transactions by firms), repurchasing agreements (short-term securitized loans), and the aforementioned Eurocurrency deposits (which others can borrow). These instruments, collectively known as paper and traded directly between two parties over the counter, soon took off in popularity and grew over the next few decades into a gigantic collection of short-term funding networks. A wide range of borrowers can easily access these any time they need funds for even just one day (overnight).

The phenomenal growth of money markets, exceeding $12 trillion in 2011 in the United States alone, has also been driven on the supply side by offering those with excess funds highly

liquid and safe investment opportunities whose returns are typically higher than those offered by bank deposits. Perhaps the biggest factor has been the fast growth of money market mutual funds (MMMFs) that invest shareholder funds across the entire range of money market instruments and promise a stable net asset value with quasi-instant withdrawal rights. Today, those MMMFs have grown to nearly $3 trillion in the United States alone, providing the money markets a steady influx of fund supplies for borrowers to tap. The bank-like features of these money market funds made their shares perfect substitutes for bank deposits, and these funds offered the additional advantage of more attractive market yields while also promising rock-solid safety even in the absence of insurance. The sudden emergence of these money market funds in the second half of the 1970s and early 1980s greatly destabilized the commercial banks at the time by prompting a huge wave of disintermediation. The only way the banks could counter that threat to their business model was to push for deregulation of their deposit rate ceilings, which they achieved in the early 1980s (see ch. 2, note 23). Since then banks have been able to offer comparable new deposit products (e.g., money market deposit accounts) or set up their own money market funds.

Money markets have profoundly changed the way banks themselves operate. Previously, banks simply kept a lot of highly liquid, but lower earning assets around (e.g., Treasury bills) in case they had to meet sudden deposit withdrawals on the liability side. In other words, the nature of their asset mix and its rate of expansion were constrained by the liquid nature of their deposit liabilities, and their exclusive reliance on such retail funding limited them to pursuing a fairly conservative strategy. Access to wholesale funding in the money markets freed banks from this constraint. Now they could set themselves aggressive targets for asset expansion and also pursue riskier, but higher yielding assets in the knowledge that they could always go to the money markets if they needed additional funds to cover any gaps on the liability side. From the early 1980s on the banking system thus became an altogether different animal, able to push for much

faster growth and greater returns as it moved decisively beyond its deposit-based size restriction onto a higher level of scale. Increasing reliance on wholesale funds in the money markets posed evidently new risks, such as maturity risk (funding long-term assets with short-term liabilities), interest rate risk (when typically more volatile short-term rates would shoot above long-term rates), or liquidity risk (when access to money markets was not assured). The banks responded to this challenge by putting much greater emphasis on so-called *asset liability management* techniques of assessing their various risks and figuring out different strategies to remedy any gaps in their balance sheets.

Today's highly developed money markets represent a global funding machine on steroids. Conservatively managed banks may still wish to rely primarily on the more stable retail funding through deposits, but any bank now has the option of pursuing aggressive growth by drawing on the money markets. Central banks have had to adjust their monetary policy strategies accordingly as wholesale funding in money markets allowed banks to move their lending (and money creation) activity beyond their deposit-based reserves. In other words, central banks lost control over the banking system capacity to create money, a capacity they had previously controlled via management of bank reserves. Since the early 1980s central banks have therefore targeted short-term interest rates rather than bank reserves, a change anchored by the Fed as early as November 1982. The money markets have also allowed a series of new nonbank financial institutions to emerge and thrive, notably finance companies and hedge funds. Even commercial and industrial firms have found the money markets a useful source of funds, relying mostly on the issue of commercial paper which for that reason can be considered the most widely used money market instrument of them all. Repurchasing agreements (or repos for short) allow borrowers to use their money market instruments, not just Treasury bills but increasingly also private paper, as collateral for short-term loans and so turn securities effectively into money to spend whenever needed.[12] Finance-led capitalism, apart from having given itself with the Euromarkets a powerful globalization engine, is

also fundamentally rooted in allowing financial institutions and many other borrowers easy access to large amounts of funds on short notice in the world's money markets.

Financial Derivatives

Derivatives, notably futures and options contracts, allow parties to cope with an uncertain future by entering into contractual commitments whose timing, size, and prices can be determined in advance. These contracts are therefore especially useful when prices are intrinsically volatile, as in the case of agricultural products (wheat, cotton, milk, cattle, corn, soybeans, etc.) whose futures contracts date back to the late nineteenth century. Financial derivatives, on the other hand, are of a more recent origin and arose in the late 1970s and early 1980s in response to the deregulation of exchange and interest rates both of which were thus rendered suddenly much more volatile. We call this type of financial contract "derivative" because it derives its value from another asset to which it is tied. These contracts are perfect exemplification of "fictitious" capital since they allow parties to gain exposure or offsets to underlying assets without actually having to buy or sell those assets in the first place. Derivatives represent a huge qualitative leap where fictitious capital in our economic system is concerned since they move us from "titles to value" having no counterpart in production (e.g., equity shares, government securities) to "derived values" dissociated with actual exchange—a potentially much wider field for contractual engagements as proven by the amazing expansion of derivatives over the past three decades into new areas of coverage. We now have derivatives for various categories of commodities (agricultural, metals, energy), foreign exchange, interest rates, financial market indexes, and credit instruments. In the near future we shall see the rapid rise of derivatives tied to events with significant economic impact, such as the weather.

We can also witness a growing variety of derivatives. Futures and options are standardized contracts to buy or sell a certain amount of a specific product on a particular date (or within

a specified time period) at a predetermined price, which are traded on public exchanges set up for that purpose (e.g., Chicago Mercantile Exchange). While options are voluntary and give the parties a choice, futures are obligatory but can be sold to someone else before maturity or rolled over at maturity. Forwards are like futures, except that they are tailor-made rather than standardized and hence set up over the counter (OTC) between two parties who keep the details of their engagement, including the price, to themselves. Swaps, another tailor-made type of OTC contract, exchange one party's benefits in a financial instrument with the other party's benefits in another financial instrument. The most common type of swap is an interest rate swap where parties exchange fixed-rate interest payments for floating-rate payments. This contract enables large institutional investors, such as pension funds or mutual funds, to protect their portfolio against adverse movements of interest rates.

Generally speaking, financial derivatives allow parties to hedge against risk where adverse price movements would otherwise produce losses. For instance, an airline company may buy oil futures to protect itself against future price hikes in jet fuel, because it can now acquire that fuel at a lower price set in advance. Or a company having to pay a certain amount in a foreign currency at a set future date might use currency futures to sell that same currency so that any appreciation of that currency producing losses when it has to pay also generates at the same time gains via the futures contract to cancel out eventual losses. Hedgers typically cover positions exposed to price risks by acquiring derivatives that offset any losses with gains. In the process they transfer the price risk to another party willing to acquire that risk. The latter are typically speculators making bets on future prices, and, unlike the hedgers, the speculators seek to profit from correctly anticipated price movements by taking on uncovered positions. Whereas hedgers try not to suffer losses, the speculators seek gains. Each party needs the other. Since hedgers depend on speculators as counterparties, you cannot "throw out the baby with the bathwater." In other words, you cannot go after speculators using financial derivatives for

their gains without harming the ability of hedgers to protect themselves against price risk, and this interdependence has given speculators a lot of power to play their guessing games without governments being able to rein them in.

Derivatives are especially attractive for speculators because of their low margin requirements (typically 2 percent to 5 percent of the contract's notional value), which make it possible to acquire large positions with very little money of one's own. With a margin requirement of 5 percent, for instance, I can spend $5 of my own capital to acquire a contract worth $100 of that particular product, and in that case a price movement by just 1 percent in the correctly anticipated direction would yield me a rate of return on my own capital of 20 percent (i.e., 1/5). If we use that same example but with a margin requirement of just 2 percent, then the rate of return would have risen to 50 percent (i.e., 1/2). This so-called *leverage effect*, where higher levels of indebtedness (and proportionately lower amounts of one's own capital) boost returns for any given amount of correctly anticipated price movement, works unfortunately also the other way around. Any unpredicted price movements in the wrong direction risk wiping out the capital of the speculator in a hurry which is why financial derivatives are not only a highly remunerative tool for speculators but also a very dangerous one.

In the early 2000s we saw derivatives move beyond their ties to exchange transactions into providing a sort of insurance against loss-making events. At first this extension applied primarily to payment disruptions on debt contracts, so-called credit events. Various credit derivatives arose, among which credit default swaps (CDS) soon became the most widely used and most notorious contracts. We have already seen in our account of the systemic crisis of 2007–09 several instances where those CDS played a highly destabilizing role, such as in their connection with issue of collateralized debt obligations (synthetic CDOs) or during the bear raids on banks in the run-up to the Lehman debacle. These abuses have raised key questions as to how credit derivatives should be set up and used. As is often the case with financial innovations, credit derivatives have had to go through

a major crisis before users and regulators could figure out how to use that new instrument properly (see, for instance, the reform of the junk bond market after its innovator, Michael Milken and his firm Drexel Burnham Lambert, were taken out of business for market manipulation). Irrespective of how this "trial by error" process will reorganize credit derivatives, their widespread use is assured.[13] And the resilience of CDS points to the huge potential of event-linked financial derivatives serving as insurance, which we can imagine to include weather events, environmental disasters, resource unemployment, and other types of loss protection (e.g., wage insurance, catastrophic health events).

Even before this radical extension, the use of financial derivatives has already grown to astronomical levels. According to different estimates, the size of the OTC derivatives market (including all swaps, forwards, and credit derivatives) ranges currently from $600 trillion to $1.2 quadrillion—anywhere between 10 and 20 times the total annual output of the world economy. Because of the innate opacity of these essentially unregulated contracts and frequent double counting of assets used in multiple contracts at the same time, it is impossible to come up with precise calculations of contract amounts. And their complexity renders any accurate assessment of their risk potential even more difficult. The best data collector for such OTC derivatives is the Bank for International Settlements (BIS, bis.org), and its latest (May 2014) estimates put the total at $710 trillion dollars.[14] Nearly 80 percent of that huge number comprises interest rate swaps, by far the largest category of the OTC derivatives. When it comes to exchange-traded derivatives, mostly futures and options, they are more easily measured than the OTC derivatives. Their total amount outstanding recently topped $90 trillion worldwide.

It is not easy to make sense of these large numbers and even harder to assess the degree of systemic risk behind them. Defenders of derivatives point out with some justification that these huge amounts represent notional values of all outstanding contracts, which are by definition far larger than the underlying risk they might represent. For example, I might borrow a million dollars with an adjustable-rate mortgage to buy a house and then

rent it out at a fixed sum. If rate hikes ever push my monthly interest expense above my fixed rent, I lose. To hedge against that risk I might enter into an interest rate swap with a counterparty who thinks interest rates will be falling and would therefore be willing to exchange his or her fixed rate flow with my variable rate flow. In that transaction the notional value is the $1 million, but the actual cash changing hands in the interest rate swap may only be $10,000, one-hundredth of the notional contract value. In that sense it is fair to say that the actual cash amount backing the $800 trillion worth of outstanding derivatives contracts is only a small fraction of that. But even that number, say 2 percent yielding a sum of $16 trillion, would be more than a quarter of global GDP. And ignoring the underlying notional values in risk calculations for derivatives contracts assumes rather optimistically that any party to those contracts going bankrupt will be able to honor its underlying cash commitments so as not to trigger collateral claims on underlying assets or asset write-downs. The moment any of those latter scenarios comes into play, notional values become important indicators of assets at risk.

Those three financial innovations, each profoundly altering the way finance operated, emerged during the stagflation crisis of the 1970s. Their combined impact was at first to intensify that crisis by facilitating the endogenous money creation process underpinning the crisis' inflationary acceleration. US banks rapidly came to rely more heavily on wholesale funding to compensate for the massive disintermediation they suffered after 1975 when money market funds emerged to offer depositors a more attractive alternative for their savings. The Eurocurrency market recycled the oil producers' excess dollars to oil-importing nations, a process that gained speed and scale after the second major oil price hike in March 1979. And the spread of derivatives soon promoted the emergence of a new rentier class of professional speculators placing highly leveraged bets on price movements and events while at the same time allowing investors to attain a whole new level of sophistication when it comes to managing their portfolios for returns and risks. These are all

major changes in the operation of finance. But their combined impact, giving us a deregulated and globally operating financial system capable of mobilizing huge sums of capital and attracting an ever-growing class of speculators, has gone even further. Together these innovations have transformed the very nature of financial capital.

The Transformation of Finance

We have witnessed some profound changes in the nature of finance over the past three decades; they were made possible by the emergence of the Euromarkets, money markets, and financial derivatives. For one thing, securities replaced loans as the principal channel of credit just as funds crowded out bank deposits as the preferred form of savings (securitization). While securitization has given rise to a whole new host of nonbank financial institutions especially in the area of funds—from pension funds to mutual funds to hedge funds to private-equity and sovereign wealth funds—it is still the banks that rule the roost. No longer constrained by structure regulations separating commercial banking, investment banking, insurance, fund management, and private wealth management, bankers have integrated all these previously separated functions of finance under one roof to become an altogether different animal (universal banking). Their strategic position is part of a broader trend of finance's expansion in size and impact, a development that has also seen private economic actors—from the world's leading corporations to middle-class households—putting more emphasis on the accumulation of financial assets while simultaneously becoming more exposed to financial liabilities (financialization). We have here, in a nutshell, the three pillars of finance-led capitalism.

Securitization

A profound change in the nature of finance has come with the shift from loans to securities as the primary form of funding. Banks themselves encouraged the move from loans to securities; starting as early as the 1960s when they developed new money

market instruments, they used to tap funds for faster asset growth than would have been possible with deposits alone. Even governments of emerging market economies have moved away from depending for their funding support on local banks, shifting after the Asian crisis in 1997/98 into an international bond market that has grown enormously since then: the Eurocurrency system's emerging market bonds (EMBs) and its widely watched EMB index (EMBI). As mentioned above, the capital adequacy rules of the 1988 Basel Accord induced loan securitizations and CDS as means of circumvention. This set the stage for a much wider use of loan securitization when banks got involved in the US housing boom of the 2000s. Thus, we have seen many indications that securities are gradually replacing loans as the primary form of credit. And when we look at the balance sheets of banks today, we find banks for the most part have larger securities portfolios than loan portfolios on their asset ledgers.

This trend has occurred because all sides involved have seen issue of securities as more advantageous than using loans. Funding through markets is fast and imposes discipline while giving borrowers access to much more capital at lower cost. Corporate managers also prefer issuing securities to large numbers of market-mediated, hence distanced, investors, to whom they provide well-defined bits and pieces of formalized information (e.g., income statements), instead of taking out loans from their nosy and moody bankers with whom they have to engage in an intimate and time-consuming relationship. For the other side, the investors, securities also appear far preferable to loans, because they include an exit option. Securities can always be sold to get out of a commitment, whereas with a loan the owner is stuck until the end of the contract.

The spread of securities has benefited from a huge expansion of trading volumes in financial markets. The unimaginably large numbers pertaining to financial derivatives have been alluded to earlier, and to further illustrate the matter it must be mentioned that the US volume of equity trading (in the stock market) rose from the equivalent of 13.1 percent of GDP in 1970 to 144.9 percent of GDP just 30 years later. Such

phenomenal growth of financial markets has not only been a matter of much better technology (e.g., electronic trading platforms), but also the result of greater built-in leverage in securities trading. In addition, a professional investor class has taken root and spread a speculator mentality throughout large segments of the population; this is what Keynes already worried about in his famous quote about speculation versus enterprise.[15] Key to this latter phenomenon have been various investment pools that have arisen in the form of so-called funds—first pension funds in the 1950s and 1960s then mutual funds and in particular money market funds in the 1970s; these were followed in the 1980s by the highly successful model of hedge funds doing the speculation for the wealthy. In the 1990s there then followed exchange-traded funds, private equity funds, and sovereign wealth funds. All those funds benefited from better-off households and corporations abandoning the traditional channel of saving through bank deposits in favor of opting for the funds' more attractive asset management services. The funds, often referred to as institutional investors (together with insurance companies), do not necessarily yield above-average returns. And they charge rather large service fees. But they do provide their clients with diversification, trading scale, market knowledge, and portfolio information services. And collectively all those funds form a gigantic pool of money that can be invested in the whole panoply of financial markets for speculative gain. Thus, these funds emerge as a key factor in the explosive growth of those financial markets in the past three decades.

Universal Banks

The old postwar monetary regime could be characterized as nationally administered credit-money and was mostly anchored in commercial banks taking deposits and making loans (indirect finance). The new system of finance emerging out of the stagflation crisis in the early 1980s was very different, if not the exact opposite. It was supranationally organized,

market-driven, and so more one of direct finance in which market-making institutions, such as investment banks and various (pension, mutual, hedge, and private equity) funds, took away market share from commercial banks. The latter lobbied hard to have their activity restrictions removed to meet this challenge. And when they were allowed to do so, as in the aftermath of London's Big Bang in 1986, with the EU's Second Banking Directive of 1989, and above all following the Gramm- Leach-Bliley Financial Services Modernization Act of 1999 in the United States, the larger banks took advantage of new-found liberties to diversify their operations and reorganize effectively. They turned themselves into universal banks combining commercial banking, investment banking, insurance, fund management, and proprietary trading. In the process they have become much larger, perhaps five to ten times as large as they used to be only a couple of decades ago when they were still mostly just retail banks. And banks have also increasingly become global in scale, helped in their geographic expansion by revolutionary advances in information technology, the systematic removal of controls on cross-border movements of capital, the 1997 WTO Financial Services Agreement that committed national regulators not to discriminate against foreign financial services firms, and greater international harmonization of rules on banks (via the Basel Committee on Banking Supervision).

In this expansion the banks have not only aimed at greater economies of scale, thanks to their automation a much bigger factor than in the 1960s or 1970s, but also at other efficiency gains. Technology has given banks the means to explore new *economies of scope* by combining different activities and instruments into a high-value service package, as when they introduced integrated cash management accounts for their wealthy customers in the late 1980s.[16] Potentially large economies of scope arise when combining hitherto separate areas of finance as occurred, for example, with growing interconnections between commercial banking and investment banking. Economies of scope are essentially experimental and thus

process-bound, having much to do with efforts by trial and error at product development and hence unpredictable. But they can have amazing effects when they work, and also when they do not. The use of CDS to facilitate the launch of securitization products (e.g., CDOs) or as alternative trading instrument for entire portfolios, as if one owned the underlying combination of securities on which one is betting, is a good example. The aggressive search for economies of scope in financial product development has pushed us, just before the crisis, toward the new worlds of structured finance and synthetic finance. These promise to come back and grow in the not-so-distant future as a whole new sphere of economic activity and social engagement in cyberspace.

Building a myriad of intertwined financing arrangements, today's universal banks also strive for *network economies*. They build networks by their very engagements with many nonbank financial institutions that occupy crucial niches in their webs of financial commitments (e.g., credit rating agencies, hedge funds, insurers, etc.). Networks also get set up to the extent that they lend themselves usefully to the transfer of risk, multiplication of capital resources, and escape from the supervision, taxation, or regulatory restriction of governments. Once set up and off the ground, those networks carry the promise of becoming self-perpetuating sources of bank income in the form of various fees, commissions, trading profits, and interest earned. The universal banks construct such networks innately when they search for partners, clients, and counterparties. After all, what are financial markets if not networks of actors tied to each other contractually and financially?

We are now in the grip of finance's new triangular network constellation of commercial banking, investment banking, and asset management via funds, a self-perpetuating machine whereby bank loans feed financial markets while securities issued there can in turn be used as collateral for more bank loans. The universal bank, combining the entire range of financial services under one roof, thus makes loans, turns these loans into securities, attaches derivative contracts to these securities,

and then trades both of these. In the process it earns a seamless stream of interest income, fees, commissions, user charges, and capital gains. A significant portion of that financial income gets dedicated to large bonuses for the human capital behind this machine to assure its aggressive reproduction. What the crisis of 2007/08 has taught us, however, is how dangerous this machine is in its tendency for overshoot.

Financialization

The phenomenon of universal banks is part of a broader development, the dramatic expansion of the financial services sector in the United States and elsewhere. Because of its money creation capacity and its strategic mesoeconomic positioning at the vortex of economic activity, that sector—which is more accurately conceived of as a system—has its own unique growth dynamic of self-feeding expansion punctuated by sharp, crisis-induced moments of retrenchment. The GDP share of the US financial industry rose from a low of just above 2 percent at the end of World War II to over 8 percent in 2007. We should note that such quadrupling in relative size applies to a very restrictive measure of what constitutes the financial industry as a service provider that basically ignores the role of financial markets in our economy. This increase in the size of finance has paralleled its growing capacity to extract larger shares from the income pie. America's turbocharged machine for generating financial income absorbed a steadily rising portion of the country's profit pie, up to 40 percent, in the run-up to the systemic crisis of 2007–09. In its wake the income share of the finance sector collapsed to an unprecedented minus 13.6 percent in October 2008 before rebounding to a 28.6 percent share in December 2010.[17]

This expansion in size and income-generation capacity of the financial services sector is reflective of a broader structural shift in our economy, a shift that has let financial motives become dominant among most of the economy's actors. This starts with the widespread chase for speculative (capital) gains

as savers have turned into investors entrusting their funds to professional traders and asset managers. And it has extended to shareholder value maximization as the dictate of corporate governance, committing firms to look at quarterly earnings as the defining bottom line (at the expense of other stakeholders in the company and of long-term planning horizons). This dominance of financial motives can also be explained by what has happened to the balance sheets of the private sector. Most of its actors, starting with large corporations and rich households but extending subsequently well beyond those to smaller firms and middle-class families, have participated in this transformation of finance on either side of the ledger. On the one hand, they have typically gained a lot more access to different kinds of debt and hence widely diversified their liabilities while ending up with much higher debt levels over time. On the other hand, they have committed a lot more of their income to the accumulation of financial assets for further income gains. Large firms do that not least as part of a direct investment strategy of external growth where they take equity positions or fund long-term supply contracts to build global production networks with a range of firms on whom their global supply chain relies. And they have also ended up with an upward shift of their portfolio investments, often thrust into that role first because of their pension benefit commitments (especially in the United States and Britain). Households, especially to the extent that they have become rich enough to accumulate wealth beyond their homes, look at financial assets as a sure way to supplement incomes and provide for the future. This *financialization* trend, just as much as the securitization trend to which it is tied, was abetted by interest rates drifting lower from 1984 on all the way to the mid-2000s, an environment propitious for price appreciation of securities.[18]

Securitization, universal banking, and financialization have fused into a unique accumulation regime centered on finance, something best described as finance-led capitalism. This new regime thrived during its long-wave upswing phase from 1982

to 2007, pushing the underlying economic growth path higher with barely any pause—a quarter of century of what the former chairman of the Fed, Ben Bernanke, termed "Great Moderation." How that upswing unfolded so spectacularly only to yield one of history's major financial crises needs to be looked at in detail, the subject of the next chapter.

CHAPTER 4

Financialization Revisited: A Mesoeconomic Approach

The different manifestations of the financialization trend show how contemporary capitalism has become dominated by financial institutions, markets, and motives. That dominance changes how our economic system operates. With large institutional investors exercising often impatient control as majority shareholders, corporate managers are increasingly concerned with quarterly earnings and share buybacks at the expense of longer-term commitments to skill formation, product development, or new production technologies. Their short-term bias gets reinforced when chief executives running these corporations get most of their remuneration in the form of stock options. Financialization has also transformed our system on the macroeconomic level. When capital moves with lightning speed across borders at an unimaginably large scale, then national economies become intertwined in entirely new ways.

Heterodox economists noting this financialization trend have focused on specific manifestations instead of giving us the whole picture. Yet, it would be a worthwhile effort to discuss the phenomenon of financialization in a more complete and integrative fashion, because it is here, in the different manifestations of financialization, that we can see finance-led capitalism at work and get a sense of how this system operates. Part of the

challenge is that we still do not have an adequately grounded view of finance for understanding how the amalgam of financial institutions and markets has become a strategically positioned system capable of self-expansion but also prone to great bouts of instability. One of the justifications for such a mesoeconomic vision of finance as a self-expanding and cyclical system is precisely to grasp its penetration of economic activities, social relations, and individual motives, hence to provide us with a more complete analysis of financialization.

How do we define this phenomenon? As Gerald Epstein put it aptly, financialization "means the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies."[1] That is a very broad definition, justified by the scale of the phenomenon: finance in all its manifestations has gained in importance. Listing all the different dimensions of finance side by side expresses also how heterodox economists have approached this topic, each concerned with a particular facet. On the same page Gerald Epstein provides a perfect example of that selective approach when he introduces his coauthors by summarizing their respective chapters, one concerned with the distributional impact benefiting holders of financial assets, another with the differences in profit rates between financial and nonfinancial firms, a third with the growing size of the finance sector, and so forth. That research is also comparative and static in nature, looking at a prefinancialization ("before") norm for the particular aspect chosen, typically around 1973, and then comparing that with a more recent anchor level ("after") for the same variable. Our notion of finance-led capitalism should provide a more comprehensive, integrative, and dynamic approach to the financialization process at the heart of this regime.

To this end, we begin by identifying how and why nonfinancial actors accumulate financial assets. Always attractive because of their liquidity and mobility, financial assets also serve as an alternative source of income and give their owners greater command in the marketplace, a modicum of power. We can look at this propensity in favor of financial assets by nonfinancial

actors as a matter of *financial centralization*, a term that accurately implies the growing role of financial assets in one's balance sheet. Of course, nonfinancial actors also ended up with more financial liabilities on the other side of the balance sheet, as they learned to live with higher levels of debt during the super-cycle from 1982 to 2007. This was even more the case for US households than for corporations, and the federal government boosted its debt levels only at the beginning and near the end of that super-cycle. Such accumulation of financial assets and liabilities in the balance sheets of nonfinancial actors could only occur because of the rapid growth of the institutions and markets providing finance, a trend we shall characterize as one of *financial concentration*. That expansion, driven by the simultaneous deregulation, computerization, and globalization of finance, became increasingly anchored in the spread of new financial markets and networks, more nodes connecting those to each other, and liquidity pumps feeding their volume. With growing density and scale that self-expanding web of financial markets and networks eventually altered the growth pattern of our economy, a third aspect of financialization best characterized as the *financial growth dynamic*. Apart from the obvious redistributional implications of a rising financial income share, growth became more dependent on higher debt levels and subject to recurrent asset bubbles. As these collapsed, falling asset prices clashed with an inelastic debt structure to impose crisis-induced adjustments. And so we actually ended up with a good deal of endemic financial instability in finance-led capitalism even before the systemic crisis of 2007–08, notwithstanding Ben Bernanke's characterization of the super-cycle as the "great moderation" in one of his most widely quoted speeches while he was heading the Federal Reserve.[2]

Financial Centralization

This historic increase in the weight of finance did not come about by chance. It resulted from the confluence of different forces arising and coalescing at exactly the right time. One important

factor was innovation. For instance, the emergence of money market mutual funds (MMMFs) in 1975 offered a new alternative to traditional bank deposits at a time when those latter carried negative real returns thanks to low interest rate ceilings imposed by the Fed under Regulation Q in a highly inflationary environment. No such limitation existed for the funds, which therefore could offer more attractive market yields, an advantage that became more important with rising inflation. The result was a massive disintermediation from the banks to the funds, and this helped turn millions of American middle-class households for the first time into owners of financial assets. That trend was greatly reinforced when US firms switched pensions from defined benefit plans to defined contribution plans, following the introduction of so-called 401(k) plans in 1980.[3] Now an even larger (and younger) number of Americans turned into investors; they were in it for the long haul and thus motivated to know about the inner workings of financial markets.

These fundamental changes in the structure of American household savings were given an ideological boost when Reagan took over the White House in January 1981. Attacking the New Deal programs so dear to the Democrats as "handouts" and "socialistic," Reagan even went so far as to suggest privatization of Social Security. Even though his more radical proposals were never enacted, Reagan changed the discourse of American politics. His alternative vision of an "ownership society," with its supposed virtues of personal responsibility and freedom of choice, found strong resonance among large numbers of Americans disaffected by the policy zigzag of the Democrats as those tried in vain to fight rising unemployment and accelerating inflation at the same time. And Reagan also managed substantial fiscal reforms that buttressed the emergence of a patrimonial middle class beginning to accumulate large amounts of securities through its mutual and pension funds. Cutting tax rates substantially across the board twice, in 1981 and then again in 1986, he reduced the top marginal tax rate from 70 percent to just 28 percent. Suddenly, it made a lot of sense, for top earners in particular, to gain more income because a smaller chunk

of those gains had to be paid in taxes. Reagan reinforced this incentive in spectacular fashion when he reduced the tax rate for capital gains to just 15 percent. Coming at a time of dramatic disinflation to end a decade-long crisis, with interest rates drifting gradually lower for years, the timing of these powerful fiscal incentives was perfect.[4] It did not take long for corporate managers and other top earners to boost their yearly incomes greatly and have a large portion of those gains paid out in lightly taxed stock options—a trend that has continued unabated for over 30 years as a key factor in the troubling increase in America's income and wealth inequality.[5]

Offering large remuneration packages stuffed with stock options was meant to reduce the agency costs of the conflict of interest between management and shareholders, a conflict that arises inevitably when ownership and control are separated. Aligning managers' priorities with those of the shareholders by giving the former a lot of shares was meant to reinforce shareholder value maximization as the primary, if not sole, corporate objective. There are obviously many other stakeholders touched by the actions and decisions of a firm—its workforce, customers, local communities in which it operates, suppliers, and so on. But these groups' interests were pushed into the background by a new kind of social contract between corporate managers and shareholders of which the stock options were a part. When the US economy came out of its decade-long stagflation crisis, the double-dip recession of 1980–82 and the sudden disappearance of inflation-induced paper profits left many US corporations under a lot of pressure to reorganize their operations. That pressure came from an often rather brutal reassessment of corporate market values in the stock market, rendered a lot more urgent when a group of shareholder activists, known as corporate raiders, began to attack undervalued corporations. The raiders' hostile takeover bids, financed by a new high-yield instrument called a junk bond, triggered restructuring efforts by targeted firms. These efforts rippled through their respective industries and sparked even more reorganization among competing firms lest they be attacked too. The often dramatic resolution of these

attacks would increasingly involve institutional investors taking sides or making their own demands. For a couple of decades pension funds and mutual funds had quietly amassed large shareholdings without much using the voting rights that came with those accumulations. Now, thrust into existential battles between raiders and management over the direction of the firm, these majority shareholders finally began to make active use of their power. Even though they sided more with management, institutional investors often agreed with the raiders' push for increased share prices as the principal management goal. And so in the 1980s shareholder value maximization became a universally shared dictate guiding corporate decision making.

In practical terms this objective translated into boosting quarterly earnings as much as possible while at times deploying price-boosting measures such as share buyback programs or stock splits. To the extent that shareholder value maximization helped generate a widespread obsession with quarterly earnings, it may have thwarted corporate concerns for long-term objectives, many of which would be important for the company's growth prospects, for example, skill formation and research and development. In addition to posing the ethical challenge of marginalizing the interests of other stakeholders, the prominence given to shareholder interests reinforced new managerial biases in favor of reflexive cost cutting, accumulation of cash cushions, and reliance on external growth strategies, such as acquiring existing capacities through mergers and takeovers.

The question of whether corporate priorities were heading in the wrong direction became more urgent as the leading firms in the United States and elsewhere accelerated their global reach. With controls on cross-border capital flows winding down across the globe and the international capital market becoming more integrated by the early 1990s, the world flows of foreign direct investment (FDI) grew on average by 13 percent per year between 1990 and 1997 and then surged to annual growth rates of 50 percent during 1998–2000. Once the FDI contraction in the wake of the 2000/01 recession had run its course, the FDI share sped up from 2003 on to triple its global volume by 2007

when it peaked at just over $2 trillion.[6] Multinational firms recognized that they had an once-in-a-lifetime opportunity to capture new markets. Revolutionary advances in communication and information technologies, coupled with sudden access to hundreds of millions of eager low-wage workers, pushed these firms much further along their globalization path. What we saw beginning in the 1990s and gaining much more depth in the 2000s was the transformation of multinational companies into *global production networks*, comprising many subsidiaries and affiliates to produce bits and pieces of increasingly standardized and globally marketed products and so forming integrated global supply chains. From the perspective of their home countries, these once celebrated national champions now appeared less than patriotic as they shrank domestic production facilities in favor of offshoring and outsourcing—a development that has soured many workers in the industrial nations on the idea of globalization.

Financial centralization has played a crucial role in facilitating this leap in the globalization of production. The more the leading firms decentralized production and spread it out geographically, the more they needed to centralize control over cash flows in order to manage their far-flung networks. The administrative center of these global production networks is today usually a giant apparatus for cash collection and reallocation. Finance also plays a major role in that center's dealings with its global network of suppliers, as these relations are reinforced by cross-shareholdings, lines of credit, trade credit, licensing agreements, joint ventures, and long-term supply contracts. The successful launch of local stock markets in key emerging markets over the past two decades—from Sao Paulo to Shanghai—has made it easier for American and European firms to build and adjust their networks and gives many emerging market firms a better chance to become global players themselves. The world's stock markets have made an important contribution to the accelerating change in industry structures toward global oligopoly, a trend the formation of global production networks (GPNs) among world market leaders has fueled since the early 2000s. A growing number of

manufacturing, high-tech, and even service industries can only support a few of these GPNs, and this means that firms lacking adequate scale for a leadership position must choose new partners and divest themselves of their marginal activities in order to focus on their core competencies. The stock market is a very powerful, if not efficient mechanism for such strategic readjustments and sectoral regroupings.

