

Twelve Market and Government Failures Leading to the 2008–09 Financial Crisis

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*The views expressed in this paper are those of the authors and do not
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Introduction

There is a market failure when the market fails to allocate its resources in an efficient manner. This assumes one of four things: it did not consider the external costs and benefits (social efficiency), it failed to produce the goods and services at a minimum cost demanded by the consumers (allocation efficiency), it has not utilized the minimum quantity of resources possible in the production of goods and services (technical efficiency), or it has not produced the goods and services at the lowest possible manufacturing costs (industrial efficiency).

A market failure tends to occur when information or know-how are imperfect or asymmetrical; when goods and services are differentiated; when resources are immobile; when power is wielded over the market (oligopoly or monopoly) in uncompetitive markets; when goods and services cannot be supplied in sufficient enough quantities to supply the market; when there are external costs and benefits (externalities) that are not taken into account and that have to be paid for by society in general, instead of by agents from the market; or when public services are provided by private agents who require economic benefits in order to be able to provide them.

There is a government failure when its attempt to correct a market failure ends in generating a greater market failure through its intervention in the market, thus reducing its efficiency, distorting its allocating functions, or creating unforeseen effects that have the opposite outcome than the one desired. When should government intervene? When it becomes aware of unforeseen scarcities or surpluses in a specific market,

when it discovers inefficiencies or inequalities in the treatment of clients or consumers, when it tries to protect groups of individuals that are in a weaker position in the market, when it attempts to introduce a safety net for those who cannot protect themselves, or when it attempts to reduce poverty or inequality in general.

The government may use different modes of market intervention. It can intervene through imposing taxes as a way to generate redistribution or to encourage or discourage the decisions made by the market agents operating in these markets. It can also intervene through regulating specific activities as a way to prevent market failures, through supporting basic market-driven institutions, such as intellectual property rights or patents with temporary monopolies, or ultimately, through supplying goods and services such as health care, education, or unemployment insurance when the market is not able to supply them.

Government failures can become apparent when the government introduces distortions in the markets where it intervenes, such as introducing rent controls, agricultural subsidies, increasing the minimum wage, taxing specific items, or establishing price differentials for identical or homogeneous products. Government failures can also become apparent through their disparate impacts, in terms of the welfare, on consumers and on manufacturers, either through subsidies granted to some or through taxes collected from others.

In addition, government failures can lead to structural problems when the decisions made are focused on resolving specific short-term problems. These decisions can contribute to a worsening of the situation in the long term since policymakers often adopt measures aimed at ensuring their reelection in the short term and create entitlements that cannot be funded over the long term. This can lead to significantly increasing public debt levels and interest rates that, in turn, can have a negative effect on markets and citizens.

Government failures can also occur due to information asymmetry, that is, when market agents know much more about that market than the government and can take steps that ultimately are advantageous for them but reduce market efficiency. This asymmetrical information could lead to a situation of regulatory capture, where the regulatory agencies become dominated by the agents or sectors they are trying to regulate, or regulatory arbitrage, where market agents are at least able to reduce the impact of regulation by engaging in arbitrage among various regulatory agencies.

This basic introductory explanation is intended to show how, during the 2008–09 financial crisis, just as in almost all of the previous crises, there were many significant market or government failures. Most institutions in the financial markets have failed, both in markets and government. The challenges attributed to information asymmetry in the markets have been significant and have led to situations of moral hazard, adverse selection, principal-agent problems, and contagion and herd behavior, among others. Governments have not only been unable to cope with these situations, but have, in some cases, contributed to them or originated them.

The remainder of this paper discusses the 12 market and government failures that led to the 2008–09 financial crisis.

Homeownership

The first failure appeared when the U.S. government tried to encourage wider homeownership by households, allowing every American family to be entitled to mortgage loans, regardless of their income level or their ability to pay, thus creating a problem of “adverse selection.” As soon as American families seeking mortgage loans determined or verified that they would not be refused a mortgage regardless of how low their incomes were, in exchange for paying very high interest rates and commissions throughout the life of the loan, many of them, especially those that were more likely to default on the loans, felt a strong incentive to take out subprime loans at any cost.

These subprime loans tend to have a very low or no down payment, which, by definition, increases the probability of default. The loan to value tends to be around 100 percent, with a zero or very low (teaser) interest rate the first two years. After two years, interest rates would increase from as low as 1 percentage point to 6 percentage points or more above the federal funds rate, which further increased the probability of default and foreclosure.

In periods of recession, the same problem of adverse selection arises when banks try to discriminate among their customers by raising the interest rates of their loans, which tend to attract mainly those who have a higher probability of defaulting on the loan. Experience shows that it is far better to discriminate by reducing quantities (rationing) through better knowledge of the client’s risk profile than by increasing

prices (rates). Therefore, the incentive of paying no or low teaser interest rates for a couple of years in exchange for paying very high interest rates later attracted those households more likely to default as soon as they had to pay higher rates.

