

# INTERPRETING THE CAUSES OF THE GREAT RECESSION OF 2008

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## Abstract

This paper places the onus for the crisis on failures in the financial system, including its flawed incentives and models. The regulators should have recognized the risks posed by the pervasive failures in the financial system and the growing bubble. The paper identifies other factors that may have contributed to the magnitude of the crisis, such as low interest rates (both as a result of Fed policy and global imbalances) and inadequate risk assessments by investors. It argues that particular actions (such as the mishandling of the Lehman Brothers collapse) may have also contributed to the magnitude of the crisis and affected the timing, but that the crisis would have occurred in any case. It argues, moreover, that low interest rates are neither necessary nor sufficient for the existence of bubbles and that low interest rates could have been a boon to the economy if the funds had been well allocated and risks well managed by the financial system. It dispenses with other attempts to shift blame away from the central failures of the financial system.

It seeks to explain the failures of the financial system, including the incentives for shortsighted behavior and excessive risk taking, identifying too-big-to-fail institutions and deficiencies in corporate governance as key.

## INTERPRETING THE CAUSES OF THE GREAT RECESSION OF 2008

Joseph E. Stiglitz<sup>1</sup>

The Great Recession of 2008 is both complex and simple. In some ways, beneath the complexity of CDS's, sub-prime mortgages, CDO's, and a host of new terms that have entered the lexicon is a run-of-the-mill credit cycle. As banks lent money freely on the basis of collateral, prices increased, allowing more and more lending. Real estate bubbles are a dime a dozen. Bubbles break, and when they break, they bring havoc in their wake. Perhaps the most unusual aspect of this bubble was the conviction of key policymakers (including two Chairmen of the Federal Reserve) that there was no bubble (perhaps a little froth), and the bald assertions (a) that one could not tell a bubble until it broke; (b) that the Fed didn't have the instruments to deflate the bubble, without doing untold damage to the economy; and (c) that it would be less expensive to clean up the mess after it broke than to take preventive action.

These assertions were made presumably on the basis of the "accepted" wisdom of the economic profession. Such views were reinforced by the belief in rational expectations and the belief that with rational expectations there couldn't be bubbles. Few would hold to these views today. But even before the crisis there was little basis for these beliefs. Brunnermeier (2001) had shown that one could have bubbles with rational expectations (so long as individuals' have different information).<sup>2</sup> Decades ago, economists had shown that there could be dynamics consistent with capital market equilibrium (rational expectations, with the no-arbitrage condition being satisfied across different assets) for *arbitrarily* far into the future, but not converging to the long run "steady state," so long as there were not futures markets extending *infinitely far* into the future.<sup>3</sup> Such paths look very much like "bubbles." There has been, in addition, a large literature on rational herding.

Standard results on the stability of market equilibrium with rational expectations employed representative agent models with infinitely lived individuals (where the transversality condition replaced the necessity of having futures markets extending infinitely far into the future). But as soon as the assumption of infinitely lived individuals was dropped, there was no assurance of convergence; the economy could oscillate infinitely, neither converging nor diverging.<sup>4</sup> Other models in the same vein emphasized the possibility of multiple rational expectations equilibria.<sup>5</sup>

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<sup>1</sup> Lecture to have been delivered at BIS Conference, Basel, June, 2009.

<sup>2</sup> Brunnermeier (2001)

<sup>3</sup> See Hahn (1966) and Shell-Stiglitz (1967).

<sup>4</sup> See, for instance, Stiglitz (1973, 2008).

<sup>5</sup> See Cass and Shell (1983) and the large literature on "sunspot" equilibrium; see also Hoff and Stiglitz (2001).

These may seem theoretical niceties, but to the extent that the belief that markets were efficient, and that efficient markets precluded the possibility of a bubble, they gave confidence to the Fed's ignoring mounting evidence that there was a bubble and are thus much more than that.

From a more practical perspective, though one might not be *sure* that there was a bubble, surely a policy maker should ask the question if it is possible, or even likely. All decision making is made under uncertainty. Policymakers need to balance the risks: historical experience should have been convincing that if there were a bubble, its breaking could have devastating consequences. There were a host of tell tale signals of a bubble—rapid expansion of credit, rising price-rental ratios, and rising ratios of say median prices to median income (which, adjusted for inflation, was stagnating or declining).<sup>6</sup>

Policymakers should have been concerned with the heavy dependence of the economy on real estate—both directly and through mortgage equity withdrawals. This meant that if there were a bubble, when it broke, the impact on the American economy could be devastating.

By the same token, the Fed should have been concerned about the models being used for risk assessment by rating agencies and investment banks, which formed a central part of the securitization process: they ignored the fact that there could be a bubble in many parts of the country and that an increase in the interest rate, say, could burst the bubble.

They should have been especially wary given the predatory lending that was pervasive—and which they did little about. It should have been clear (and was clear to many) that an increase in interest rates would make it impossible for many borrowers to service their debt and would make it impossible for many others to refinance their mortgage when balloon payments came due. This would force many houses onto the market, exacerbating downward pressures on prices: the bursting of the bubble could be particularly vicious.

In short, there were marked downside risks, which the Fed and other regulators should have taken into account. The notion that its only instrument was to increase the interest rate was a self-enforced constraint: just as in the 90s, it might have been able to dampen (“prick”) the tech bubble by an increase in margin requirements (and it was criticized for having failed to do so)<sup>7</sup>, the case for tightened regulation in mortgage lending was even more compelling. The advantage of such instruments is that they can be titrated: as evidence of the bubble mounted, as the risks grew, the regulations could have been tightened.

The risk, of course, was that with the economy so dependent on housing, even if interest rates remained relatively low, dampening the housing bubble would have

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<sup>6</sup> See for instance World Bank (1997).

<sup>7</sup> See, e.g. Chapter 3 of Stiglitz (2003).

stalled, or at least dampened, the economy. But if that were the case, it should have been all the more frightening for the Fed: it would mean that if the bubble broke, the likelihood was that the economy would go into a tailspin.