Financial Concentration

It is often said that bankers follow their corporate customers across the globe. While an accurate observation, it downplays the genuinely self-motivated globalization drive of banks and even nonbank financial institutions. One reason for that drive is obviously geographic diversification, especially as long as business cycles among the key economic countries or regions are not synchronized. The funds in particular have in this way justified their push for global portfolios. Another reason is regulatory arbitrage or outright evasion, a process that started early on, in the 1960s, when the creation of the Eurocurrency markets gave banks the chance to organize a worldwide network that operates supranationally in a stateless space beyond the reach of any national regulator. The globalization of finance was born right there. And already then it overpowered the capital controls in place, including those set up by the greatest power on earth.[7] Not only was this a global network like none before, but Eurocurrency deposits and loans also were important because they represented a type of money market instrument to draw from. During the inflationary 1970s in particular, when domestic interest rate ceilings kept US deposit rates often below surging inflation rates, American banks would encourage their corporate clients to deposit their funds in Eurodollars at market rates overnight. They would also borrow from their overseas subsidiaries since Eurodollar loans were cheaper than domestic loans, largely because of the absence of regulatory costs.

As the Eurodollar deposits and loans thus gained money market characteristics, they paved the way for other money market

instruments to emerge and thrive—commercial paper, bankers' acceptances, excess reserves known as federal funds, negotiable certificates of deposits, and so on. As those took root, further helped by the introduction of money market mutual funds (MMMFs) in 1975 as a huge source of funds, they offered large sums on short notice at reasonable rates to banks, then increasingly also to nonbank financial institutions and even corporations. Various institutions could also borrow against them in so-called repurchasing agreements (repos), which turned securities into money (see ch. 3, note 12). Access to money market instruments made it easier for their users, notably banks and then hedge funds, to pursue more aggressive asset growth targets since they could cover any cash shortfall with stopgap borrowings in the world's money markets.

Initially, the emergence of money market funds in the late 1970s squeezed commercial banks greatly, with the latter suffering massive disintermediation out of their deposits, which had been rendered less attractive because of regulatory interest rate ceilings. Even after deregulation bank deposits never fully recovered their previous dominant position. The national income data of the US Commerce Department's Bureau of Economic Analysis (BEA) pertaining to the category of "traditional bank-based credit intermediation" shows that the commercial banking activity of taking deposits and making loans actually declined from about 3.1 percent of GDP in 1985 to 2.4 percent in 2007. The Fed's flow of funds data (now called financial accounts) for the same period show a steady decline of insured bank deposits from 52 percent of total short-term funding of the US finance sector in 1984 to just 31 percent in 2007. In contrast, the share of money market fund assets rose from 5 percent to 21 percent in the same period. This apparent erosion of what we have termed *indirect finance* (i.e., taking deposits, making loans) was part of a broader transformation of finance, which we began to discuss in the preceding chapter.

Just as funds replaced deposits as the principal form of saving, so securities crowded out loans as the preferred form of credit. Buyers (investors) have come to prefer securities, because those

offer liquidity and give them an exit option while loans are commitments hard to get out of. Sellers (issuers) also like securities better than loans, because the former tap a much broader supply of funds and come with lower costs. In addition, securities have less onerous information requirements than loans, providing markets with formalized information in the form of standardized income statements. Bankers, on the other hand, often rely on informal signals and ongoing relationships when assessing their borrowers' creditworthiness. Most important, financial intermediaries themselves would rather deal with securities than with loans, especially to the extent that their market-making brokerage, dealership, and underwriting services yield greater and more stable income sources in the form of fees, commissions, and trading profits than the volatile interest income associated with loans. We have therefore seen an explosion of new financial markets since 1980s beyond the already discussed money markets and notably including bonds (e.g., high-yield corporate bonds previously known as junk bonds, emerging market bonds), derivatives, and loan securitization products. The transaction volume of financial markets has surged as well. The Fed's financial accounts show that the value of traded equities and fixed income securities grew in the United States from 107 percent of GDP in 1980 to 323 percent of GDP in 2007—an increase fueled not least by steadily rising stock market prices and the takeoff of loan securitization.[8]

Such spectacular growth of *market finance* more than compensated for the relative decline of indirect finance noted earlier. Thus, the finance sector itself managed to expand from 4.9 percent of American GDP in 1980 to 8.3 percent in 2006. This figure captures the value added component of finance, essentially profits plus compensation (i.e., net revenues minus nonwage inputs). If we want to look at finance more broadly in terms of total output (or revenues), the national income data from the BEA shows that very sector to have grown from 9.5 percent of GDP in 1980 to 15.6 percent in 2007. To the extent that growth came from market finance, it included traditional and

alternative (i.e., hedge funds, private equity funds, venture capital) asset management, pension fund administration, derivatives trading and origination, equities and fixed income trading, and broker-dealer services (including underwriting fees).

However, this official measure of growth in the finance sector excluded securitization, the bundling of loans against which to write pass-through securities whose income flows generated by the underlying loan pool (e.g., interest, repayment of principal) get passed on to their holders after deduction of origination and servicing fees, which go to the issuer. Ironically, that activity was encouraged by the US government in the 1980s when government-sponsored lenders Fannie Mae and Freddie Mac promoted MBS and the LDC debt crisis was resolved with the help of so-called Brady bonds facilitating a loan-for-bond swap. It gained an added impetus when banks decided to move much of their lending activity off their balance sheets as new capital requirements for bank loans under the Basel Accord of 1988 took effect.[9] By unloading their loans from their balance sheets, banks also transferred credit risk to third parties. And they got their money back much faster, which enabled them to make a new loan rather than having to wait until the old loan was fully paid off. That acceleration of lending did not show up as such in the books of the banks; there, once loans were unloaded, they were simply replaced by a new loan rather than aggregated. This means that the aforementioned relative decline of indirect finance was more likely due to a greater share of it not being captured by official measurements. In the 1990s securitization moved beyond mortgages to reach other segments of household debt (e.g., student loans, car loans, and credit cards) against which asset-backed commercial paper (ABCP) could be issued. Such loan-backed paper ultimately became a vital part of the money markets in the 2000s when banks made more aggressive use of conduits and structured investment vehicles, having those special purpose entities (SPEs) borrow short-term via ABCP to invest long-term in mortgage-backed securities (MBS) or collateralized debt obligations (CDOs, see ch. 1).

Securitization helped drive up household debt. From the Fed's financial accounts we can see that the fraction of consumer debt held in securitized form rose from 8 percent in 1980 to about 50 percent in 2006. And this increase in the share of household credit securitization coincided with a rise in household debt from 48 percent of GDP in 1980 to 103 percent in 2007, a massive increase driven mostly by securitization as the share of bank loans in total US consumer credit remained constant around 40 percent of GDP throughout the period. Securitization, which was focused primarily on mortgage debt, made it easier and cheaper to finance home purchases, thereby amplifying existing incentive biases in favor of home ownership (e.g., tax deductibility of mortgage interest) and so contributing to the overbuilding of America. That problem became acute during the housing bubble of the 2000s when Americans borrowed increasing amounts at an accelerating pace in the wake of rising home prices.

Securitization is part of the so-called shadow banking system, as are the above-mentioned money market funds and the special purpose entities, which seek short-term funds in money markets (e.g., ABCP) in order to invest in longer-term instruments (e.g., MBS, CDO tranches). In contrast to regular banks, however, the MMFs and SPEs undertake such credit intermediation without access to the Fed's facilities and deposit insurance as lender of last resort. And they also tend to organize their credit intermediation as a chain, with many more links than regular banking would have. Such lengthening of the intermediation chain was greatly facilitated by another crucial pillar of the shadow-banking system, namely, repurchasing agreements also known as repos. This form of secured lending rose from 5.9 percent of US domestic nonfinancial sector debt in 1980 to 15.5 percent in 2007.[10] As illustrated with the rehypothecation example in the preceding note, repos tend to extend credit intermediation chains. For instance, banks often conduct reverse repos with hedge funds to fund the latter's purchases of asset-backed securities and then turn around to use the securities acquired in this process to engage in their own repo financing where they typically borrow funds from money market funds. Economists

Robin Greenwood and David Scharfstein introduced a proxy measure for the lengthening of the intermediation chain, the credit intermediation index (CII), by dividing total liabilities of all sectors by the total end user liabilities (of households, non-financial firms, and government), and they concluded that this CII rose from 1.83 in 1980 to 2.26 in 2007.[11]

Shadow banking is not part of so-called market finance. Instead, I would characterize this part of our financial system as *network finance*, in recognition of its structure as a web of intertwined insider networks also known as over-the-counter markets that connect banks, broker-dealers, money market funds, hedge funds, and special purpose entities through securitization instruments, money market claims, and repos. As recently as 2014 the Financial Stability Board estimated those shadow banking networks, which normally exist off-balance-sheet and hence beyond official statistical measurements, to have grown to between $25 and $35 trillion in the United States. In terms of their output measure, shadow banks make up somewhere between 25 and 30 percent of the total finance sector. That is, if we were to include them, shadow banks would easily push the output figure of the US finance sector from the official BEA figure of 15.6 percent to over 20 percent of GDP.

Of course, the dramatic expansion of market and network finance provided a rich source of income generation for the finance sector—mostly in the form of fees, commissions, and trading profits beyond its traditional intermediation-based income from indirect finance in the form of net interest spreads. From the national income data of the BEA we can see that the proportion of total US corporate profits taken up by financial institutions rose spectacularly from 21.2 percent in 1979 to a 46 percent peak in 2002 before settling into a 38–41 percent range in the five years before the 2007 crisis (amid record high profits overall). How systemic that crisis proved to be is evidenced by the collapse of the financial sector's profits to minus 10 percent of the total in the first quarter of 2009, before bouncing back strongly to a 30 percent share by the end of 2010.

Another indication of financial concentration is the rapidly rising market share of the largest US banks, as they managed to transform themselves in the 1990s and 2000s into universal banks with a global presence combining commercial banking, investment banking, fund management, and insurance under one roof for scale economies, scope economies, and network economies.[12] In 1990 the five largest US banks controlled only 9.7 percent of total assets in that sector. At the end of 2013 their combined market share had risen to an astounding 44 percent. In less than a quarter century US banking has gone from a highly decentralized, still predominantly regional industry to a supranational and highly concentrated structure whose leaders have amassed $1 to $2 trillion in assets each. This has left us with a serious "too-big-to-fail" problem we need to tackle.

Financial Growth Dynamic

Left-leaning economists, notably post-Keynesians, such as Engelbert Stockhammer or radicals such as John Bellamy Foster, have argued that financialization breeds stagnation by discouraging productive investment activity.[13] In view of the strong productivity gains and reasonably good growth performance of the US economy during its long-wave upswing from the early 1980s to the 2007 crisis, this argument invites skepticism. I am more sympathetic to another argument favored by the Left, namely that financialization has had profound and problematic redistributional consequences. Thomas Piketty's book *Capital in the Twenty-First Century* laid out this argument in painstaking detail and with a mass of empirical evidence.[14] The argument of growing wealth and income inequality plays out on both functional and personal distribution levels. When it comes to functional income distribution, the post-Keynesian economist Eckhard Hein has identified several transmission channels through which the rising national income share going to net interest and dividend payments (financial income) puts pressure on the share of industrial profit, and in response corporate managers mobilize to push down workers' compensation shares.[15] We have observed

that redistribution trend to the detriment of (steadily declining) labor shares in the majority of industrial nations over the past three decades, as productivity growth has consistently outpaced real wage gains. The US wage share, according to the BEA's national income accounts, declined from its postwar peak of 59 percent in 1970 to just below 50 percent in 2012. Adding employers' payments of pension contributions, health insurance, and social security taxes, labor's share fell from a peak of 67.8 percent in 1980 to its 2012 trough of 61.3 percent.

Regarding personal income distribution, in 2012 the top 1 percent earned 22.2 percent of all pretax income of which only one-fifth came from work-related compensation. The bottom 90 percent of Americans earned for the first time less than half of the entire nation's income (49.6 percent). Wealth distribution in the United States is even more unequal. In 2010 the richest 1 percent owned 35.4 percent of all privately held wealth (net of liabilities), leaving the large majority of Americans with little or no wealth: our bottom 80 percent of households only possessed 11 percent of total wealth. Inequality gets more pronounced when we strip homes, the most important asset for the majority of American households, from wealth. In 2010 the richest 1 percent of American households owned 42.1 percent of financial wealth, which subtracts the value of one's home from total net worth; by contrast, the bottom 80 percent owned only 4.7 percent.

There are many implications of such an increase in inequality for the growth dynamic of rich countries, including the United States, the European Union, and Japan. For one thing, a shrinking middle class will undermine social consumption norms and mass markets upon which the fortunes of many consumer goods and service sectors depend. Instead, these sectors will be forced into product segmentation based on social class differentiation, which may make it harder to achieve economies of scale and scope. Since the wealthy consume a smaller portion of their income, the level of aggregate demand is more likely to be depressed—a phenomenon we have witnessed in particular during this postcrisis recovery over the past four to five years. And that inadequacy

of demand has been rendered worse by high unemployment, stagnant middle-class incomes, and the necessary deleveraging in the face of high levels of consumer debt. The unsatisfying growth performance has fed widespread disaffection, which in turn has accentuated political polarization toward the extremes and has led to policy paralysis. Governments have not been able to generate sufficient consensus for use of fiscal policy to stimulate greater demand: in the United States because of the deeply rooted gridlock between President Obama and the Republicans and in the European Union because of the application of the new fiscal pact imposing more austerity on already deflation-prone economies suffering from high unemployment. In the absence of fiscal policy, governments have relied more on monetary policy, which enjoys greater political autonomy but cannot do the job of stimulation as effectively when countries suffer from postcrisis liquidity traps. And unconventional monetary policy (e.g., quantitative easing) at the zero bound, when interest rates stay at or near zero for years, only exacerbates income and wealth inequality by stimulating financial markets while punishing middle-class savers and retirees. Structural reforms, such as progressive tax reform, labor market deregulation, or restructuring of pensions and health care as baby boomers reach retirement age, have become more urgent while at the same time more difficult to push through amid widespread middle-class frustration and polarization. To the extent that such secular stagnation and policy paralysis take root over the longer haul, the underlying inequality begins to undermine investment, job creation, prosperity, and the economic dynamism capitalist societies need to spur innovation and reward effort. Inequality is therefore not just a moral, social, and political issue, but also an economic challenge that even the powerful elite at the top must realize needs to be addressed.

Even before we arrived at this difficult juncture, financialization had already given us a severely biased growth dynamic. For one thing, we have come to depend much more on debt financing of spending. Debt-to-income ratios rose substantially during the long-wave upswing. At first glance this may not be all that

surprising. As we noted in chapter 2, post-Keynesian economist Hyman Minsky argued that long periods of relatively strong growth encouraged greater leverage as widely shared optimism led to risks being downplayed. But he applied this argument primarily to corporate debt, which rose in the United States from 31 percent of GDP in 1980 to 50 percent in 2007. More impressive, and indeed worrisome, was the doubling of the share of household debt over the same period to over 100 percent of GDP.[16] Most of that growth was the result of securitization, above all mortgages, while the expansion of corporate debt also came about through bonds rather than loans. So it is clear that, in line with Minsky's observations, financial innovation made it easier for debtors to take on more leverage. This so-called *debt economy* extended to the federal government as well, whose (net) debt level rose in the aftermath of the deep double-dip recession of the early 1980s and the Reagan-era fiscal stimulus from 26.5 percent of GDP in 1980 to 49 percent in 1992. Tax hikes under President Bush Sr. and President Clinton lowered this ratio to 33 percent in 2003 after several years of budget surpluses. But big tax cuts and spending hikes under President Bush Jr. raised the ratio back up to 40.5 percent before the Great Recession pushed it rapidly to 68.7 percent of GDP in 2011.[17]

Our increased reliance on debt has been matched by the spectacular growth of financial assets on the other side of the balance-sheet ledger. Financial assets (FAs), summed across all sectors, grew in tandem with national output during the postwar boom and subsequent stagflation crisis, yielding a fairly stable FA/GDP ratio in the US of 4.1 in 1952 and rising only slightly to 4.8 in 1980. Over the next three decades, however, financial assets grew much more rapidly than the real economy, with the FA/GDP ratio rising to a peak of 10.7 in 2007 before falling back to about 10 in 2010. During the same period the ratio of financial assets to tangible assets rose from its long-term postwar level of 1.5 in 1980 to 3.5 in 2010. Tradable fixed-income assets (bonds) grew mostly because of financial innovation, in particular loan securitization, which spawned new issues of asset-backed securities on a gigantic scale. Equity shares, on the other

hand, grew more due to rising stock market valuation of firms rather than due to increased share volumes, and in that sense shareholder value maximization had proved a success.

What is behind this incredible explosion of financial assets? At this point we return to our discussion of fictitious capital at the beginning of chapter 3. We now live in the age of fictitious capital where finance has become an asset creation machine to issue, manage, and trade securities for a series of consecutive gains—underwriting fees and spread gains when issuing securities, service fees when managing them, commissions plus capital gains when trading them. We use one set of securities, money market claims, to acquire another set of securities, say, asset-backed securities, at a much greater scale. When looking at this machine from the point of view of a universal bank, we can see that it has the means to boost all its major components at once: it can issue new securities on behalf of corporate clients, manage funds trading those securities, set up liquidity pipelines for the markets or networks circulating these securities, and make loans to potential buyers of these securities. Each of those interventions creates income for the bank while providing a large and growing elite of financial asset holders with a continuous opportunity for speculative capital gains. We have already noted how the creation of financial income has skewed income distribution in favor of a powerful elite capturing the lion's share of wealth creation. This can be pushed too far. If hedge fund managers who charge an incentive fee of 20 percent of all the profits earned on top of the yearly management fee of 2 percent of total asset value can still claim carried interest for the former to qualify for lower taxation of their superhigh fee income as capital gains, then we have solid proof of that elite power. If investment bankers can issue highly rated, but in effect risky MBS on the one hand and then make secret bets on their demise using CDS, we can see the dangers of multipronged manipulations by universal banks willing to ignore minimal ethical standards and firewalls. When banks consciously downplay and hide risk in order to reap higher returns associated with that risk because they know that in the end

their losses will be socialized, then moral hazard has become a massive market failure.

A key dimension of fictitious capital concerns the process of endogenous money creation when the banking system transforms zero- or low-yield excess reserves into higher-yielding assets in acts of credit extension. Karl Marx and Friedrich Hayek, from opposite ends of the spectrum spanning the history of economic thought, both thought that such credit-money, created when banks make loans and credit the borrowers' accounts with new deposits, had no counterpart (as with gold) and hence represented fictitious capital. But in the late nineteenth and early twentieth centuries, when those economists thought of credit-money as fictitious capital, chances were that the money-creating loan would go to the real economy to finance a purchase or investment. A century later the process of money creation has become much more complex! It is far less directly connected to the real economy, having typically to go through several intermediation steps before it funds end users producing or consuming goods and services. These credit intermediation chains indicate a growing share of money creation going into the financial sector itself to boost its activity volumes and asset prices.

There used to be a time, right around the emergence of finance-led capitalism in the early 1980s, when central bankers were debating the relative virtues of different money supply measures, from the narrow money supply M_1 all the way to the very broadly conceived monetary aggregates M_4 and L. This discussion arose with the spread of new money market instruments in the 1970s and deregulated bank deposits in the 1980s, some of which had actual, albeit restrained monetary attributes (e.g., limited check-writing privileges against money market fund shares) while others could almost instantly be turned into cash (e.g., automatic transfer of savings accounts). The different money supply measures reflected a new system of concentric rings of inside money (M_0 or monetary base MB), narrow money (M_1), quasi-money (M_2, MZM [money zero maturity], and/or M_3), and highly liquid near money paper (M_4 or L). In the end, central banks, figuring they could not control the size

of any of those, stopped using the monetary aggregates in their policy considerations. Hence, our regulators lost track of how the process of money creation operates. At the center are still the central banks with their provision of (excess) reserves, which they have supplied on a far more aggressive scale since the systemic crisis hit in September 2008, as exemplified by multibillion bond-buying programs known as quantitative easing. These excess reserves get picked up by banks to make loans and hence create new money. But banks can also use their excess reserves to buy securities. In that case their money creation is more likely directed toward the financial sector, as would also be the case when making loans to broker-dealers with which to fund the latter's margin credit, or creating loans that get securitized, or extending lines of credit to financial markets or networks that get activated when funding support is needed. And then there are mechanisms where creation of quasi-money instruments showing up in medium money rings of M_2, MZM, or M_3, such as money market fund shares or Eurodollars, sets off a chain reaction of liquidity provision via the money markets funding longer-term securities. This then shows up in the narrow money ring only as a velocity increase of M_1. Such maturity or liquidity intermediation chains can even increase velocities for the quasi-monies in M_2, MZM, or M_3, as happens in repos using securities as money. Rather than picturing this as concentric rings, it may be better to think of the money creation process as an inverted pyramid connecting the different layers of money supply so that one layer's change in quantity shows up in the layer below it either as a velocity change or a fraction of the higher layer's volume adjustment.

Data from the Federal Reserve Bank of St. Louis show that M_1 velocity rose steadily from 1980 to 2007 and M_2 velocity rose gradually up to 1998; after that it declined rather steeply over the next decade, and velocity of MZM fell precipitously throughout from its 1981 peak of 3.55 to its 2014 trough of 1.38.[18] Measured in terms of income velocity rather than of transaction velocity, these official velocity figures decline the more that particular monetary aggregate is redirected toward financial transactions

that do not show up in the velocity's numerator. And when we then look at the difference between M_2 and MZM (money zero maturity), replacing small-time deposits typically closely tied to the real economy with money market funds at the heart of shadow banking, we should not be too surprised that the latter had slowing velocity as it fed the intermediation chains and money markets underpinning fictitious capital. The St. Louis Fed, the bastion of monetarism within the Federal Reserve System, has pushed the MZM stock as the most reliable indicator of inflation. But rather than being concerned with the effects of money supply variations on (output) inflation, the monetarists should worry about the money supply's impact on asset inflation. Significant redirection of money creation by banks and their shadow banking allies toward financial markets boosts the prices of assets traded in those markets. The transformation of finance has given our system a heightened propensity for asset price bubbles.

This *bubble economy* goes hand in hand with our *debt economy*. Bubbles encourage debt financing, first to benefit from the leverage effect boosting rates of return and then because of the wealth effect making asset owners comfortable taking on more debt. And to the extent that asset prices get pushed up, the borrowing capacity of asset holders improves because they now have greater collateral to offer. In turn, increased debt financing will just speed up the bubble until it becomes unsustainable and bursts. At that point there is a crisis as collapsing asset prices clash with much more rigid debt structures that cannot be devalued so rapidly. Not only does that dichotomy threaten people with insolvency as capital gets eaten up when the asset base shrinks rapidly while liabilities do not, but they have to scramble to get their debt levels down—this is the much-discussed deleveraging amid what financial economist Richard Koo has termed "balance sheet recession."[19]

Asset Bubbles

The notion of a bubble economy is not only justified when looking at the profound structural changes in the modus operandi

of finance and their combined impact on the growth dynamic of advanced capitalist economies. No, that notion also reflects what actually happened in the United States during the upswing phase of the latest financial super-cycle from 1982 to 2007. In that period we experienced three consecutive asset bubbles, first the bull market fed by the corporate raiders' attacks on undervalued companies (1984–87), followed by yet another stock market boom that came to be called the dot-com bubble in the wake of Internet mania (1997–2000), to conclude with the housing bubble discussed already in chapter 1 (2002–07). Such asset bubbles are not least a reflection of long periods of more or less uninterrupted economic expansion, hence clearly part and parcel of Hyman Minsky's super-cycle. The prevailing optimism typifying such long-wave upswings creates the necessary euphoric crowd psychology for explosive market rallies, with highly accommodating monetary policy in the aftermath of crash-induced setbacks setting the stage for the next bubble. Minsky noted as well that bubbles typically feed off financial innovations that provide either new sources for debt financing of asset purchases or create additional pathways to profit from sustained asset inflation. We can see this play out clearly in each of the three bubbles mentioned above.

Take the first of these bubbles for illustration. When the United States emerged from the decade-long stagflation crisis through the brutal double-dip recession of 1979–82, its firms were suddenly deprived of their inflation-induced accounting profits and left undervalued by a battered stock market. At that point a highly aggressive investment bank, Drexel Burnham Lambert, trying to catch up with its larger brethren, introduced so-called junk bonds (i.e., corporate bonds for firms rated below investment grade) whose comparatively high yields more than compensated for the actual default risk they posed. They thus proved very attractive for investors hungry for yield after so many years of stagflation's devastation of investment returns. Drexel's boss Michael Milken used the new security he had championed to build a powerful funding network that provided billions to his favorite clients, a group of clever, risk-prone, and unscrupulous

shareholder activists who came to be known as corporate raiders for hostile takeover attacks on chosen targets.

The raiders' daring takeover bids, breaking long-established "live and let live" rules pervading corporate America, were known as *leveraged buyouts* (LBO) because they involved issue of speculative-grade junk bonds to help pay for the acquisition and then used the target firm's cash flow or breakup value to service the debt. These attacks forced many of America's legendary firms (e.g., Walt Disney, MGM/UA, Sotheby's, Singer, Datapoint, RJR Nabisco, Gulf Oil, Phillips Petroleum, Reliance Group) to respond with far-reaching restructuring plans for majority support from institutional investors, introduce costly defenses (shareholder rights plans, so-called poison pills), pay off the attackers, or risk being taken over with a distinct possibility of dismemberment. These attacks spawned a third innovation, a new type of *risk arbitrage*. As the raiders exploited the difference between a target's current market value and its expected liquidation value, investors were trying to profit from the attacks by acquiring shares of the raiders' targets and simultaneously short-selling shares of the attacking firms. Pretty soon that play was extended to other firms in the target's industry that might fall prey to attacks lest they too reorganized their operations to boost their share prices. It is here, in this wave of ripple effects unsettling entire sectors of the American economy that the speculative froth built to the point of a mania so typical near the peak of a bubble. By the mid-1980s Drexel's ability to control the junk bond market had reached a point where it could just issue a so-called highly confident letter promising to raise the debt needed to finance the attack and get banks to commit more cash for the proposed deal. Even though that promise was in no way legally binding, Drexel's reputation was such that its word was considered as good as cash, a telling example of fictitious capital at work at the start of finance-led capitalism. Drexel's hold on the market came undone when the bubble burst with the stock market crash of October 1987, sparking its downfall and the disintegration of the junk bond market.[20]

The second bubble arose with the Internet revolution that took off after 1994. It did not take long before this new computer network evoked dreams of a "New Economy" even though at that point, right after its birth, no one had yet figured out reliably how to make money out of this essentially free medium. Right away all kinds of dot-com companies emerged to offer their services, but their business models were less than obvious. What seemed imperative in this New Economy was to have a presence on the web, from which derived the importance of measuring visibility (e.g., clicks), in order to harness network economies that could/would eventually lead to a profit somehow—as they actually did a decade or two later with Google, Amazon, Alibaba, Facebook, and others. But in the mid-1990s, the economy was nowhere near that point and instead focused on any Internet start-up's cash burn rate as it tried to spend itself into profitability.

Luckily for those start-ups, there was a highly accommodating funding architecture in place to turn profitless and free-spending dot-coms into the object of a mad bubble. Important changes in listing requirements during the mid-1970s to allow firms being listed even without proven profitability record had turned the NASDAQ (National Association of Securities Dealers Automated Quotations) stock market into a magnet for high-tech stocks, providing a tailor-made platform for all those dot-coms to go public.[21] Before reaching that point, start-ups had the support of *venture capital funds*, themselves funded by a variety of institutional investors, such as pension funds, foundations, or endowments, which had experienced their own boom during the second half of the 1990s. The crucial link between the two would be the *initial public offering* (IPO), which involved firms selling shares to the general public for the first time and thereby turning a hitherto private company into a public company. Early on in the dot-com bubble there were some Internet entrepreneurs whose successful IPOs made them famously rich, and this created a buzz attracting many other would-be entrepreneurs to try their hand at the much-anticipated commercialization of the Internet. Later on it was mostly the investment bankers acting as

underwriters who became rich from IPOs because of ever-larger spreads between acquisition and resale values of the new shares. The bubble reached feverish proportions right before the turn of the millennium when the feared Y2K bug prompted large outlays on new computers. This made it easier for the Internet to get anchored in people's everyday lives and corporate operations. When that bug turned out to have been much exaggerated, the bubble burst with a bang.[22]

These first two bubbles centered on equity shares, exploiting the perceived differences between market value and book value of firms, one of the key vectors of fictitious capital identified by Marx. The first time around the motivating factor was the systematic undervaluation of firms by the market, which made it seem more profitable to sell off the firms in pieces rather than continue to keep them going. Out of this emerged the imposition of shareholder value maximization and after the stagflation a fairly extensive restructuring of US industry as long-term effects enduring beyond the bubble. In the second bubble the opposite happened, as speculators attached vastly exaggerated market valuations to barely existing and/or dubious book values. Yet, four years into the crash, by 2004, half of the dot-coms taken public during the heydays of the bubble were still alive even though their market valuations had long since evaporated, and this resilience illustrates that a secondary stock market for resale of shares among the public does not all that directly affect the operational capacity of that firm's productive apparatus. Still, what remained after the dot-com bubble was the massive expansion of the Internet's infrastructure—from fiber optics spanning the globe to the revamping of America's stock of computers.

The third bubble, extensively discussed in chapter 1, was different. That boom did not focus on corporations and their shares, but instead took root among households pursuing the American Dream of home ownership. A series of financial innovations—new mortgage products, the setting up of special purpose entities, securitization extensions such as CDOs or structured finance slicing asset-backed securities into tranches, or CDS and their use in synthetic finance arrangements— allowed banks to

develop their new originate-and-distribute model that captured investors with the prospect of high yields at triple-A levels of quality. The end users, the borrowers, were attracted by the prospect of using their home to draw cash from when its price rises. This was a far more broadly based asset bubble than the previous ones, engulfing millions of Americans as it increased their spending power. What is crucial in such household-based bubbles is the large *wealth effect* that arises in their wake, disproportionately raising consumer spending during the boom.[23] That wealth effect is both psychological, with households feeling wealthier due to rising asset prices (e.g., housing) even if the capital gains are not realized, as well as financial, to the extent that higher-valued assets boost owners' borrowing capacity by serving as loan collateral. Significantly, the personal savings rate declines during bubbles as (perceived and actualized) capital gains replace the need to put some money aside for later use. BEA data show that the US personal savings rate, as a percentage of after-tax disposable income, fell from 10.9 percent in early 1982 to minus 1.8 percent just before the crisis hit in mid-2007. And in another indication of bubble-driven excess spending the US trade deficits moved during the same period from minus 0.8 percent of GDP to minus 6.1 percent of GDP. How the richest country in the world ends up with a negative savings rate and how it turns from the world's leading capital exporter into the largest net debtor in the course of a quarter century are two related questions worthy of further exploration.

CHAPTER 5

Shadow Banking as Network Finance

In 2007/08, when the world faced one of the greatest financial crises in history, almost no one among economists, bankers, or government officials anywhere had seen this one coming. Why? It was not just the optimism prevailing after so many years of a Goldilocks economy or the orthodoxy's blind spot when it comes to finance in their models. More troubling was the fact that the crisis had exploded underground, in the part of the plumbing system of the economy that was hidden even from the professionals' eyes. Now that we have put this traumatic experience behind us and enjoy the fruits of a (finally) solid recovery, we still must wonder whether such a hit out of the blue can recur. Or have we learned enough about the last crisis and the locus of its origination not to repeat the same mistakes?

The first time we got a sense of something brewing out of sight was in August 2007 when a sudden panic in the hitherto obscure asset-backed commercial paper (ABCP) segment of the US money market started gumming up even the most central part of the world's money markets—the global interbank market. How could contagion have been so massive and traveled so speedily around the globe? What came to the fore here in violent fashion was an interwoven web of financial markets organized as networks and breaking down under pressure and

in the process paralyzing adjacent parts of the system. What also became clear at that moment was that no one had seen this web's components as tied together. Many observers and practitioners of modern finance were obviously familiar with the growing presence of hedge funds, CDS, money markets, MBS, and so forth. But they were far less aware as to how all these had become interconnected. And so they could not possibly realize how in different places along that web of networks stress had built up much like along the fault lines of tectonic plates before an earthquake.