Subprime Mortgages

The second failure occurred in the originated and securitized subprime mortgages market, both in terms of government regulation and supervision. On the one hand, the majority of mortgages were not originated by the banks but by agents and brokers working on commission, who were not regulated and who were only required to obtain an administrative local state permit to sell financial products. Therefore, their main objective was to sell a mortgage to a family and charge a commission without much effort to verify whether the mortgage holder could pay it. Thus, they failed to meet a key requirement in the banking business of investing short-term deposits in long-term credits and loans with low likelihoods of default in relation to their profitability. These agents and brokers would bring with them a kind of “credit-scoring” sheet provided by the bank or the thrift, with a series of questions to be asked of the potential mortgage holder to determine their creditworthiness. Nevertheless, the commission incentive held a higher priority for the agents than the creditworthiness of the household, so they tended to fill out the application in a more positive manner than they should have.

On the other hand, the majority of families who assumed these mortgages had 100 percent of loan to value of their homes covered, plus the costs, with zero or near-zero teaser interest rates during the first two years, a situation that clearly provided a strong incentive to sign the mortgage contract without bothering to read the fine print, since they could live in their home for two years for free or almost free. After the two years they could sell it with a slight profit above the

mortgage, assuming real estate property values continued to rise. They could then move on to another mortgage and repeat the same process with their next home.

However, if these families had read the fine print they would have realized that the interest rates at the start of the third year would begin at 6 or 7 percent, (when the prime rate was close to 4 percent) and would increase each year up to 14 or 15 percent, which would ultimately make it nearly impossible to pay the mortgage payments, thus ensuring a default. The agent or broker on behalf of the mortgage lender or bank conducting the transaction did not care whether it could be paid or not; once they received their commission they assumed no responsibility for the fate of the loan. The bank that drew up the contract should have realized that the applicants would not be able to afford the payments at such high interest rates.

When, as finally happened, housing prices began to drop, something that had not happened since World War II, homeowners could not sell their homes and could not pay the ever increasing high interest rates, leaving them with three options. The first was to pay the interest rates for one more year while they awaited a potential price recovery. The second was that homeowners could return their house keys to the bank and rent another property; unlike in Europe, where additional guarantees are required, such as the salary of the buyer or the additional guaranty of a relative, in the United States the liability for payment is limited exclusively to the collateral, that is, the home. The third option was to remain in the home until evicted, since, in some U.S. states, a judge must decide whether the homeowner should be evicted for failure to make their mortgage payments and will sometimes rule in favor of the homeowner.

Yet, the banks and other financial intermediary institutions that had transacted these mortgages had somewhat distorted incentives and were not concerned about whether the loans would default. They were converting them and many other loans into securities, which were sold to special purpose vehicles off their balance sheets, where they could discard their risks or pass them on to others willing to buy them. These mortgages were packaged with thousands of other credits from different categories, such as consumer and credit card loans, and sliced by structuring them into tranches of different credit rating levels that could be broken up into separate components for investors according to their different appetite for risk.

In many cases, the regulators mandated that the bank maintain for each securitization the first default risk or capital tranche of these securities on their balance sheet, but not the rest. In those that were mandatory, some supervisors did not check enough to verify compliance, given the extreme complexity of these structured products.

In sum, incentives were definitely distorted for the buyer, the broker, and the bank and generated serious market and government failures. These securities defied common sense and therefore were prone to cause serious damage to financial institutions. How could adding a large mass of low-rated securities result in a much higher average rating?

Securitization

The third major market and government failure was that many banks that were securitizing mortgages and selling them believed that they had removed their risk burden—an idea that ultimately proved not always to be right. At the same time that many of them were removing the securities from their balance sheets, they were creating, off balance sheet, specific investment vehicles (SIVs) and conduits¹ with hardly any capital. These were used to invest in long-term assets, funded in the short-term commercial paper market with the long-term asset as collateral. In this way, the banks could leverage their capital much more than their balance sheets would indicate, and beyond the minimum capital requirements mandated by Basel I and Basel II.² The banks did this fully aware that they had a significant implicit risk with these vehicles, since in reality they were not off their balance sheet.

In other words, the banks were creating a parallel, off-balance-sheet banking system that would take short-term resources and invest them in long-term risky assets that were neither regulated nor subject to supervision. The only assurance given to their supervisors was that, if the short-term funding in the commercial paper market dried up, the

1 A conduit is an organization (government or private) that compiles mortgages and other loans in a large group, repackages them as mortgage-backed bonds, other pay-through securities, or pass-through securities, and issues these securities to investors. For example, the Real Estate Mortgage Investment Conduit (REMIC) is a pass-through vehicle that enables the issuing of mortgage-backed securities.

2 See section on Basel II, below.

same bank would assure the provision of the necessary liquidity to pay for the short-term funding maturities in those vehicles.