There are strong non-linearities: the economy has good buffers for absorbing small to mild shocks, but there are disproportionate costs to large shocks. Firms are forced into bankruptcy, with a large loss in organizational and institutional capital. The damage is not undone overnight. That is why the view that it would be easier to repair the damage after the bubble broke than to attempt to prick the bubble was, on the face of it, implausible. Long experience with the many, many crises that have marked the world in the era of deregulation shows that the aftereffects of crises last years, and the economies never fully regain the lost ground.

The experiences of the many other countries experiencing a debt-financed consumption boom should have been telling. America was borrowing large amounts from abroad, which one could think of, at the margin, as financing a tax cut for the rich, a war in Iraq, and a housing boom. If the housing boom was in fact a bubble, America would be left with a legacy of debt, but the seeming assets behind the debt would have diminished in value. At least in the aftermath of the tech bubble, there was a legacy of productive technology.

In short, the rationale underlying the Fed's ignoring the bubble were indefensible. It might not have been able to maintain the economy at full employment, given other problems confronting the economy—weaknesses in domestic aggregate demand resulting from the growing inequality and high oil prices, weaknesses in global aggregate demand arising from the growing inequality in most countries around the world and the increased demand for precautionary savings—through the build-up in reserves—following the mishandling of the East Asia and Latin American crises of the late 90s and early years of this decade. But it most likely could have avoided the extremes of the crisis of 2007/2008.

One other strand of thought may have given the Fed comfort in its seemingly mindless ignoring of the bubble: the widespread belief among central bankers in inflation targeting, the belief that low and stable inflation was necessary and almost sufficient for high and sustained economic growth. (America was lucky in facing low inflation, not so much because of wise monetary policy on its part but, at least in part, because China had been experiencing deflation; combined with its stable exchange rate, this meant that Americans faced stable prices for at least a wide range of consumer goods.) But history—and a growing body of economic literature—had shown that CPI price stability was neither necessary nor sufficient for sustained growth, and in particular, the bursting of bubbles—and especially real estate bubbles—could have devastating consequences. The ready flow of liquidity (justified because there were no inflationary pressures and because, without them, presumably aggregate demand would have been weak) supported the bubble.

When the bubble broke and brought havoc to the economic and financial system, Greenspan admitted that there had been a flaw in his economic model, which was

the basis of his regulatory stance. He had had excessive faith in the incentives and ability of those in the financial sector to manage their risk. But in admitting that error, he also may have been admitting that he had failed to grasp the role of regulation. Managing one's own risk, from the perspective of maximizing the value of the enterprise, is what financial institutions are supposed to do. If that were all that there were to the matter, there would be no need for regulation, no need to substitute a regulator's risk judgments for that of the bank manager or the market.

There are two reasons for regulation<sup>8</sup>: one is that there can be large externalities, or large effects of the action of one party on the well-being of others, effects that are not adequately reflected in the price system. When one bank goes bankrupt, it can have systemic effects. Bank managers have no incentives to incorporate these social costs; and they may have no ability to do so, since fully knowing these systemic effects requires knowledge of actions that are not fully revealed by prices being taken contemporaneously by other market participants. (The standard competitive model assumes that all the relevant information is conveyed by prices. With market imperfections, that is not the case.)

Thus, even if banks perfectly assessed their own risk, there would be no assurance that the system as a whole was stable. This is true even if there were no banks that were too big to fail, so long as they engaged in correlated behaviors. Did the regulators not understand this fundamental point? Did they not want to understand it? (These issues are of concern today; there is much talk about systemically significant institutions—though too little is being done about them—but almost no discussion of the risks of correlated behavior of large numbers of institutions whose correlated behavior is systemically important, even though each alone is not systemically important.)

The growing interdependence of financial institutions, brought on by derivative transactions, has only made matters worse. It appears that they had failed to engage in an adequate network analysis of these interdependencies, even though research had pointed out their importance and the risk of bankruptcy cascades.<sup>9</sup>

A second reason for regulation is investor protection—preventing predatory lending and other abusive practices. In this crisis, the failure to curtail such practices contributed to the instability of the financial system: it was, in a sense, hoisted by its own petard.

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<sup>8</sup> There are actually several more, set forth clearly in the recent report of the Commission of Experts on Reforms of the International Monetary and Financial System (2009). These include maintaining competition (suppression of competition helps explain the development of an efficient electronics payment mechanism that modern technology would support) and ensuring access to credit.

<sup>9</sup> See, for instance, Greenwald and Stiglitz (2003), chapter 7, and De Masi et al (2009). Data available on the Japanese banking system had, in fact, allowed an analysis of the interdependencies in that market. Corresponding data for other markets does not seem to be publicly available. It appears that the Fed and Treasury were taken aback even by the linkage between Lehman Brothers and money markets.

Greenspan's admission of "error" reveals another deeper problem with the regulatory stance that he, and many other regulators, took: it was not *robust*. It was predicated on a particular behavioral model. If that model was wrong—as it proved to be—the economy could be exposed to great risks. A good "Bayesian" should recognize that our knowledge is limited, our models incomplete, and there is a risk that they might be wrong. Robust regulation should take into account that possibility and particularly focus on the worst consequences if that is the case. It should not be designed to protect the economic and financial system. By contrast, it was increasingly "fine tuned" to the assumption that financial markets were efficient and worked well.

Robust regulation should, in addition, recognize the limitations of regulation—that there will be circumvention of any set of regulations. Such circumvention is not a reason for abandoning regulation (as many had argued in favor of deregulation), but for building an overlay of checks and balances, regulations which enhance market discipline (through transparency regulations), strengthen appropriate incentives, restrict conflicts of interest, and restrain the opportunities to take advantage of these problems which will never be fully corrected, in particular, by restricting excessive risk taking and certain practices and products where potential social costs exceed the benefits.<sup>10</sup>

The same failure to understand the critical role of externalities and failures in the price system in regulation also led regulators and market participants to misjudge the nature of the innovations in the financial system. The fact that an innovation increased profits of a financial institution did not mean that it improved the efficiency or stability of the economy. Much of the innovation was directed at tax, accounting, and regulatory arbitrage. Some of it entailed new ways to exploit borrowers. To be sure, there were some innovations—like the development of the venture capital firms—which could be linked to increased productivity in the *real* economy. But it is hard both now, and before the crisis, to link many of the other innovations to sustained increases in the growth of the economy, where growth is properly measured.<sup>11</sup> Even if there were some short term *real* increases in growth, they have been overwhelmed by the costs. Evidence suggests that it will take years to catch up for the lost growth—that ten years or more from now, the economy will be operating at a lower level than it would have been had we not had the crisis. Hence, there is a heavy burden in showing that between 2002 and 2007 the increased real growth was sufficiently higher than it would have been without the financial innovations to offset the losses that have occurred as a result of the crisis.