When people get so badly surprised by what Martin Wolf, the chief economics commentator at the London *Financial Times*, has called a "doomsday machine," it is not surprising that you become obsessed with what hit you out of the blue.[1] And so we have tried to come to grips with the surprising phenomenon in a hurry. Study after study has tried to shed light on so-called shadow banking, and a battery of new restrictions has already been deployed by various regulatory agencies to tame the beast. This strong reaction does not mean there will be success. Part of the problem with shadow banking is that it thrives precisely in the face of regulatory restraints, and if new ones are imposed, the system will just grow around those. It is therefore imperative that we have a good sense of the shadow banking system's modus operandi to anticipate how the interaction between reregulation, innovation, and reorganization drives that system's growth. Frankly, we are not quite there yet.

While progress has been made, much must be understood better about shadow banks. Taking stock of our current state-of-the-art knowledge, we shall try to move the debate forward by looking at the shadow banking system (SBS) from a new perspective, namely, that of network finance. We have already seen in chapter 1 how the different components of the SBS interacted to create a perfect storm—the downgrading of MBS and CDOs amid a hike in subprime defaults panicked buyers of ABCP, which in turn collapsed the securitization machine and triggered massive runs on banks, which pushed the nation to the edge of a deadly spiral of debt deflation. Now we have to add concepts

introduced in subsequent chapters—financial innovation, systemic crisis, fictitious capital, bubble economy, and others—to get a better sense of shadow banking as the network finance part of modern banking.

Defining Shadow Banking

On August 31, 2007, just as we were becoming aware of something very ominous brewing in the world's money markets amid a run on ABCP, Pimco's Paul McCulley, speaking at the annual economic policy symposium of the Federal Reserve Bank of Kansas City in Jackson Hole, Wyoming, coined the phrase "shadow banking system" (SBS), which he defined as "the whole alphabet soup of levered up nonbank investment conduits, vehicles, and structures"[2] Since then, after that system had exploded into one of the most violent systemic crises ever, we have gone through a concerted effort to come to grips with its presence in our midst. There have been a lot of attempts to define the phenomenon, and economists have ultimately settled for an official definition furnished by the Financial Stability Board (FSB), which was put in charge of analyzing and regulating shadow banking. In a 2013 report the FSB wrote that "[T]he 'shadow banking system' can broadly be described as 'credit intermediation involving entities (fully or partially) outside the regular banking system' or nonbank credit intermediation for short."[3]

This definition is technically correct but leaves much to be desired. Already the term "shadow banking" is perhaps misleading to the extent that it implies something sinister going on as in "shadowy" or, worse, "shady." True, a significant aspect of shadow banking concerns the organized facilitation of tax evasion, money laundering, and otherwise illicit fund transfers through tax havens (e.g., Cayman Islands, Luxembourg), which, as it turns out, occurs on a rather massive scale. But this is still far from being the central SBS feature. The nearly inevitable evocation of criminality implied by the term leads me to wish for a better name. But "shadow banking" has stuck in the minds of people and become difficult to replace.

Another unfortunate aspect of the FSB definition, especially in its shortened version of "nonbank credit intermediation," is its implication that the activities comprising shadow banking are separated from traditional banking. Nothing could be further from the truth! Shadow banking activities happen by definition *outside* the regulated sphere of commercial banking, which is a special dimension of finance because of the fiduciary responsibility it implies. Commercial banks deal with other people's money, have the power to create new money, and enjoy privileged access to the payment services of the central bank, including its crucial facilities as lender of last resort. Hence these banks are subject to special regulation and oversight. Facing an imposed limit on their activities and growth capacity, they have tried systematically—by means of financial innovation—to move beyond this constraint in order to expand into other areas of finance and deal with unregulated competitors that offer credible alternatives to commercial banking services, such as money market funds. Shadow banking is thus part and parcel of the growth of finance, driven forward by banks escaping the confines of regulated commercial banking and the banks' less regulated competitors fighting for market share.

There have been many other attempts at defining the phenomenon of shadow banking. This is an inherently difficult task, because the phenomenon comprises both activities and entities, as the FSB definition correctly emphasizes. Taken together in their totality these shadow banking activities and entities are a disparate bunch; yet, all are somehow more or less connected to each other. To get a sense of their togetherness as a system requires a more dynamic and integrative definition than the ones provided by Paul McCulley or the FSB. Among definitions highlighting the SBS in terms of activities, I like the one put forth by Perry Mehrling in terms of "money market funding of capital market lending" because it is short and to the point. An acceptable definition of the SBS in terms of entities is that of the Federal Reserve Bank of New York pointing to "entities that conduct maturity, liquidity, and credit intermediation without government guarantee or access to central bank liquidity."[4]

SBS definitions comprising both activities and entities are more difficult to formulate, but may give us a more clearly systemic view of the whole phenomenon. Here I would put forth my own definition in terms of "relatively less regulated or entirely unregulated financial intermediaries creating a web of interwoven networks to circulate credit instruments for the purposes of maturity, liquidity, and credit intermediation."[5]

A key aspect of shadow banking highlighted by this definition is its organization as a "web of interwoven networks." Since it evolved in the shadows beyond the reach of regulatory agencies, it had to organize itself precisely in that fashion. The other types of finance are by definition visible, hence reachable by regulators. *Indirect finance*, whereby commercial banks take deposits and make loans, is heavily regulated for its money creation potential as an object of monetary policy (e.g., imposition of reserve requirements on deposits). *Market finance*, involving the organized trading of securities, such as stocks or futures, rests on the self-regulation of these markets as public exchanges and on their supervision by specialized regulators (e.g., Securities and Exchange Commission, Commodity Futures Trading Commission). But *network finance*, involving the creation of insider networks spawning bilateral trades, may escape the radar screen of the government. All underground organizations operate as such insider networks; shadow banking is no different in that regard.

To understand the behavioral characteristics of shadow banking as network finance we can draw on social network analysis, starting with the pioneering work of Stanford sociologist Mark Granovetter. According to Granovetter, economic relations between actors are comprehensible only if seen as embedded in actual social networks as opposed to their presumed existence in abstract models of idealized markets.[6] That approach studies how and why actors ("nodes") belonging to a network interact with each other ("ties") and how close they are with each other ("connectedness"). More recent work has applied the insights of social network theory to matters of finance and has shed new light on important issues, such as systemic risk, the role of

informal ties in investment decisions or corporate governance, and the modus operandi of certain financial institutions.[7] But this promising work has yet to be extended to shadow banking where it can help us illuminate its innovation-driven growth dynamic, the strategic importance of information in these networks, and their fragile nature.

Innovation-Driven Growth Dynamic of Shadow Banking

Standard economic theory has remarkably little to say about financial innovation and thus cannot appreciate how much the spectacular growth of shadow banking has been driven by innovation.[8] We have already noted earlier that financial innovation is easily copied and for that reason offers innovators only limited first-mover advantages. The SBS accommodates typical responses by innovators to this key characteristic of financial innovation by providing for speedy propagation, encouraging opacity, permitting complexity, and facilitating customization, all of which make the innovation more difficult to copy. The SBS, for example, thrives on network-type markets that are more easily constructed than public exchanges whose increasingly capital-intensive nature demands large trading volumes to break even and whose credibility depends on well-reputed self-regulation. Given these constraints, it may be easier to diffuse the innovation in a less structured manner between parties getting together in bilateral deals and building multinodal networks of interaction. Networks also allow opacity, affording those "in the know" advantages of information asymmetry that can be exploited profitably as a source of monopoly rents. Of course, such opacity is built into the SBS, which operates after all in the shadows. Arrangements in bilateral dealings lend themselves also more to customization, which takes account of the specific interests of the parties involved. And that same lack of standardization in networks allows also for complexity, much of it a function of customizability.

Another aspect of financial innovation we already pointed to briefly is its regulation-evading intent. Almost all the major

financial innovations of recent decades served to move the innovating institutions beyond a regulatory restraint. Finance is by definition a heavily regulated activity, and its regulations are meant to constrain. Banks view these regulations as an extra cost, much like a tax, and/or as an imposed limitation on their growth capacity. Either way, they have an incentive to lessen that burden, and innovation helps them with this objective. Once circumvented by new instruments and practices, the prevailing regulation has been rendered obsolete. Much of the deregulation of money and banking in recent decades was the result of innovation rendering old regulations ineffective.[9] When bankers bypass existing regulations by means of innovation, their field of action expands. But then they often abuse their newly found freedom, and their excessive behavior may result in a crisis. In the wake of a crisis they get reregulated, which sets off a new round of attempts at regulation-evading innovation. This is a dialectical process with regulation the thesis, innovation the antithesis, crisis and reregulation the synthesis. The SBS, whose activities and entities are meant to operate beyond the reach of regulators, is obviously a highly attractive sphere of finance where this regulatory dialectic plays out most dramatically to the extent that it embodies regulation-evading innovations stitched together into a coherent funding system.

To the extent that financial regulation is by and large still a national matter, there are also nationally specific shadow banking systems, each of which has been uniquely shaped by a largely domestic dialectic of regulation and innovation. Take, for example, China's huge shadow banking system whose primary features of wealth management products and trust investments are entirely the result of local deposit rate ceilings on bank deposits and prohibition of borrowing by municipal governments. By comparison, the very different shadow banking system in the United States has been dramatically shaped by much-valued home ownership, which is why securitization of mortgages has played such a large role in it.

This is not to say that shadow banking is a predominantly local phenomenon—on the contrary. The SBS is a planetary force, the

most advanced manifestation of global finance, which in itself spearheads the broader globalization process. And on that supranational level the regulatory dialectic concerns the various Basel agreements under the auspices of the Bank for International Settlements (BIS) as the global governance authority for regulation of transnational banking activities. That process started with the 1988 Basel Capital Accord, which introduced a risk-weighted minimum capital to assets ratio to cover loans and so address credit risk in the aftermath of the LDC debt crisis of 1982–87. In the Basel II Accord (2004) securities, operations, and other risk sources were added to that ratio in light of structural changes having led to high-tech universal banking. And in the Basel III Accord (2010), responding to the crisis of 2007/08, the BIS toughened bank capital requirements while adding liquidity buffers and overall leverage limitations. The capital requirements of the Basel agreements prompted banks to move more of their intermediation activities off their books, thus providing strong impetus for the growth of shadow banking.

The regulatory dialectic is still at work inasmuch as post crisis reregulation efforts have already caused shadow banking to react, such as hedge funds filling the void of lending to small and medium-sized firms. This adjustment capacity of shadow banking is largely due to its innate flexibility in being organized as networks. The two parties involved need only agree on terms to have a deal. And so there is ample room for customization to meet the specific needs of potential parties to a given transaction, as happens with currency swaps or interest rate swaps. But shadow banking's flexibility goes even further than customization and extends to the uses of financial instruments. In networks it is easy to figure out new ways to use a given instrument and mobilize support among other network members to give it a try. A recent example is how CDS have been used beyond default insurance to make bets on the value fluctuations of portfolios without owning them (naked CDS), as complement to CDOs (synthetic finance), or as signaling device to indicate the volatility of market sentiments as happened with the bear runs on banks in 2008.

The built-in flexibility of network finance extends to its expansion dynamic. Whenever a given network configuration hits a structural limit to its linear expansion, the parties involved will try to figure out bypass strategies for a different growth path. Accordingly, people have moved from MBS with strict underwriting standards to those with lesser standards sliced and diced into tranches (structured finance) and on to CDOs securitizing the senior tranches of MBS to CDOs squared or cubed. Or they have gone from a highly selective group of leading banks allowed to offer their securities as collateral for central bank loans (primary dealers) to much more widespread short-term collateralized lending (repos) and its generalization beyond banks through insertion of clearinghouses (tripartite repos). Often, this kind of layering requires new networks. For example, the splitting of MBS or CDOs into tranches necessitated a new group of investors for the high-risk mezzanine and equity tranches, which is how the banks got deeply involved with hedge funds. In a similar vein, introduction of synthetic CDOs involved finding unfunded investors as well as monoline insurers willing to make bets on their creditworthiness (see chapter 1).

It is this adaptability of network finance that has helped make shadow banking the fastest growing part of the world's credit system. By mid-2007 shadow banking had globally reached $62 trillion only to shrink sharply to $56 trillion at the end of 2008 as the financial crisis took its toll. By the end of 2013 shadow banking had fully recovered and grown to $67 trillion, representing 27 percent of the world's financial system. In some countries, depending on how heavily local regulations weigh on the traditional banking sector, that market share of the SBS is much higher as, for instance, in China where it absorbs more than half of that country's total financial services sector. Even though Europe's shadow banking sector almost rivals that of the United States, the latter is still the world's largest and absorbs almost 40 percent of the total. Thus, the system is very dynamic and capable of tremendous self-expansion. This impressive record of expansion and recovery also tells us that the SBS serves a useful

purpose of credit intermediation beyond what the other types of finance—indirect finance and market finance—can offer.

The Four Pillars of Shadow Banking

In 1958 banks in London accepted to hold the Soviet Union's dollar-denominated reserves even though those funds were denominated in a currency other than their own. These banks created thereby in one swoop an alternative payment system to the one run by the world's leading central banks, which had been sort of a monopoly of Britain (1879–1914) and then the United States (during Bretton Woods' first decade and a half).[10]The new private payment system, reinforced later by two bank-owned supercomputer systems known as Clearing House Interbank Payments System (CHIPS, in 1970) for large cross-border transactions and the Society for Worldwide Interbank Financial Telecommunication (SWIFT, in 1973) for the data protocol guiding interbank fund transfers, fostered a global private banking network absorbing the growing volume of US dollars in international circulation. That network, known as Euromarket (short for Eurocurrency markets), operated beyond the reach of national banking regulators and, with its stateless money sloshing around the globe, became the institutional platform of global finance upon which the SBS formed and built. While initially predominantly a system of indirect finance, consisting of deposits and loans in currencies outside their country of issue (e.g., dollar-denominated loans by a British bank to a French company), it subsequently expanded into new areas of market finance and network finance.

Pillar 1—Money Markets

Crucial here were various dollar-based money market instruments that emerged in the 1960s and took off in the inflationary 1970s when investment horizons collapsed toward the short term while real interest rates in the regulated indirect finance sector of banking were often negative. Instruments, such as

commercial paper or negotiable certificates of deposits, became more attractive than traditional bank deposits. This shift from regulated indirect finance to self-regulated market finance and/or unregulated network finance became more pronounced after 1975 when money market funds emerged to prompt massive disintermediation out of bank deposits and boost the budding money markets. The Euromarket extended this structural shift in the early 1970s toward the middle range of maturities when it popularized floating rate notes with maturities ranging from two to five years but priced on the basis of money market rates that get reset all the time.[11]

The Euromarket also gave rise to cross-border interbank lending, which even today absorbs more than half of the market's size. This huge international interbank market (IIBM) became indispensable during the petrodollar recycling process of the 1970s. Such worldwide shuffling around of funds on a hitherto unprecedented scale created a much greater need to allocate liquidity quickly and efficiently among a much larger number of banks, with assurances that money would be available on demand during periods of market stress (a concern that had become acute after the failures of the Franklin National Bank and the Herstatt Bank in 1974 and their outsized impact on the Euromarket). The Basel Concordat of 1975, bringing together the world's leading central banks for coordinated crisis management, enhanced the implicit assumption that those institutions would offer lender-of-last-resort assistance if there was a serious problem in the IIBM as the central banks now committed to taking over responsibility for that transnational section of the interbank market. This assurance made it much easier for the IIBM to expand in volume and geographically as it began to draw in more and more countries joining the world economy with postcrisis reforms of capital account liberalization and exchange rate management (in the wake of the LDC debt crisis of 1982–87). But the interbank network ran into a big problem during the Asian crisis of 1997–98 that also engulfed Russia (August 1998) and Latin America (in 1999). Many emerging market borrowers with currency denomination mismatches

between their (local currency) assets and (dollar- or euro-based) liabilities got squeezed in the course of this crisis when massive capital flight broke their pegs and triggered large declines of their currencies.[12]

That crisis ultimately did not do much to slow the expansion of the interbank market. After a short dip, it resumed its fast-paced expansion all the way to the next global financial crisis a decade later. This extraordinary growth of the IIBM had to do with the growing demand for liquidity, which means demand for quick and easy access to cash when needed. There were many forces at work creating a greater need for liquidity and its efficient allocation across the world. Most of those arose in the wake of financial globalization, notably the rapid growth of cross-border investment flows causing an explosion of short-term liabilities in need of liquidity cushions, acceleration of bank support for the burgeoning SBS and its highly leveraged positions (in money markets, securitization, OTC derivatives), and the worldwide spread of real-time gross settlement systems (RTGS) for large transfers getting settled instantly without collateral (from 3 central banks in 1985 to 90 in 2005).

Pillar 2—Repurchasing Agreements

Because of this profound increase in the banking system's need for liquidity, an enormous amount of unsecured lending built up in the interbank market from the late 1980s on. The fallout from the Asian crisis of 1997–98 made it quite clear that the interbank market was prone to severe and sudden credit rationing when faced with a financial instability shock. The lack of collateral meant that lenders were obliged to assess the creditworthiness of their counterparties but lacked adequate information to do so effectively. In the absence of such reliable information they could not price their credit risk correctly or demand adequate risk premiums. Without proactive interest rate spreads to reflect risk accurately, the only reaction to trouble was to stop lending altogether, which made the 1997/98 crisis so much worse than it should have been, especially with regard to that credit

crunch's violent force of contagion across the planet. From then on banks favored securing their loans with adequate collateral, offering their counterparties interest rate differentials in inverse relation to collateral requirements in the hope that good borrowers would thereby reveal themselves as such by choosing to offer more collateral in return for lower interest rates; that is, these borrowers would act on the assumption of lower probability of default. This is how the volume of securities financing transactions known as "repos" (for RPs or repurchasing agreements) grew at home and in the IIBM, adding a second pillar to the evolving shadow banking system in support of its money markets. Repos provided the oil in the engine of the global banking network and also funded the extraordinary growth of nonbank financial institutions, thus boosting shadow banking, notably money market funds, hedge funds, and finance companies. But repos took a huge hit in the global credit crunch of 2008 from which they have yet to recover.[13]

Pillar 3—Securitization

We have already extensively discussed the securitization machine, which emerged in the 1990s to launch America's globally financed housing bubble during the 2000s and then triggered the systemic crisis of 2007/08. Its origins were sponsored by the US government. Already in the late 1970s Fannie Mae and Freddie Mac attempted to launch MBS as a means to create a secondary market for home mortgages that would otherwise take 20 to 30 years to pay off. This maturity was far too long for banks to sustain a lending level commensurate with the American Dream of home ownership as social policy goal. In 1988 two developments tied to the resolution of the LDC debt crisis (1982–87) gave securitization a huge boost. The first was the introduction of the so-called Brady bonds (after former US Treasury Secretary Nicholas Brady) to fund loan for bond swaps whereby US-backed bonds replaced LDC loans at a discount, which marked the debt write-down as loss. The success of the Brady bonds paved the way for widely traded sovereign

Eurobonds, which have given emerging market economies far better access to the world's capital markets ever since. The second boost came from the 1988 Basel Accord. It imposed a risk-weighted capital to asset ratio, which then prompted banks to keep only riskier loans in their balance sheets, whose regulatory capital requirement was less than what the banks themselves would have set aside. The banks rid themselves of safer loans for which Basel's so-called Cooke ratio was considered too punitive. This response required more sustained loan securitization efforts and greater use of CDS to insure the riskier loans still kept on the banks' books.

In the late 1990s banks began to challenge the market monopoly of Fannie and Freddie, which they had a much better chance to do when those government-sponsored lenders got caught in a serious accounting scandal in the early 2000s. That opening gave US banks a shot at taking control over issuing MBS, whose rapid volume expansion they facilitated with further innovations such as nontraditional mortgages to securitize, additional securitization layers with the help of CDOs, the structured finance invention of slicing and dicing those MBS and CDO into tranches, the use of CDS in synthetic finance arrangements to boost the volume of CDO issues, and the funding of CDO purchases in the money markets through the issue of ABCP.

Pillar 4—OTC Derivatives

The fourth pillar of the SBS comprises over-the-counter derivatives like swaps and credit derivatives. Unlike the standardized futures and options contracts traded in public exchanges, these OTC derivatives are uniquely tailored to individual portfolio adjustment needs, and thus they are a prime example of customization enhancing innovation. Interest rate swaps, in particular, have become immensely popular for transferring price risk associated with fluctuations in variable rates to which one can be exposed either as debtor or creditor. The inventiveness of the SBS has been especially impressive in the multiple uses of CDS as insurance products, signaling devices of market sentiment,

carriers of synthetic finance arrangements, and tools for speculation on the direction of portfolios one does not own. Generally speaking, OTC derivatives have been widely used in support of the other SBS pillars to transfer risks; at the same time, they also spread potential contagion by intensifying the interconnectedness of that system's different networks.

Given the constantly adjusting nature of the SBS in the wake of growth propelling innovation, coupled with its special affinity for pursuit of scope and network economies, it is no surprise that its four pillars got tied together into a web.[14] At its core we have the world's money markets where banks, nonbank financial institutions, and now increasingly even corporations can access relatively cheap funds on short notice. A crucial money market instrument, a short-term bond known as commercial paper, has always enjoyed backup support of banks by means of lines of credit that could be drawn on whenever needed to keep the market for such paper liquid and stable. Not only has commercial paper served as the main access channel for corporations to tap wholesale funds available in the money markets, but it has also become a potent instrument to extend securitization beyond capital markets to money markets by means of ABCP which bundle together a large variety of loans (credit cards, car loans, and so forth). And so we got what economist Perry Mehrling described as "money market funding of capital market lending" on a higher scale. What we have seen is the fusion of money markets on the liability side and the securitization machine on the asset side of various shadow banking intermediaries' balance sheets. And then we got the repos tied to money markets as an intermediation chain extension while financial derivatives of different sorts have been deployed across the entire architecture of shadow banking either for hedging purposes of the actors involved or as speculative device to attract new players into the various networks.

A highly regarded research team at the Federal Reserve Bank of New York (FRBNY) has studied the flow of funds matrices of the shadow banking system in the United States and its international extensions to give us a sense of its complex architecture.[15]

That complexity is reinforced by the propensity of the SBS to break down intermediation and risk transfer activities into separate steps linked together by means of intermediation chains. Any interruption in one chain link threatens to set off ripple effect ruptures along the chain, and these can spread to other nodes in the network. To the extent that such ruptures spread to other networks connected to the one initiating the disruption, they run the risk of triggering a systemic crisis. When studying such disruption scenarios, we need to go beyond the FRBNY's focus on flows. We need to keep in mind that stocks count too! SBS entities tend to be very thinly capitalized, which makes them vulnerable to sharp declines in asset value in the wake of market crashes because they also have more sluggish liability structures that cannot be reduced easily to match what is happening on the left side of the balance sheet. All this—the chains, the interconnectedness within and between networks, downwardly rigid liability structures in the face of volatile asset valuations that fluctuate procyclically—renders the SBS a source of multiple systemic risks.

The Fragility of Financial Networks

The interconnectedness of shadow banking networks makes any financial instability shock within the SBS prone to contagion (and hence a source of *systemic* risk) but does not explain what might cause such a shock in the first place. For this we go once again back to the origins of the 2007–09 crisis to draw a crucial lesson about the fragility of the SBS network structures in the face of stress. Several of the SBS networks simply disintegrated, and we have to ask why that happened. The disintegration had to do with how these networks were organized in contrast to markets set up as a public exchange. Public exchanges have much information about trades and about price formation from a multitude of bids and offers; the exchange itself acts as clearinghouse in settling transactions among market participants and has specialists assigned to maintain stable conditions in specific corners of the market. The OTC market networks had none of

those stabilizing features because they privatized information, made prices a bilateral phenomenon kept concealed from others, had no third party to intervene in cases of trouble, and put no one in charge of stabilizing excessively volatile markets. Under these conditions OTC markets depended on trust and confidence. And when those were undermined, trading stopped suddenly because nobody could figure out correct prices anymore. This striking indication of fragility under stress is a troubling characteristic worthy of further exploration since it emerged during the crisis of 2007–09 as the most important source of systemic risk.[16]

Much of the activity in shadow banking concerns funding agreements between two actors. In such bilateral engagements the two sides involved need to know quite a bit about each other to determine viable terms that seal the deal. Otherwise neither side would be able to figure out how much to trust the other. And trust is a quintessential prerequisite for any such deal to happen. Actually trust *and* confidence at the same time: trust in the partner's willingness and ability to carry out his or her side of the deal and confidence that the general conditions underlying the agreement are very likely to play out as anticipated so that the execution of the deal will not be jeopardized by unexpected disturbances from the outside. Yet, we have to accept that we will never know as much about the other side as that actor does about himself or herself, and so we cannot be sure that we know enough. Economists, especially the seminal works of Nobel Prize winners George Akerlof, Michael Spence, and Joseph Stiglitz, have addressed this problem of information asymmetry in terms of adverse selection and moral hazard.[17] Regarding adverse selection, the underinformed side does not know whether the other party is motivated by conditions that are more likely to add to risk (e.g., a relatively sick person seeking health insurance, a financially troubled debtor needing a loan desperately). And regarding moral hazard the underinformed side does not know in advance how the other party will behave once the deal is concluded. These informational problems pose a risk unique to network finance, namely, *counterparty risk,* the risk that the other

party to the deal will not keep to the agreement as prescribed. Even though there are methods to overcome these information asymmetries, such as Spence's signaling or Stiglitz's screening, there will always be counterparty risk to the extent that people do not ever know enough about the other party or about all relevant circumstances that can affect the outcome of their deal.

Shadow banking is designed to give rise to information asymmetry to the extent that its networks are run by insiders who possess more information than others. The financial institutions building SBS networks make sure that the information needed for transactions and access to it are both restricted. The parties controlling the creation, distribution, and interpretation of market-making information have a decisive edge over all other participants with less information. And the former can use that advantage to exact monopoly rents more effectively. For instance, spreads between bids and offers are larger in shadow banking networks than in public exchanges precisely because in the former that information is not publicly available. The problem is that such privatization of crucial information about trading runs counter to the effective and smooth operation of markets.

Imperfect information is the major reason why the SBS networks proved so fragile in the crisis of 2007/08. When unexpected circumstances arose to undermine trust in the counterparty and/or erode the confidence that the deal can be carried out as planned, the networks simply disintegrated when deal making stopped. Those unexpected circumstances typically revealed a missing or erroneous piece of information so that the uninformed party simply pulled back out of fear. In that context, social network theory offers us the useful concept of *incomplete networks* in which missing data (known as missing edges) undermine the proper functioning of such networks and trigger disruptions possibly to the point of dissolution.[18] Linking those missing edges to the problems of adverse selection and moral hazard typically found in credit relations, we can interpret missing data as information we should have had a chance to consider properly in order to make reasonably informed decisions and

realistically balanced risk-return evaluations underlying such decisions. What may be missing here is not so much the information itself, but our ability to process it correctly. That is one more reason why the fluctuating nature of financial activity is problematic inasmuch as it also creates a procyclical mind-set among decision makers. During euphoric booms we have cognitive filters that downplay potential risks, and the opposite happens during downturns when fear prevents us from seeing any good reason to calm down. We overreact with greater panic the more we have been excessively optimistic beforehand.

It was precisely this sequence of euphoria and panic that shook the SBS networks to their core. In the boom years preceding the crisis we saw widespread underestimation of risks. This bias invited excesses in behavior, which would eventually become unsustainable and create a counterreaction when a moment of unexpected instability signaled the degree to which one's optimism had erred. What was totally surprising, however, was the fact that such mood swings would go so far as to disintegrate the networks of shadow banking altogether. Securitization stopped more or less from one day to the next. ABCP went from the hottest new money market channel to pariah status in a hurry. And more or less automatically renewed repos were suddenly turned off. In hindsight we can see why so-called OTC markets proved far more vulnerable than public exchange markets.

This systemic vulnerability of OTC market networks was in large part due to the absence of a public backstop in the SBS. Shadow banks enjoyed neither deposit insurance coverage by the FDIC (Federal Deposit Insurance Corporation) nor direct access to the Fed's facilities as lender of last resort. This made shadow banks inherently riskier than protected traditional banking. To compensate for the absence of government protection shadow banking entities created their own *private assurance mechanisms* (PAMs) to reassure counterparties and other actors involved that the engagements made would be carried out. As long as these private alternatives worked, they made everybody believe that the paper floating around in the shadows was as good as cash. But when they stopped working, their apparent inadequacies created a

violent counterreaction. And these PAMs did stop working properly under conditions of stress, precisely because they were not adequate to begin with. Being private, these various protection devices proved too limited in scope, were subject to unmanageable conflicts of interest, or had not been sufficiently funded to make good on their promises. Their failure to perform when it really counted proved decisive for the disastrous lack of resilience among the various OTC market networks of the shadow banking system.

The Failure of Private Assurance Mechanisms

In the early 2000s shadow banking reached into millions of American households and turned home ownership into the equivalent of an automated-teller machine from which homeowners could draw cash when they needed it. By securitizing home mortgages, bankers were able to accelerate turnover of their mortgages and speed up lending while at the same time attracting investors from all over the world. This combination fueled debt-financed home purchases, and that spike in demand pushed up housing prices. This development in turn permitted homeowners to refinance their mortgages with higher principal or take out an additional home equity loan to be spent wherever the borrower wanted. Such debt-financed excess spending from the capital gains of a housing boom turned Americans into the world's buyers of the last resort absorbing the export-led growth of Europe and of many emerging market economies. Mortgage securitization, of which there was much extension by innovation, was funded by the world's money markets as they incorporated ABCP whose issue funded purchases of MBS and CDOs by an army of special purpose vehicles the banks had set up to move the whole operation off their books. The money markets, supported by money market funds, were in turn made more liquid and better distributed by repos, which turned securities into the equivalent of cash and distributed funds according to need. Those repos basically augmented the aggregate funding capacity of the world's money markets to give a large variety of financial institutions access to additional cash whenever needed.

The question is how such a huge funding machine could emerge beyond the reach of regulators and end up operating in the shadows at such a vast scale. As the amazingly complex SBS maps of Zoltan Pozsar and colleagues at the Federal Reserve Bank of New York illustrated, there may have been at least a dozen links in an uninterrupted intermediation chain from beginning to end—from, say, a saver putting money into a money market fund to a mortgage broker using the proceeds of securitization for a loan to a prospective homeowner. While no one understood all those interconnections of the chain until their ruptures in the 2007–09 crisis made them violently obvious, there were special arrangements put into place at neuralgic points along the length of the chain to make the intertwined intermediation steps safer.

In the absence of explicit and direct public support by the monetary authorities such as exists in traditional banking with the Fed's discount window or the FDIC's deposit insurance, shadow banks had no choice but to introduce various private assurance mechanisms (PAMs) as substitutes for the public protection they did not have. Each of those PAMs worked for a while as long as the public believed in their effectiveness. With those PAMs in place the generally positive mood turned into a presumption of certain success, a systematic underestimation of risk as a result of which investors came to regard the supposedly liquid and safe instrument (e.g., ABCP, CDO) "as good as cash." But when the housing bubble burst, none of the PAMs survived intact. And it was the PAMs' collective failure that was the most important reason for this crisis to become systemic on a global scale.

Conflicted Rating Agencies

If we examine chronologically the different layers of global finance shredded to bits by the subprime bullet, we can see how each layer was broken apart by a malfunctioning private backstop buckling under the stress of a bursting bubble. For example, at the very onset of the crisis in mid-2007 Moody's and

Standard & Poor's downgraded many of the MBS and CDO they had at first rated AAA. Ironically, this attempt to correct an earlier error proved fatefully procyclical, triggering much concern among investors whose pullback brought new issues to a standstill and caused the value of old issues to collapse.[19] In retrospect it is perhaps not too surprising that rating agencies, a PAM par excellence, failed to perform adequately. How can analysts evaluate default risk of a security objectively when its issuer is the client paying them for their rating? In the case of the securitization machine that conflict of interest went as far as having the rating agencies actually participate in the construction of those MBS or CDO to assure an AAA rating for their super senior and/or senior tranches. When the first wave of subprimes came up for interest rate resets after a two-year grace period, it triggered a nearly 10 percent default by mid-2007 among borrowers no longer able to service their suddenly much more expensive mortgages. Shocked rating agencies began to worry that even some senior tranches might end up with losses, and so they started a wave of downgrades. Since investors could not know with any precision what the MBS or CDO contained in terms of bad loans, they saw the rating reversals as proof that not even the creators of these complex securities had a clue about what was going on.