These vehicles tended to produce another significant market failure in some banks since, paradoxically, in order to get a greater long-term return on their assets, the managers of many of these special vehicles were buying the same structured products based on subprime mortgages. Through these vehicles, they were taking on the same risk that the bank had intended to transfer by securitizing and selling them to a third party. Furthermore, in order to remove the subprime risk from their balance sheet, the banks were not taking into account that their own vehicles were taking back the risk again without the knowledge of the banks' internal risk management team and their internal and external auditors.

As soon as the ratings of these products began to deteriorate when the subprime mortgages increasingly went into default, investors in the commercial paper mortgage market began to get out of it slowly at first and then abruptly toward the end. Thus, on that fateful day, August 9, 2007, the U.S. commercial paper market backed by mortgage-related products suddenly dried up, resulting in a \$300 billion³ reduction in size in one day.

The banks could not refinance them as they had promised their supervisors, so the Federal Reserve and the European Central Bank had to inject billions of dollars and euros into these banks in order to avoid serious solvency-related issues, and subsequently had to continue to fund them. If they had forced the banks to reintroduce the securities into their balance sheets (which they never should have removed in the first place), the banks would have consumed regulatory capital that they did not have. This would have resulted in an even greater credit crunch than what ultimately occurred.

What is most significant is that, were it not for these vehicles and the parallel banking system created, there would be no other reason to explain why a problem that originated in the U.S. mortgage securitization system was able to spread in such a way to the European banks. In light of this failure, the question that needs to be asked is: How could the supervisory authorities in the U.S. and European banks be allowed to create and maintain vehicles falsely located off balance sheet and worth \$600 billion in the United States and more than \$500 billion in Europe? This represents a government failure difficult to comprehend.

³ All dollar amounts are in U.S. dollars.

Investors

The fourth incomprehensible failure needs to be attributed to the way investors themselves have behaved. These investors were managing very large bank, pension, and insurance asset portfolios or hedge funds and were supposed to have accumulated a high degree of expertise in investing (as high as the fees they charged). How was it possible that so many of these sophisticated investors were buying these structured products with a AAA or AA rating without being able to understand their content due to the huge mathematical complexity of their structures? The only explanation is that they bought these products because they were more profitable than the traditional AAA- or AA-rated assets, which is in itself an oxymoron in terms of finance theory.

In this context, the first question that needs to be asked is: How can these structured products get a AAA rating? Their contents are not understandable, their direct risk cannot be determined, they can only be sold bilaterally (over-the-counter), they have no liquidity, and they are not traded in an organized market. How could they get this rating when, so far, only the United States, other major industrialized countries, and leading international corporations could qualify for this top credit rating, not only because of their high levels of creditworthiness but also because the prices of their shares were reported on a continuous basis since they were contracted in securities markets that enjoyed enormous liquidity and could be bought and sold several times in a day?

The second question that needs to be asked is: How could presumably sophisticated investors believe that a structured product with a AAA rating and a return almost 1 percentage point higher than a traditional AAA product truly be AAA? Was it because they trusted the rating agencies even though it was contrary to the most basic common sense? Or was it because it brought a higher return to their portfolios, which clearly indicated higher risk as well?

Rating Agencies

The fifth failure both in markets and governments was associated with the credit rating agencies that assess the default risks associated with financial assets that are issued, bought, and sold in the markets. Three factors merit attention. First, these entities constitute an oligopoly, and they attribute this privileged status to the official recognition given to them by the financial market regulators, the watchdogs responsible for the maximum level of transparency and access to market information. They received this recognition because, in principle, they believed that they were the most capable, most serious-minded, and most independent entities qualified to provide a quality and efficient credit rating to every security issued, thus preventing investors from being deceived by the securities-issuing entities, whether they are corporations, financial entities, or governments.

Second, these agencies are also privileged in that they cannot be legally prosecuted. That is, they have no legal or administrative responsibility (like auditors have) over the ratings they give because of the protections they enjoy under the first amendment of the U.S. Constitution; their employees are considered to be merely “financial reporters” that are exercising their “freedom of expression.”

Third, until 1970, these agencies were appropriately financed by the investors whose interests they are responsible for protecting. However, after 1970, the agencies were funded by the issuers and sellers of bonds or structured products who they are supposed to monitor and rate, thus

creating a large conflict of interest: On the one hand, the bond issuers can decide not to contract an agency if they get a provisional rating that they consider to be low, and can attempt to contract with another that will give a higher rating, since they know what rating they will receive before they make a decision.

On the other hand, some of these agencies were able to get up to 50 percent of their income by rating default risks of these new structured asset-backed products, most of them structured with subprime mortgages. It appeared that they were increasingly “captured” by this product category, because they had a clear incentive to push the products to the maximum to preserve their buoyant and new business.

Finally, and this was even more serious, some agencies were also able to sell to the bond issuers who were paying them for their credit rating services, advisory services, and models that showed how to structure complex bunches of assets in a way that would optimize their ratings.