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<sup>10</sup> The theory of robust regulation is set forth in Stiglitz (2001) and Honahan and Stiglitz (2001).

<sup>11</sup> The issue of the appropriate measurement of GDP has been recently explored by an international Commission on the Measurement of Economic Performance and Social Progress (see <http://www.stiglitz-sen-fitoussi.fr/en/index.htm>). It is clear that the distortions to the economy associated with the bubble meant that during the years prior to the crisis, the GDP numbers provided an inaccurate picture of the economy's performance.

These arguments may seem obvious now, and to raise them now may raise the obvious criticism: this is looking at the world from 20/20 hindsight. But all of these points were raised by me and others well before the bubble broke.

### *Thought Experiments in Parsing out the Blame*

I began this talk focusing on the Fed, because of the focus of this group on Central Banks and their policies. Some critics<sup>12</sup> put the Fed's loose monetary policy at the center of the crisis. I want to argue here though that the question is far more complex. The list of those who and what contributed to the crisis (and the policies that contributed to the crisis) is long: global imbalances, rating agencies, investment banks, mortgage originators, mortgage brokers, CRA, Fannie Mae, foreign purchasers of securities, economists, moral hazard created by previous bank bailouts, deregulation, bankruptcy reform, tax law changes that encouraged leveraging, the reckless rescues. And within each of these categories, there are further debates: which regulatory failures were responsible—the repeal of Glass Steagall, the decision not to regulate derivatives, the SEC's 2004 decision to allow more leverage, the failure to force firms to expense stock options, or more broadly, the failure to deal with longstanding problems in corporate governance? The list is a long one, and almost surely each contributed either to the creation of the crisis or to making it worse.

Still, there is a well-defined conceptual question: is there a single “mistake” without which the crisis would not have occurred? A single action, which by itself, could account for the crisis? Or a combination of actions or mistake? In the hard sciences, we could conduct an experiment—try deregulation, but with a less loose monetary policy, and see if we have a crisis. In economics, we can't perform these experiments. We have to rely on thought experiments and historical experiences.

Two more preliminary remarks: in the heat of the moment, particular events become the focus of attention. In the Thai crisis, it was particular actions of the Central Bank in attempting to prevent the fall of the value of the Baht. In historical perspective, these events diminish in importance: it was the real estate bubble, and its breaking, which brought on the crisis. The actions of the Central Bank were designed to forestall the consequences; instead, when the nature of their action became apparent, it may have precipitated it. But the crisis would have occurred in any case, though perhaps a little later.

The second is that there are multiple levels of explanations. Interpreting an experience such as this crisis is like peeling an onion. Under each explanation, there is another. We need to explain, why were interest rates so low? Why did the financial sector do such a bad job of allocating capital and managing risk? If our answer is flawed incentive structures, we have to ask the deeper question: why

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<sup>12</sup> See, for instance, Taylor (2009).

were incentive structures designed to encourage such shortsighted and excessively risky behavior? Why did the rating agencies do such a bad job (once again) of doing their ratings? Each of these are long stories, with many details. In this brief talk, I want to pick up on a few of the more controversial themes and dispense with what I view as some of the “second order” explanations.

### *Low Interest Rates*

From this perspective, low interest rates cannot and should not be blamed for the crisis. We have had low interest rates in a period with good regulation—the period after the war; we did not have a bubble. The low interest rates helped fuel the high economic growth. Had our financial markets channeled investments into more productive uses, the low interest rates could have been a boon to the economy. Low cost of capital should have been an advantage—that is the case in all of the standard growth models.

By the same token, some countries have had bubbles even with high (internal) interest rates—designed to sterilize an influx of capital. That was the case in East Asia. Evidently, low interest rates are neither necessary nor sufficient for a bubble.

Of course, sustaining a bubble for long does require a flow of liquidity, the availability of credit. But with the development of global capital markets, such a flow of liquidity can come either from domestic sources or from abroad. Many of our regulatory institutions focus on domestic banks. The domestic shadow banking system is less regulated, and, to a large extent, with open capital markets, there is reliance on foreign regulators for regulating foreign financial institutions—the risk of which has become all too evident since the collapse of the Icelandic institutions. A foreign supply of funds can finance a bubble—and has done so in several instances. The breaking of the bubble can have large domestic consequences, even when the financing of the bubble comes from outside.

### *The Crisis That Wasn't*

This could have been the case in the United States. But it wasn't. Of course, there was considerable finance from outside. Securitization has facilitated this. So has the globalization of financial markets. But had this been the crux of the issue, America's banks would have been in far better shape. The massive bailouts would have been unnecessary. The brunt of the bursting of the bubble would be borne by the holders of the securities abroad and by foreign lenders.

Of course, large changes in asset prices would have had ramifications for the domestic market. The inability to continue to finance rampant consumption by mortgage equity withdrawals would have dampened consumption—as it has. But had American banks behaved well, had they assessed risk as they should have done,

they would have been able to withstand the shock. They would have realized the risk of a collapse in housing prices and the resulting shock to aggregate demand and taken it into account. Of course, they might have assumed that the government would respond with countercyclical policies (based on historical experience), and an incompetent government might have failed to do so in an effective way. The result might be a downturn of longer duration than any reasonable lender might have expected, and then, even banks that did a reasonably good job in risk assessment would face difficulties—just as banks in the many developing countries where regulators were far better than those in the US are today facing problems.