Defunct Monolines

Various credit enhancements, such as additional collateral, a letter of credit, or monoline insurance, had been put in place to assure investors of the issuer's creditworthiness. Well intended, those buffers were no match for the widespread panic ensuing in response to the downgrades. Especially spectacular was the disintegration of monolines, bond insurers promising to cover MBS and CDO fully in case of disruptions in debt servicing; in effect the insurers had lent their AAA ratings to the insured product. When the prospect of having to pay out large sums for troubled securities got the monolines themselves downgraded, they lost their raison d'être and more or less disappeared. The

two largest US monolines suffered significant payout losses from their huge exposure (AMBAC's was $29.2 billion, MBIA's $17.3 billion) and saw their share prices fall by more than 98 percent to penny stock price levels before recovering a bit.[20]

AIG as Unfunded CDS Insurer

As many of the CDOs in the bubble's later stages were boosted by CDS, their crisis spilled rapidly over to the credit derivatives. In so-called synthetic finance arrangements original CDOs came to be supplemented by synthetic CDOs whose creation involved using naked CDS to generate additional income flows from the CDS premiums in lieu of pass-through interest payments (see ch. 1). This arrangement could take off because American Insurance Group (AIG), the world's largest insurance company, was willing to issue CDS insuring tens of billions of dollars worth of CDOs without setting aside any funds or buying reinsurance to hedge against that risk. As the subprime crisis accelerated during the first half of 2008, it became clear that AIG would be hit hard, and it was downgraded. That sparked a liquidity crisis for AIG, which led the Federal Reserve to bail out the insurer by means of a secured credit facility in the amount of $85 billion (in return for a majority stake in the company) out of fear that an AIG default on any of its insured products would cause a catastrophic collapse of the CDS market and leave large institutions on the other side of the CDS transactions (e.g., Merrill Lynch, Goldman Sachs) with huge losses from which they would never recover.

SPEs as Dependents

Special purpose entities (SPEs) used by banks for securitization were another PAM destroyed by the subprime crisis. SPEs are legal entities pursuing a narrowly defined activity or objective (e.g., asset transfer); typically, companies set up SPEs in offshore financial centers (e.g., Bahamas) as orphan companies run by appointed trustees. SPEs first became important for banks when the latter were looking for ways to escape the new capital

requirements of Basel I (1988) by moving assets off their balance sheets. But their use exploded when loan securitization took off in the early 2000s to fuel a real estate bubble in the United States. Banks could only transform loans into securities by transferring the latter to legally separate SPEs, and then, with structured finance, they even had to rid themselves of the underlying pool of loans to assure holders of senior tranches priority access to payments from those loans in the pool. After 2004 banks set up a new type of SPE known as structured investment vehicle (SIV). SIVs acted as a credit spread lender issuing short-term ABCP to finance investments in longer-term securitizations, such as the senior tranches of CDOs. Between 2004 and the onset of the 2007 crisis SIV assets tripled to $400 billion. But the August 9 decision by BNP Paribas to stop two funds heavily involved in US-based MBS and CDOs because of valuation problems triggered a panic among the usual buyers of the SIV's ABCP. They feared that those vehicles might suffer steep losses from their securitized assets. This made it much more difficult for SIVs to refinance their maturing debt, obliging them to sell off assets into declining markets so that losses mounted rapidly. Those losses became catastrophic when the markets for even the better senior tranches of MBS had fallen by more than half and then basically froze in the absence of realistic prices.

At that point the banks basically had to come to terms with a profound contradiction, which this disaster had laid bare so starkly. On the one hand, they had set up securitization as a part of shadow banking to escape regulatory constraints and had used various SPEs for that purpose, which they then pretended to have nothing to do with. On the other hand, they had continued to support their SPEs with lines of credit and other funding sources, especially the somewhat more transparent SIVs whose modus operandi necessitated top ratings. To obtain and maintain triple-A ratings, the SIVs had to show adequate liquidity cushions with the support of their sponsoring banks. Whereas the other SPEs could appear as though truly separated from their sponsors and so pretend credibly to be orphans, no such illusion was possible with the SIVs. When those got hit by

the ABCP panic in August 2007, their sponsors faced very large reputational and legal risks. The most important SIV sponsor, Citibank, buckled under that pressure and declared in December 2007 that it would take all three of its SIVs back onto its books and so essentially make good on their losses. This obliged other banks to follow suit, triggering in February 2008 the spectacular failure of British housing lender Northern Rock amid a classic bank run following heavy SIV-related losses.[21]

Run on Repos

A second major panic shaping the crisis of 2007/08 concerned repos, the collateralized short-term loans that had doubled during the housing bubble of the 2000s to a total of $12 trillion by August 2007. Part of that growth came about through a widening of securities eligible to serve as repo collateral beyond risk-free Treasuries. By mid-2007 agency securities issued by Fannie Mae or Freddie Mac and MBS made up about half of all repo collateral, thus tying repos increasingly to the housing bubble. This link was quite direct, inasmuch as banks would use newly issued MBS as collateral in repos to fund operations. After June 2007 this housing-related collateral came under pressure with the onset of the subprime crisis. Declining values of MBS prompted investors to demand greater "haircuts," requiring an ever-growing percentage of collateral value above the loan principal. Economists Gary Gorton and Andrew Metrick have characterized this hiking of repo haircuts as the SBS' equivalent of a bank run, albeit an entirely invisible one.[22]

With the growing importance of repos as a funding mechanism to use securities for cash, a supposedly safer alternative known as tripartite repo became commonplace just before the crisis to the point of constituting two-thirds of all repo transactions by 2007. This arrangement interjected an intermediary as clearing agent into the transaction between lender and borrower. In the United States there were only two banks, JP Morgan and Bank of New York Mellon, entrusted with this role. Their insertion made repos safer and easier to conclude, and this lowering of

barriers allowed more parties to engage in repos. But a quirk in the repo processing procedure of the two custodians, involving a "daily unwind" procedure of returning the securities back to the borrower in the morning while settling the cash transaction only at the end of the day, meant that repo borrowers were in effect extended eight hours of unsecured credit each day. Starting with Bear Stearns in March 2008 and even more dramatically in the case of Lehman Brothers in September 2008, their repo lenders suddenly became worried about what could happen with this unsecured credit if those investment banks were to fail during the hours of unsecured credit extension. And at one point lenders just refused those heavy repo users further credit, sealing in each case the fate of cash-strapped borrowers suddenly cut off from their lifeline. Thus, it was ironically a supposedly safer type of repo that triggered a more powerful liquidity squeeze and in consequence rendered illiquid institutions rapidly insolvent.[23]

Breaking the Buck

The final and most intense money market panic followed Lehman's collapse when Reserve Primary Fund, the nation's oldest money market fund, wrote off its $785 million investment in Lehman's short-term debt two days later. This write-off lowered Reserve Primary's share price to 97 cents after its assets had shrunk by 60 percent to $23 billion in just two days. Failing to secure credit in time to prop up the fund, Reserve Primary had no choice but to "break the buck" with disastrous results for the world's money markets. Lacking the deposit insurance afforded traditional bank deposits, US money market funds (MMFs) had made it a practice to maintain a guaranteed net asset value of $1 per share so that depositors could be sure to get the principal back plus any interest the fund would earn on their investments. This sacrosanct promise had been maintained by all MMFs for over 30 years, with the exception of a tiny fund folding in 1994, and now the oldest fund had to renege on it at a time when confidence had already been shattered by the dramatic events unfolding at breathtaking speed during the first

half of September 2008. The problem of "breaking the buck," even if it was just by three cents a share, was that any signs of panic among shareholders would inevitably trigger a suspension of redemptions because of mounting losses if and when funds were forced to sell off assets into declining markets. And this is exactly what happened!

The day after Reserve Primary broke the buck, a record $140 billion were pulled out of money market accounts. The MMFs started selling off assets en masse and hoarding cash to meet the wave of redemption requests as well as they could. Their pullback caused other money market parts to freeze up, with the volume of commercial paper falling by a huge $52.1 billion that week and repo lending drying up as well. As banks were too panicked to lend to each other or invest in any other asset amid collapsing financial markets, they too started hoarding cash. While they normally have about $2 billion on hand at any given time, during the week following the Lehman collapse, banks had amassed an unprecedented $190 billion. With money markets broken and clogged up, the entire world economy was threatened with imminent paralysis due to the inability of companies and financial institutions to secure their daily funding any longer.

Shadow Banking as a Money Creation Machine

When thinking about the SBS systemically, something the crisis of 2007–08 has made a necessity, we can see that its totality as a "web of interwoven networks" constitutes a money creation machine on top of the traditional system of credit-money. The latter had been established with Roosevelt's New Deal reforms of money and banking (e.g., Glass-Steagall Act of 1933, Banking Act of 1935). Based on fractional reserve banking, a concept already discovered by capitalism's earliest banks in Renaissance Italy, banks would gain reserves via deposits, set aside a certain fraction of those as required reserves to meet deposit withdrawal needs, and then loan out the remaining excess reserves whereby they created "new" money in the form of additional

demand deposits tied to the loan. This process carries a money creation multiplier inasmuch as the spent loan would transfer reserves to yet another bank.[24] This is an instance of what I characterized earlier as indirect finance, traditional commercial banking creating credit-money as interest-bearing (loan) capital. With its international extension of Bretton Woods that system of nationally administered credit-money worked wonders during the postwar boom of the 1950s and 1960s, allowing continuous financing of deficit spending by governments (for the welfare state), corporations (adopting mass production technologies with global reach), and households (for ambitious social consumption norms tied to homes and cars). But that system came under duress during the stagflation years of the 1970s and early 1980s. Out of that structural crisis and its resolution by financial deregulation reforms emerged a new monetary system, that of network finance, which hooked itself onto traditional commercial banking as shadow banks creating credit-money as "fictitious capital."[25]

Marx exhibited tremendous insight (in vol. 3 of *Capital*) when he introduced the distinction between financial capital as "interest-bearing capital" and as "fictitious capital" while tying both to money. Once credit-money is tied to debt, money itself would be either "interest-bearing capital" (i.e., bank loans creating new money) or "fictitious capital" (i.e., shadow banks creating liquidity). Let us set aside for the moment that money serves as fictitious capital whenever it becomes per se the object of speculation, as in currency trading or interest rate swaps. The very soul of shadow banking concerns money creation as fictitious capital for the purpose of yielding additional capital income in the form of trading profits, fees, and commissions. The bank loans created by money creation as interest-bearing capital now get securitized by an army of shadow banks in such a way that short-term asset-backed securities in the money markets fund long-term asset-backed securities in the capital markets and both types of loan securitizations get further monetized by repos set up as intermediation chains. That monetization occurs when the banks use the securitized instruments as collateral for access

to cash provided by the money markets. The components of this loan <-> securitization <-> monetization tripod are further boosted by a variety of financial derivatives enabling additional investors to provide risk protection services or speculative gains. We need to look at these four interconnected pillars of shadow banking (securitization, money markets, repos, financial derivatives) as a type of money creation, which speeds up lending by turning loans into securities and these securities into access to cash. Fractional reserve banking here takes the form of leveraging, and the money multiplier occurs through the intermediation chains set up notably with repos and rehypothecation.[26]

This money creation system of shadow banking is directly connected to the traditional money creation system of commercial banking on both ends, when it securitizes loans on one side of the ledger and then supplements bank deposits with money market instruments as "borrowed liabilities" on the other side of the ledger. Unfortunately, that complementary money creation system in shadow banking lacked the kind of access to the central bank's payments services and lender-of-last-resort facilities enjoyed by traditional banking. The SBS therefore had to make do with PAMs that turned out to be suboptimal, if not altogether fraudulent. Be that as it may, the PAMs all collapsed one after another when hit by the subprime crisis during 2007 and 2008—the triple-A ratings of MBS, the monoliners, AIG, the SIVs, the tripartite repos, and finally in most devastating fashion the MMFs. And so we had the equivalent of a huge bank run akin to the one devastating the global economy from September 1931 to March 1933. Except that this time around the central banks, led by the US Federal Reserve under the guidance of deflation specialist Ben Bernanke, had the good sense to intervene aggressively when the crisis became systemic. The Fed, when faced with the post-Lehman panic in the money markets, did not take long to insure MMF shares, to buy toxic assets from banks and other financial institutions, to pump huge amounts of reserves into the system, and to push the government of the United States to provide a taxpayer-financed bank recapitalization fund known as Troubled Asset Relief Program or TARP.

CHAPTER 6

The International Monetary System in Flux

Financialization is a truly global phenomenon; so is shadow banking. Both are vectors of global finance, which emerged in the 1960s with the double inventions of Eurocurrencies and wholesale funding in money markets. The globalization of finance, driven forward by a few hundred transnational banks combining indirect finance, market finance, and network finance under one roof, has put nearly every one of the world's 190 national economies into a new international context. Their specific insertion into the world economy is usually a two-edged sword. On the one hand, national economies of all stripes have gained far more access to the world's capital as well as to its markets. Yet, at the same time they are subject to more stringent constraints imposed by ruthless competitors and/or impatient investors. This seemingly contradictory outcome of financial globalization is crystallized in the dominance of *hot money* defined as short-term cross-border portfolio investment flows of a speculative nature, whose volume and volatility have come to trump the more traditional international activities of trade and foreign direct (long-term) investments. When looking at this phenomenon reshaping the world economy, it is as if "the tail had come to wag the dog."

Today's prominence of hot money flows forces us to rethink international economic relations. Standard theory, referred to as open economy macroeconomics, looks at cross-border transactions from the point of view of a national economy connected to the rest of the world through its balance of payments and its currency's exchange rates. From that angle the world economy is the sum of its parts (i.e., the national economies put together), current accounts determine capital flows as passive residuals, and exchange rate fluctuations restore external balance. In reality none of these conditions hold any longer. Capital accounts have come to dominate current accounts, and external disequilibria have become embedded irrespective of exchange rate behavior. The world economy has ostensibly reached a level of globalization where it has gained a supranational growth dynamic all its own to which most national economies are subjected in more or less inescapable fashion. Equally beyond the purview of standard theory is the international monetary system (IMS), an amalgam of institutional arrangements concerning acceptable forms of world money in international transactions, exchange rate regimes, and convertibility conditions, through which cross-border transactions have to pass. The prevailing IMS gives rise to asymmetries in the interactions between countries through its institutional biases, which structure hierarchical power relations while at the same time integrating different forms of capital in their respective global reach.

Finance-led capitalism requires a different approach to international economic relations, one in which the world economy has become more than the sum of its parts because financial globalization engulfs different countries and regions in asymmetric fashion. The *metaeconomic* framework, the subject of this chapter, overcomes the orthodoxy's anachronistic separation of international trade and international finance to see how those two dimensions have become integrated in the modus operandi of transnational banks whose operations span the globe. Placing the IMS at the center of this alternative approach, we can see it moving ever so slowly from a dollar-centered to a more multipolar

system. This transition is necessarily slow, as it is driven by contradictory and counterbalancing forces. Financialization's drive toward financial concentration clashes with the system's monetary fragmentation, and global finance organizes the tensions between these two forces by mobilizing centrifugal activity away from the US dollar while simultaneously also organizing centripetal pushes toward the dollar. Both forces occur simultaneously through layers of financial flows, and the key question is how to maintain the prevailing balance between the two over the credit cycle.

The Extraordinary Growth of Cross-Border Capital Flows

The postwar boom, two decades of rapid growth among many industrial nations (1948–68), occurred within a well-regulated international monetary system known as Bretton Woods. That system combined low interest rates with fixed exchange rates, an overvalued US dollar, and large-scale US capital exports—the ingredients for export-led growth by other industrial nations catching up with the United States while keeping energy cheap. That system came under pressure during the stagflation crisis of the 1970s, when the combination of accelerating inflation and slowing growth eroded the wage-productivity, creditor-debtor, and public-private balances of the social contract underpinning that boom. The demise of Bretton Woods had already been predicted by Robert Triffin a decade earlier when this Belgian-American economist noted that the US balance of payments deficits supplying the rest of the world with the dollars they needed to pay each other would ultimately lead to excess supplies of dollars bound to weaken that currency.[1] That contradiction exploded during the summer of 1971 into a run on the US dollar. On August 15 of that year President Richard Nixon decided to suspend the automatic convertibility guarantee between the US dollar and gold at the promised $35 per ounce, a guarantee that had been at the core of that system since its inception in 1945.

These speculation attacks bringing about the denouement of Bretton Woods originated in the Eurocurrency market, the global private banking network offering deposits and loans in currencies outside their respective country of issue and operating beyond the reach of national central banks.[2] Ever since its inception in 1960 that network had grown very rapidly, at an average clip of 20 percent per year, by absorbing Bretton Woods' rapid buildup of excess dollars in international circulation. Another reason for its rapid expansion beyond Bretton Woods was its irresistible competitiveness. The absence of regulatory restrictions (which are a tax-like cost) allows banks in the Euromarket to offer higher deposit rates and lower loan rates than domestic banks while still earning a bigger profit margin (i.e., spread). They could also experiment freely with new instruments (e.g., floating rate notes, emerging market bonds) and institutional structures (e.g., fusion of commercial and investment banking), thereby becoming the primary vector for the transformation of financial capital we have witnessed over the past three decades. It was this engine of global finance, which obliged the United States to give up on fixed exchange rates in March 1973, remove capital controls in January 1974, and deregulate interest rates in October 1979.

Since then the Euromarket, representing a central platform for global finance circulating stateless currencies, has relentlessly fed short-term cross-border movements of capital known as hot money. We know from precrisis data published by the Peterson Institute for International Economics that, whereas nominal world GDP increased fourfold from 1980 to 2006, (bilateral) trade flows expanded more than sixfold, and the stock of foreign direct investment (FDI) grew by about 20 times during that period. Yet, according to data collected by the Institute for International Finance, the volume of cross-border portfolio investment flows (loans, securities) has grown thirtyfold since 1980.[3] The "International Financial Statistics" of the International Monetary Fund (IMF) measure both foreign inflows as well as domestic outflows of all its member countries. Taking the average of the two as a gross measure of global

capital flows, we can see that such flows (a measure of total direct investment and portfolio investment flows in both directions) rose from about 1.5 percent of worldwide GDP in 1970 to 4 percent in 1980 and 6 percent in 1990 before exploding to 19 percent just before the global crisis in 2007.

It needs to be noted that the official IMF figures actually underestimate total gross flows across borders. To begin with, they exclude transactions involving financial derivatives, and those have become huge in recent years as finance became increasingly about the transfer of risks and not just of funds. Another problem is that many short-term transactions between international financial institutions (e.g., interbank market) are cleared by netting daily offsetting transactions for which we therefore only get the net figures reported rather than the gross figures.[4] It is as if the hottest of the hot money thus goes largely unmeasured. And then there are the vast unreported capital flows motivated by money laundering or tax evasion, which are purposely hidden. Further pointing to the growing disassociation of capital accounts from current accounts, there is yet another factor causing capital flows to be systematically underreported. As the rapidly evolving globalization of production has driven multinational firms to transform themselves into global production networks whose standardized and globally marketed products contain semifinished parts and components from many different places, intrafirm trade between the parent company and its foreign subsidiaries (or among those) has exploded in volume to make up about a third of all trade today. That kind of trade does not require financial flows, since it gets compensated for by accounting debits and credits on the firm's books.

Be that as it may, we have sufficient indicators of steadily expanding cross-border capital flows since the end of Bretton Woods in the early 1970s and then a veritable explosion of such activity from the mid-1990s on. Perhaps the most telling aggregate measure of such flows comes from central bank surveys of the foreign exchange market (FOREX), especially those of the Bank of England and the Fed focusing on London (40 percent) and New York (20 percent) as the world's two largest currency

trading centers, as well as the triannual surveys of the Bank for International Settlements. Their extrapolated data shows the daily average global currency trading volume to have risen at a phenomenal pace from about $100 billion in 1973 to $500 billion in 1988, $1.7 trillion in 1998, $3.2 trillion in 2007, and finally $5.5 trillion in 2015. True, much of that sum exists only as electronic promises that may cancel each other out and hence never come fully to fruition as actual cash flows. It is after all a gross figure, which gets netted out daily among the leading banks running the world's interbank market. And many of the underlying currency contracts—forwards, futures, options—involve very high leverage, which keeps the amounts paid out of one's own pockets to a minimum. That huge gross volume of daily FOREX trading, amounting to more than a quarter of America's annual gross domestic product per average day, is thus backed by only a small fraction of real cash. But even $200 billion in actual cash payments would represent a very significant sum at risk in the nerve center of our world economy.

All this is obviously an indication of finance's progressive globalization. In the 1970s, a decade during which much of the developed world abolished capital and exchange controls that had kept most investment activity within closed borders, the new Euromarket network funneled the oil producers' huge surplus to oil-importing nations following two major oil price hikes in October 1973 and March 1979. This petrodollar recycling took the form of Euromarket loans, mostly at variable rates and denominated in US dollars. In the 1980s US mutual and pension funds started diversifying their portfolios geographically, thereby finding the means and motivation to enter, even invade, foreign securities markets. Cross-border flows of financial capital thus began to move gradually from loans to securities, a development further reinforced by fast-paced innovation within the Euromarket (e.g., floating rate notes, sovereign bonds), growing interconnectedness between hitherto national debt and equity markets, and the facilitation of speculative activity with the spread of financial derivatives (e.g., currency futures). As developing countries opened up from the late 1980s on to turn

into so-called emerging markets, they became the focus of attention of global investors seeking higher returns available there. In turn, those fast-growing economies sought to access global capital more aggressively, often borrowing more cheaply abroad to fund higher-yielding activity at home.

All these developments may explain why cross-border capital flows grew at a faster pace than other international activities and reached 6 percent of worldwide GDP by 1990. But they do not explain the explosion in growth of those flows after 1990 (to 19 percent by 2007). That extraordinary increase requires a different explanation, one that puts the dominance of capital accounts at its center. One reason why so much capital flows nowadays freely across borders, apart from the removal of regulatory barriers that once had made national borders a real impediment, is the revolution in communication and information technologies. Turning payment systems and trading platforms into electronic communication networks has greatly facilitated transfers of funds and dissemination of information at the heart of financial markets. Notably, the Internet has had a huge impact on banking and the stock market, as cyberspace engulfs our planet to move electronic signals at lightning speed. An even more powerful boost to the superfast growth of financial transactions between countries after 1990 came from the spread of new instruments, in particular customized risk transfer contracts, such as currency swaps, that basically internationalized the credit system by allowing borrowers from one corner of the world to tap funds from anywhere else on the planet.

While these facilitators of truly globalized capital flows have all been put into place over the past quarter of a century to do their propagating work, we should also note that the crisis of 2007–09, global as it was, triggered a very sharp reversal of such cross-border flows that took years to play out.[5] A confluence of factors, notably capital flight by panic-stricken investors suddenly overwhelmed by a home bias and massive deleveraging of overextended borrowers no longer able to access funds globally, may explain to some degree why cross-border capital flows fell by 25 to 40 percent in each of the three years following the crisis

in July 2007 in most direct and portfolio investment categories. But the depth of this flow reversal and its persistence, so much more pronounced than in previous downturns, indicates that something more is going on. It points to a highly procyclical global growth dynamic driven by liberated capital accounts that have grown across much of the world after 1990 thanks to financialization. Before tracing the main engines of this new growth pattern, however, we need to take account of the fact that these financial capital flows get mobilized in the international monetary system. This institutional construct determines which forms of world money are acceptable, how exchange rates should be managed, what kind of international payment system is used to move funds from one country to another, and how payment obligations between different countries are settled. Whatever IMS is in place at the time, it will have built-in asymmetries in the relations between countries, asymmetries that inevitably shape the emerging global growth dynamic mentioned above. So we first have to take a closer look at the current IMS and its built-in asymmetries.

The Kingston "System"

In January 1976 the member nations of the IMF came together in Kingston (Jamaica) to make the necessary amendments to the fund's Articles of Agreement, which reflected fundamental changes in the international monetary system following the collapse of Bretton Woods in 1971. Years of discussions preceding that meeting had failed to yield more ambitious reforms aimed at a new exchange rate system for adjustable pegs, limits on international liquidity creation, and promotion of the IMF's special drawing rights (SDRs) as an alternative means of settling international payment obligations. The United States had blocked any of the more ambitious plans pushed by France and other industrial nations. The compromise agreed to in Kingston basically ratified existing features of the international monetary system, as the United States had insisted on. Countries could adopt any exchange rate regime they wished, provided they abstained

from manipulating their currency to prevent needed adjustments in their external balance or to give their domestic producers an unfair competitive advantage. Gold was demonetized to remove its role from the international monetary system. And SDRs were upgraded, but not enough to overcome their marginal status as an incomplete money form subject to stringent limitations on their issue.[6]

The Kingston agreement enshrined the continued dominance of the US dollar as world money, the national currency most widely used as international medium of exchange in cross-border transactions or held by central banks as reserve asset. It is not difficult to understand why successive US administrations from Nixon on have sought to forestall reforms that would undermine the global dominance of their currency. That role of the dollar as world-money offers its issuer, the United States, a huge advantage, one we may refer to as global seigniorage, by freeing its domestic economy from any external constraint. Other countries have to earn dollars to settle their international payment obligations and service their foreign debt. Hence, they cannot run up excessively large balance of payments deficits. The United States, on the other hand, can simply print dollars and so does not have to earn them. It can run indefinite balance of payments deficits, as long as the rest of the world is willing to absorb the requisite dollar outflows—something they are collectively inclined to do since the dollar serves as international medium of exchange. It is obviously an enormous advantage to be able to borrow from the rest of the world in one's own currency and so have one's deficits automatically covered when the central banks of surplus countries build up dollar reserves that they reinvest in Treasury securities for a modest gain. Anyone holding or using dollars abroad in effect finances US deficits. Whenever any of America's foreign debt comes due, US monetary authorities simply replace the maturing debt with a new pile of Treasuries. Over the last three decades the US has taken on about $5 trillion (net) in debt owed to foreigners, and Americans have barely felt its effects or taken note of its revolving nature.

America's "exorbitant privilege," to use a phrase coined first by French finance minister Valéry Giscard d'Estaing in the late 1960s, is related to yet another asymmetry of the global dollar standard, this one having to do with US monetary policy.[7] Facing the dual role of the dollar as America's national currency and the world's primary reserve asset, the Fed typically focuses on the former and rarely, if ever, on the latter. As a matter of fact, the US monetary authorities leave questions of exchange rate levels and international payment obligations to others in order to focus solely on domestic policy objectives. At the same time, whatever the Fed does has direct consequences for the rest of the world and often has considerable impact there. The global effects of US monetary policy operate through a variety of transmission channels, whether they concern the spread of inflationary versus deflationary pressures emanating from the US economy, shifts in credit conditions (to the extent that Euromarket interest rates are tied to US interest rates), or redistributive effects from changes in the terms of trade that arise in the wake of a rising or falling dollar. When looking at all the major crises since the collapse of Bretton Woods in 1971, notably the two oil price shocks of 1973 and 1979, the freeze of the Euromarket in 1974, the LDC debt crisis of 1982–87, or the Asian crisis of 1997/8, we can see that each of them was preceded by a procyclical US monetary policy shift that reverberated through the world economy to hit whatever constellation of vulnerability it was prone to unsettle at the time.[8]

The unrivaled deficit funding capacity of the United States has made it a special debtor nation, with its external and budget deficits absorbing typically between two thirds and three quarters of the world's aggregate balance of payments surpluses. That asymmetry has made it tougher for other deficit countries to finance their borrowing needs, notwithstanding the rapid growth of the new global sovereign bond market in the past quarter of a century. While clearly improving access to global capital markets, these sovereign bonds are denominated in dollars, and these dollars have to be earned continuously to service foreign debt. And the Kingston system puts all the pressure to

restore external balance on deficit countries. This is a crucially important problem to the extent that a balanced global growth pattern requires symmetric adjustments between deficit and surplus countries, a point already stressed by Keynes in the early 1940s when he was working on his radical Bancor plan for a new international monetary system that was shot down at the Bretton Woods conference in July 1944.[9] One privileged debtor might crowd out other, more marginal debtors that then face even more pressure to undertake needed adjustments.

Monetary Fragmentation

Before addressing the complex question of adjustment, we need to take a closer look at another important feature of the Kingston system. The dollar's share of the world market has been declining gradually ever since the collapse of Bretton Woods. However, that decline can be characterized as uneven for two reasons. For one, it has been anything but even-paced. There were periods, such as in the first half of the 1980s or in the late 1990s, when the dollar's international position rebounded to a point where US authorities began to worry that its renewed strength might cause it to appreciate it too much and so risk undermining the competitiveness of US industries by making their products more expensive for buyers abroad. Moreover, the extent of the dollar's erosion varies a great deal depending on which world-money function we look at. On the international level the three traditional functions of money—medium of exchange, unit of account, and store of value—duplicate in terms of public and private uses. We therefore have in reality a 3 x 2 matrix of different world-money roles of which we would ultimately have to take a weighted average, to be exact. For instance, world-money's role as store of value renders it a favored financial asset for foreign exchange reserves (public use) or for denominating financial transactions (private use). When looking at its role as unit of account, the international role of money manifests itself as favored denomination for global commodities (public use) or for getting trade invoiced in general (private use). In its role

as medium of exchange world-money serves as anchor currency (public use) or as vehicle for foreign exchange transactions (private use).[10]

When looking at the available data, we can see the US dollar still absorbing in 2013 about 62 percent of the world's official foreign exchange reserves and representing one of two sides in 87 percent (out of 200 percent) of currency trades. Over 80 percent of all global commodities are still traded in US dollars, and the greenback is also the denomination of choice in 43 percent of world trade even though there are many other currencies making rapid inroads. When it comes to the Euromarket, the dollar has a 40 percent share of all cross-border deposits or loans whereas only about 30 percent of the international bond market is denominated in US dollars. All functions considered, it is fair to conclude that the US dollar serves as world-money for about half of all international transactions, compared to about 95 percent only 40 years ago.

This raises the question of what other currencies have gained greater use as world-money in the global economy. The most obvious candidate is the euro, the single currency used in 19 of the 28 nations comprising the European Union. Its origins date back to an early decision following the collapse of Bretton Woods of having continental Europe's major currencies float against the dollar together. Had the Europeans not undertaken this commitment, as crystallized first in the D-mark zone or "Snake" (1972–79) and then even more ambitiously with the European Monetary System (EMS, 1979–92), they would have faced a German mark appreciating much more rapidly than other European currencies to the point of undermining their project of economic integration. Instead, they managed to parlay their successful EMS into the euro project when their common market initiative (Single European Act of 1987) paved the way for a monetary union (Maastricht Treaty of 1992) introducing a three-phase transition to a single currency within a decade. Ever since its full implementation in 2002, the euro has had more of an international role than the currencies it replaced had together (e.g., Deutsche mark, French franc, Dutch guilder). But, as with

the Japanese yen in the 1990s, the euro's international progress has been halted by a long-standing crisis that broke out in late 2009.[11] Twenty-two percent of the world's official foreign exchange reserves are currently denominated in euro, down from 28 percent in 2010. The euro figures in 32 percent of all foreign exchange transactions (out of 200), down from 39 percent in 2009. The impact of the euro crisis on the EU's single currency has been less pronounced when it comes to the international bond market where the euro is holding on to its market share of 30 percent and is running neck and neck with the US dollar. Similarly, its 20 percent share of cross-border deposits or loans has remained quite stable throughout the euro crisis of 2009–12, even though those shares are only half of those of the US dollar. All those share figures considered, it is fair to conclude that the euro constitutes today about a quarter of the world economy.

While the euro's rise to the status of key challenger of the dollar has been slowed, if not altogether halted, in the aftermath of its systemic crisis that persists to date, there are many other currencies gaining a modicum of global recognition. Three safe-haven currencies have formed the third layer of the world-money pyramid since the 1970s—the British pound (the world's absolute leader in the nineteenth century), the Japanese yen (now hampered by Japan's generational deflation crisis), and the Swiss franc (shooting consistently above the weight of Switzerland thanks to the global wealth management dominance of its banks). Here, the pound is the most resilient thanks to its legendary history and the undisputed status of London as the world's leading financial center.

Since 2009 we have seen a host of other currencies become for the first time in their existence the object of sustained interest in the international investor community. We may refer to those as *resource currencies*, because the primary reason for their sudden global presence is that their issuing countries are strategic resource suppliers benefiting from a decade-long commodity boom tied to the rapid growth of the emerging market economies. This is certainly true, among others, for the Canadian

dollar, the Australian dollar, the New Zealand dollar, the Russian rouble, the South African rand, the Brazilian real, and the Saudi Arabian riyal. It helps if those countries of issue also offer high real interest rates, as is the case with Brazil. Other currencies are gaining international recognition because they are issued by countries with great potential to become manufacturing powers or large new middle-class markets for Western consumer goods. This would certainly be the case for the Korean won, the Malaysian ringgit, the Indonesian rupiah, the Indian rupee, or the Mexican peso. Much of the push to internationalize all these resource currencies comes from the so-called carry trade whereby investors borrow in low interest currencies (e.g., US dollar, yen) to invest those funds in higher interest currencies (e.g., real). A corollary of that consists of local financial institutions in those emerging market economies borrowing in key currencies (at lower interest rates) to finance domestic assets (at higher interest rates). Still, none of these currencies has yet a world-money market share in excess of 2 percent.