The result was that, according to the Asset Backed Security Index-Home Equity (ABX-HE), the structured products with a AAA rating, worth 100 at the beginning of August 2007, reached a value of 24 in 2008 and 2009 (5 times less), those with an initial AA rating fell to less than 10 (10 times less), and those with an A rating fell to less than 5 (20 times less than their initial rating). These historic drops in value had been unknown since the rating system came into existence, illustrating the colossal failure committed by these agencies to deliver on their principal and single responsibility: to accurately assess products and accord the products with ratings in line with the risk they might pose to investors. This task was considered so important that they were permitted to develop an oligopolistic and privileged position with the connivance of the regulators.

Banks

The sixth major failure during the 2008–09 financial crisis was committed by the banks themselves and other financial entities when they failed to effectively carry out their main responsibility of serving as an intermediary between the savings of depositors and the investments of investors in an economic system. The failure was caused by borrowing short from the former and lending long to the latter while also dealing with the risks associated with interest rate changes, term mismatching, and nonperforming loan counterparties. To achieve this careful and difficult balance, banks had to have extremely rigorous control over the risks being assumed.

The reason the financial system exists is based exclusively on its capacity to compile and analyze information. If the entire world had access to all the information in existence, there would be no need for a banking system or any financial intermediary. The banks and other intermediaries only exist because of information asymmetries. Otherwise, all savers in the economy who are now depositors would lend money directly to investors, whether they were businesses, governments, or families; or they would invest directly in stocks and bonds issued by corporations or governments without requiring the use of intermediaries.

Nevertheless, the fundamental problem with finance is that the existing flow of information is asymmetrical; in other words, some know much more than others about every situation. The borrowers know more about their own creditworthiness or about that of the proposal

submitted for a loan than the lending bank. The client of an insurer knows more about the probability of an accident happening or the likelihood of getting sick or about his life expectancy than his insurer. The seller always knows more about the quality of the products or financial assets he or she is trying to sell than the buyer. The executives in a bank know more about the financial and counterparty risk of the bank assets than the board of directors, who in turn, know more about it than their shareholders, and the shareholders know more than the creditors, and the creditors know more than the depositors.

That is why there are financial intermediaries between savers and investors. These intermediaries have been able to develop an informational advantage as they compile, analyze, calculate, and maximize their greater knowledge related to payment capacity of borrowers or the current level of creditworthiness of corporations that issue stocks and bonds, and are capable of grouping and bundling all the risks assumed in order to reduce their average risk through increasing their volume and diversity.

For both depositors and investors, this kind of activity demands a very high level of trust in the accuracy and quality of the information and advice provided by the financial intermediaries. If this level of trust is broken, as was the case during the 2008–09 financial crisis, it can ultimately paralyze the activities of the financial intermediaries and the markets, generate uncertainty, and eventually cause panic, producing a run on the banks and paralyzing markets, leading to serious negative consequences for the overall economy.

In addition, there are several characteristics in the banking and financial systems that are especially important for the overall economy and society where they operate.

The first characteristic is that banks, even the private ones, provide a public service, and because of this they can potentially cause both market and government failures. On the one hand, they are a public service, while on the other, they are a for-profit business. Billions of payments requiring transfers of funds are carried out by the banks every day. Hundreds of millions of people around the world have deposited their assets in money market and bank savings accounts, have purchased their homes and cars, obtained student or business loans directly through a bank, or obtained insurance against death, accidents, theft, fire, and so forth, through an insurance company. Most of the millions

of monthly electricity, water, and heating bills, as well as paychecks, are transacted through banking institutions.

The second characteristic is that banks and other financial intermediaries borrow short from depositors or other savers and lend long to investors, subsequently incurring interest rate, term mismatching, and counterparty risks that make them highly vulnerable to any abrupt change in economic conditions. Therefore, they are a public service that takes important risks.

The third is that these entities undertake very important and necessary tasks for the success of the economy by channeling resources from the savers to the investors and by transferring the risk from those who cannot afford to take them to those who are willing to assume them.

The fourth is that banks are needed to ensure effective implementation of monetary policy. Monetary policy is the most relevant economic policy for softening the impact of economic fluctuations and cycles and for maintaining price stability. It needs the banking system since the autonomous shifts in interest rates set by the central bank move the cost of bank loans down to the rest of the economy, also known as the transmission mechanisms of monetary policy.

This breakdown in trust has, once again, taken place with greater momentum during the 2008–09 crisis and has unleashed a chain of market failures.

For example, investors have lost all faith in the complex financial instruments guaranteed by mortgages with high credit ratings that turned out to be erroneous. The erroneouness of the ratings was already suspected given the total inconsistency of believing that these should generate a higher yield than other assets with the same rating. Nevertheless, there are always some investors who are willing to ignore reality if they can make more money.