### *The Failure of America's Financial Markets*

I put the failures in the financial markets front and center: the financial markets failed to allocate capital well. They mispriced and misjudged risk. Of course, they have done so repeatedly—which is why they have had to be bailed out repeatedly. It is remarkable that our regulators ignored this long historical experience—and the strong line of theory explaining why this is so. But they did.

If our financial markets had functioned well—as the “market fundamentalists” claimed unregulated/self-regulated markets would—then, of course, there would have been no need for regulation, and the regulatory failures would have been of no consequence.

In short, in this “thought experiment,” blame for the crisis must lie centrally with the financial markets. But given the long history of failure of financial markets, there is a “public failure”—the failure of the government to address the problem of market failure. Given the failures of the financial market, given the failure of the government to prevent the failures of the financial market, the low interest rates made matters worse, helping fuel the bubble. So, of course, did the ready supply of funds from abroad.

The Fed (and the US Treasury more generally) may have contributed to the crisis in another way: the infamous Greenspan and Bernanke puts provided assurance to the markets that, if they should run into problems, they would be bailed out with a flood of liquidity. Bad lending around the world had been rewarded by bailout after bailout. This led to moral hazard and contributed to a low price for risk. And, towards the end, the government (e.g. through the Federal Home Loan Banks), desperately trying to prevent the whole thing from unraveling before the election, added fuel to the fire that was already raging.<sup>13</sup> So too, Fannie Mae and Freddie Mac (since 1968 privately owned corporations), envious of the profits and bonuses being made by their colleagues in others parts of the financial sector, joined the fray.

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<sup>13</sup> See Ferguson and Johnson (2009).

## *Shifting Blame*

Those that want to believe in the market have struggled to find someone else to whom blame can be shifted. One often heard candidates are government efforts to encourage lending to minorities and underserved communities through the Community Reinvestment Act (CRA) requirements and to increase home ownership through Fannie Mae and Freddie Mac. Default rates on CRA lending are actually lower than on other categories of lending, and CRA lending is just too small, in any case, to have accounted for the magnitude of the problem.<sup>14</sup>

Fannie Mae and Freddie Mac can, of course, be at most a part of the explanation: they cannot explain the AIG debacle, the single most expensive part of the financial mess, costing \$180 billion. That had to do with banks' failure to assess counterparty risk—long recognized as the central issue in derivative transactions. Nor can it explain the difficulties that the banks got into in their holding of mortgages and other bad lending. If Fannie Mae and Freddie Mac were the central problem, the government would not have had to spend \$700 billion plus bailing out the rest of the financial system. The banks simply did a bad job in risk assessment. If Fannie Mae and Freddie Mac were contributing to a bubble (or if foreign lenders were doing so, or if low interest rates were doing so), then part of the banks' responsibility in risk assessment was to realize this and to make sure that they were protected against the consequences. In short, no amount of finger pointing at Fannie Mae and Freddie Mac (or at the Fed for low interest rates, or at foreign suppliers of funds for inadequate risk assessment) can absolve the banks of their failures.

Moreover, the notion that the banks' bad lending was the result of government pressures to increase home ownership is, on the face of it, absurd. The government had not introduced any incentives to the banking system. President Bush may have talked about the ownership society, but banks have never been moved towards corporate responsibility simply on the basis of a presidential speech.

Assessing Fannie Mae and Freddie Ma's contribution to the bubble is more complicated. Their focus was on "conforming loans," not on the subprime mortgages that were the source of so much of the problems. They did not originate the innovative concepts (like liar loans) that led to such problems. Mortgage originators like Countrywide, and the banks, were at the center of this lending. Fannie Mae and Freddie Mac got into the game late, but almost surely, their active involvement helped prolong and extend the bubble. To return to our "counterfactual thought experiment," if Fannie Mae and Freddie Mac had not joined the fray, it is conceivable that the bubble would have burst a little earlier, the damage done would have been a little less. They have some culpability, but it is limited.

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<sup>14</sup>See Canner and Bhutta (2008) and Kroszner (2008).

But their culpability is not the result of government efforts to increase home ownership. There is always a home appropriate to an individual's income and circumstances. No one that I know who believed in the objectives of expanded home ownership thought that such a risky strategy made sense: in the end, home ownership was expanded slightly for a short period of time, and in the end, many of America's poor lost not only their home, but also their life savings. Indeed, consumer advocates tried to stop these predatory lending practices in many states but were beaten back by the banks and the mortgage originators.

It was the drive for short-run profits (fees) combined with the lack of regulation that resulted in bad lending practices that in turn resulted in loans beyond people's ability to pay. The irony is that, as such lending led to a bubble and home prices soared, the size of the homes that many acquired was little different from what it might have been had there been no bad-lending generated bubble.

### *Global Imbalances*

Some, such as Martin Wolf<sup>15</sup>, put global imbalances at center stage. High savings in Asia, especially associated with reserve accumulations, helped drive down global interest rates. The massive imbalances—high U.S. deficits offset by large surpluses in a few countries—were not sustainable.

I agree that the global imbalances were unsustainable. This is especially so since the country that was borrowing the most—the U.S.—should have been saving for the impending retirement of the baby boomers. But the problems in the U.S. could have arisen without the global imbalances, and those problems broke out before the global imbalances were no longer sustainable. That is, the Fed continues to have some discretion in setting interest rates and determining credit availability. While global credit conditions do affect the U.S., they were not determinative. They might be the source of the next crisis, but they were not the source of this crisis.

One response to this critique of the global balance theory is that (at least traditionally) the Fed only controlled the short rate. The market determined the long. And even if the Fed had raised the short rate, the "savings glut" would have driven down the long rate (as it did, in what Greenspan referred to as the conundrum). And it is the long rate which (at least until recent years) is most relevant for the mortgage markets. But an increasing proportion of the mortgages during the bubble were based on the short rate, which the Fed did control; this crisis has shown that the Fed can intervene to affect the long rate as well (and it has done so occasionally in the past). Lowering interest rates across the board might, of course, have lowered the dollar even more, but that would have been good for the American economy, faced as it was by weak aggregate demand—and the increased aggregate demand might have fortified regulators who would be worried that

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<sup>15</sup> See Wolf (2008).

pricking the real estate bubble would bring about a recession. In short, low interest rates—whether the result of Fed action or a global savings glut—need not have led to the bubble, and if it had led to a bubble, need not have had the disastrous consequences for our banks, *if* they had engaged in good risk analysis and sound lending practices or *if* the regulators had prevented them from engaging in reckless behavior.