And then there is China's yuan, also referred to as renmimbi ("people's money" in Mandarin). In the transition from communism to capitalism Chinese leaders kept their currency for the longest time from becoming freely convertible. They imposed tight capital controls to sustain a highly regulated and fund-based (as opposed to profit-based) banking system that is tied to state-owned enterprises whose operations the leading four state-controlled banks financed upon demand. Tight capital controls were also crucial for China's decade-long strategy of keeping its currency pegged to the dollar at a deliberately undervalued level to boost its export-led growth strategy. Since 2008, in the aftermath of a global crisis emanating from the United States, the Chinese leadership has accelerated initiatives to make its currency less dependent on the US dollar. After having used Hong Kong as springboard for the first steps toward internationalization of the yuan in the early 2000s, Chinese authorities have dramatically pushed further in that direction in the past five years. They have greatly facilitated the use of the yuan in trade to the point where today 22 percent of China's exports and

imports are settled in yuan. It is now already the second most widely used currency in trade finance, after the US dollar. In pursuit of this objective the People's Bank of China has entered into bilateral swap agreements with 25 other central banks totaling more than ¥3.1 trillion (= $500 billion). Debt financing is another area of expansion, with issuance of so-called dim sum bonds quintupling since 2010 to an annual volume of $40 billion. Leading financial centers, notably London and Singapore, have vied aggressively for renmimbi business by letting Chinese banks set up shop as clearing banks in the hope of thereby becoming dominant offshore renmimbi banking centers.

The yuan may soon even gain status as reserve currency, with various governments (e.g., Venezuela, Brazil, Nigeria) recently augmenting the share of their reserves denominated in yuan.[12] And China has set up three new multilateral lending institutions (BRICS Development Bank, Asian Infrastructure Investment Bank, Silk Road Fund) whose loans will finance large-scale infrastructure investments benefiting the country's leading firms. While further internationalization of the yuan will in the end depend on China's willingness to liberalize its capital account, a process necessitating far-reaching reforms of its heavily regulated banks and state enterprises that are difficult to carry out, this currency is bound to catch up with China's already powerful global position as a trading nation and exporter of capital. Even though the renmimbi still only has a 2 percent market share in spot transactions, it has already become the seventh most traded currency in the world. In the not-so long run, say, over the next couple of decades, the yuan may well emerge as the most serious challenger to the dollar's still-dominant world-money status.

We are now facing the prospect of having a number of internationally recognized currencies competing with each other for global recognition. While the dollar will remain still dominant for quite some time, it faces new challengers—notably the euro and the yuan—that for the first time in nearly a century have the scale to compete seriously with the world's leader. In the longer run we may even get to the point where our international monetary system moves from a dollar-denominated system to a

tripolar system in which the United States, the European Union, and China use the regional dominance of their respective currencies to carve out monetary zones of influence in competition with the other two currency blocs. Such a system might require a much higher degree of policy coordination among the three leaders to counteract the inherent propensity for expressions of monetary protectionism, such as launching currency wars trying to underbid the other two currencies.

The growing proliferation of globally traded currencies with limited world-money status reflects what is happening to the world economy. It is changed as a result of the formation of the European Union as the world's largest trading bloc in the past quarter of a century, the rise of China to the status of economic superpower, and more generally the successful launch of emerging markets. Still, such *monetary fragmentation* is not an inherent tendency of any international monetary system. At the center of such a system is typically a single international monetary standard, from gold to pounds to dollar. The global community tends to converge toward such a single standard, because it wants to make sure that it holds a globally accepted money form it can get rid of whenever and wherever it wants. With nearly every country interacting commercially as well as financially with pretty much all the other countries of the world, everyone prefers to hold also a globally recognized reserve asset with which to settle cross-border payment obligations with the largest possible number of counterparties. International monetary systems have thus always tended toward a single monetary standard expressing the world community's centralized *international liquidity preference.* This is why the bimetallic standards of yesteryear always forced battles between gold and silver that were ultimately won by the former. And this is also the reason why the dollar has been sustaining its status as dominant form of international medium of exchange so far beyond the actual share of the US economy in the world market.[13]

What we have here as a unique organizing principle of the current international monetary system is a dialectic between financial centralization toward the dollar as single world-money

standard—as manifest in a massive flight to quality into US Treasuries in 2008 and 2009 in the aftermath of a global financial crisis triggered by the United States—and monetary fragmentation toward other currencies, notably the euro and the yuan. The coexistence of these two simultaneous forces implies centripetal movements into the US dollar by foreign investors and centrifugal movements away from the US dollar, which together define the multilayered composition of the world economy in general and financial capital flows across borders in particular. Rather than being simply contradictory, these two movements in opposite directions are synthetic inasmuch as they correspond to layers of simultaneous capital flows in both directions, organized by globalized finance.

Adjustment Mechanisms

Another indication of monetary fragmentation in today's international monetary system is the proliferation of different exchange rate regimes, as a growing number of countries seeks to move away from the comparatively less stable extremes of the currency price spectrum, namely, free float on one end and pegs, sometimes even reinforced by currency board arrangements, on the other. Today, after several major worldwide currency crises, more and more countries are trying to find hybrid arrangements, which hopefully combine the best of the two worlds—the flexibility of floating exchange rates especially in response to various shocks and the stability of fixed exchange rates to facilitate long-term planning. We have so-called managed floats, whereby central banks intervene occasionally in active fashion to keep otherwise floating exchange rates from moving too much. And then there are crawling pegs, where central banks allow gradual currency price adjustments in small steps following a predetermined formula. Another version are adjustable pegs, which keep currency prices fixed by anchoring them to a stronger currency; at the same time, these pegs allow occasional corrections of the exchange rate level when macroeconomic developments warrant such adjustments.[14] Additional

hybrid arrangements apply to single-currency areas formed among neighbors (euro zone, CFA franc zone in Western Africa) to float together against an anchor currency so as to maintain better internal cohesion. And finally we can envision as the penultimate hybrid solution so-called *target zone arrangements* among the leaders of the three currency blocs, as recommended by John Williamson from the Peterson Institute of International Economics, to keep their respective currency prices within a fairly tight band (and hence currency price movements limited to, say, ± 10 percent from the agreed target levels). Such arrangements can only be based on growing economic policy coordination to keep the macroeconomic performance of the countries involved relatively convergent.[15]

The proliferation of different exchange rate regimes clearly poses a challenge for countries trying to correct chronic and large external imbalances. Ever since Milton Friedman made his case for flexible exchange rates in the early 1950s, mainstream economists have always insisted that the exchange rate should be allowed to fluctuate freely in order to provide correct incentives for the swift elimination of balance of payments disequilibria. Messing with that market-driven mechanism, so the argument goes, undermines this valuable adjustment function of exchange rates. According to Friedman, balance of payments deficits would automatically be corrected by that country's currency depreciating due to deficit-related excess supplies, which in turn would make imports more expensive and exports cheaper to restore balance. The reverse would happen with surplus countries whose currencies would appreciate.[16] In reality, however, such adjustment works only if export and import volumes change more strongly than the depreciation-induced increase (or appreciation-induced decrease) in import prices. Moreover, even if such elasticity is high enough, volume changes are much slower than price changes so that any depreciation would initially lead to greater import spending and losses for export earnings to make the initial deficit temporarily worse—the so-called J curve.[17]

Correcting external imbalances via changes in currency prices is thus a process fraught with difficulties under the

best of circumstances, especially if trade volumes happen to adjust too slowly and not strongly enough in response to price changes. But this adjustment mechanism gets further compromised to the extent that current accounts follow the logic of purchasing power parity equilibrium whereas capital accounts are shaped by interest parity equilibrium. Those two equilibria may not yield the same exchange rate levels, a problem bound to become more urgent with the growing dominance of capital accounts discussed above. And then there is the additional problem that effective equilibrating of external balances requires real exchange rates, adjusted for inflation rate differentials between the countries concerned. It is not easy to get appropriately comparable inflation measures, especially if we are dealing here with anticipated inflation to occur in the future (as in the case of capital flows). Add to this amalgam of challenges the fact that the majority of nations do not permit free floating of exchange rates, and it is no surprise that we have not had any empirical validation of exchange rate movements restoring external balances. Since 1973 we have witnessed recurrently massive currency price cycles while many countries continued to face chronic balance of payments deficits or surpluses in the course of such cyclical fluctuations. And the continuous nature of such external imbalances persisted even though these up-and-down patterns of exchange rates tended to overshoot in both directions, thanks to massive amounts of currency speculation and arbitrage activity all moving in the same direction until some breaking point violently reverses the pattern.[18]

In the absence of effective rebalancing via currency price adjustments, we have to ask what else might help restore external balance. The necessary rebalancing targets the external current account balance X_n (exports X minus imports M), which connects to the private sector balance (between savings S and gross investment I_g) and public sector balance (tax revenues T minus public expenditures G).[19] So we get:

$$X_n = (S - I_g) + (T - G)$$

Countries could then try to reduce a deficit in net exports X_n by changing their economic policy mix. Higher interest rates, for example, might reduce private sector I while boosting S. Fiscal austerity moves could reduce budget deficits for a better balance between T and G. In either case, the X_n deficit will improve. The problem with that adjustment option is that deficit countries will not be inclined to undertake such monetary and/or fiscal austerity voluntarily in due time because of its high political cost. Of course, such policy-induced adjustment on the part of deficit countries might be greatly helped if surplus countries would at the same time do the opposite through stimulative policies or by allowing wages to increase faster. But the latter group cannot be obliged to comply, since it can let its current account surpluses persist indefinitely. At one point, in the mid-1980s, the world's leading economies tried to implement such global policy coordination between deficit and surplus countries, first in the 1985 Plaza Accord (aiming at an orderly decline of the overvalued US dollar) followed by the Louvre Accord of 1987, which collapsed shortly thereafter when the US stock market crash of October 1987 necessitated economic policy adjustments that neither side was willing to undertake.

In the absence of effective exchange rate adjustments or coordinated policy mix adjustments deficit countries have typically had their adjustments imposed on them through a currency crisis. Such crisis-induced adjustment moves the exchange rate dramatically lower in one swoop. In its wake interest rates shoot up and recession ensues, tending to raise S and depress I_g. Such sudden shifts in the private sector balance are only partially offset by automatic declines in T and boosts in G so that X_n usually also improves. Not surprisingly, the Kingston system has had its share of currency crises to the point where economists have by now developed three generations of currency crisis models.[20]

An Interdependent World, a Global Growth Pattern

Globalization obliges us to go beyond individual countries' adjustments and look at the whole picture. Some countries can

run chronic current account surpluses because other countries are locked into equally persistent current account deficits. Global finance organizes the cross-border capital transfers needed for both groups of countries to live simultaneously with their respective external imbalances that play themselves out as a global growth pattern. The Kingston system has organized that pattern within the context of a Minskian super-cycle, in other words, a long wave that started in October 1979 when the United States undertook a dramatic shift in its policy mix to break the stagflation dynamic with the Fed's three-year tightening followed by Reagan's fiscal policy stimulation after 1981. The ensuing US twin (budget and trade) deficits, turning the United States into a net debtor nation by 1985, became the engine for the global demand boost needed for the rest of the world to launch export-led growth strategies as catching-up process.

Whenever the international monetary system permits such catching-up processes through appropriate capital transfers, it contributes to globally rapid growth for several decades and so constitutes a crucial institutional anchor for the upswing phases of long waves. This was the case when Britain's nineteenth-century gold standard became extended globally after 1879 so that gold inflows to London from the rest of the world came to support British capital exports within its colonial empire, to Europe and beyond – a globally growth-promoting configuration that lasted until 1914. And this was perhaps even more obviously the case during the postwar Bretton Woods years (1945–71) when massive US capital exports combined with the dollar's systemic overvaluation to help other (war-torn) industrial nations rebuild and then grow fast by means of persistent trade surpluses. The Kingston system mobilized such a global catching-up pattern differently by having the center (the US economy) come to rely on massive capital imports to turn into a bubble economy whose growth spurts in the wake of three consecutive asset bubbles—the bull market triggered by the corporate raiders in the mid-1980s, the Internet mania of the late 1990s, and the housing bubble of the 2000s—helped turn its citizens into the buyers of last resort for the rest of the world.

It would be wrong to conclude from these differences in the catching-up dynamic—the center as capital exporter during the Britain-led gold exchange standard and Bretton Woods, the center as capital importer in the Kingston system—that these represent either-or choices. In other words, we cannot just look at the net flows between countries. Instead, we have to look at the totality of the gross flows. During any given time period we will have both centrifugal flows from the center to the catching-up periphery and centripetal flows from the periphery to the center. The question is then one of balance between the two and the rate of expansion of their respective scales. In the case of the Kingston system we already noted at the beginning of this chapter that financial globalization facilitated an extraordinary expansion of portfolio investment flows after 1990. This is confirmed by other data as well. McKinsey's 2013 report, for instance, noted that cross-border capital flows (including foreign direct investments, purchases of foreign bonds and equity, and cross-border loans and deposits) rose from $1.3 trillion (or 5 percent of global GDP) in 1990 to $4.7 trillion (13 percent of global GDP) in 2000 and then to a peak of $11.8 trillion (or 20 percent of global GDP), but they then fell steeply during the crisis to just about $2 trillion in 2009 and were at $4.3 trillion in 2012, still 60 percent below the precrisis peak.[21]

Such an explosion in the scale of cross-border capital flows just before the crisis facilitated ever-larger current account imbalances underlying the global growth pattern at the time. For instance, US trade deficits reached 7 percent of GDP by 2007, and China's trade surplus approached 9 percent at the same time. The latter had to supply ever-larger sums of capital to the former for this debt-financed excess demand emanating from America's largest asset bubble to do its job of turning US homeowners into the world's buyers of last resort. Apart from the financial liberalization and technological revolution underpinning such huge expansion of cross-border flows, there was also a crucially important demographic factor in play here. Around 1990 three billion people, basically half of the world's population, entered global capitalism all at the same time, both

as cheap workers and as prospective middle-class consumers with large pent-up demand. We are not just talking here of the collapse of the Soviet empire and the transformation of China from a communist planned economy to a state-guided capitalist economy whose spectacular takeoff shook the world economy to its core. We also need to include here such populous nations as India, Brazil, Indonesia, Turkey, and Mexico (and scores of smaller nations) all of whom exited their nationalist import substitution phase of development with neoliberal market-opening reforms and political change away from their traditional single-party states.

Global finance played a huge role in that transition by imposing its policy preferences on all those newly emerging market economies while at the same time regulating their share of access to the world's financial capital both in terms of savings and capacity for money creation. After painful reform processes punctuated by two great currency crises—the LDC debt crisis of the 1980s and the Asian (in reality global) crisis of the late 1990s—those emerging market economies turned into such by means of rapid export-led growth as their eager workers became part of global supply chains that moved more and more of the world's manufacturing base their way. Traumatized by those two major financial crises, the emerging market economies decided to defend themselves against devastating attacks by currency speculators through huge buildups of currency reserves. That pool of money also helped defend their undervalued currencies anchored by pegs or less rigid hybrid exchange rate regimes, which were key to their export-led growth strategies. Lacking highly developed domestic financial systems, their massive reserve buildup had nowhere else to go but into buying US Treasuries, thereby financing automatically the huge trade deficits of the United States, which helped them in turn sustain their own trade surpluses. This is what Ben Bernanke was referring to when he was talking about the "global savings glut" just before the crisis.[22] But his view, like that of many others, was still colored by the standard "us" versus "them" dichotomy of international economics as seen from the point of view of

individual countries. What we need to understand is the whole picture, external deficits and surpluses begetting each other and depending on each other to become embedded as chronic imbalances that drive a global growth pattern.

Of course, such patterns of catching up by the periphery are not sustainable. External deficits and surpluses do not just cancel each other out neutrally, especially when they get both rapidly larger in the late phases of the long-wave upswing as happened during the decade preceding the 2007–08 crisis. What we see here as a growth pattern, especially when looking at it from a long-wave perspective, is a gradual buildup of worldwide conditions of overproduction sustained for a couple of decades by an artificial debt-financed boost in global demand emanating from the center, the United States, which ran large trade deficits as the world's buyer of last resort. This can only go on as long as the periphery, much of the rest of the world, recycles its current account surpluses to fund the underlying debt buildup of the center. But such debt buildup is unsustainable, even when the center finances its external debt in its own currency. Such denomination advantage, indication of a global seigniorage benefit accruing to the issuer of world money (here the US dollar), only prolongs the debt buildup and postpones the inevitable day of reckoning. To the extent that the center's debt buildup fuels domestic asset bubbles boosting demand, that day arrives when the bubble bursts. The catching-up process of the periphery through export-led growth reveals itself at that moment as the engine for global overproduction conditions, which suddenly come to the fore when the bursting of the asset bubble in the center destroys the center's debt financing capacity to serve as buyer of last resort for the rest of the world. This is exactly what happened in 2007–08, and that crisis was appropriately global in nature. As the ripple effects of the subprime crisis worked themselves through the world economy, they hit other regions one by one.

While the emerging markets and commodity producers had enough steam to stimulate their own economies as a shield against the contagion of the financial crisis, the eurozone was

unable to do the same. That region had created its own euro-related bubble after 2002, as its periphery could paper over its own structural deficiencies by taking on a lot of debt in the wake of unsustainably favorable financial market conditions. After the eurozone got hit by the asymmetric shock of the subprime crisis in September 2008, its periphery found itself with shaky local banking systems, burgeoning budget deficits, rapidly rising public debt, and widening imbalances within the zone between the group of surplus countries led by Germany and the larger group of deficit countries. Amid such massive internal destabilization the eurozone lacked the federal policy apparatus to cope with such a shock, and so its own systemic crisis ensued in October 2009. Eventually even the emerging market economies could not sustain their pace of growth while commodity producers had their decades-long boom cut from under their feet. That is where we are today, and in that sense it is fair to conclude that the global crisis is not yet over.

In sum, it is useful to apply a long-wave context to the growth dynamic of the world economy driven by rapid financial globalization. At the heart of this latest long wave, from its inception in 1982 to its systemic crisis after September 2008, has been a Minskian financial super-cycle fueled by US twin deficits and worldwide recycling of external surpluses from periphery to center. The global boost in demand from this configuration led commentators, such as the Fed's Ben Bernanke, to prematurely celebrate the "Great Moderation." Even during that period of stable and favorable growth conditions we had a series of important financial crises with international ramifications. The US economy underwent two stock market bubbles, that of the corporate raiders in the mid-1980s and the one of e-commerce in the late 1990s. The bursting of either (in 1989 and 2000) caused relatively mild US recessions, soon overcome by aggressive Fed policies to lower interest rates and by favorable global growth conditions. The latter were boosted by the export-led growth strategies of the other industrial nations, the emerging market economies, and the commodity producers whose combined surpluses the US economy absorbed with its deficits. In that context

we can identify the various currency crises during that long-wave upswing, in particular the one associated with the LDC debt crisis in the 1980s and the Asian crisis of the late 1990s, as necessary adjustment mechanisms to reinforce those economies' collective competitiveness by means of sharp currency devaluations vis-à-vis the US dollar and impetus for further structural reforms at home. These adjustment crises in the periphery happened while there were bubbles in the US economy so that once again the concomitant downturns from those shocks were mild. With this mutual counterbalancing between center and periphery over two business cycles the stage was set for the acceleration of the financial super-cycle after 2002, which Minsky's dictum of "stability breeds instability" so clearly predicted, until the systemic crisis hit six years later.

We are now at the beginning of the postcrisis phase, thanks to recovery of the US economy, the slow institutional rebuilding of the eurozone, needed policy mix adjustments among emerging markets, and globally much lower commodity prices. Our problem is that we lack adequate levels of aggregate demand across an integrated and interdependent world economy to match global production capacities. We cannot go back to the status quo ante, even though the US economy can operate at the current level, where it has halved its budget and trade deficits from precrisis peaks, for quite some time to keep the rest of the world from falling off the debt deflation cliff. Since much of that growth dynamic has been driven by financialization and financial globalization, how the postcrisis growth dynamic plays out worldwide will ultimately depend on finance as growth engine. And that in turn is shaped by global efforts to reregulate finance, the subject of the next chapter.

CHAPTER 7

Reregulation Challenges

The financial services industry, centered on banks and various financial markets, has always been a comparatively regulated sector of the economy. The question then is why. How can we justify subjecting finance to a fairly strict system of government oversight and regulation?[1] There are several reasons for such extensive government involvement in finance. One is that financial institutions carry a special fiduciary responsibility because they are dealing with other people's money. A wide range of economic actors must be willing to entrust their savings to financial institutions managing funds on clients' behalf. These institutions depend on the public's trust and need to be held accountable to deserve that trust, conditions that are much more likely to be preserved when backed by governmental supervision and regulation. A second reason is the power of financial institutions, in particular banks, to create new money in acts of credit extension. This power gives them a strategic position of great macroeconomic importance. To the extent that this money creation activity, a key source of banks' profit income, is both subject to procyclical instability and possibly discriminatory inequality, it needs to be regulated by the central bank's monetary policy tools affecting banks' reserves used for money creation and also by laws protecting bank clients from outright discrimination.

A third reason behind financial regulation pertains to crisis management. When isolated incidences of financial instability morph into full-blown credit crunches, they are going to affect the economy's growth negatively. Financial crises have large contagion potential, especially near the cyclical peak when many borrowers are overextended, because panic tends to feed on itself. Lest they are allowed to get out of hand and so throw us into a depression, financial crises need to be contained and managed.

Hence, there exist several good reasons to regulate finance, and these have only become more pertinent with the growing strategic importance of finance in our "debt economy."[2] Policy makers have for this reason deployed a whole armory of regulatory constraints, notably monetary policy tools affecting levels and composition of reserves in the banking system, consumer protection laws for fair and informed treatment of clients, safety regulations for crisis management (e.g., deposit insurance, bank capital requirements), and structure regulations setting apart different types of financial institutions and markets while also shaping the relationships between them. The question of how best to regulate finance has gained renewed relevance now that we are in the middle of a major worldwide financial reregulation effort, as has been historically the case in the wake of systemic crises. It seems that past systemic crises have always spawned major regulatory initiatives to fix the underlying causes of what made that particular crisis so devastating—as evidenced by Roosevelt's New Deal reforms of money and banking between 1933 and 1935 and the deregulation efforts under Carter and Reagan in response to the stagflation of the 1970s. And so it is once again the case now, with major regulatory initiatives in the United States and elsewhere since 2010. Even though critics have complained that such reregulation efforts do not go far enough in the face of all-powerful banks thwarting too many constraints put upon them, we should not underestimate how serious an impact those initiatives are likely to have on the modus operandi of our economy in the age of finance-led capitalism.[3]

It is no surprise that major reregulation efforts, such as the Glass-Steagall Act of 1933 or the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, got triggered by major financial crises. Those events are major learning opportunities. A systemic crisis is like a window into a previously hidden room to the extent that its ruptures and contagion dynamics reveal structural weaknesses and interconnections no one had grasped before. Such revelations extend to the inadequacies of crisis management, which require fixing. To the extent that new regulations address newly revealed problems, we enter uncharted waters. We simply do not know whether the new regulations will work until they are tested by yet another crisis. And that crisis is sure to be quite different from the previous one. Financial regulators therefore run the risk of always "fighting the last war." Still, the ongoing postcrisis reregulation efforts—from Dodd-Frank in the United States to the banking union of the European Union and Basel III on a global scale—have been quite ambitious and far-reaching in scope, commensurate with the unprecedented crisis they seek to address.

Regulatory Dialectic

Financial regulations have their own evolutionary dynamic, one that Edward Kane has repeatedly characterized as *regulatory dialectic*. Borrowing from German philosopher Georg Wilhelm Friedrich Hegel's notion of dialectic pointing to the resolution of contradictory tensions (thesis and antithesis) by means of their integration into a higher order (synthesis), Kane applies this process to financial regulations. These constitute the thesis banks try to bypass by means of innovations to evade regulations (antithesis). Having succeeded to escape those regulatory restraints, banks enjoy their newly found freedom to the point of excess behavior as a result of which they trigger financial crises. In the wake of such crises they face reregulation (synthesis).[4]

We have seen this process play itself out numerous times. Beyond the many examples we could cite, it is perhaps more useful to draw broader lessons from Kane's regulatory dialectic

framework. For instance, the postwar regime of financial regulations put into place by Roosevelt's money and banking reforms of the 1930s, a regime of nationally administered credit-money, was bypassed in radical fashion by the invention of the Eurodollar market in 1960. The Eurodollar enabled banks to operate supranationally beyond the reach of any national monetary authorities. As this Euromarket grew rapidly into a parallel, largely unregulated, globally organized banking system, it put pressure on the regulatory restrictions in the domestic banking systems of the United States and Europe. Those lost much of their effectiveness to the degree that any nation's larger banks could simply shift their deposit-taking, loan-granting, and market-making activities into the unregulated (and consequently more profitable) Euromarket space.

Before the Euromarket broke down prevailing domestic banking regulations, it destroyed Bretton Woods' fixed exchange rates and capital controls during the early 1970s. Then, in the second half of the 1970s, it attacked interest rate ceilings in domestic banking. Those had become even more difficult to maintain with the introduction of money market funds (MMFs) in 1975 whose unregulated market yields triggered massive disintermediation of funds out of the commercial banks by depositors seeking better returns in the MMFs. The attraction of the uncapped yields found in MMFs and in the Euromarket became progressively more intense in the late 1970s when accelerating inflation deepened the financial repression of interest rate ceilings.[5] In the 1980s the Euromarket worked to undermine existing structure regulations, notably the long-standing separation between commercial banking and investment banking. Much of the banking deregulation measures we witnessed during that period, such as the Depository Institutions Deregulation and Monetary Control Act of 1980 or the Financial Services Modernization Act of 1999 in the United States, were thus acknowledging de jure what had already happened de facto, namely, that these regulations had been rendered largely ineffective by financial innovation and the globalization of finance.

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It is worthwhile noting that the Euromarket itself has been object of the aforementioned regulatory dialectic. The first time this global banking network found itself in crisis, in June 1974, it revealed a new type of settlement risk unique to international (i.e., cross-border) banking transactions, a risk that arose when German authorities closed down Herstatt Bank before its counterparties in New York had received payments in dollars to complete a dollar-mark foreign exchange transaction Herstatt had engaged in earlier. The shocked market reaction to this messy closure prompted the monetary authorities of the leading nations to get together under the auspices of the Bank for International Settlements (BIS), a sort of umbrella organization grouping together the world's leading central banks, and set up the so-called Basel Committee on Banking Supervision (BCBS) which in turn concluded the so-called *Basel Concordat* in 1975 to coordinate both supervisory and crisis management tasks between the authorities of home and host countries more effectively.[6] In addition, the leading central banks grouped together in the BCBS also committed themselves to introduce so-called real-time gross settlement systems for immediate settlement of high-value transactions, which forestalled the recurrence of any Herstatt-like situation.

In August 1982 the Euromarket suffered another major crisis when several (notably Latin American) countries all declared themselves at the same time unable to repay their foreign debts properly. After having borrowed heavily during much of the 1970s to cover their trade deficits in the wake of more expensive oil, they had then seen their debt servicing capacity undermined in the wake of higher US interest rates. At that point the three largest of these sovereign debtors—Argentina, Brazil, and Mexico—had borrowed the equivalent of 220 percent of the capital of the nine largest US banks, and they thus posed a systemic threat to the entire American banking system. That debt crisis, ultimately engulfing scores of heavily indebted developing countries, necessitated the creation of a new international lender

of the last resort. Its crisis management centered on emergency funds by the International Monetary Fund (IMF) in return for structural adjustment programs of reforms by debtor nations. Bridge loans from the US Treasury's Exchange Stabilization Fund and the Bank for International Settlements gave the LDC debtor nations breathing space (and prevented their sovereign debt defaults) until they had made their deals with the IMF. Once signed, these agreements triggered debt rescheduling deals with the private lenders of the Euromarket. The latter were the world's leading banks and were thus protected from immediate write-downs and given time to prepare for the eventual inevitable losses. Those losses arose finally seven years later, starting in 1989, when the LDC (less developed countries) debt crisis moved into a different phase with the introduction of so-called Brady bonds. Those helped replace essentially nonperforming LDC loans still carried on the books of the banks with new bonds backed by the US Treasury that had lower face values. The Brady Plan, which ultimately helped about 20 debtor nations to climb out of their sovereign debt crisis, was the culmination of efforts that had started on a significant scale as early as 1987 to resolve the LDC debt crisis by means of loans for bonds swaps.[7]

In the wake of this profound and enduring Euromarket crisis the leading central banks got together in 1988 to impose a new regulatory regime on transnational banks operating beyond the reach of national regulators. In the so-called Basel Accord of 1988 the 13 member countries of the G-10 group making up the BCBS decided to impose on commercial banks operating in their respective jurisdictions a common capitalization standard whereby the required minimum capital level would vary in direct proportion to the banks' perceived levels of credit risk in their loan portfolios. Obviously responding to the LDC debt crisis of the 1980s, the regulators wanted to make sure that transnational banks capable of bypassing national regulators would now have to meet a globally enforced standard of bank capital with which to absorb losses from their loan and bond portfolios. At the heart of this new regulatory regime was the *Cooke ratio*, so named after BCBS chair Peter Cooke, which divided bank capital by

risk-weighted assets and specified that this ratio had to be at least 8 percent. Different risk weights applied to different types of debt. The safest debt, such as sovereign debt, would carry a weight of 0 percent and hence require no capital to be set aside. AAA-rated MBS were given a 20 percent weight (requiring 1.6 cents of capital for every dollar), municipal revenue bonds and residential mortgages a 50 percent weight, and most corporate debt a 100 percent weight.[8]

The idea behind the Cooke ratio was to let banks manage their risk-return trade-off strategies on their own within a common set of rules through which the regulators could impose compliance. This new approach of supervised self-regulation by the BCBS as global regulator aimed at bank safety, obliging banks to counterbalance riskier lending strategies aimed at higher returns with sufficiently large equity cushions in case of losses. Unfortunately, the banks had other things in mind, applying once again financial innovation to bypass regulatory restraints. The great weakness of the original Basel Capital Accord of 1988 (Basel I) were its very broad debt categories for which the same risk weight applied across the board irrespective of the large differences in credit risk within any of these categories. Banks were inclined to distinguish between the new regulatory accounting risk of the category, as expressed by its risk weight, and what they perceived to be the actual economic risk calculus for each debt item on their balance sheets. For example, if a particular mortgage was considered riskier than justified by the regulatory accounting standard, a US bank would consider the prescribed four cents of capital for each dollar lent a good deal and so be inclined to keep that loan on the books. On the other hand, if a mortgage to a very creditworthy lender would by its own account warrant a lower capital cushion than the four cents, the bank considered the new rule onerous. In that case it preferred to get rid of the loan for which the required capital cushion was deemed excessive. Since banks had just gotten into the business of loan sales and loan securitization at the conclusion of the LDC debt crisis, they had found a powerful tool for taking low-risk debt off their books. Loan securitization exploded after 1988.

At the same time, the banks needed another mechanism to cope with the higher-risk loans kept on their books with relatively low safety cushions, and that tool were CDS, which enabled banks to transfer default risks to any buyer of such insurance. That instrument began to take root in the early 1990s.

The ironic consequence of Basel I was therefore to have encouraged banks to get rid of their lower-risk debt while at the same time maintaining higher-risk debt on their books—the exact opposite what the new regulatory regime had intended. But there were other reasons why the original Basel agreement proved inadequate. Throughout the 1990s, as the long-standing separation between commercial banking and investment banking rapidly eroded amid banks' efforts to transform themselves into universal banks, the larger institutions had substantially increased their investments in bonds, equity shares, currencies, and derivatives. As a result, their balance sheets contained much more market risk from adverse price movements in their securities portfolios. In 1996 the BCBS amended Basel I to include market risk for a wide variety of securities in the application of the regulatory capital to asset ratio. But this extension did not address the fundamental weakness of Basel I's regulatory dialectic. Thus, the regulators were considering a much more fundamental change in their new approach of supervised self-regulation of the bank's risk-return trade-offs, and they were helped in this regard by rapid advances in the modeling and management of risk.

In June 2004, after several years of intense discussions and negotiations, the BCBS proposed far-reaching changes to its capital requirements, introducing the so-called Basel II Agreement.[9] Abandoning the failed concept of broad risk categories, the committee opted instead for letting the banks do their own risk measurements and risk-weight determinations to arrive at the requisite minimum capitalization level of 8 percent, the so-called McDonough ratio. This dramatic increase in the banks' autonomy of self-regulation had to be compensated, however, by obliging them to discuss their risk-management techniques more extensively with their regulators (the so-called Pillar 2 of the new

capital accord) and divulge quite a bit more information about those methods to their prospective shareholders so as to impose a modicum of market discipline (Pillar 3). The key to making this new approach work was to ensure the quality of the banks' risk management efforts. To this end the banks were obliged to consider a wide variety of risks, including credit risks, market risks, operational risks arising from any disruption of day-to-day operations caused by technological mishaps or human error, and any other risk source deemed worthy of capital set-asides. In addition, banks were given different options with regard to their approach to risk. For each major (credit, market, operational) risk source banks had to follow a minimum risk measurement approach specified by the BCBS. Larger international banks were asked to go beyond that and strive for higher risk management standards, either by following the current state-of-the-art models specified by the BCBS for each of the three major risk categories or by developing their own improved versions. If the latter were arguably better than the BCBS norm, regulators could allow banks to set aside less capital when using those proprietary methods. This was meant to give banks a strong incentive to foster better risk management techniques, but in the end this option became a license for banks to undercapitalize their operations systematically—with tragic results a few years later.