Later, with the collapse of Lehman Brothers, the trust of the shareholders and creditors in banks and in other financial intermediaries was lost because they realized that significant patterns of deteriorated and toxic assets were being covered up. To make matters worse, the trust of the banks among themselves was finally lost as they stopped lending to each other through the interbank market, the largest financial market in the world, because they were unaware of the extent of the volume of deteriorated assets they had on their own balance sheets or of their low creditworthiness in the short term. In other words, if this financial

and banking system, which is innately vulnerable, partially collapses due to a lack of trust on the part of those who use it, the impact on the rest of the financial system and the resulting system's impact on the real economy can potentially be enormous, as was shown during the Great Depression and once, again, in 2008–09, during the Great Recession.

Based on the aforementioned reasons, a bank failure is very different from any other business going bankrupt, regardless of its negative impact on the labor market. When a major industrial or service-related corporation goes bankrupt, its competitors rejoice because it can potentially benefit them; it implies one less competitor in the marketplace and they can potentially take over part of its market share. But when a major bank collapses, the other banks tremble because they are all interconnected through the interbank overnight lending market, the largest lending market in existence. A failed institution can potentially default on large loan amounts owed to other banks. If the latter institutions, in turn, encounter problems due to the former, they can cause other banks with which they have lines of credit to fail. This can lead to the collapse of banks that are interconnected, producing a domino effect in the banking system.

Thus, if the banking system were to collapse, albeit temporarily, it would place in jeopardy the loans and payments system used daily by more than a billion people around the world. A collapse of the system of payments would imply a paralysis of economic activities. Significant credit shrinkage would have devastating consequences for every home and business that has taken loans and needs to renew them or take out a new loan. Markets that dry up, stop functioning, or are barely active hinder the only alternative source of financing available to businesses and financial institutions. The financial system is enormously complex and highly interconnected; a financial crisis in a large country or in large financial intermediaries can spread to the rest of the banks around the world. All of these failures in the financial system can contribute to a serious recession that can have global effects, as has been the case in the 2008–09 crisis.

All of the characteristics of the financial intermediaries make them especially relevant by being capable of maintaining liquidity and solvency through adequately controlling their risk, which is the reason why bank depositors and their creditors have placed their trust in them. This makes it imperative for banks to focus their main efforts on being sufficiently cautious in not taking risks when investing other

people's resources, that of their depositors, creditors, and shareholders. Nevertheless, this crisis has shown that many banks have not met their principal obligation, and this has generated a serious market failure.

Part of the reason why banks assumed a greater risk than usual was due to an increasing trend of credit growth and risk taking in recent years. Following a prolonged period of low interest rates, shareholders were demanding higher and higher short-term yields on their shares, and bank executives were rewarded with bonuses based on whether they could increase such yields. In the process they forgot that each short-term risk taken can lead to losses in the medium term. In addition, new formulas were used for hiring and paying executives that posed a moral hazard, since they would never lose, regardless of what events took place.

First, they were either paid a signing bonus just to lure them away from another competitor, or they were guaranteed a bonus or premium during their first two of three years. Second, they were paid an annual bonus based on the yearly profits, forgetting that the bank that assumes a risk that takes years to mature can end years later in very large losses through the so-called "tail risks." Third, they were assured a "golden parachute" in the event they were fired. With this kind of package they were encouraged to take increasingly greater risks since they would receive a bigger bonus each time. If they eventually failed and were dismissed, they would still come out winners.

Regulation

The seventh serious failure leading to the 2008–09 crisis was that history repeated itself: It appeared that the regulators failed to remember the lessons of the Great Depression when they began to reconsider the idea of relaxing the banking regulatory requirements and even allow the banks to regulate themselves. Until the Great Depression, banks were hardly regulated at all. It was only when faced with the huge vulnerabilities of banking activities and the enormous losses suffered by their depositors, shareholders, and creditors that discussions focused on “narrow banking,” that is, whether only two categories of banks should exist: those authorized to accept deposits that could only be invested in totally safe and superior quality assets, and those that would be prohibited from accessing those deposits and could only get their funding exclusively from wholesale financial markets that should make loans to investors and consumers taking risks.

As a result of the Great Depression, the U.S. Congress took three important actions. First, it created the Federal Deposit Insurance Corporation (FDIC), a fund to guaranty bank deposits with the goal of preventing depositors from losing confidence in the banks in the future and of avoiding a run on deposits that could lead to bank failures. Second, it authorized the Federal Reserve to serve as a lender of last resort for the banks, thus injecting the liquidity necessary to prevent them from encountering problems of solvency and, ultimately, bankruptcy. Third, it passed the Glass-Steagall Act, which formally separated the banks into two categories: commercial banks, which would be able to

accept deposits from the public and make loans at risk and were subject to very strict regulation and supervision by the federal agencies; and investment banks, which could not accept deposits from the public and were financed in the wholesale markets not requiring the regulation of the Fed or other federal agencies, but only that of the market supervisor.

This solution created a problem and a market failure. The banks saw that, if the depositors were not going to suffer major losses because their deposits were guaranteed, and the central banks would assist them in the event that they faced problems of liquidity or solvency, then they, the banks, would have a clear incentive to take on more risk. In short, a moral hazard was created.