We have to explain, of course, the imbalances, and the irony is that the same mistakes—the repeated IMF/US Treasury bailouts—that gave rise to the moral hazard and contributed to the reckless lending also contributed to the high savings, as the developing countries did not want to ever again have to resort to the IMF. They had to rely on self-insurance—on reserves.

### *Purchasers of Securities*

A related line of “defense” of the financial sector and the Fed is to shift blame to buyers of American securities, and for some reason, it is especially foreign buyers that are blamed. (In one seminar, a prominent American academic blamed Chinese buyers. China may have been buying American agency bonds, but it was careful enough not to buy many of its toxic mortgages. Its judgment that the US government would stand behind the agency bonds proved correct.) If these had not created the demand for toxic mortgages, so the argument goes, the market would not have produced them. Like the argument blaming Fannie Mae and Freddie Mac, the buyers of the securities share some blame, but, again, if that was the whole story, then America would not have had the banking crisis that proved so costly.

Indeed, it was the belief that the financial system had distributed the risk widely, around the world, that gave comfort to the regulators that there was little risk to the bubble: if it broke, the effects would be minimal. Even a couple trillion dollars of losses is a small fraction of global wealth, easily absorbed. The problem was that a large part of the risk was not distributed but kept on the books of the banks. It appears as if the banks had, in fact, not distributed the risk in the way that they said, and the investors had not been quite as foolish as seemed at first glance—the securities they bought had been made more attractive by the fact that the banks had “enriched” them by holding on to some of the risk, putting it off balance sheet.

Moreover, this does not fully absolve the financial sector: there may have been fraudulent marketing.<sup>16</sup> They sold as AAA products—with the seal of approval of the rating agencies—securities that clearly did not deserve that appellation. As I remark below, they may have defrauded themselves as well; but they claimed to be the global experts on risk and were rewarded accordingly. It is not surprising that others trusted them.

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<sup>16</sup> The prevalence of fraudulent marketing practices was highlighted in a recent study at New York University. See Jones (2009).

Net, it is not clear whether the foreign purchases made America's plight better or worse. The counterfactual is again not clear. One view has it that America would have produced the same bubble: they were manufacturing toxic mortgages as fast as they could. The foreign demand may have driven down interest rates a little and increased the supply a little, and thus the size of the bubble may have increased a little. But the net benefit to the U.S. of offloading so much risk abroad more than offsets the slight increase in the size of the bubble. The other view suggests that the increased demand for toxic mortgages increased the supply almost in tandem, and because accordingly the prices were elevated all the more, the price decline (with all of its consequences) was all the greater. I have not seen careful empirical work estimating the net effect, which depends in part on the response of monetary authorities as well. My own hunch is that net, America benefited from the foreign purchases.

That leaves two questions: why did the rating agencies perform so badly? And why did the buyers (both foreign and domestic) trust them so much?

This is, of course, not the first failure of the rating agencies. They performed abysmally in the last global crisis.<sup>17</sup> There are two alternative explanations (as there are for many of the similar failures throughout the financial system): flawed incentives and incompetence. Clearly the incentives were awry. They were paid by those who rated them. They made money by consulting on how to get ratings higher. The resulting drive for "extracting" as much rating power out of a given set of securities contributed to the complexity of the securities and the difficulties of unwinding and valuation after the crisis struck. Competition made matters worse: there was a race to the bottom. With imperfect information, competition does not always have the desirable properties normally assumed. The system of grading contributed to information imperfections, because it made judgment of accuracy of ratings more difficult: there was not a simple forecast of the probability of default (or some other adverse outcome).

That having been said, one has to ask, would the rating agencies have done much better had they not had such perverse incentives? The investment banks' risk judgments were equally flawed. But, of course, their incentives were even more flawed: they were (until they got caught short) among the big winners from the overrating.

The obvious flaws in the analysis of the investment banks and rating agencies are hard to excuse. Some of the risks I pointed out in the early stages of the securitization movement—the risks of underestimating correlations and the likelihood of price declines.<sup>18</sup> Indeed, I called into question the intellectual foundations of securitization, concerns that have been increased in the intervening years and by the crisis itself. Securitization's advantage is supposedly that it allows a more efficient distribution of risk through the global economy; its disadvantage is

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<sup>17</sup> See, for instance, Ferri, Liu, and Stiglitz (1999).

<sup>18</sup> See Stiglitz (1992).

that it creates new asymmetries of information. With the creation of national and global banks and widely diversified ownership of the banking institutions themselves, the advantages of risk diversification were greatly reduced. In some areas, such as the issuance of bonds by large corporations, the information problems can be addressed, at least partially, by the large number of market analysts. But the information problems were never effectively addressed in the mortgage market: the originators realized that those who purchased the mortgages, those who repackaged them, those that rated the repackaged products, and the ultimate purchasers, none of these could or did do a good job at risk evaluation of the individual products, and this created a huge moral hazard problem. What we saw—the race to the bottom—is what economics predicted.