Apart from having been barely implemented by the time the systemic crisis hit in August 2007, Basel II left banks entirely unprepared to cope with this cataclysmic event. Not only were they severely short of capital to meet huge losses, but the BCBS' rather lax definition of what constitutes bank capital also counted dubious instruments as part of the banks' capital base, instruments that frequently evaporated quickly into thin air when they came under stress. So-called Tier 2 capital items, including loan loss reserves, asset revaluation gains, subordinated debt, and hybrid instruments containing both debt and equity elements (e.g., perpetual preferred stock), accentuated the banks' propensity for undercapitalization by pretending to be capital when they were not. Basel II also had a clearly procyclical bias, first making the booms stronger by allowing banks to underestimate

their risks and then worsening the downturns by forcing banks to restrict lending as they had to boost eroded capital cushions in the face of larger credit losses. Worst of all, Basel II also reinforced the banks' attempts to move a growing portion of their intermediation activities off their balance sheets and into the burgeoning shadow banking system, so that they did not have to put any capital aside for a large share of their operations. No surprise then that the crisis of 2007–08 prompted extensive rethinking among the regulators in the BCBS; this led in December 2010 to a significant reform known as Basel III.[10]

The new accord complements Basel II rather than replacing it. It made substantial changes in three areas of bank management by strengthening the capital requirement framework, imposing liquidity cushions on banks to withstand periods of stress in the money markets, and limiting the size of banks through aggregate leverage ratios. All these provisions address major points of systemic weakness in the global banking sector, which came to light during the crisis of 2007/08 and aggravated its intensity. Taken together, the Basel III provisions have put banks under a much tougher regulatory framework. Since the goals in terms of bank capital, liquidity, and leverage caps are fairly ambitious and risk slowing bank lending if implemented too rapidly, the banks were given several years—a timetable stretching all the way to 2019—before they will have to be in full compliance with the new rules. In the meantime, banks will have to undergo nationally administered stress tests annually to see the extent to which their gradual implementation of Basel III provisions have left them prepared for the next crisis. It is also noteworthy that regulators gave a selected group of banks "too big to fail" the status of "systemically important financial institutions"; these banks will face tougher regulatory standards, more information disclosure, and greater supervision. This status may extend beyond banks to other strategic financial institutions, such as the leading insurers AIG and MetLife. Several countries with important financial centers, notably the United States and Switzerland, have gone significantly beyond the minimum thresholds of Basel III in setting their own tougher regulatory standards. It is too early to tell

to what extent these more stringent rules will provoke regulatory arbitrage among American or Swiss banks seeking less stringent rule application elsewhere.

By triggering numerous bank failures and saddling a large number of the world's leading banks with losses for years to come, inadequate levels of bank capital contributed greatly to the crisis. That strategic weakness had to be fixed in Basel III. Its capital requirements are quite a bit tougher than the old ones. For one, the BCBS now puts a lot more emphasis on Tier 1 capital, which consists of common shares and retained earnings, while harmonizing Tier 2 capital items, reducing reliance on those, and phasing out even more flaky Tier 3 instruments. Banks would have to have a minimum of 6 percent of risk-weighted assets (RWA) in Tier 1 capital at all times, up from 4 percent under Basel II. In addition, banks are now required to build up two separate capital buffers to be better prepared for periods of crisis. The first buffer, known as a mandatory capital conservation buffer and amounting to 2.5 percent of RWA, would have to be built up and preserved outside of periods of stress. To the extent that it gets used up to absorb losses, banks would be required by regulators to rebuild this buffer expeditiously by either curtailing their dividend payouts and bonuses or issuing new equity shares. The second is a "discretionary counter-cyclical buffer" of up to 2.5 percent of RWA that national regulators could require their banks to build up during periods of strong credit demand; this would slow down a bubble. All these tranches considered, banks could thus end up with a capital requirement of up to 11 percent of RWA in high-quality Tier 1 capital, with too-big-to-fail lenders classified by regulators as "systemically important financial institutions" (SIFIs) possibly even required to hold more.

Basel III also added a new requirement for banks in terms of assuring that they had sufficiently large reserves of highly liquid assets to draw from in times of money market stress of the kind suffered twice during the crisis of 2007/08. A new liquidity coverage ratio (LCR) would require large banks to withstand a month-long stress period of large net cash outflows, thus obliging them to hold adequate amounts of high-quality assets that can be

sold easily even when markets experience periods of turmoil (e.g., Treasuries, bonds of government-sponsored entities, highly rated corporate bonds, top-notch equities). A second minimum liquidity standard known as the net stable funding ratio (NSFR) requires banks to fund their long-term assets, such as loans and bonds, with stable sources of funds other than with short-term wholesale funds access to which proved dangerously precarious in 2007 and 2008. Yet another innovation of strategic importance in Basel III is a minimum leverage ratio, which divides Tier 1 capital by a bank's total (not risk-weighted) assets and so limits the size of the bigger banks. Basel III foresaw a minimum leverage ratio of 3 percent, but the Fed has doubled that ratio to 6 percent for those US lenders it deems "systemically important." Finally, Basel III also tightened considerably the banks' risk management standards in a variety of crucial areas, notably inclusion of counterparty risk when funding through the shadow banking networks, lengthening of time horizons in risk models, and use of tougher loss measures.

New Frontiers in Financial Regulation

Basel III marks a major extension in the gradual effort to come up with a global regulatory framework for transnational banks operating across and beyond national boundaries. Regulators have now put in place a relatively tough regime for bank capital buffers, liquidity cushions, and leverage caps that will make it more difficult for banks to act as irresponsibly as they did before the crisis. Equally important has been the support given to the BCBS' efforts by the key national regulators, especially the Fed and the European Commission, both of which integrated Basel III recommendations rapidly into their respective legal frameworks and insisted on even tougher standards applied locally to institutions under their jurisdiction. This is a very different response from, say, the highly skeptical and overly selective approach the Fed exhibited in response to the first two Basel agreements. Global governance is a fragile affair and requires strong backing by the leading powers as a necessary, but not sufficient condition to be effective.

The global financial reregulation effort has gone even beyond Basel III, as was laid down in an ambitious plan for financial regulatory reform at the conclusion of the first G-20 summit in Washington in October 2008.[11] That action plan gave governments the means for coordinating their nationally specific initiatives around several central themes so that their legislative initiatives ended up remarkably similar and compatible with each other. This is a key prerequisite for avoiding regulatory arbitrage by banks seeking to exploit the laxest regulatory practices in order to undermine tougher application of the same standard elsewhere. With regulations so similar to each other it is ultimately also much easier to build a global regulatory regime. Among the key national or regional initiatives of financial reregulation implementing the G-20's action plan are America's Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, various directives of the European Commission (e.g., Capital Requirement Directive IV, Recovery and Resolution Directive [RRD], European Market Infrastructure Regulation, Alternative Investment Manager Directive) coupled with implementation of the European Banking Union, which provides for a uniform supervisory mechanism, a common deposit insurance scheme, and a resolution fund, as well as Britain's Financial Services (Banking Reform) Act of 2013. These new laws have much in common, but they also have some subtle differences worth considering. They collectively introduce major regulatory innovations, which move us into uncharted territory and have yet to stand the test of time.

Macroprudential Regulation and Systemic Risk Management

Just as the Basel Agreements responded to new risk manifestations (e.g., settlement risk in the Basel Concordat, counterparty risk in Basel III), so regulators everywhere recognized the turbulent events of 2007 and 2008 as a systemic crisis that needs to be addressed as such. Financial reregulation thus has put identification of systemic risk at the center of regulators' attention.

We have termed this new regulatory dimension *macroprudential regulation*. Its objective is to avoid buildup of systemic risks to the point where they may trigger massive financial crises. Since systemic risk addresses a phenomenon encompassing all of finance across its different segments, it requires different specialized regulators to work together. Dodd-Frank set up the multi-agency Financial Stability Oversight Council (FSOC) under the leadership of the US Treasury for that purpose, while the Europeans introduced the even more complex European Systemic Risk Board (ESRB) led by the European Central Bank in Frankfurt. With Dodd-Frank imposing new information disclosure requirements on banks and many other nonbank institutions (e.g., money market funds, hedge funds), the law also set up a new Office of Financial Research (OFR) to help with the analysis of the data for identification of systemic risk buildup trends. There is a danger of being inundated with so much data that such trends will be difficult to discern unless the OFR goes beyond mainstream economic theory and hires heterodox economists who know a thing or two about the dynamics of financial crises. Apart from the question how well the different regulators with long histories of turf battles will cooperate under the aegis of the FSOC or the ESRB, the ultimate test will come when the regulators face the task of addressing systemic risk build up before it is too late. This requires imposition of selective credit controls slowing, if not reversing, the worrisome trend, such as setting lower loan-to-value ratios for mortgages in the face of a housing bubble. In 2014 we saw first manifestations of such macroprudential rules when the United States pushed through a reform of its money market funds' net asset value (NAV) rule and the United Kingdom limited mortgage amounts.[12]

Systemically Important Financial Institutions

At the heart of the new regulatory approach toward systemic risk is the idea of identifying institutions that are "too big to fail" and classifying them as "systemically important financial institutions." That status is given to institutions based on size,

interconnectedness, substitutability (i.e., unique role in financial architecture), and global cross-jurisdictional activity. Any SIFI will be regularly subjected to stress tests checking its resilience in the face of various crisis scenarios. The SIFIs are also subject to greater oversight, more stringent reporting requirements, stronger capital and/or liquidity buffers, and tougher leverage caps. The idea is not to let them get to the point of failure in the first place where they could present a systemic risk. Parallel to the FSOCs and ESRB's process of designating SIFIs, the G-20's Financial Stability Board (FSB) would assign the status of "global systemically important bank" (G-SIB) to the world's leading banks, which would be subject to tougher BCBS capital, leverage, and liquidity standards while regularly having to prove their loss absorption capacity. Since banks, and even more so nonbank institutions such as insurers, would not want being saddled with the burdensome SIFI standard, one must wonder to what extent regulators will have the backbone to assign sufficient numbers of institutions.[13] The January 2015 lawsuit of MetLife against the FSOC, aimed at reversing its designation as a SIFI, will be an important test case. Institutions with SIFI status will have to weigh their dependence on good relationships with the regulators over the long haul against being too obstinate.

Resolution Authority

In the aftermath of so many rescues in 2007 and 2008 there was an enormous public outcry against bailing out banks, which were largely viewed as undeserving after having caused the crisis with reckless behavior in the first place while imposing huge negative externalities on the rest of the economy. Therefore, legislators were keen on making a "never again" promise with regard to taxpayer-financed rescues of failed banks. The impact of such typically costly operations on budget deficits was of further concern. And there was also a sense that banks were irresponsible in the run-up to the crisis, because they knew they would be bailed out if their risky bets would not pan out. Such moral

hazard could be effectively undercut with a promise that banks would no longer be bailed out by the government if failing. Accordingly, the postcrisis reregulation effort has centered on legislative commitments to end taxpayer-funded bank bailouts. For good measure, the US Congress deprived the Fed in Dodd-Frank of its very broad section 13(3) emergency lending powers "under unusual and exigent circumstances" and replaced it with a provision requiring the Fed's cooperation with (and authorization by) the US Treasury to set up broadly accessible emergency lending facilities rather than the targeted rescues (Bear Stearns, AIG) it used to fund under section 13(3). Depending on the precise nature of the next major financial crisis, legislators may rue the day they deprived the Fed of the flexibility, speed, and targeting capacity in rescue operations that are highly specific in circumstance and require very rapid intervention.

Rather than waiting for bank failures to happen and then scrambling for rescues, regulators decided in favor of a more proactive procedure that marks a radical departure from past practice. Instead of bailouts there would now be so-called resolutions, the costs of which would be covered out of a fund set up by the government and financed by regular contributions from participating banks. Such resolutions would basically be mechanisms of restructuring failed or failing institutions speedily. Under that new regime banks would have to provide regulators with detailed and annually upgraded plans on how they should be dealt with in case of imminent failure. Dodd-Frank requires living wills from its SIFIs whereas the EU's directive demands recovery plans. This semantic distinction reveals a deeper philosophical difference between the Americans and Europeans as to what to do with failed banks. The United States wants to liquidate insolvent banks, while the Europeans hope to resolve bank failures by restructuring their banks so that they may be nourished back to health. For that purpose Britain's regulatory reform and the EU's Recovery and Resolution Directive (RRD) regime foresee so-called bail-in provisions whereby shareholders would be divested of their shares and creditors would have their claims cancelled or reduced. The affected shares could be transferred

to creditors or to potential buyers of the bank. These steps aim to lower the bank's liabilities and recapitalize it so that it may be thereby rendered solvent again. Helpful in that regard may also be the introduction of a new hybrid instrument in Europe, so-called contingent convertibles (CoCos), which are debt instruments that would automatically become bank capital absorbing losses and counting toward a bank's capital requirement if and when the issuer's actual capital level falls below the regulatory minimum. CoCos would carry higher yields than normal bonds issued by large banks because of the conversion risk, but there is the added potential benefit of large capital gains if the banks recover following such conversion.[14]

Regulating Shadow Banking

In 2011 the G-20 powers authorized the FSB, a global body of finance ministers and central bankers set up in 2009 to monitor global finance and make policy recommendations for its improved regulation, to focus in particular on shadow banking. The FSB has begun to make some serious suggestions on how to cope with systemic risks in shadow banking and to coordinate with the BCBS as well as national regulators on how best to put these into effect. Its steps are largely within the purview of Dodd-Frank or various EU directives, thus capable of assuming legal force in the key financial centers of the world if the relevant regulators accept and push for their implementation.[15] Some of the FSB's suggestions have already been adopted, others are being readied for implementation, and some are still in the discussion stage. Taken together, the FSB proposals address all the points of vulnerability in the shadow banking system, whose ruptures under stress greatly exacerbated the systemic crisis in 2007/08. A key area of reform concerns the MMFs (money market funds) for which the FSB recommended insurance to prevent future runs. America's Securities and Exchange Commission has instead opted for obliging some of the retail MMFs widely used by household savers to replace their one-dollar-per-share promise with floating share prices and letting them slow down

withdrawals during runs, reforms that may also be adopted by the European Securities and Markets Authority. Dodd-Frank imposed a securitization risk retention requirement according to which banks must retain a 5 percent interest in the credit risk of the assets they securitize so that they keep "some skin in the game" and have thus an incentive to consider the risk profile of their securitization constructs more seriously. New international accounting rules, in particular the new consolidation standards IFRS 10–11–12 adopted in 2013, clarify how banks have to deal with special purpose vehicles they set up in a much more transparent and engaged manner than was the case before the crisis. Regulation has also been proposed by the FSB for yet another pillar of the shadow banking system, namely, securities financing transactions, and American and European regulators are committed to implementing that proposed regulation. Proposals in that direction, currently being implemented over the next couple of years, include more stringent reporting requirements for SFTs (securities financing transactions), restrictions on the reuse of collateral in repos (to slow down rehypothecation), standardization of "haircuts," which specifies higher collateral coverage to reduce counterparty risk in repos, and clarification of default procedures in SFT. The Fed has also negotiated a new set of clearing and settlement timelines in tripartite repos with JP Morgan and Bank of New York Mellon, the two central intermediaries in such transactions, to reduce intraday credit exposures arising from inefficiencies in the daily unwind of repo transactions; this had caused panicky pullback reactions on several occasions during the systemic crisis to devastating effect.

Boosting Market Resilience

Perhaps the most frightening aspect of the 2007/08 crisis was the fragility of various OTC markets, notably MBS and repos. These are not really markets in the sense that these latter assure broad access and price discovery. Financial markets organized as public exchanges (e.g., New York Stock Exchange) trade standardized

products, have publicly available information about prices and transactions, assure fair access, and oblige the exchanges themselves to provide third-party settlement guarantees. In contrast, OTC markets are webs of (often insider) networks tied together through intermediation chains. They consist of bilateral dealings in highly customized arrangements and are by their very nature opaque, with an added incentive to control crucial data, such as prices or bid spreads, to reap monopoly rents rooted in advantages from information asymmetry. OTC markets do not have centralized clearing and settlement mechanisms guaranteed by third parties, nor are they self-regulated like the public exchanges. Since they are based on trust among parties and confidence that conditions are propitious for promises to be kept, they are fragile when either disappears. And when there is confusion about valuing highly customized claims and associated promises now in doubt, pricing becomes difficult. But without reliable prices, trading disappears in a hurry. Having gone through such network disintegration on several occasions during the systemic crisis, regulators have decided to transform vulnerable networks by interjecting central counterparties (CCPs) as clearinghouses into bilateral dealings, thus providing a third party collecting information, settling transactions, and guaranteeing settlement. This new market structure targets in particular the OTC derivatives, such as CDS. The danger with such an arrangement is to concentrate systemic risk in the few CCPs, such as LCH.Clearnet or the Options Clearing Corporation, which will therefore need to be well capitalized and subject to effective regulatory oversight if not support. There is also the risk of market fragmentation if national or regional CCP frameworks differ too much, with first initiatives by the International Organization of Securities Commissions (IOSCO) toward transnational standardization of new CCP-based market structures having to proceed quite a bit further.

Another postcrisis focus on enhanced market resilience concerns credit rating agencies (CRAs), such as Moody's and Standard & Poor's. These have proven deeply flawed by underestimating risk in boom times and then reinforcing crises by

waves of downgrades. They have innate conflicts of interest if they are paid by those whose instruments they rate. The practice of rate shopping was widespread among issuers wanting top ratings for their securities issues. Yet, reliable ratings are crucial to the good functioning of financial markets and send important signals to market participants. All major reregulation efforts, such as Dodd-Frank, the FSB's guidelines, and directives by the European Union, have targeted CRA reform as a high priority. It is still early in the process, but we have already identified the contours of such a reform. There will need to be more transparency about the ratings process and disclosure of ratings, less reliance on CRAs in favor of pushing issuers to do their own internal ratings, and more information for investors to facilitate their due diligence, a different CRA remuneration system, rotation of CRAs, fostering a greater number of CRAs (perhaps even public ones) to break the current duopoly, and providing better guidance for rating of the more complex securities.

Structure Regulations

Postcrisis regulatory reform has even extended to structure regulations affecting the range of permissible activities and setting boundaries for banks and other financial institutions. These changes are likely the most heavily resisted but have the supposed advantage of clarity and simplicity—an especially attractive feature in light of the inherent complexity of the other regulatory innovations. Debates are shaped by the legacy of Glass-Steagall, a radical yet simple Depression-era structure regulation separating commercial banking and investment banking that seemed to have worked so well for decades. The nostalgia for Glass-Steagall is also fueled by a sober postcrisis assessment of an inherent contradiction in today's universal banks. Those do-it-all financial supermarkets use the deposit-taking and loan-making activities of commercial banking to fund all kinds of higher-risk activities of investment banking or fund management, including shadow banking. In that combined multifunctional structure of universal banks there is a money creation process at work that,

rather than being directed toward the real economy of production and exchange, remains within the confines of finance to boost its markets and institutions as carriers of asset bubbles. Commercial banking, including its elastic money creation process in response to the public's borrowing needs, is an activity with a strong public-good dimension and should be treated like a public utility backed by the government and also regulated by it. Commercial banking requires privileged access to the nation's payment system and government protection in case of failure. It should therefore not be used by banks to fund their other functions (e.g., investment banking) motivated by private gain. Therefore, it would be desirable to return to Glass-Steagall's principle of separating commercial banking from other, higher-risk functions of finance. Such renewed separation might arguably also address the moral-hazard problem posed by banks "too big to fail" to the extent that it obliges breakups of these giants into smaller units. Governments could then isolate the commercial banks for supervision and protection while leaving other, higher-risk financial institutions to fend for themselves so that they fully bear the risks in pursuit of their returns.[16]

Even though a return to Glass-Steagall was never truly in the cards, legislators in the United States and Europe still succeeded to introduce significant new structure regulations after 2010. Such regulatory extension first took shape with passage of Dodd-Frank, which included, as a last-minute insertion after a huge battle ending in legislative stalemate, the so-called Volcker Rule (named after Obama's key economic advisor and former Fed chair Paul Volcker). This rule restricted banks from engaging in proprietary trading for their own profit and from owning or sponsoring hedge funds as well as private equity funds. US banks have managed to weaken this rule by carving out large exceptions, notably trading on behalf of customers, hedging activities with which to reduce risks as well as underwriting and market-making activities, under the cover of which they still would be able to trade a lot on their own accounts. In the European Union the Liikanen Rule (named after Finnish central banker Erkki Liikanen who headed the High-Level Expert Group on Bank

Structural Reform) also bans proprietary trading by banks and restricts banks' relationships with hedge funds as well as private equity funds. In contrast to the Volcker Rule, the EU equivalent defines the scope of proprietary trading even more narrowly, with a greater number of exceptions (e.g., launching risky securitization, derivatives trading, money market trading for cash management purposes), and applies it only to the largest banks. But the EU gives itself the power to apply the Liikanen Rule to other related trading activities and more banks, if financial stability conditions warrant such extension. And the EU also allows national legislation to adopt tougher limits, as has already happened in France and Germany. It may also impose ring-fencing of banks' risky trading operations by putting them into a separately capitalized affiliate. Britain's Vickers Rule (named after Sir John Vickers who headed the Independent Commission on Banking) provides for ring-fencing of retail banking operations containing household and small-business deposits covered by government insurance. The problem here is that the deposit base of most leading British banks, with exception of HSBC, is smaller than their retail loan assets. The difference between the two will have to be bridged by covered bonds, which subordinate the claims of senior and unsecured creditors as well as uninsured depositors in case of failure. Now that EU regulators have opted for a bail-in approach imposing losses on creditors during resolutions of failed banks, this may become a complicating issue if Britain's banks become insolvent.

It is by no means clear whether any of these three rules can be implemented effectively. Separating activities through ring-fencing is difficult, and prohibited activities will have to be wound down even though they used to be crucially important for the bottom line of banks. There will also be a good deal of temptation to stretch exceptions to the maximum, and this will ultimately necessitate a new relationship of transparency and compromise between bankers and regulators. There are significant differences between the Volcker, Liikanen, and Vickers rules, which will oblige the transnational banks to restructure their operations differently in the United States, the European

Union, and the United Kingdom. And there will surely be regulatory arbitrage by banks steering their activities toward the least onerous regulatory framework. It is hard to say which of these structure regulations will be the toughest, especially since the Liikanen framework gives EU regulators much discretion to extend the rule and toughen its standards.

More generally speaking, the financial reregulation effort is a multiyear undertaking that has yet to be fully implemented. It is an incredibly elaborate affair, and it is a good question whether the complexity of modern-day banking is going to be made better by equally complex regulations. We simply do not know whether regulatory innovations, such as countercyclical capital buffers or resolution authority or macroprudential regulation, will work or not until they are tested by crisis. Regulatory agencies will have to work together much more closely, both within countries and between countries. This is an especially challenging task for central banks, such as the Fed or the European Central Bank, whose regulatory responsibilities have greatly increased in the aftermath of the crisis as they have to match monetary policy with financial stability as coequal objectives. The effort at finance reregulation has boosted global governance by upgrading the G-20, the FSB, and the BIS at a time when the traditional pillars of governance—the IMF, the World Bank, and the World Trade Organization—have all seen their standing eroded.

The global approach to financial reregulation is based on the same broad principles, but the devil is in the details. And there may be crucial differences in terms of how and when the new regulations are being put into effect in different regions; this again presents a great temptation for financial institutions to push through loopholes and exploit differences to their advantage. Apart from focusing on regulatory circumvention and/or regulatory arbitrage, leading financial institutions also bring to bear considerable political influence and lobbying power aimed at rolling back regulatory restrictions. In terms of lobbying expenditures, the banking sector has consistently spent more than any other sector in the United States. Banks have a strong institutional presence in Washington through such

advocacy groups as the Financial Services Roundtable and aim for global representation through their trade group known as the Institute for International Finance. The technical complexity of financial regulations obliges lawmakers and regulators to consult regularly with bankers, and the two sides meet often. Implementation of specific rules provided for by Dodd-Frank, the European Commission's directives, and Basel III has repeatedly been slowed by furious lobbying efforts to water down proposed regulations. And in a famous incident, a budget deal in December 2014 to avert a government shutdown, the banks sneaked in a provision (written by Citigroup) to repeal Dodd-Frank's so-called push-out rule that had cut off their trading in complex derivatives from funding by insured deposits and other "too-big-to-fail" subsidies from the government.

But that victory notwithstanding, the finance lobby has also its limits. It is often weakened by internal divisions (e.g., between large banks and smaller community banks). And it faces growing opposition from other stakeholders getting better organized, as exemplified by Americans for Financial Reform or Europe's Finance Watch. Banks must also contend with public anger at their role in the crisis, which politicians might want to take into account when passing reregulation legislation. As European leaders have shown with recent passage of the European Banking Union, regulators can impose tough new rules and constraints on banks when acting together and mobilizing political support (as Senator Elizabeth Warren did when pushing successfully for inclusion of the Consumer Financial Protection Bureau in Dodd-Frank). The reregulation battle is not yet over, and crucial rules are yet to be finalized.

What we can safely assume, however, is that banks have already been saddled with considerable compliance costs and now face a significant number of new constraints on their freedom of action. They will surely experience lower returns on equity and be forced to retreat on several (geographic and activity) fronts. The global do-it-all universal-banking model of yesteryear may nowadays no longer be viable across the board, and many of the world's leading banks have begun to restructure accordingly.

Ultimately, finance has only a few truly global dimensions, such as currency trading or providing services for its largest corporate clients as they organize themselves into global production networks. Other financial service activities can be organized in geographically more selective fashion, and there will be many niche players as banks pull back to their core competencies. They will be pressured to do so not just because of the new capital, liquidity, and leverage requirements they face and by compliance pressure from their regulators, but also by shareholders getting frustrated with the "new normal" of lower returns and pushing bank managers to focus on more lucrative venues. As banks retrench, they will leave space for other institutions to fill the vacuum as we can see already with hedge funds increasing their corporate lending activity. And we have yet to see how shadow banking evolves in the face of all these new regulatory constraints whose circumvention is after all what shadow banks are about. This gets us to the broader question as to what the future of finance could or should be all about.

CHAPTER 8

The New Face of Finance

Having gone through a systemic crisis, finance-led capitalism is at a threshold—and with it the future of global markets. Even though critics on the political Left complain that the crisis has rendered finance even more concentrated and reregulation has left its basic structure intact, much has changed since those fateful days of 2008. Transnational banks, the stalwarts of global finance, are still bearing the wounds of this traumatic period. Weakened by heavy losses, these banks are now dealing with a huge regulatory remake while trying to pass stress tests and cope with destroyed reputations. The banks are on the defense and in retreat, trying to figure out the right kind of product mix that can pass muster with impatient shareholders and more watchful regulators. This leaves an opening for smaller, more nimble institutions taking away market share from traditional banks whose do-it-all strategy had turned them into dysfunctional conglomerates long ago. But the gradual decline of universal banking, evidenced by the postcrisis retreat of so many once-leading banks, poses a question that may even contain a momentous opportunity: what is to become of finance-led capitalism and how can we harness the undeniable power of finance for better uses? It is time to identify already ongoing trends as to how finance will likely evolve in the

medium term before taking the longer view of its proper role in a newly configured capitalism.

A Difficult Transition Period

To begin with, let us acknowledge that not all banks are the same. There are many different types of banks. The majority of banks in the world consists of small, local banks confined in their offerings to the traditional services of taking deposits, making loans, and providing customers access to payment services. These community banks do as well as their communities, and their contribution to the local economy, while vital, is not intrinsically problematic. Then we have regional banks, larger and more diversified in their service offerings, but still essentially confined in their geographic reach while obviously significant for the overall well-being of the regions in which they operate. Their reach may even stretch across several neighboring countries and help those integrate economically, as is the case, for instance, with Austria's Raiffeisen Bank's important presence in Eastern Europe and Russia. Then we have a third group of banks, often nationally dominant but controlled by the state and used for its economic development strategies. A good example of that group would be the Brazilian Development Bank (BNDES), the China Development Bank, or America's Fannie Mae and Freddie Mac. However, here we want to focus on a fourth group of banks, those that operate globally and offer a very large range of financial services.

This latter group, comprising about 150 globally organized universal banks, exercises an extraordinary degree of ownership control over the world's productive resources and mobilizes the global web of cross-border capital flows. Its members are both the power center of key national economies and the engine driving globalization. The domestic influence, strategic importance, and global reach of those 150 supersized transnational banks (TNBs) constitute a true power center in the global economy.[1] While only about 40 of those banks have so far been classified as global systemically important financial institutions, there are

an additional 300 or so banks, mutual funds, hedge funds, and insurers across the world, whose importance warrants international attention by policy makers and regulators because of their crucial impact on strategically important regions. Those 450 leading banks and nonbank financial institutions (e.g., insurers AIG or AXA) constitute the heart of finance-led capitalism, which is why we are especially interested in them as a group. Collectively they caused the global crisis of 2007–08, were almost destroyed by that disaster, and were bailed out at great expense by their respective governments. Finally, these organizations' painful restructuring impacted greatly on the slow and uneven pace of worldwide recovery.

Today, this powerful group of financial institutions is still facing many challenges. One is having had to carry so many toxic assets for so long on their books, partly because there was no market for them to unload and partly because recognizing losses tied to those impaired assets had to be stretched out lest such loss recognition wiped out the institutions' capital. Central banks, starting with the Fed, helped banks get rid of toxic assets, often in swaps with higher-quality Treasuries and agency securities or by allowing their use as collateral as if they were still fully performing. A second postcrisis challenge arose from reputational and legal risks the banks had to bear first amid public anger at the costly rescues of irresponsible bankers, then in the wake of highly publicized parliamentary investigations of their reckless behavior in the run-up to the crisis, and finally in the face of postcrisis pursuit by regulators uncovering scandals. Whether those scandals involved cartel-like market manipulation (as when setting the key LIBOR rate or closing prices for exchange rates) or incidences of criminal behavior (e.g., UBS' tax evasion case, BNP Paribas' circumvention of sanctions), they all led to heavy penalties and made the banks look really bad. Finally, the banks have had to deal with a massive increase in regulatory compliance burden thanks to far-reaching reregulation efforts, which are in many instances still nowhere near completion.

As if these challenges were not already quite overwhelming, the world's leading banks have also had to adjust their operations

amid lasting damage to many of their funding pillars and/or once-profitable investment outlets. Even though the Fed's repeated bouts of quantitative easing pushed long-term interest rates lower and so boosted securities prices, trading volume has remained below precrisis levels for key loan securitization instruments, which were hit by a collapse in confidence during the crisis and have not fully recovered since. According to data from bond dealer PIMCO, the market for nonagency MBS (not backed by the government), which amounted to $2.1 trillion at the peak of the housing bubble in late 2006, had shrunk to $830 billion in late 2013, and 93 percent of this were still rated below investment grade and hence off-limits for most fixed income funds. New issues of nonagency MBS have remained below $1 billion per month in the United States, a fraction of what banks issued at the peak. Luckily, Fannie Mae and Freddie Mac, more able to withstand losses and face risks after the government's takeover in July 2008, have remained strongly engaged in backing the issue of agency MBS and so kept the bank supply of mortgage loans fairly steady to help the US housing recovery along. Still, SIFMA (Securities Industry and Financial Markets Association) data tracking trading volumes concerning agency MBS have shown a decline in daily transactions volumes from $345 billion in 2007 to $162 billion in June 2014, a market shrinkage by more than half.[2] Even more spectacular has been the collapse of asset-backed commercial paper (ABCP), once a crucial funding conduit for shadow banks vested in MBS and hit by a huge panic in August 2007 from which this instrument has not recovered. The volume of outstanding ABCP has fallen from a July 2007 peak of $1215 billion to its current (March 2015) level of just $220 billion. Yet another crucial precrisis funding mechanism of the shadow banking system, repurchasing agreements (repos), shrank from an average market volume of $7.02 trillion daily outstanding in the first quarter of 2008 to $4.6 trillion in August 2014. Similar signs of crisis-induced erosion can be found with money market funds, CDS, community bank lending, and so forth. The crisis, systemic as it was, has left deep wounds that have healed only very slowly.

A major reason for slowing the recovery of several strategic financial instruments has been unprecedented central bank intervention affecting those markets. Huge bond purchase programs, known as quantitative easing, were launched in sustained fashion by the Fed, the Bank of England, and more recently also by the European Central Bank and the Bank of Japan. Ostensibly designed to move central banks beyond the zero lower bound as they confront recession-induced deflation threats, this unorthodox monetary policy has lowered long-term rates and boosted the prices of traditional securities.[3] It has also flooded the banking system with large increases in reserves to push liquidity injections through the clogged plumbing system of financial intermediation and so avoid turning the necessary postcrisis deleveraging into a debt deflation spiral. That battle is still under way, and it has led to curious market distortions, starting with the fact that we now have actually negative nominal interest rates for bank reserves, short-term Treasury bills, and refinancing facilities in a number of countries. With interest rates compressed for years between zero and 1.5 percent across half of their yield curve's term structure (with maturities ranging from one week to five years), the banks' interest rate spreads have become much smaller. Their search for higher-risk, higher-yield alternatives has been held back by still widespread risk aversion in the aftermath of a traumatic crisis and has also been checked by new regulations. It has not helped that the gigantic securities purchases by central banks have created an intense shortage of market liquidity, which has deprived banks of the collateral for rapid leveraging of their operations, a capacity they used to have when launching asset bubbles before the crisis.