Moral hazard is a situation in which one party is responsible for the interests of another but has a strong incentive to place his or her own interests above that of the other party. In colloquial terms it is referred to as “Heads I win, tails you lose.” In this case, the bank won if the significant risk it took paid off, and the government and the taxpayers lost in cases of default, leaving the bank a winner either way, a situation that served as an incentive to assume greater risk. That is why regulation and supervision became increasingly more stringent after the Great Depression and World War II.

Nevertheless, despite what happened during the Great Depression and earlier, the beginning of the 1980s ushered in a period of increasing bank deregulation and self-regulation, which originated with new trends in economic theory. Keynesian economics, which had dominated since the Great Depression, failed to explain the reasons for the supply crisis unleashed by the sharp increase in oil prices in 1973–74. A new economic theory surged based on two hypotheses: “rational expectations” and “efficient and complete markets.” These new theoretical developments were the intellectual basis of the rise of a new political trend toward financial deregulation.

British Prime Minister Margaret Thatcher and U.S. President Ronald Reagan launched a period where measures were adopted supposedly based on these two hypotheses without sufficiently challenging them with the empirical evidence accumulated since the Great Depression—empirical evidence that would also resurface during the 2008–09 financial crisis that led to the Great Recession. For example, despite the historic evidence repeatedly showing that maintaining very low interest rates over an extended period inevitably results in financial asset and real estate bubbles, which, once they burst, placed the

financial system and real estate market in jeopardy, policies were still deliberately aimed at maintaining low interest rates, resulting in two huge bubbles in a single decade, the 2000 dot-com and 2007 financial and real estate bubbles.

Another major paradox is that, even today, the central banks use the dynamic stochastic general equilibrium (DSGE) model in their decisionmaking—a model that does not factor in price bubbles for financial and real estate assets and their subsequent collapses. Nor do the financial markets or unemployment play any role in this model. The reason for this is that Banks assume that the hypothesis takes for granted that the markets are efficient and all the financial asset prices are always correct and reflect their fundamental value because the market brokers and operators are completely rational and every price always reflects all the available information. Since, according to the model, every agent is right and thinks the same thing, this model uses only one representative agent as a proxy for all others (even though it is obviously not representative of actual market behavior).

For this reason, the central banks have had to concentrate their efforts exclusively on carrying out medium-term inflation targeting of consumer prices. But they have not adopted measures to avoid an excessive increase in asset prices that can ultimately create serious problems of financial and banking instability, with enormous costs to societies, as occurred in Japan in 1990, and recently around the world in 2007 and 2009.

Despite these financial bubbles and their subsequent recurring crises throughout history, the predominant academic trend during the last three decades has paradoxically been the “efficient financial market hypothesis,” subsequently joined by the “rational expectations hypothesis,” which assert that not only are financial markets efficient and their prices correct, but also that all citizens exhibit the same rationality vis-à-vis economic policy decisions, rendering them scarcely effective, since the citizens have already disregarded them even before they were made.

And what is most surprising is that these ideas have persisted, ignoring the three 2001 Nobel laureates in economics, George Akerlof, Michael Spence, and Joseph Stiglitz, who identified inconsistencies, inefficiencies, and failures in financial and other markets due to information asymmetries that tend to create problems such as “principal-agent,” “adverse selection,” “herd behavior,” “contagion,” and “moral hazard.” They also ignored the ideas of Herbert Simon, one of the first

Nobel laureates in economics, who in 1978 identified the difficulties in making correct decisions in businesses and formulated the theory of “bounded rationality.”⁴

Nor has consideration been given to the 1988 Nobel laureate in economics, Maurice Allais, who demonstrated in the 1940s the “Allais paradoxes,” which showed investment decisions that appeared correct according to these hypotheses really were not and would inevitably lead to losses. Nor has consideration been given to the 2002 Nobel laureates in economics, Daniel Kahnemann and Vernon Smith (Amos Twersky was only mentioned; the Nobel Prize is not awarded posthumously), who demonstrated that market agents, investors, and operators of financial markets tend to show a “bounded rationality” in general that is especially limited in situations of high uncertainty.

Paradoxically, the 2008–09 financial crisis would probably not have happened if the investors and brokers in banking and financial markets had really believed in the hypotheses of rational expectations and efficient markets. On the one hand, the originators of the hypothesis of efficient markets, such as Eugene Fama, asserted that, since there can never be profits that are greater than those of the market, because at every moment market prices reflect all the information available, the best alternative is to invest in stock indexes and not spend money on obtaining information or paying for expensive financial advisors or managers. In short, investors and financiers have not followed the patterns reflected in the predominant paradigms they studied at universities and business schools, but have instead tried to beat the market, risking more and investing in new structured financial products that were not understood, were illiquid, and were not contracted in organized markets.