Securitization had another problem, which should have been evident from the greater difficulties in restructuring the East Asian debt compared to the Latin American debt: a reduced inability to restructure obligations, when debtors cannot repay. In the old fashioned lending, when a borrower got into trouble, the bank had the information which allowed it to make a judgment of whether this was just a temporary difficulty. Long term relationships and an incentive on the part of the lender to establish a reputation as a good lender meant that, on both sides, there were incentives for dealing with such problems efficiently and fairly. Securitization attenuated these incentives. Lack of trust (for good reason, noted below) in the servicers, who would manage such renegotiation, induced restrictions on restructuring. The patterns of lending opened up large opportunities for conflicts of interest, and this increased the likelihood of litigation—always a problem in a litigious society. In many of the problematic areas, borrowers had a second mortgage. Restructuring put into conflict the interests of holders of first and second mortgages. If there had been a single mortgage, it might make sense to write down the principal for a mortgage that was underwater by, say, 25%. The transaction costs of a foreclosure would result in even greater losses. But in the case of foreclosure, if there was a second mortgage holder, he would be wiped out, and the holder of the first would get the entire proceeds. Of course, the first mortgage holder would benefit if there were a write-down, and the second holder took the entire hit, for the likelihood of a foreclosure would then be greatly reduced. Into this morass, one more complexity was added: the service providers who were responsible for the renegotiation were often owned by the holders of the second mortgage, so they had an incentive to try to force the first mortgage holder to bear a share of the write down. Difficulties in restructuring meant, of course, that a larger fraction of homes would go into foreclosure.<sup>19</sup>

It is not evident why the ultimate purchasers trusted the rating agencies and investment banks—they are less likely to do so in the future, which is why it may be

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<sup>19</sup> There were other incentives not to restructure, such as accounting rules. Some of the ways that the bailouts were conducted also may have created incentives not to restructure. The Administration's own program did not provide any incentives for writing down principal, a major flaw in my judgment.

difficult to restart this part of the securities market. The government has stepped into the breach, claiming that it is doing so temporarily. It may be there longer, unless investors forget the lessons quickly. (The trust in the investment banks may seem especially peculiar, given the problems exposed earlier in the decade, in the follow up to the Enron scandal.<sup>20</sup> The conversion of many of these institutions away from partnerships may have also played a role in their seemingly shortsighted behavior.)

Some of the failures relate to intellectual inconsistencies that are hard to forgive: they used data only for a limited period, a data set in which there was no bubble and therefore no probability of a national price decline. They used default data from an era in which the mortgage products were markedly different: they believed that they were innovating, changing the world, and yet they used data from the past, as if the world hadn't changed. But it had—and for the worse. Why would one assume that the default probability for a liar loan was remotely similar to that of a conforming loan? It is not clear whether they adjusted default probabilities for the increase in loan to value ratios, but clearly they hadn't done it enough. And what would have been reasonable assumptions for mortgages that were clearly beyond the ability of the borrower to repay?

The rating agencies were, of course, empowered by the regulators. There was a delegation of responsibility both by regulators and by fund managers to the rating agencies. Investors trusted the rating agencies. They all believed that there was a free lunch and that one could obtain higher returns without more risk by the magic of financial engineering. What is marvelous about all of this is again the level of intellectual incoherence: how could one reconcile the beliefs that (i) prior to, say, 2000, markets were efficient (after all, the efficient markets hypothesis was not intended just to apply to the post-2000 world); but that (ii) they were engaged in financial engineering which so increased the efficiency of the market that they could extract huge amounts in bonuses and financial sector profits—so much so that the sector's profits constituted 40% of all corporate profits in 2007.

Part of the problem was the clear failure of risk analysis throughout the system. Bonuses were based on “performance,” but performance was based on returns—not adjusted for risk. Rewards were based on increasing beta, not alpha. Banks and their officers didn't understand the Modigliani-Miller theorem. They thought that increasing leverage meant that money was used more efficiently. Had these lawyers who were running many of the investment banks taken a basic course in economics, they would have been taught otherwise. They would have learned that though information economics and tax arbitrage circumscribed the domain of validity of the Modigliani-Miller theorem, it provided a deep insight into the limited gains from leverage and that bankruptcy costs (which Modigliani and Miller had ignored) provided a further important limitation.<sup>21</sup>

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<sup>20</sup> See Stiglitz (2003).

<sup>21</sup> See Stiglitz (1969).

The irony was that in the attempt to use financial money more efficiently, real resources—what really matters—wound up being used less efficiently.

### *Explaining the Failures of the Financial Sector*

Explaining the failures of the financial sector entails the same ambiguity: to what extent should we blame faulty incentives, and to what extent is it incompetence (flawed models)? To be sure, the two reinforced each other. They had an incentive to use flawed models and not to see the flaws in the models they used, just as they had an incentive to engage in non-transparent complexity and predatory lending and to move risks off balance sheet. This increased fees, profits, and bonuses. Competition on standardized products might have driven profits to zero.

Clearly, the incentive structures within the financial sector were designed to encourage shortsightedness and excessive risk taking. As in other sectors, stock options encouraged creative (off balance) sheet accounting, but the incentives for circumventing financial regulation might have sufficed. What was distinctive about the financial sector in the era of modern financial engineering is that these perverse incentives could generate products with low probabilities of large losses accompanied by slightly higher than normal returns otherwise—so that one couldn't really ascertain whether the average return was sufficient to compensate for the risk until years later. In short, there was enormous scope for fooling themselves as well as others—including regulators.

The implications for regulatory design are potentially profound. It means that the regulators, like the market, have difficulty really ascertaining “fair market value.” Of course, what they should be focusing on are extreme outcomes—the possibilities of the bank not being able to make its commitments. (This, by the way, is one of the reasons that standard accounting procedures, focusing on the market value of liabilities as well as assets, are not appropriate for regulatory purposes. The fact that the market value of the liabilities goes down because of an increased probability of default should not provide comfort to the regulator that the bank is in a better position, though it might mean that the market value of the equity in the corporation increases. Indeed, a strategy that increases the losses in bad states and simultaneously increases the gains in good states—so that the expected value remains the same—would, from this perspective, look like a good move, as it is for shareholders; bankruptcy introduces “convexity” into the payoff function, implying that increased risk is a good thing for shareholders; but for the regulator, worried about the public fisc and the likelihood of a large pay-out for deposit insurance, such a strategy is distinctly a bad thing. Mark-to-market accounting of liabilities makes no sense, from the perspective of the regulator.)