The world's leading universal banks are for the most part seriously squeezed by the fallout damage from the systemic crisis and the implementation of new regulatory constraints. They have to get used to a "new normal" of significantly lower returns on assets and equity, averaging typically only half of precrisis levels. New regulations and frustrated shareholders are putting a lot of pressure on those wounded giants to retrench. Global retail banking leaders, such as Citibank, HSBC, Barclays, and

Royal Bank of Scotland (RBS), have all recently abandoned consumer banking in over a dozen countries each. Swiss banks UBS and Credit Suisse have sharply scaled back their worldwide investment banking operations to focus on wealth management. Investment banking activity has also been cut back by BNP Paribas, Barclays, and RBS. And the list goes on.[4] The new regulatory framework put into place makes sure that the world's leading banks will have to take a more focused look at their structure, activities, and geographic expansion for years to come. Their retreat from less-profitable areas will leave more space for others to fill the vacuum, notably banks from emerging market economies embarking on their own internationalization strategies (e.g., China's ICBC or Saudi Arabia's National Commercial Bank) or hedge funds turning into corporate lenders.

Emerging market banks will not be the only new players on the global scene. The retreat of the world's leading banks is not a passing affair and more than just a necessary postcrisis adjustment. There is growing recognition that the universal banking model on a global scale has failed and will no longer be allowed to thrive within the new regulatory framework currently put into place. Tougher capital requirements and leverage limits will combine with constraints on shadow banking to deprive banks of debt-fueled and bubble-driven expansion opportunities. This leaves space for a lot of new players to emerge and fill the vacuum created by the retreat of universal banks. Many of those will be niche players, and much of their market entry will occur on the Internet. Financial services have already moved massively online and will continue to do so even more in the near future. There is now considerable innovation in cyberspace providing all kinds of financial services in new ways, especially via smartphones and through apps.

Alternative Finance Online

One model to emerge is that of banks that are fully online, such as Ally Financial, which save themselves the trouble and cost of maintaining physical branches. It remains to be seen whether

the cost savings from operating just on the Internet will translate into more competitive offers on deposit and loan rates. Good examples illustrating this trend are Ally Financial in the United States and mBank in Poland, a country where online banking has taken off due to the vacuum left behind by an entirely antiquated banking structure failing to make a timely transition from its Communist roots. Depending on how savvy Internet banks are in communicating with clients online, they can reach a potentially very large base of mostly young customers who are traditionally underserved when it comes to accessing financial services. Traditional banks will have to follow suit if they want to capture the next generation, but it is not clear whether bankers have the wherewithal to muster a convincing online presence. A closer look at how the leading banks have gone about expanding onto the Internet reveals that their websites are uniformly bulky, boring, complicated, and inclined to look at online financial services in piecemeal fashion. Traditional banking has yet to come up with winning online strategies. This is an important challenge to overcome, since online banking offers customers significant advantages in terms of convenience (e.g., no waiting in lines), availability of information, and innovation.

Electronic Wallets

As banking services move more and more into cyberspace, the technological transformation in the provision of financial services threatens the market dominance of traditional financial institutions. Tech firms and e-commerce firms can now offer new online versions of those services to the extent that these become essentially dependent on proprietary communication and information processing technologies. This evolution is already taking root in the area of payment services, especially with regard to "electronic wallets" you can carry around on your device for online fund transfers. This development started with PayPal in 1998, which 15 years later has over 150 million users moving $145 billion in 190 countries and among 25 different currencies. While PayPal connects payers and payees via bank accounts or

through credit cards, it also allows customers to hold funds in PayPal accounts or tap online revolving lines of credit. PayPal's success and major technological advances boosting the speed of the Internet and access to it have since spawned a rapidly accelerating number of online-payment systems. PayPal itself has helped promote Venmo, a popular mobile payment app for sending money from person to person on the Internet. Venmo does not charge its users anything for payments, but earns revenues from the small fees it charges businesses accepting its service. Now the big players are getting involved in offering various payment services. Google offers Google Wallet, Apple has Apple Pay, Chinese Internet leader Alibaba uses Alipay (which processed an amazing $519 billion in payments in 2013 alone), and so on.[5]

Rapid advances in near field communication (NFC) technology make smartphones much more interactive with each other and more easily connected to other NFC devices, such as readers. In the not-so-distant future it will be globally normal practice for people to use their mobile devices for fund transfers, thereby grabbing a lot of business from banks. Such mobile payment services will reinforce a crucial development in the modus operandi of contemporary capitalism, the ability to design, write, and sell all kinds of applications that dramatically enhance the functionality of handheld computerized devices. This app revolution is giving rise to what Germans have termed *Plattform Kapitalismus* (platform capitalism) which has already spawned such phenomenal overnight success stories as the on-call taxi service Uber and promises to transform the world of work by matching freelance workers with jobs on demand. Integrating fund transfers into this online world of app-based services will surely make the transformative power of those services that much stronger.[6] It is at this point that we will be able to consider this dramatic extension of e-commerce as the vector of a new accumulation regime in the sense of the French Regulationists. But will *Plattform Kapitalismus* replace finance-led capitalism? That depends not least on the extent to which the world's leading Internet firms—Google, Apple, Alibaba—and/or smaller mobile niche players crowd out banks as finance becomes an app.

Peer-to-Peer Lending

There are many indications that this may indeed be in store. We have not only seen a proliferation of mobile payment services, but also the penetration of other financial services online. One good example is peer-to-peer lending (P2PL) on websites combining lending platforms and tools for checking credit that bypass banks and other traditional lenders (e.g., finance companies), such as Prosper or Lending Club, both of which together have processed 180,000 loans worth $2 billion since their inception in 2006. There has been considerable expansion of P2PL platforms in the wake of the crisis, as banks and other traditional lenders cut back their loan portfolios. Bringing together investors and borrowers, the platforms can offer loans faster and more cheaply than the bureaucracy-heavy banks whose administrative costs are much higher. Peer-to-peer lenders have also proven innovative in terms of assessing the creditworthiness of the individuals and small businesses to whom they lend. Rather than relying on the credit scores reported by credit bureaus as the banks do, they use insights from behavioral finance to design questionnaires aimed at revealing personality traits of applicants through subtle questions for which there are no obvious right answers and which often involve a choice of pictures. These psychometric tests are designed to evaluate the credit risk with regard to borrowers with no credit history and are thus also widely used in microfinance schemes. P2PL platforms pass on interest income from the borrowers to the investors, but they ask both groups to pay fees for access to their platform as their primary revenue stream. Larger financial institutions, such as the world's leading asset manager BlackRock or new investment management company Blue Elephant Capital Management, have become attracted to the relatively high returns of P2PL and have invested in the leading American and British providers.

Invoice Trading

An illustrative example of the burgeoning alternative finance arrangements emerging online is Aztec Money, which provides

export trade financing in lieu of the more traditional channels of invoice factoring, bank loans, or lines of credit. In the wake of the 2007/08 crisis, banks cut back their funding support for the exports of emerging market economies and their companies playing a critical role in global supply chains. Aztec Money has filled that vacuum by providing a marketplace for firms to sell their accounts receivable in auctions to the highest bidders. Neither side pays a fee if there is no sale, but Aztec Money charges 2 percent on completed transactions.

Crowdfunding

One of the more remarkable developments in alternative online finance since 2012 has been the takeoff of crowdfunding platforms, driven by such newcomers as Kickstarter, Microventures, or SeedInvest. Initiators of projects, which may be a new service, product, or cause, seek to raise monetary contributions from individuals or groups online via platforms specializing in this type of venture capital intermediation. Its breakneck expansion over the past few years has seen over a thousand crowdfunding platforms emerge globally; according to financial trends research firm Tabb Group, these platforms will have funded $17 billion in projects in 2015 alone. That growth has come while banks have severely cut back their loans to small businesses (from $711 billion in 2007 to just $482 billion in 2013 in the United States). Obama's JOBS (Jumpstart Our Business Startups) Act, passed with bipartisan support in 2012, has greatly boosted crowdfunding by increasing the number of shareholders allowed before obliging a company to register its common stock with the SEC. The act also removed restrictions on private placements of securities, thus facilitating broader marketing of such private placements, and expanded the scope of emerging growth companies subject to greater regulatory relief. The growth of crowdfunding in the wake of the JOBS Act has been dazzling even though the SEC has yet to publish the law's required new regulations for equity crowdfunding, which would take away the funding of new and emerging businesses from Wall Street and

put it into the hands of the general public through an entirely new class of capital formation. The currently leading platforms, such as Kickstarter, practice reward-based crowdfunding where most of the time the entrepreneurial firm sets a fundraising goal and keeps none of the funds unless that goal is met. Equity crowdfunding, when it finally takes off in 2016 in the wake of the SEC's hotly anticipated new regulations, will greatly expand the pool of small investors by drawing in those who actually want to become an active part of the entrepreneurial experiment they are asked to fund.

Digital Currencies

The most far-reaching manifestation of alternative finance arrangements emerging online are undoubtedly digital currencies that carry the potential to replace traditional money forms. Rather than being a centralized electronic money system using existing official currency such as PayPal, those alternatives would more likely be cryptocurrencies featuring decentralized control and using their own public ledger for recording transactions.[7] The most important example of such a cryptocurrency challenging established government-managed money has been bitcoin. Launched in 2009 as a stand-alone online payment system by the pseudonymous Satoshi Nakamoto (nobody knows who that is!), bitcoin is a decentralized digital currency operating in a peer-to-peer network whose total market capitalization peaked in November 2013 in excess of $10 billion. One of its unique features, especially dear to libertarians on the political right who are typically worried about the inflationary biases of fiat money issued at will by what they consider to be intrinsically irresponsible governments, is that bitcoin's total supply has been fixed in advance by its founder(s) to a limit of 21 million bitcoins.

The fixed supply limit has been a dominant feature of bitcoin, with several important consequences. One has been extreme price volatility concerning bitcoin's dollar value, subject to the interaction of demand and supply as befits a private commodity. Its limited supply, reinforced by very complicated and

time-consuming rules pertaining to its issue (see below), has at times been met with frenzied demand. This demand in turn has given rise to speculative bubbles driving the trading value of bitcoin at one point over $1,100 per coin in November 2013. Since then bitcoin's purchasing power has declined precipitously to an exchange rate of about $250 (April 2015) in the wake of several events damaging its reputation. The volatility of bitcoin's exchange rate, having already gone through several major up-and-down cycles, is ultimately an impediment to its spread, since it creates significant uncertainty, which undermines its capacity to serve as store of value and imposes possibly major losses on its users. Future digital currencies will need to exhibit greater stability.

What is most fascinating about bitcoin pertains to the modalities of its issue and utilization. New coins are issued in response to solving algorithmic puzzles that have a built-in tendency to become ever more difficult. This challenge has given rise to much software development specifically aimed at those puzzles. More important, the puzzle-linked issue of bitcoin units has created a large community of computer-savvy followers, known as miners, who engage in finding the cryptographic solutions demanded in order to earn bitcoin as reward. Facing increasingly difficult problems, the miners pool their resources and share the reward of new bitcoin units gained in proportion to their effort. This process of collective discovery is directly tied to the payment system of bitcoin inasmuch as the successful puzzle solutions of the miners expand the block chain that records bitcoin transactions as a public ledger accessible to all for verification. So the miners themselves as a group make bitcoin's payment system both more secure and better, since their solutions to the algorithmic puzzles impact directly on improving the payments and the infrastructure of transaction processing that supports the digital currency's circulation online. Yet at the same time, and this is a major contradiction facing this particular version of a cryptocurrency, bitcoin's attraction of highly capable computer specialists has also made it vulnerable to hacker attacks, online theft, and criminal elements using its highly secured network

for their own illicit purposes such as money laundering or drug dealing.[8]

During its spectacular takeoff period bitcoin found growing acceptance among online companies, including such large firms as Amazon, CVS, Expedia, Overstock, PayPal, Target, and Zynga as well as local businesses worldwide. It rapidly gained a reputation for carrying much lower transaction costs than credit card usage online (where merchants have to pay up to 3 percent in fees) and for being safer as well as faster than traditional cash transfers routed through banks. Within three years the number of bitcoin transactions grew to over a hundred thousand per day. Its successful launch spawned a whole infrastructure of bitcoin-based service providers, notably software developers, currency exchanges, and online marketplaces. But then, in late 2013, just when bitcoin became a talking point of the mainstream media, its fortunes suddenly changed for the worse. The cause was a combination of government restraints—starting with a ban by the People's Bank of China in December 2013—and operational scandals, such as the US government's seizure of online black market Silk Road in October 2013 followed by the messy collapse of the world's largest bitcoin exchange Mt. Gox in February 2014. Ever since then bitcoin has seen sharp declines in its value, which put pressure on its users and caused large losses across its network. While this cryptocurrency experiment may eventually run its course, it has paved the way for other cybercash variants and provided useful technology, notably the bitcoin wallets or the public ledger technology behind the block chain, which has many other potentially useful applications.[9]

Bitcoin has also raised the question of how financial regulators should deal with the emergence of alternative finance experiments online. As an alternative to the traditional payment system it has obviously become an object of heightened attention among central bankers and regulatory agencies. There is first of all the still unsettled question how bitcoin should be classified, whether as a virtual currency (United States), as property (Australia), or as a commodity (Finland). Then there is the problem of whether and how best to regulate bitcoin exchanges,

especially in terms of their compliance with rules against money laundering and terrorist finance. Finally, regulators will have to decide in what fashion to allow banks to get involved in bitcoin-based transactions; so far most countries are following China's example of prohibiting such engagements. These regulatory challenges posed by bitcoin apply more broadly to potentially all new alternative finance arrangements, most still in the early stages of their existence where the authorities take a wait-and-see attitude to gather more information and allow more debate before deciding what approach to take. They also need to get a better sense of how these new alternatives to traditional finance behave when operating on a larger scale and in what way they disrupt established practices. In the meantime it is quite clear that regulators all over the world view this new face of finance with a great deal of ambiguity and do not yet have a consensus as to their preferred responses and watch each other's reactions to get a better clue.

Finance as Progressive Force

In 2012 Robert Shiller tried to counter the damaged reputation of bankers by pointing to the possibly progressive role and often positive contribution of finance in making our society a better place.[10] The Nobel Prize winner, who made his fame as an early critic of the efficient market hypothesis (EMH) underpinning much financial innovation and as a Cassandra-like voice warning of the fallout of asset bubbles, argues here that the practitioners of finance (e.g., investment bankers, asset managers) have always been stewards of society's assets. Such crucial financial innovations as insurance, pensions, savings accounts, or mortgages have made society a better place by helping us increase our assets, manage them better, and protect them against devaluation or destruction. In his opinion, finance is a very powerful force for the good of society and needs to have that potential restored. This can be done by unleashing more, rather than less, financial innovation, provided that it results in positive contributions to tackling society's problems and making the economy grow

better. In this context Shiller mentions housing price futures, which would protect young couples in need of larger houses to accommodate a growing family against being priced out of a booming real estate market and older couples becoming empty nesters against a capital loss from lower housing prices when facing downsizing. He also wants preplanned workouts, which would allow homeowners to reduce debt servicing charges on their mortgages when housing prices fall or the economy tanks. In the same vein, he calls for fixed payment bonds to be replaced by governments issuing shares in their economy, which would pay the shareholders dividends in proportion to the economy's performance.

Shiller's point is important inasmuch as we now have the opportunity to restore the progressive role of finance in advancing societal wellbeing. We have a rich history in that regard. In the nineteenth century mutual savings banks, owned by their members, pooled funds to provide workers a safe place to save and grant them loans for access to low-income housing. Credit unions offer their members, who own and democratically control these nonprofit institutions, attractive savings outlets and low-cost credit while supporting community development. More recently we have seen the emergence of socially responsible mutual funds investing expressly in firms making societally beneficial contributions in terms of their transparent corporate governance standards, stakeholder-inclusive community relations, environmental standards, or fair workplace practices. And then there is microfinance, introduced in the 1970s by Nobel Prize winner Mohammad Yunus with the launch of his Grameen Bank in Bangladesh. Typically using a group-based model whose members share joint liability, microfinance schemes now offer 150 million low-income households across the world access to financial services (e.g., money transfers) and small loans they otherwise would not have access to. This type of support package, targeting areas traditional banks shun, often helps fund entrepreneurial activity designed to lift microcredit users out of abject poverty.

It is not difficult to imagine how new progressive finance arrangements might thrive when operating on the Internet.

Their online presence would facilitate formation of cooperative networks or empowering members to exercise democratic control over their mutual institutions. The Internet has the socio-technological potential to become the primary vector of a new type of bottom-up politics for a civil society befitting the twenty-first century. Once it sets aside pure profit motive, crowdfunding in particular may easily spawn various new, not-for-profit services of benefit to investors and borrowers alike. It might then become the funding stream for all kinds of socially useful projects, such as community investment in improved schools or health centers, online commons bringing stakeholders together to design urban sustainability projects in blighted neighborhoods, or decentralized creation and distribution of renewable energy sources.

In that regard it would be useful to complement existing accounting rules with a new accounting system based on social values, one that is designed to internalize externalities by valuing social costs and benefits explicitly and so change the incentive structure of market-based transactions. If social-value accountants and investors managed to calculate those externalities in a reasonably reliable fashion around a broad societal consensus about the worth of mutually shared benefits or costs, they could change business models dramatically by assessing the avoidance of future negative externalities. For example, such an accounting system could factor in costs of cutting back carbon emissions in the fight against climate change as equivalent to a positive revenue stream of which the service or technology provider(s) should get a deserved share. Socially responsible businesses could then make a profit as a function of, and in proportion to, the social benefit that their service or technology offers the community they serve, and this must be extended to the avoidance of social costs. Such radical rethinking of profit and accounting might be necessary for the scale of investment we will need to wage an effective struggle against climate change. Finance can be extremely useful in this transition. If we can find a way not just to value social costs and benefits but also monetize these flows, then we can create a whole new generation of financial

products for the implementation of socially beneficial projects and in support of socially responsible businesses. This may have the added benefit of moving us away from a capitalism dominated by shareholders, as in finance-led capitalism, and open the way for a stakeholder-implicated and more socially oriented type of capitalism that combines public and private interests in its accounting.

Finance is a very powerful force in any cash flow economy where we have to spend now in order to get more later. And it can be a force for the good, provided we as a society are willing to push it in that direction. We shall soon face all kinds of difficult challenges the resolution of which will be made much easier with the support of the right kind of financial arrangements and instruments. For instance, wage insurance would make the work force more mobile, the labor market more flexible, and human capital more accessible for workers, especially if their wage insurance pool gets funding help from employers and governments alike. Nonprofit credit unions and microfinance schemes could help immigrants integrate more rapidly, thus preparing us better for the inevitably large migrations we will face in the wake of environmental catastrophe and failed states ripped apart by political turmoil. Tax-sheltered or subsidized savings accounts, in which government injects tax benefits or direct subsidy funds whenever the private parties add to their savings, may be a highly effective vehicle to finance access to higher education, adult schooling, or worker retraining, as would be low-interest loans with flexible debt servicing schedules tied proportionally to the borrower's future earnings. Debtors should also be able to pay back in monetized labor time or get better repayment terms when opting for socially useful careers. Facing the challenges posed by climate change, we will need to direct a lot of resources toward retrofitting cities, protecting coasts from rising sea levels, dealing with extreme weather events, and changing our energy mix away from fossil fuels. All this will be expensive. We urgently need to come up with new financing tools to help us fund these massive investments, such as weather futures as hedge against losses from meteorological catastrophes or revenue

bonds yielding investors income generated by the cost savings or revenue enhancements from climate change projects.

Global Coordination Challenges

The above list of possibly useful financial innovations is far from exhaustive. What those examples have in common is that they are dealing with global issues. The idea of wage insurance would address worldwide labor market trends comprising inadequate unemployment compensation systems, casualization of the labor force into independent contractors, increased job turnover, difficult insertion of youth into the labor market, and the need for continuous retraining among adult workers. Climate change and migrations are obviously global challenges by their very supranational nature. Hence, we need to anticipate that much of the future innovation activity in finance will have to pass through the international monetary system. And there we have to contend with a potential problem of monetary fragmentation, which will make global solutions more difficult to implement in a coordinated fashion.

Our international monetary system is under a great deal of stress. Since the crisis of 2007/08 leading central banks have dramatically expanded their balance sheets, often tripling or quadrupling their precrisis size. They have done so by taking damaged portions of their domestic banking systems onto their books (e.g., Fed purchases of MBS) and buying up huge quantities of government bonds in their respective quantitative easing programs. The trend started already well before the crisis with the Bank of Japan in the face of stubborn decade-long deflation. The country's expansionary monetary policy worked for Japan to the extent that it pushed the yen's exchange rates down. But a depreciating yen, promoting export-led recovery, slowed advanced economies elsewhere by making their currencies more expensive. When the Fed started its own balance sheet expansion in the immediate aftermath of the crisis, it helped the US economy improve its trade deficit at the expense of the European Union whose euro appreciated strongly against the dollar. Facing

then its own crisis, the European Central Bank's recent launch of quantitative easing led to a spectacular euro depreciation that in turn has now slowed the US economy. The consecutive depreciations of the yen, dollar, and then euro have undermined the export-led growth of emerging market economies whose currencies are simply too high. One region's recovery via the currency lever spills over to other regions finding themselves squeezed as their monies become less competitive. As all try to depreciate their way out of stagnation, they risk making global deflation pressures worse. We thus live in what Martin Wolf has called a "managed depression."[11]

It is not clear how this new type of currency-mediated protectionism will in the end alter the relative position of key currencies in the system's monetary pyramid. The dollar may well retain its current dominant position for many years to come, principally because of the built-in weakness of its principal challengers. But the EU, still in a state of profound and acute crisis, may gradually undertake the kinds of reforms—banking union, abandonment of its current fiscal austerity stance in favor of fiscal federalism allowing large-scale transfers from rich to poorer regions, issue and monetization of EU-wide bonds complementing or substituting sovereign bonds of its member nations—that render the euro a worthy and more credible challenger. And China's accelerating efforts at internationalizing its still largely inconvertible currency, relying on a three-pronged strategy of making the renmimbi more widely used in international transactions, pushing the global expansion of its leading banks, and setting up new multilateral institutions (e.g., the BRICS Bank, Silk Road Fund, Asian Infrastructure Investment Bank), will at some point create a new challenger to the dollar's world-money dominance.

We may then in the not-so-distant future face a bipolar (dollar, renmimbi) or tripolar (dollar, euro, renmimbi) system of currency blocs, each centered on a powerful economy—United States, Germany, China—using its currency to cement a zone of influence it dominates. If these blocs let market forces alone decide their relative position, the bipolar or tripolar system will

exhibit a great deal of volatility in terms of currency prices and reversible capital flows. Under such conditions the blocs relate to each other in adversarial and competing fashion, making monetary protectionism the preponderant bias of the system. We thus end up with a strong deflationary bias in the world economy, which suffers from a more or less continuous inadequacy of demand and so cannot sustain sufficiently high growth rates across the board. We need a better international monetary system than the bipolar or tripolar market-driven system we are currently facing.

One way to avoid such a dangerous outcome is to go back to the target zone proposal of John Williamson.[12] His idea was to set up a new system of exchange rate targets among the key currencies, at calculable levels corresponding to what he termed "fundamental equilibrium exchange rates" (FEER) This notion of FEER, preferable to the traditional equilibrium concepts of purchasing power parity or interest parity, applies to an effective exchange rate against a basket of that country's major trading partners that would maintain a country's internal balance (with a GDP gap close to full employment) and external balance (with balance of payments imbalances below 3 percent of GDP). Williamson proposed to let exchange rates fluctuate within a certain band of, say, plus or minus 10 percent from the target level set by the central banks. Only if and when the actual currency price threatened to push through the floor or ceiling of that band in consistent fashion would the central banks have to intervene in coordinated fashion. The dual advantage of such target zones would be to reduce currency price volatility and foster needed cooperation among participating central banks.

Williamson's proposal was made in the mid-1980s when the world's leading powers actually tried out his idea, first in the Plaza Agreement of October 1985 aiming for an orderly dollar devaluation and then in the Louvre Accord of February 1987 setting and maintaining target zones among the seven leading currencies. In that period central banks intervened repeatedly to defend the target rates they had agreed to secretly, by intervening

together in foreign exchange markets or coordinating simultaneous interest rate changes. But such limited central bank coordination did not suffice to counter large-volume market flows, and that target zone experiment ultimately fell apart after the stock market crash of October 1987 when the governments concerned could not agree to the modalities of a deeper level of policy coordination.

What would be needed for such a target zone arrangement to work is to go beyond simultaneous foreign exchange interventions and interest rate adjustments of central banks and employ the full battery of economic policy tools, notably fiscal policy and even industrial policy, to affect needed changes in the private sector balance (between savings and investments), public sector balance (between tax revenues and government expenditures), and/or external balance (between imports and exports). Such sectoral rebalancing was necessary then especially in the face of America's large twin deficits, and it is needed even more now to address the global problem of inadequate aggregate demand. All three bloc leaders could do their part simultaneously to correct specific imbalances and boost demand in the process. The United States, for instance, has an urgent need for a massive public infrastructure investment program to upgrade its aging transportation, communication, and energy distribution systems. Germany should abandon its counterproductive mercantilism to reduce its trade surpluses and at the same time allow the EU's restrictive budget pact (with national budget deficits to be kept below 3 percent of GDP) be set aside temporarily, if not altogether relaxed. China needs to get its personal savings rate down and boost household spending, something most easily accomplished by encouraging easier access to consumer credit. How do you get each of these powers to undertake such (often politically difficult) rebalancing measures in the interest of boosting global demand? And how do you make sure that they undertake these initiatives simultaneously so as not to destabilize exchange rates too much? All this requires an effective multilateral coordination mechanism, not an easy feat in light of severely hampered global governance.[13]

It is best to build such coordination into the modus operandi of the international monetary system. And this can be done without too much technical difficulty by upgrading the special drawing rights (SDR) issued by the IMF. As of now, the SDR operate in very limited fashion. With each IMF member receiving its SDR allocation, they count as official reserves that can be transferred between countries for settlement of official payment obligations. SDR represent a basket of key currencies, with the dollar and the euro each given a weight of 40 percent and the pound sterling as well as the yen splitting the remaining 20 percent. Any SDR holder has the right to draw on the currencies in the basket, and these therefore need to be available to back the SDR. Right now the basket currencies are issued by official budgetary approval procedures, and this has basically allowed the US Congress to keep new issues of SDR to an absolute minimum. It might be possible to allow creation ex nihilo of currency reserves underpinning the SDR basket by central banks, a fairly simple modification that would greatly facilitate creation of new SDR and hence promote much wider application of this supranational form of money.

Such a move envisions SDR to carry out all the (public and private) functions of international money and so stabilize an otherwise volatile, market-driven, centrifugal system of competing key currencies. Take, for instance, the use of SDR as unit of account with which to price global commodities such as oil. A weighted average, the SDR's own value fluctuates a lot less than that of each of its components, which makes commodity prices inherently less unstable if denominated in SDR units. The same logic applies to lessening interest rate volatility when international bonds get denominated in SDR. At the core of such a system centering on SDR should be international policy coordination, under the auspices of the IMF, among the countries represented in the SDR's currency basket. This coordination should go beyond setting interest rates or exchange rates and should include identification of sectoral imbalances, counteracting policy responses, and time horizons for their implementation. Basket members can come up with their own specific measures,

but they have to agree to the overall rebalancing objectives, provided those are accurately assessed. Such a system would be considerably more stable than the current noncooperative system.

We might conceivably push the SDR's role all the way to Keynes' Bancor plan of 1943, as the exclusive international medium of exchange settling all cross-border transactions.[14] But we do not have to go that far if we make the SDR the cornerstone of international policy coordination and symmetric adjustments equally shared between chronic deficit and surplus countries. While there are several ways to regulate private use and/or access to SDR, it might be helpful to allow individual market agents a choice between using national currencies or opting instead for SDR by running substitution accounts between these two systems; these accounts could be administered at the level of national central banks and accommodated by the IMF endogenously issuing SDR in response to public demand. Such a choice is rendered even more compelling by keeping the world's key currencies in the SDR basket. The drawing rights may then simply be reversible, and they thus also allow currency holders to switch into SDR upon demand. And once we offer that choice, we can envisage tying the SDR to an alternative finance system of socially responsible institutions, well-behaved markets, and useful funding instruments tied to the real economy—a system that turns finance into a source for good of the kind we have begun to describe above. The financial institutions and markets choosing to denominate their balance sheets and transactions in SDR would follow a code of conduct rooted in the principles of what we by then will have come to define as progressive finance.[15]

Creating a new, more responsible financial system parallel to the existing one may be easier than destroying and transforming the latter. Facing competitive pressure from a better behaved and socially more responsible alternative, to which people and firms have free access, will also push the existing system to do better for society. All the regulations of the world cannot match the moral compass of bankers, traders, and investors who will all more likely strive in that direction if they feel the threat

of losing business and can see what a better alternative would look like. The SDR-based system should have the added advantage of putting international coordination at its administrative center, a quality missing far too much today but essential for tomorrow. We cannot face the worldwide challenges of climate change, demographic imbalances, pandemics, access to affordable housing and education, food security, nuclear nonproliferation, and cybersecurity unless we work together. This truth applies especially to the global warming of our planet's oceans and atmosphere, which will wreak havoc with our weather patterns and ecosystem. We will need to retrofit our cities, push energy conservation and efficiency as never before, and transform our energy mix from fossil fuels to renewables – all that in a hurry and across the planet!

And here finance can play an immensely useful role if we come up with practical solutions to fund projects for reducing emissions or capturing carbon. This is not just a question of launching green bonds, imposing global carbon taxes on fossil fuels, use those revenues for large-scale transfers to help the most vulnerable regions, or build better markets for cap and trade carbon emission permits and greenhouse gas reduction vouchers that link their holders to the ecology-driven part of our capitalist system. If we really want to use finance at its most potent to push our system in that direction, then we must extend carbon financial instruments to their direct monetization (which is where finance, tied to money creation, operates at its maximum strength). The challenge then is to create a banking system in which these carbon-related permits and vouchers become part of the system's cash reserves and/or get bought by central banks. Given that all the leading central banks have begun to privilege certain segments of the credit markets in their postcrisis reforms (e.g., the Fed vis-à-vis housing, the ECB with regard to lending to small and medium-sized firms), it is not too far-fetched to see central banks go down the road of project development finance as one of their new policy objectives. If such a carbon finance monetization system is part of the SDR-denominated alternative, then it will be rooted in global consensus, become explicit

part of international coordination, and follow the code of conduct of progressive finance. This, and nothing less, is what the challenge of climate change demands if we want to save our planet.

A Closing Thought

Finance is all powerful because we live in a cash flow economy and need access to credit. Once liberated from the constraints of innately scarce metals (with the end of Bretton Woods in 1971) and subsequently deregulated (by 1982), finance basically took over our capitalist economy and made its accumulation dynamic the source of its own profit expansion. In its wake finance-led capitalism turned into a bubble economy increasingly embedded in cross-border flows of interest bearing and fictitious capital of a (short-term) speculative nature. That biased and asymmetric growth pattern, crystallized at its most profound in the globally funded US housing bubble of the 2000s, gave us a systemic crisis of unprecedented violence and geographic reach in 2007/08.

The French Regulationists have taught us that such systemic crises typically provide an impetus for a transformation in the modus operandi of capitalism—a new accumulation regime as they have termed it, with its own unique mode of regulation. Between the app revolution and a new energy mix we need to make sure that finance plays its constructive part. It is far better for everyone if the power of finance can be harnessed for socially useful purposes and so be turned into a source of societal well-being rather than remain a destructive force prone to trigger crises and just make a few of us super-rich at the expense of the rest of the world.

Notes

1 From Subprimes to Global Meltdown

1. See B. McLean (2005) for more details on the accounting scandal hitting Fannie Mae and Freddie Mac, with special emphasis on the political battles surrounding these two institutions under pressure.
2. Good data on mortgage-backed securities is collected by the Securities Industries and Financial Markets Associations (SIFMA). See the link "data and research" at the association's site: sifma.org.
3. For a more extensive discussion of the rise of the originate-to-distribute model in US banking during the 2000s, see V. Bord and J. Santos (2012).
4. After many years of benign neglect in the face of consecutive asset bubbles, Federal Reserve chair Alan Greenspan finally decided near the end of his long term to pay attention to the wealth effect on consumer behavior in the wake of the housing boom. See A. Greenspan and J. Kennedy (2007). For a broader discussion of the US savings rate turning negative in 2005, see C. Steindel (2007) or M. Guidolin and E. La Jeunesse (2007).
5. Typically NegAm mortgages limited any payment increases to, say, 7.5 percent but then contained exception clauses allowing much larger adjustments to full interest-plus-principal amortization after five years or whenever the balance had grown by 15 percent.
6. See www.insidemortgagefinance.com/issues/imfpubs_ibcl/2007_12/.
7. When CDOs were first used in the 1990s, their collateral was made up of sovereign bonds from emerging-market economies, corporate bonds, and bank loans. After 1998, when they began to become more widespread, they were deliberately more

diversified—one reason for their growing popularity—by including a variety of consumer-related debt (student loans, credit card debt) as well as equipment leases. Only after 2003 did the focus of new CDO turn to mortgage-related products.