On the other hand, economic agents have not proved that their behavior followed the patterns envisioned by the creators and drivers of the rational expectation hypothesis like Robert Lucas, Thomas Sargent, and Edward Prescott. Faced with such low interest rates over a long period of time, the logical response by rational market agents would have been to raise their expectations of higher inflation and higher interest rates in the future and logically assume lower debt levels than what they

4 The concept of bounded rationality says that actors are limited in three ways when making a decision. First, there is a limit to the amount of information they have available; second, the human mind has a limited ability to process the information available; and third, there is a limited amount of time in which to make a decision.

ultimately incurred. Nevertheless, American families decided to continue to borrow more to consume longer, invest in financial products, or purchase a new home, contributing to unexpected negative savings rates that in turn accelerated the financial asset and real estate bubbles.

Supervision

The eighth failure relates to banking supervision. In most cases, the largest bank failures and the most expensive bank bailouts have coincided with countries where the supervisor was not the central bank, but the governments, like in Belgium, Germany, and Switzerland; independent agencies, like the Financial Services Authority in the United Kingdom; or several supervisory institutions, like in the United States, where supervisory arbitrage seems to be a problem. By comparison, in countries where the supervisor has been the central bank, bank failures have been on average none or very small, as in Canada, France, Italy, and Spain. There are a very few exceptions to this rule, but mainly in countries where the banking concentration was very large, as in Ireland and the Netherlands, where the central banks are the bank supervisors but have serious problems properly supervising such relatively huge banks in relation to the size of the country.

This real supervisory experience under the extreme test of a huge banking crisis should be highly relevant for how supervision should be organized and developed going forward, to avoid making the same mistakes in another crisis that will arrive one day, as has happened over the last eight centuries.

The Group of Thirty 2008 report on the different structures of banking supervision⁵ assesses the four main supervisory systems in the world.

5 *The Structure of Financial Supervision: Approaches and Challenges in a Global Marketplace*, The Group of Thirty, Washington, DC, 2008.

The first system is based on an institutional approach, where the legal statutes of every financial intermediary determine its supervisor. This system tends to be the most inefficient, given the rapid change in financial markets and the difficulty establishing the boundaries among different products and financial services.

The second system uses a functional approach, where the supervisory function is determined by the type of business and not by the type of institution. This system is more efficient than the first one, but it needs a very high level of coordination among the different supervisors.

The third system is the integrated approach, where there is a sole supervisor for all financial entities. This system is better than the first two, since it avoids supervisory arbitrage, supervisory conflicts, and supervisory confusion. However, its main drawback is the risk of concentrating all supervision in one institution.

The fourth system is the “twin peaks” approach, where in peak one there is a supervisor taking care of the stability and solvency of all financial institutions and in peak two there is a supervisor making sure that markets work properly and efficiently and that consumers of financial services are well protected. This system seems to be the most efficient and is being adopted by an increasing number of countries. Paradoxically, one of the first to adopt it was the Netherlands, which has suffered many problems, but those were mainly due to banking concentration. It makes sense for central banks to be the first “peak,” given that they have more information about what financial institutions do, tend to have better and more sophisticated inspectors because they can pay better and attract the best ones, and because financial institutions increasingly provide all kinds of financial services and it is very difficult to find differences among them. Further, it is logical to separate the prudential supervisory role completely from the conduct-of-business oversight role in peak two, since the prudential responsibility of peak one can clash with the investor protection role of peak two.

Risk Management

The ninth significant problem, associated with market failure, is that many banks failed to manage their risk appropriately and sufficiently. Sometimes, as mentioned, it is because of pressures from the shareholders to get a higher return on equity, and sometimes it is because of the executive remuneration system, which encourages greater risk taking. Other times it is because the executives believed that their long-term financing would remain cheap, since basic interest rates would continue to be low.

Nevertheless, deficiencies were also identified in the predominant methodology for measuring “value at risk,” which can only measure the risk of one isolated financial entity during an extraordinary event for a short period of time. In short, this form of measuring risk does not work when the risk is systemic or when the stability of the entire banking or financial system is at risk. Therefore, efforts must be made to identify other systems of risk measure that can factor in this probability.

This is why economists Tobias Adrian and Markus Brunnermeier proposed a new measure: the Conditional Value at Risk (CoVaR), which is a Value at Risk (VaR) conditioned on all other banks, which takes into consideration the spillovers and externalities of risks between and among banks that can lead to fluctuating risk spirals. If a large bank or group of banks need to reduce their balance sheet and deleverage by selling assets, this can have a negative effect on market prices that could force other banks to do the same, followed by many more and ultimately the majority, thus creating a positive feedback effect resulting

in a major credit crunch that should be avoided at all cost given its negative effects on economic activity.

In addition, stress tests should be applied taking into account the likelihood of a systemic risk to make them more realistic. During the 2008–09 financial crisis, for example, there was a period when all markets became illiquid and all risks became interconnected so that the benefits of diversification vanished. Many hedges stopped working, such as the use of bonds and collateralized credit default swaps. Normally when a corporation defaults on its payments their bond prices fall and their credit default swaps appreciate, but in this case, both fell simultaneously due to a lack of liquidity. That was one of the most important market failures, together with the drying up of the interbank market.