It suggests that bank regulators should look askance at complex products. There should be no place for them in depository institutions backed by the government, implicitly or explicitly, whether they are part of the banking system or the shadow

banking system. This does not necessarily mean that government should forbid such products. Transactions between consenting adults should be allowed, so long as they do not put others at risk. The point is that these risks should be put elsewhere in the system. The current arrangements, with for instance CDS's concentrated in the big banks, puts the tax payer at risk. More generally, any system which allows these products to be issued by institutions which are, effectively, underwritten by the government (because they are too big to fail or too intertwined to fail) is, in effect, subsidizing such institutions, distorting the economy, and creating an unlevel playing field. It leads to a destabilizing dynamic: the big institutions grow, not because they are more efficient but because they are implicitly subsidized.

The behavior of market participants is affected by a wide range of laws and regulations and how these are enforced. I have just described how the failure to enforce strong competition laws created distorted incentives, leading to excessive risk taking. Some believe that the passage in 2005 of the "Bankruptcy Abuse Prevention and Consumer Protection Act" contributed to reckless lending. Tax laws too provide incentives for excess leverage.

### *Explaining Distorted Incentives in the Financial Sector*

Economists naturally prefer to emphasize the role of flawed incentives in explaining aberrant behavior. Too big to fail institutions obviously have distorted incentives—if they take risks and win, they reap the rewards; if they fail, the taxpayer picks up the tab. The Bush and Obama Administrations have introduced a new concept institutions that are too big to be resolved, so bondholders and shareholders are at least partially protected. I believe it is a spurious notion. The big banks had an incentive to stir fears that not bailing out bondholders and shareholders would generate such turmoil that there would be chaos and all would suffer. They succeeded. (It is, of course, impossible to ascertain whether those who actually argued this position truly believed it or were simply using it as an argument to extract the money they needed.)

In stirring such fears, the alleged consequences of Lehman Brothers' collapse are often cited. But blaming the mishandling of Lehman Brothers' bankruptcy for the subsequent freeze in credit markets is not persuasive. The real source of the problem was that the banks didn't know their own balance sheets and so knew that they couldn't know the balance sheets of other banks to whom they might lend. If Lehman had a role, it was that it increased the ambiguity about the nature of the government guarantee, i.e. the market had only been working because market participants had assumed there was a government guarantee; when that assumption was questioned, markets froze.

The events following Lehman Brothers' collapse and the subsequent problems with AIG did convey information, and that information too was unsettling. The

information was that banks were in a more precarious shape than many had realized, that the financial institutions were more intertwined, and that they had made more errors in risk analysis (e.g. about counterparty risk) than many had thought. The problems with AIG brought home the importance of counterparty risk, and the intellectual incoherence of the banks—who had failed to net out positions. When asked why, they said it was because they could not imagine the failure of the counterparty, even though they were trading CDS's on the failure of these very same counterparties. When the government rushed to ask for \$700 billion in assistance, it too may have conveyed a sense of an impending disaster.<sup>22</sup> But the problems were deep and pervasive, as subsequent bailouts evidenced. The continuing fall in real estate prices and increase in foreclosures likely were little affected, and that meant so too were the mounting losses in the banks. There was a real basis for the lack of confidence.

Incentive structures inside the banks encouraged shortsighted behavior and excessive risk taking. In the end, it was clear that these incentive structures did not serve either shareholders or bondholders well, let alone the interests of the broader economy. But they may have served well the interests of those running the financial institutions. They were designed to allow them to keep large rewards, even if subsequently their investment decisions (for which they were supposedly being rewarded) proved disastrous. We need to ask why these reward structures became prevalent. Deficiencies in corporate governance are at least part of the answer. Sarbanes-Oxley was supposed to address these concerns, but it left open the problems posed by stock options and the incentives that they provide for deceptive accounting. While the problems posed arise in other industries, they are particularly serious in finance, where the opportunities for using financial engineering could be combined with creative accounting.

One might have hoped that investors would provide a check, reducing the market value of firms that had “distorted” incentive structures—just as one might have hoped that the purchasers of the mortgage-backed securities would have provided a check on bad mortgage originating practices. But in both cases they failed. This is partly attributable to the shortsighted behavior of many investors and their failure to understand risk. But if the experts on risk analysis in banks could not understand and analyze risk, what should we expect of the ordinary investor? Indeed, quite the contrary, one would expect that sophisticated risk managers would exploit the lack of understanding of risk by investors. They would know that investors might not appreciate that higher returns generated by higher leverage were associated with higher risk. (That is why they could get away with incentive structures that rewarded them not just for more “alpha” but also for more “beta”). Worse, if market participants did not fully understand risk, they might “punish” firms that did not engage in high leverage, because in the short term their performance would be poorer. Even if a CEO realized that increased leverage exposed the firm to a level of risk that he thought was excessive, his responsibility to maximize share value might

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<sup>22</sup> See Cochrane and Zingales (2009).

induce him to take on high leverage. “Responsible” firms might not survive long enough to demonstrate the virtues of their alternative investment strategy.

These problems reflect the fact that in modern economies, there are a host of “agency” problems—people take actions on behalf of others, but the interests are seldom perfectly aligned. The separation of ownership and control was recognized long ago by Berle and Means (1932), but today, not only are there “agency” problems within corporations, but also with those who invest in the corporations (e.g. pension funds). When combined with the problems of pervasive externalities in financial markets, it means that private rewards are often not well aligned with social returns. This discrepancy gives rise to the need for regulation.

### *Concluding Comments*

We could continue the task of trying to drill deeper into the causes of the crisis. We could and should ask why we did not have the regulations and regulatory structures that would have protected against these problems, why the regulators didn’t use all the powers that they had, why, within the diverse set of ideas within modern economics, certain ideas became fashionable, at least with policymakers, and others did not.

Seventy five years after the Great Depression, debates continue about the causes of that event and why it took so long for the economy to recover. This will surely be the case for the Great Recession. There is never a single “cause” of an event of such complexity. Fortunately for purposes of analysis, but unfortunately for the world, financial and economic crises have occurred frequently (except in the short period after World War II when we had effective regulations and regulatory institutions), and this wealth of experience allows us to supplement analytic thought experiments, contemplating what might have happened if only this or that policy had been pursued.