8. Moody's, for instance, earned almost half of its revenues from structured products like MBS and CDOs in 2006, at the height of the housing bubble, and its operating margins in excess of 50 percent made it one of the most profitable companies of the United States.
9. The overall value of synthetic CDOs created in the three years preceding the crisis was surely much higher, in the trillions. Some estimates (see G. Zuckerman 2009) go as far as $5 trillion. The reason for this discrepancy between official numbers and vastly higher estimates is that many of these trades involving synthetic CDOs, being off the books, were never reported. And one also needs to keep in mind that the same bundle of securities could be used over and over again for many synthetic CDOs.
10. The official US commission investigating the subprime crisis (Financial Crisis Inquiry Commission, 2010) undertook detailed analyses of several synthetic CDOs abused that way by their issuers in an obvious conflict of interest, notably Goldman Sachs' Abacus 2004–1 and hedge fund Magnetar's "Constellation CDOs." For more on those see also J. Tavakoli (2008) as well as B. McLean and J. Nocera (2011).
11. See Charles Kindleberger (1978).
12. See the excellent account by R. Dodd (2007) of how the "market" for MBS and CDOs disintegrated with surprising speed.
13. Such use of debt to boost returns is known as the leverage effect. If, for instance, you pay for a contract with 90 percent of its value in debt (and hence put only 10 percent down from your own capital), then any correctly anticipated increase in the value of that contract by 1 percent translates into a 10 percent rate of return (= the capital gain of 1 percent divided by capital of 10 percent).
14. Since a hedge fund borrows against its assets, its lender will ask to make up the difference between the outstanding principal of the loan and the value of the collateral if the latter has fallen in value below the former. Highly leveraged by its very nature as speculator, a hedge fund is likely to face such margin calls faster and more often than other, less indebted investors during any market downturn. Once the call comes, one has to act quickly to come up with the extra cash—either out of one's own capital or by selling off assets to generate the cash needed.

15. As the primer of Price Waterhouse Cooper (2011) on SPEs makes clear, the banks had not only "grey legal area" considerations to weigh, but also financial motivations of loss- and risk-minimization for their takeovers and bailouts of their defunct SPEs.
16. For an excellent analysis of the panic in the ABCP segment of the US securitization infrastructure, see D. Covitz, N. Liang, and G. Sanchez (2009).
17. The term "bear raids" was coined in George Soros (2009), an excellent account of the negative feedback loop between rising CDS premiums, increased short selling, and falling stock prices that destroyed a number of financial institutions during 2008.
18. With stocks below $5 per share qualifying as "penny stocks" held in low regard by Wall Street, many mutual funds actually contain explicit rules prohibiting them from buying or holding stocks below that price threshold.
19. It should be noted that those bailouts by means of takeovers, while sparing the US government the cost of full liquidation and avoiding outright nationalization (an anathema for the conservative Bush Administration), still proved costly for US taxpayers. In those rescue operations the Federal Deposit Insurance Corporation would typically cap total losses for the acquiring bank, take over the worst assets of the failing institution, and provide other means of regulatory forbearance as incentives for such a takeover.
20. In the aftermath of the Lehman disaster Bush officials downplayed their initial tough-love approach and instead argued that there was no way they could have saved the firm, because it was an investment bank for which they lacked commensurate regulatory powers. This argument is questionable, since the Fed has the power under section 13(3) of the Federal Reserve Act to make emergency loans basically to anyone "in unusual and exigent circumstances," as it did for the first time in recent history with a $29 billion loan to JPMorgan for its purchase of Bear Stearns, also an investment bank. For more on the intricacies of the Lehman bankruptcy see L. MacDonald and P. Robinson (2009).
21. If we take the two sides of the national product and income "coin" Y (national product) = C (consumption) + I_g (gross investment) + G (government spending) + X_n (net exports, i.e., exports minus imports) and Y (national income) = C + S (savings) + T (tax revenues), we obtain $X_n = (S - I) + (T - G)$. The calculation of those different sectoral balances X_n, $S - I$ and $T - G$ in the following paragraphs are from the US Bureau of Economic Analysis and the Federal Reserve Board.

22. More details on the Fed's spectacular credit-easing initiatives are provided in J. Carlson et al. (2009) as well as R. Guttmann (2012). For a more general summary of the Fed's crisis management strategy, including an illuminating discussion of the difference between "monetary easing" and "credit easing," see B. Bernanke (2009).

2 Long Waves, Structural Crises, and Credit-Money

1. See Wynne Godley (2005) and Nouriel Roubini (2006).
2. See, for instance, Nobuhiro Kiyotaki (2011) and his references to possible finance-induced shocks, even though he readily admits that contemporary "real business cycle" models barely consider monetary factors and largely ignore the role of financial intermediation.
3. Key founding contributions defining the essence of post-Keynesian economics, at least its American variant, are Paul Davidson (1972), Alfred Eichner and Jan Kregel (1975), and Sidney Weintraub (1978). There is also a European variant of post-Keynesian economics, best crystallized by Wynne Godley and Francis Cripps (1983) or the Cambridge Journal of Economics ever since.
4. See, for instance, John Cassidy (2008), Justin Lahart (2007), or George Magnus (2007).
5. Minsky introduced in this context another important concept relevant to our discussion of financial crisis, namely, that of "margin of safety" or "cushion" of safety. According to Jan Kregel (2008), that margin serves as a proxy measure for the market's resilience against disruption.
6. See I. Fisher (1933) on the debt deflation spiral and H. Minsky (1964) on the financial dimension of long-wave dynamics.
7. If we were to extend the roster of long-wave indices in Kondratiev (1925/1984; 1926/1936) all the way to today, we would end up with a fourth historic cycle from 1949 on whose recession phase would presumably have begun in 2000. Modern followers of Kondratiev using his price-based methodology (including wholesale price indices as well as commodity prices), such as tradertom.com, kondratieffwavecycle.com, kondratieffwinter.com, and financialsense.com, actually insist that his long waves comprise four different phases ("seasons") of spring, summer, autumn, and winter.
8. See J. Schumpeter (1939).
9. The wage hike formula referred to in Ferri and Minsky (1992) was put into effect in the famous collective bargaining agreement

of 1948 between General Motors and the United Automobile Workers, which soon thereafter became the standard across US industry.

10. See T. Palley (2009).
11. See H. Minsky (1975). M. Kalecki (1971) argued that there is a mutually reinforcing interaction between profits and investment that works in both directions as a multiplier-accelerator and is thus the key force behind the cyclical up-and-down fluctuations typically characterizing capitalism's growth pattern.
12. For the volume 3 reference see K. Marx (1867/1992). Also see K. Marx (1894/1959) for the volume 3reference.
13. Just for semantics' sake, offshoring refers to production tasks being relocated to foreign subsidiaries of the parent company whereas outsourcing occurs when corporations give those tasks to other firms with whom they enter typically into long-term supply relations.
14. Seigniorage, referring to the advantages arising from the issue of money, has usually a rather narrow meaning on a global scale. The country issuing the currency possessing world-money status occupies in many ways the position of a banker vis-à-vis the rest of the world, issuing in the process low- or even zero-yield liabilities (i.e., reserves) and at the same time higher-yielding assets (e.g., direct investment). But the strategic implication of global seigniorage goes much further than that, allowing the issuer to run indefinite deficits that are automatically financed by anyone abroad using its currency as reserve or medium of exchange.
15. Among the key works of Régulationists translated into English we can cite in alphabetic order Michel Aglietta (1979), Robert Boyer and Yves Saillard (2001), Benjamin Coriat (2006), Robert Guttmann (1994), Alain Lipietz (1985, 1987), Jacques Mazier et al. (1999).
16. Régulationists timed the extensive accumulation regime with its competitive mode of regulation from 1850 to 1913. This was perhaps a reflection of the French experience, especially the early decades of the Third Republic following the defeat by Prussia (1870–71) during which France's rural areas modernized, its major cities got transformed, and its colonial empire expanded greatly. Domestic considerations notwithstanding, that time framework basically ignores the reality of the long wave then at work in the rest of the industrial world, which comprised a structural crisis (1873–78) and downswing phase (until 1896) in key countries, such as the United States, Britain, and Germany.

17. For more on this Régulationist distinction between "small" and "great" crises see Robert Boyer (2004) and Bernard Chavance (2012).
18. See Michel Aglietta (1998) on patrimonial capitalism and Robert Boyer (2000) on finance-led growth. For my own contribution to the notion of finance-led capitalism, see Robert Guttmann (2008, 2009).
19. This distinction between money as an exogenous stock variable and money as an endogenous flow variable is one of the crucial dividing lines between economic orthodoxy and heterodox theories, in particular post-Keynesian economics. See Basil Moore (1988) and Tom Palley (1997) for more on this fundamental theoretical debate.
20. The discount window loaned funds to banks with deficient reserve levels, which the borrowing banks could book as reserve additions. The Fed could make it easier or harder to obtain such funds by changing the discount rate (i.e., interest rate on discount loans) or altering the conditions under which commercial banks could draw funds (e.g., collateral requirements, frequency, duration). In open market operations the Fed would trade government securities, buying them if it wanted to increase reserves in the banking system or selling them if it wanted to drain reserves out of the system.
21. These provisions included the Consumer Credit Protection Act of 1968 focusing mostly on information disclosure requirements, the Fair Credit Reporting Act of 1970 regulating the collection, use, and dissemination of consumer information, the Fair Credit Billing Act of 1974 against unfair billing practices, the antidiscrimination Equal Credit Opportunity Act of 1974, the Fair Debt Collection Practices Act of 1977 providing legal protection against abusive debt collection practices, and the antiredlining provisions of the Community Reinvestment Act of 1977.
22. The wage-productivity balance collapsed across several national economies at the same time in a wave of labor militancy (e.g., France's general strike of May 1968, Italy's "Hot Autumn" of 1969) while assembly-line production began to meet its technological limitations. There were several other reasons for the sustained productivity slowdown, notably massive entry of new workers into the labor market and falling investment shares. And the United States economy overheated in a burst of inflation when already rapid growth was further boosted by rising military spending in the wake of the Vietnam War, which the Johnson administration

could not counteract with tax increases because of the growing domestic opposition to the war.

23. The crucial pieces of legislation dealing with interest rate deregulation were the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980 as well as the Garn-St.Germain Depository Institutions Act (DIA) of 1982.

3 The Foundations of Finance-Led Capitalism

1. See Robert Guttmann (2008). For an example of European post-Keynesians adopting the term, see Eckhard Hein et al. (2008).
2. See J. M. Keynes (1933). In chapter 4 of Capital (vol. 1) Karl Marx (1867/1992) introduced the monetary circuits C – M – C (exchange), M – C. . . . C' – M' (production), and M – M' (credit). As noted by Dudley Dillard (1984), this is one of the very few notions of Marx that Keynes explicitly approved of.
3. See, for instance, on this point John Gurley and Edward Shaw (1960), a classic in financial economics and a sophisticated attempt to contextualize financial intermediation's role in the economy.
4. See in particular part 5 of volume 3 of Capital (Marx 1894/1959), notably chapter 29.
5. Standard financial economics has given us a lot of theoretical insights regarding how to calculate that value of securities as their "fair market price" on the basis of such income capitalization—from the "capital asset pricing model" (William Sharpe 1970) and the "efficient market hypothesis" (Eugene Fama 1965, 1970) to the "options pricing model" (Fischer Black and Myron Sholes 1973).
6. See in this context especially chapter 25, which Marx entitled "Credit and Fictitious Capital" and where he talked about money "creating fictitious capital by the manufacture of mere means of circulation" (1894/1959, 470) Interestingly enough, Friedrich Hayek (1931), the founder of the Austrian School, also considered the money creation process by the banking system fictitious capital inasmuch as that process generated credit in excess of savings and so encouraged "malinvestment" among businesses.
7. The central bank is the only institution of a national economy that can write checks against itself. This privilege gives it the power to create bank reserves out of thin air (ex nihilo) by making loans to banks or buying securities. That power can also work in reverse, where the central bank refuses to accommodate even to a point when it shrinks available bank reserves by selling securities or calling in its loans to banks.

8. Even today, in light of the systemic crisis of 2007–09, influential commentators, such as Martin Wolf (2014a) of the Financial Times, are calling for restraining the money creation capacity of banks by abolishing fractional reserve banking with 100 percent reserve requirements so that there are no excess reserves in the banking system to loan out.
9. There have been a few voices in recent years calling for mesoeconomic analysis, but these have not given us a clear idea of what such an approach should entail. While they may rightfully point to the need for an institutional or evolutionary approach to economics, we have yet to see a coherent mesoeconomic theory take root. Among the most interesting attempts at mesoeconomic analysis are Stuart Holland (1987) or Kurt Dopfer, John Foster, and Jason Potts (2004).
10. We owe this notion of "regulatory dialectic" to Edward Kane (1981).
11. The best statistics for the Eurobanks come from the Bank for International Settlements. But as the BIS is the first to admit, there are many considerable measurement difficulties pertaining to this essentially private and only partially regulated global banking network. For more on the detailed operations of the Eurobanks see Dong He and Robert McCauley (2012).
12. In a repo one party agrees to sell its securities to another party and then repurchase those at a predetermined date at a slightly lower price, with the price difference in effect marking the interest paid for what in effect amounts to a secured loan arrangement.
13. One reason for continued widespread use of credit default swaps (CDS) after the crisis is the resilience they have shown in the face of adversity, as illustrated by the useful role they played in the postbankruptcy liquidation of Lehman Brothers.
14. See Bank for International Settlements (2014), for instance.
15. "Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes a bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill done" (Keynes 1936, 142).
16. Integrated cash management accounts combine checking deposits, savings deposits or money market fund shares, debit or credit cards, and brokerage accounts, and possibly also overdraft facilities as lines of credit. They contain "sweep" provisions for automated fund transfers between the different account components for improved cash and portfolio management. They were

first introduced by Merrill Lynch's so-called Cash Management Account in the newly deregulated world of the late 1980s.

17. All these numbers are from the graph in table 6.16 in Bureau of Economic Analysis (2013). Financial-sector profit, as measured there, has five components consisting of "credit intermediation and related activities; securities, commodity contracts, and other financial investments and related activities; insurance carriers and related activities; funds, trusts, and other investment vehicles; and bank and other holding companies."
18. For more extensive discussions of financialization see Gerald Epstein (2005), Greta Krippner (2005), Eckhard Hein and Till Van Treeck (2008), and Engelbert Stockhammer (2008). In those contributions financialization is alternatively defined as the disproportionate increase of the financial services sectors, the explosion in the size and variety of financial markets, the dominance of financial motives, and the heavy accumulation of financial assets and liabilities among a wide range of actors.

4 Financialization Revisited: A Mesoeconomic Approach

1. See Gerald Epstein (2005, 3).
2. See Ben Bernanke (2004).
3. Defined benefit plans committed the firm to guarantee its employees a predetermined level of benefits upon retirement. Such a commitment meant all the risks were with the employer and left funds typically underfunded. In a defined contribution plan the employer commits only to a guaranteed level of regular contributions into the fund, transferring the risks concerning future benefit levels to the employees. A 401(k) plan is a tax-deferred defined contribution plan where taxation of contributions and gains is postponed until employees retire and begin to draw benefits from their pension.
4. Falling interest rates are generally associated with rising securities prices. There is an inverse relation between those variables that is both mathematical and functional at the same time.
5. According to the Compustat Executive Compensation database, in the United States the CEO-to-worker compensation ratio, including options exercised, rose from 29 in 1978 to a peak of 343.4 in 1999 and a still considerable 231 in 2010.
6. See International Monetary Fund (2003) and UNCTAD (2013). Since the crisis the FDI volume has fluctuated between $1.3 trillion and $1.6 trillion.

7. Facing pressure on the overvalued dollar from the rapidly growing US balance of payments deficit, US authorities tried during much of the 1960s and early 1970s to restrain capital outflows through such controls as voluntary bank-lending limits and a tax on American purchases of foreign stocks and bonds known as the Interest Equalization Tax.
8. These and subsequent data on the growth of the US finance sector presented in this section are drawn from Federal Reserve (2014). For a more detailed discussion of these data see also Robin Greenwood and David Scharfstein (2013).
9. The Basel Accord, concluded among the Group of Ten (G-10) countries under the auspices of the Bank for International Settlements, asked banks to set aside more capital against their loans in proportion to the riskiness of those loans. Over 100 countries complied with this rule.
10. If anything, these official figures on repos underestimate their size by, for instance, ignoring so-called rehypothecation in which lenders receiving securities as collateral use those in turn to raise secured financing for themselves.
11. These authors point out (Greenwood and Scharfstein 2013, 27) that their CII calculation understates the lengthening of credit intermediation chains by ignoring intrasectoral intermediation activity, credit derivatives, and rehypothecation, all of which do not show up in the Fed's financial accounts.
12. Economies of scale arise when greater production volumes yield efficiency gains by driving down unit costs. Economies of scope are synergies from combining different technologies or products, which make one plus one more than two in product development. Network economies render those networks more valuable to their members with growing size.
13. See, for instance, Engelbert Stockhammer (2004) or Fred Magdoff and John Bellamy Foster (2014).
14. See Thomas Piketty (2013/2014).
15. See Eckhard Hein (2010, 2012). He stresses in this context the short-termism of the shareholder value maximization dictate, spreading deindustrialization, and declining bargaining power of workers amid growing cross-border flows of capital.
16. Robert Guttmann and Dominique Plihon (2010) have shown that the trend toward much-increased household debt levels has been evident in many industrial nations.
17. The figures here represent US government debt net of debt held by government agencies, such as the Fed or the Social Security

Trust Fund. If we include that government-owned part of the debt as well, the US debt-to-GDP ratio would now stand at close to 100 percent.

18. See the Federal Reserve Bank of St. Louis (2014). Velocity is measured as the ratio of GDP divided by the relevant money supply measure, thus measuring in effect how often a dollar in that measure turns over during the year.
19. See Richard Koo (2011).
20. The Dow Jones moved from 1085.57 in August 1984 to a peak of 2722.42 three years later, followed by the 508-point (22.6 percent) decline in the Black Monday crash of October 19, 1987. The junk bond market reorganized in the early 1990s into a more transparent and broadly based successor version known as high-yield bonds.
21. The NASDAQ network was set up in 1971 as the world's first electronic stock market. Its NASDAQ Composite Index crossed 1000 for the first time in July 1995, hit 2000 three years later, then exploded to its all-time closing high of 5048.62 on March 10, 2000, before collapsing and bottoming out at 1108.40 on October 10, 2004.
22. The Y2K bug related to the feared disruption caused by malfunctioning computers if they confused in their processing of the "01/01/00" date the year 2000 with 1900.
23. It should be noted that one of only two publications by Alan Greenspan while leading the Fed for over 18 years was on the US housing bubble's wealth effect (see Alan Greenspan and James Kennedy, 2008).

5 Shadow Banking as Network Finance

1. See Martin Wolf (2014b).
2. See also Paul McCulley (2007) for a more elaborate version of that original definition.
3. See Financial Stability Board (2013).
4. Poszar et al. (2010/2013).
5. See Perry Mehrling et al. (2013) and Zoltan Poszar et al. (2013). A recent IMF study on shadow banking (see International Monetary Fund 2014a, 91) provides a useful summary of different SBS definitions.
6. See Mark Granovetter (1973, 1985). For more on social network theory and its usefulness for the analysis of economic phenomena see also Stanley Wasserman and Katherine Faust (1994) as well as Matthew Jackson (2010).

7. See Franklin Allen and Ana Babus (2009).
8. For a good discussion and survey of standard economic theory's limited approach to financial innovation see Josh Lerner and Peter Tufano (2011).
9. Good examples of such deregulation to get rid of now-ineffective regulations are the Depository Institutions Deregulation and Monetary Control Act of 1980 phasing out interest rate ceilings under Regulation Q, which had been rendered counterproductive by the emergence of money market funds, and the Gramm-Leach-Bliley Financial Services Modernization Act of 1999 repealing Glass-Steagall's separation of commercial and investment banking that had no longer any useful purpose when both types of banking could be merged in the Euromarket.
10. During the interwar period neither the United Kingdom (no longer) nor the United States (not yet) could play the role of international monetary leader for the organization of a proper new global payments system following the collapse of the gold standard with the onset of World War I, and so the entire world economy eventually disintegrated (1931–1939).
11. See Chris O'Malley (2015).
12. See Henri Bernard and Joseph Bisignano (2000) for an extensive study of how and why the interbank market reacted so violently to the "Asian" crisis of 1997–98.
13. Pablo Garcia-Luna and Adrian Van Rixtel (2014) of the BIS report that cross-border interbank lending (including interoffice positions) fell from $22.7 trillion at the end of March 2008 to $17.0 trillion at the end of September 2013.
14. To recall, scope economies arise in product development, where putting different innovations together results in one plus one equaling not two, but three or five or ten. The SBS itself exemplifies scope economies. And network economies apply to networks becoming more valuable for their respective members the bigger they get. Shadow banking is all about network extension.
15. Apart from the now-classic study illustrating the SBS flow matrices by Zoltan Poszar et al. (2010/2013), see also Tobias Adrian and Adam Ashcroft (2012a, 2012b).
16. See Randall Dodd (2012) for a meaningful discussion of the decisive differences between exchanges and OTC markets rendering the latter so much more vulnerable.
17. See George Akerlof (1970), Michael Spence (1973), and Joseph Stiglitz (1975) for their pathbreaking contributions to what was then the new field of information economics.

18. See in this context, for instance, Bowen Yan and Steven Gregory (2011).
19. See Efraim Benmelech and Jennifer Dlugosz (2010) for more detail on the ratings reversal and its consequences.
20. See Markus Brunnermeier (2009) for an account of the monoline debacle and other elements of the intensifying liquidity squeeze building during 2007.
21. Apart from the Bank of England's mishandling of that crisis amidst concerns about moral hazard—concerns its subsequent nationalization of Northern Rock nullified—this bank's failure also had a huge symbolic impact on the public worldwide. Not only did it show the crisis to be global rather than just American, but the long queues of desperate bank clients trying to withdraw their money evoked images of the Great Depression.
22. See Gary Gorton and Andrew Metrick (2012) who used proxy variables such as price indices for MBS and credit spreads between the money market's key interest rate (LIBOR) and the rate on overnight interest swaps, coupled with the repo rate, to measure the degree of tension in the repo "market."
23. See Adam Copeland, Antoine Martin, and Michael Walker (2011) for more details on these episodes of tripartite repos malfunctioning with devastating repercussions.
24. Let us remember that in our system of credit-money reserves get transferred from the bank on which a check ("demand deposit") was drawn to the bank in which the check was deposited. That second bank has thus gained (excess) reserves to loan out and hence create new money with.
25. I discuss the emergence, boom, and crisis of the postwar regime of nationally administered credit-money (see Robert Guttmann 1994) before analyzing its subsequent technological transformation into electronic credit-money (see Robert Guttmann 2003).
26. Rehypothecation involves the reusing for additional borrowing of securities that serve as repo collateral. A bank, for instance, would often enter a reverse repo with a hedge fund and then turn around to use the securities gained in this way in a new repo to borrow additional funds.

6 The International Monetary System in Flux

1. Robert Triffin (1961) points out this contradiction known as the Triffin Dilemma.

2. To what extent Eurocurrencies constitute money has been a hotly debated topic ever since their inception. See in this regard the very interesting discussion in Edward Frydl (1982).
3. See Matthew Adler and Gary Clyde Hufbauer (2008). For capital flow measures see Institute of International Finance (2014).
4. If, for example, on any given day US banks hold $10 million of claims against UK banks and in turn UK banks hold $12 million of claims against US banks, there will only be a reported flow of $2 million from the United States to Britain even though there were $22 million in transactions involved.
5. See the BIS's Mahir Binici and Mehmet Yörükoglu (2011) and Fernando Broner et al. (2013) as well as the Fed's Shaghil Ahmed and Andrei Zlate (2013) for more details.
6. As currently constituted, SDRs can only be used as official reserve asset and to settle payment obligations between governments, but they have practically no private use. Their issue has to be approved by a supermajority of the IMF and involves also parliamentary budget authorizations among relevant member states that are hard to come by. For more detail see the International Monetary Fund (2014b).
7. See Barry Eichengreen (2011) for a discussion of the dollar's seigniorage privilege; he also attributed the phrase "exorbitant privilege" to Giscard d'Estaing.
8. See Stephan Schulmeister (2000) for an excellent analysis of these transmission channels, demonstrating convincingly how each major international crisis between 1971 and 1998 was preceded by globally destabilizing US monetary policy changes.
9. Keynes' proposed a new supranational medium of exchange for all international transactions (the so-called Bancor), issued by an international clearing union, which would impose automatic adjustments on both surplus and deficit countries. The relevance of Keynes' ideas for today's international monetary system is well discussed by Vijay Joshi and Robert Skidelski (2010).
10. We have a variety of data sources to identify the currency composition of these different world-money roles, from discussions of central banks of their own currency's international standing (e.g., European Central Bank 2014) to the International Monetary Fund (2015) reporting on composition of foreign exchange reserves and the central bank surveys of foreign exchange turnover by the Bank for International Settlements (2014).
11. See Robert Guttmann and Dominique Plihon (2013) for a historical account of the euro project from its inception to its current crisis.

12. For more information on China's recent efforts to internationalize its currency see the Economist (2011), Barry Eichengreen and Masahiro Kawai (2014), or James Kygne and Josh Noble (2014).
13. Several sources, notably the IMF and the US Department of Agriculture's (2014) International Macroeconomic Data Set, show the US economy's global market share to have gradually declined from about 28 percent in 1973 to just 22 percent in 2014. The rise of the emerging market economies during that period was set off, moreover, by the relative decline of Europe.
14. According to International Monetary Fund (2013), there are currently 12 countries using currency boards, 45 countries relying on conventional pegs, 19 countries with adjustable pegs, 17 countries experimenting with crawling pegs, 35 countries preferring managed floats, and 30 countries having committed themselves to free floats.
15. See John Williamson (1986; 1987).
16. See Milton Friedman (1953).
17. According the Marshall-Lerner condition, currency devaluation or depreciation will improve the balance of payments only if the sum of the long-run demand elasticity for imports and exports is greater than one so the quantity effects of the currency price change are stronger than the cost effect. For more on the J curve see Steven Magee (1973).
18. This exchange rate pattern of cyclical overshoots in both directions was already noted in the mid-1970s by Rüdiger Dornbusch (1976) and Jürg Niehans (1977). It was given further legitimation by the world's greatest currency speculator at the time, George Soros (1994), whose theory of "reflexivity" focused on the turning points in that pattern. How speculators came to drive such exchange rate overshoot patterns was also the theme of Stephan Schulmeister (2010).
19. This equation arises from Keynes' two macroeconomic accounting identities according to which gross domestic product Y equals the flow of expenditures $C + I_g + G + X_n$ while at the same time equaling national income $Y = C + S + T$.
20. The first model was Paul Krugman (1979), who emphasized the chronic balance of payments deficits making the prevailing peg untenable as a country's reserves were eroding rapidly. The second generation of models centered on Maurice Obstfeld (1986) who pointed to the panic contagion driven by self-fulfilling market expectations. The third variant, most saliently put forth by Giancarlo Corsetti, Paulo Pesenti, and Nouriel Roubini (1998) and Roberto Chang and Andres Velasco (2000), used lessons from

the Asian crisis of 1997/98 to point out the connections between currency and banking crises.
21. See McKinsey Global Institute (2013).
22. See Ben Bernanke (2005).

7 Reregulation Challenges

1. See Bert Ely (2008) for a good summary of financial regulation and its context.
2. The notion of a "debt economy," indicating an economy whose growth process depends heavily on debt financing and is therefore shaped by liability structures, was first coined by Sir John Hicks (1974). On the crucial role of debt in human history see David Graeber (2011).
3. See the Occupy Wall Street movement of 2011/12 and the spectacular rise of Senator Elisabeth Warren (D-MA), a long-standing critic of American banking, as examples of the strong echo such critics of finance have found in the context of this latest crisis.
4. See most recently Edward Kane (2011, 2012).
5. Financial repression occurs when governments impose losses on savers by keeping interest rates below inflation rates.
6. The BIS (see bis.org site) was set up in 1930 to deal with Germany's reparations imposed by the Versailles Treaty and then languished in obscurity during much of the postwar period, only to be revived as the umbrella organization of the world's leading central banks with the emergence of the Euromarket as a truly supranational dimension of finance. Lacking the force of law (in the absence of an international state authority), the BIS and its committees can only make recommendations to national authorities and then put moral pressure on them to implement what it has recommended.
7. The plan gave creditors a menu of options beyond debt restructuring to let them reduce exposure to a particular country or commit even more funds to that debtor.
8. More details on the Basel Accord of 1988 and its provisions, including how bank capital was defined and off-balance-sheet items like derivatives had to be treated, can be found in Bank for International Settlements (1988).
9. For more on Basel II see Federal Reserve (2003) and Bank for International Settlements (2004).
10. See Bank for International Settlements (2011) for a summary of Basel III provisions.
11. The G-20, comprising twenty nations that together make up 85 percent of the world economy, used to be just a talking forum

for finance ministers and central bank governors before the crisis. In the immediate aftermath of the crisis the grouping was significantly upgraded into yearly or semi-annual summits of the heads of state entering commitments with the force of moral suasion.

12. See Adair Turner (2014) for an excellent discussion of the broader context within which to place macroprudential regulation, in particular with regard to housing bubbles.
13. So far FSOC has chosen 29 large US banks and 4 nonbank institutions as SIFIs whereas the ESRB has chosen 28 EU-based banks. The FSB has given G-SIB status to 32 transnational banks. There are 9 global systemically important insurers. There are also 20 domestic SIFI institutions outside the United States or the European Union: in Australia, Canada, China, Japan, and Switzerland.
14. For a good introduction to how CoCos are supposed to work see the BIS' Stefan Avdjiev, Anastasia Kartasheva, and Bilyana Bogdanova (2013).
15. See Financial Stability Board (2013) for its regulatory proposals with regard to shadow banking. Other discussions of shadow banking regulation worthy of note are Gary Gorton and Andrew Metrick (2010) and Daniel Tarullo (2013).
16. Powerful US politicians across the political spectrum, from Elizabeth Warren (D-MA) to John McCain (R-AZ), have called for a return to Glass-Steagall. Jan Kregel (2010) has provided an insightful analysis of Glass-Steagall to show why we can no longer go back to that separation of commercial banking and the rest of finance.

8 The New Face of Finance

1. See the now legendary study of the global economic power network by a group of Swiss complex systems analysts using a very innovative mathematical approach, as reported by Andy Coghlan and Debora MacKenzie (2011).
2. See Securities Industries and Financial Markets Association (2014). For more details on the postcrisis functioning of the agency MBS market, see also James Vickery and Joshua Wright (2013).
3. Two brief clarifications are called for here. One is the inverse relation between long-term interest rates (being pushed down by central banks) and securities prices, whether bonds or equities (both of which pushed to record-high levels by 2015). The zero lower bound problem arises when a deflationary environment will have

pushed nominal interest rates to zero, in the process depriving central banks of their habitual intervention tool.

4. See the Economist (2012), Martin Arnold and Camilla Hall (2014) as well as Oliver Ralph (2015) for examples of the global banks' retrenchment process.
5. See Paul Mozur (2014) for more details on Alipay, the world's largest online fund transfer service by volume.
6. See the Economist (2015a, 2015b) for interesting accounts of how the app revolution has transformed capitalism already and is likely to change its modus operandi even more profoundly in the near future.
7. For a more detailed taxonomy of different types of electronic money see Robert Guttmann (2003).
8. The impact of the criminal dimension of the bitcoin experiment has been well captured by Izabella Kaminska (2015). Other interesting discussions of bitcoin as an alternative payments system can be found in Kashmir Hill (2013) and Dominic Frisby (2014).
9. How the block chain technology underpinning bitcoin could transform financial markets is the subject of an interesting discussion by Gillian Tett (2015).
10. See here Robert Shiller (2012).
11. See Martin Wolf (2014c).
12. See John Williamson (1986, 1987).
13. The severe limits imposed on global governance by political and commercial elites still beholden to the dictate of national sovereignty are exemplified by US Congress' failure to pass a very modest reform of the IMF's vote allocation, India's refusal to sign the WTO's Bali Accord on trade facilitation, and the inability of the world community to come up with an effective successor to the Kyoto Protocol on climate change.
14. See the reference to Keynes' Bancor in footnote 9 of chapter 6.
15. It should be noted, especially in light of today's widespread Islamophobia in the West, that the principles of Islamic finance may well correspond to those we could envisage progressive finance to hold dear. Those include a prescription against profiting from credit arrangements (hence its interdiction against interest), a requirement to share risks equally between lenders and borrowers, a prohibition against speculation, and an insistence on tying finance to real objects. For more details on Islamic finance see Economist (2014) and the website www.islamic-finance.com.

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Index