While I have placed the onus of responsibility for the failures on the financial system, to a large extent they were doing what actors in a market system are supposed to do: pursue their own self-interest. The major lesson of this crisis is that the pursuit of self-interest, particularly within the financial sector, may not lead to societal well-being, unless we set the rules of the games correctly. Fixing these “rules of the game” is the big task ahead.

## References

- Berle, A. and G. Means, *The Modern Corporation and Private Property*, New York: Harcourt, Brace & World, Inc., 1932.
- Brunnermeier, M., *Asset Pricing under Asymmetric Information: Bubbles, Crashes, Technical Analysis, and Herding*, Oxford, UK: Oxford University Press, 2001.
- Canner, G. and N. Bhutta, "Staff Analysis of the Relationship between the CRA and the Subprime Crisis," memorandum, Board of Governors of the Federal Reserve System, November 21, 2008
- Cass, D. and K. Shell, "Do Sunspots Matter," *Journal of Political Economy*, 91, 1983, pp. 193-227.
- Cochrane, U. H. and Luigi Zingales, "Lehman and the Financial Crisis," *Wall Street Journal*, September 15, 2009.
- Commission of Experts on Reforms of the International Monetary and Financial System, final report, September 21, 2009, available at [http://www.un.org/ga/econcrisissummit/docs/FinalReport\\_CoE.pdf](http://www.un.org/ga/econcrisissummit/docs/FinalReport_CoE.pdf).
- De Masi, G., Y. Fujiwara, M. Gallegati, B. Greenwald, and J. E. Stiglitz, "An Analysis of the Japanese Credit Network," Quantitative Finance Papers, 2009.
- Ferri, G., L.-G. Liu, and J. E. Stiglitz "The Procyclical Role of Rating Agencies: Evidence from the East Asian Crisis," with, *Economic Notes*, 28(3), 1999, pp. 335-355.
- Ferguson, T. and R. Johnson, "Too Big to Bail: The 'Paulson Put,' Presidential Politics, and the Global Financial Meltdown, Part I: From Shadow Banking System to Shadow Bailout." *International Journal of Political Economy*, 38(1). 2009 pp. 3-34.
- Greenwald, B. and J. E. Stiglitz, *Towards a New Paradigm for Monetary*, London: Cambridge University Press, 2003
- Hahn, F., "Equilibrium Dynamics with Heterogeneous Capital Goods" *Quarterly Journal of Economics* vol. 80 (1966) pp 633-46.
- Hoff, K. and J. E. Stiglitz, "Modern Economic Theory and Development" *Frontiers of Development Economics: The Future in Perspective*, G. Meier and J. Stiglitz (eds.), Oxford: Oxford University Press, 2001, pp. 389-459.
- Honohan, P. and J.E. Stiglitz, "Robust Financial Restraint," in *Financial Liberalization: How Far, How Fast?* G. Caprio, P. Honohan and J.E. Stiglitz (eds.), Cambridge, UK: Cambridge University Press, 2001, pp. 31-63.
- Jones, S., "One in five hedge fund managers found to be misrepresenting facts," *Financial Times*, October 14, 2009, p. A1.
- Kroszner, R.S., "The Community Reinvestment Act and the Recent Mortgage Crisis," speech at Confronting Concentrated Poverty Policy Forum, Board of Governors of the Federal Reserve System, Washington, D.C., December 3, 2008.

- Shell, K. and J. E. Stiglitz, "Allocation of Investment in a Dynamic Economy," *Quarterly Journal of Economics*, 81, November 1967, pp. 592-609
- Stiglitz, J.E., "A Re-Examination of the Modigliani-Miller Theorem," *American Economic Review*, 59(5), December 1969, pp. 784-793. (Presented at the 1967 meetings of the Econometric Society, Washington, D.C.)
- \_\_\_\_\_, "On the Irrelevance of Corporate Financial Policy," *American Economic Review*, 64(6), December 1974, pp. 851-866. (Presented at a conference in Hakone, Japan, 1970.)
- \_\_\_\_\_, "The Badly Behaved Economy with the Well Behaved Production Function," in *Models of Economic Growth*, J. Mirrlees (ed.), MacMillan Publishing Company, 1973, pp. 118-137. (Presented at the International Economic Association Conference on Growth Theory, Jerusalem, 1970.)
- \_\_\_\_\_, "On the Relevance or Irrelevance of Public Financial Policy: Indexation, Price Rigidities and Optimal Monetary Policy," in *Inflation, Debt and Indexation*, R. Dornbusch and M. Simonsen (eds.), MIT Press, 1983, pp. 183-222.
- \_\_\_\_\_, "On the Relevance or Irrelevance of Public Financial Policy," in *The Economics of Public Debt*, Proceedings of the 1986 International Economics Association Meeting, London: Macmillan Press, 1988, pp. 4-76.
- \_\_\_\_\_, "Banks versus Markets as Mechanisms for Allocating and Coordinating Investment," in *The Economics of Cooperation: East Asian Development and the Case for Pro-Market Intervention*, J.A. Roumasset and S. Barr (eds.), Westview Press, Boulder, 1992, pp. 15-38. (Presented at Investment Coordination in the Pacific Century: Lessons from Theory and Practice Conference, given at the University of Hawaii, January 1990.)
- \_\_\_\_\_, "Principles of Financial Regulation: A Dynamic Approach," *The World Bank Observer*, 16(1), Spring 2001, pp. 1-18.
- \_\_\_\_\_, *Roaring Nineties*, New York: W.W. Norton, 2003.
- \_\_\_\_\_, "Rational Expectations, Wobbly Growth, and Monetary Policy" Columbia University, 2008.
- Taylor, J.B., "The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong," *Critical Review*, 21(2-3), pp. 341-364.
- Wolf, M., *Fixing Global Finance: How to Curb Financial Crises in the 21<sup>st</sup> Century*, Baltimore, MD: Johns Hopkins University Press, 2008.
- World Bank, *Private Capital Flows to Developing Countries: The Road to Financial Integration*, Oxford, UK: Oxford University Press, 1997.