An overemphasis was also placed on the use of excessively sophisticated and complex risk management systems, which only contributed to reducing transparency and making it more difficult to detect errors due to an increased reliance on assumptions that, in turn, increased the likelihood of error in some of them. Good risk management begins with the basic rules of common sense and caution, not with complex models taken from physics that deal with matter and can never be applied to the human condition and its impulsive and emotional behavior.

Another problem identified in risk management is that, when faced with pressures from shareholders and analysts to get banks to generate greater yields per transaction, risk activities pay increasingly greater rewards and in turn attract a better level of talent. Consequently, those who assume risk tend to dominate those who are supposed to supervise them. This reduces the efficiency of the latter, who are supposed to know as much about the risks as those who take them on. This results in greater risk, less risk control, and a greater likelihood of encountering solvency-related problems in the future.

Over-the-Counter Derivatives Markets and Credit Default Swaps

The 10th market- and regulatory-related failure has been the enormous development of bilateral or over-the-counter derivatives markets, for both foreign exchange and loan interest rates, that have reached never-before-seen historic levels. In mid-2008, out of the total notional value of all the derivatives markets of \$700 trillion, 86 percent—\$600 trillion—was from OTC, and only \$100 trillion was contracted in structured or regulated markets such as the Chicago Mercantile Exchange in the United States or the Liffe in Europe. These OTC markets, unlike other stock, bonds, and futures markets, are not regulated, nor do they have a centralized counterparty risk management system, and could lead to serious default problems in a deep financial crisis.

The credit default swap market that insures bond investors or loan creditors to cover default risk reached a total value of \$63 trillion in notional value, an amount greater than the \$57 trillion value of global gross domestic product (although these amounts cannot really be compared because the first one is a stock figure while the second reflects an annual flow). In this market, broker A sells protection to broker B who buys protection against a credit rating downgrade, a restructuring, or a loan or bond default in a specific country or corporation in exchange for a fee.

The challenge faced by the credit default swap market is that it has transitioned from a buyer's and seller's market of protection, where the first party would take a bond or loan to protect against a default and

the second party would be willing to provide the protection because he or she had the opposite position or because he or she felt the rewards were worth it, into a pure speculator's market where neither party possesses any assets. Instead, they bet on whether or not a default or "credit event" will happen to a certain loan or bond. This market has nothing to do with a traditional insurance market because the seller of protection has no capital requirements as insurers do, and the buyer of protection cannot easily determine the counterparty risk of the protection seller, as in the case of an insurer that is regulated.

In addition, this market has transitioned from selling and buying protection of simple bonds and loans to special investment vehicles and structured products such as Asset Backed Securities, Mortgage Backed Securities, and Collateralized Debt Obligations, working with information that is much less precise, to a market that mainly speculates on future credit events where neither the buyer nor the seller own any of the assets traded. The collapse of Lehman Brothers was a decisive moment in testing the efficiency of this market and unraveling the web of defaulting counterparties.

Due to the above, the regulators decided that this market had to have the same regulated infrastructure as the futures markets, in short, a Central Counterparty Clearing House, to know the potential liabilities of each market participant at every moment. This centralized clearinghouse assumes the counterparty risk of the parties in all contracts and publicizes the information, requiring the participants to back them with a centralized fund to cover potential defaults. In addition, the net position of each participant is always known and should be immediately guaranteed with collateral.

Basel II

The 11th failure was the approval of the new Basel II accord. The two innovations introduced by this system have been the capital requirements that are dependent on the weighted or adjusted risk, whereas Basel I barely considered the risk and its relative weight in determining the minimum capital requirement set at 8 percent of its total assets. In Basel II, risk management is tasked to banks themselves, in situations where they are large enough to pay for the building of very sophisticated internal models that can measure and weigh their risks (although these models must be approved by their supervisor beforehand), and the credit rating agencies, in cases where the smaller banks are not able to pay the high costs associated with maintaining and implementing these internal models.

In short, paradoxically, Basel II gives the task of calculating and weighting their risks to the same large banks, many of which have shown deficiencies in their internal risk management calculating their own risk, and to the same credit rating agencies that have failed in rating structured products. Under Basel I, at least they were required to maintain an 8 percent capital requirement of their total assets, while under Basel II, internal risk systems of large banks determined, on average, a 4 percent capital requirement, which allowed them to increase their average leverage from 12.5 times their capital in Basel I, to 25 times their capital in Basel II, with a rather high standard deviation.

Finally, Basel II did not succeed in reducing the procyclical nature of the financial system that contributes to high credit growth during

the expansive phases of the cycle, when it is less needed for growth to remain within its potential rates, and to slower credit growth in the recessive phases, when it is more needed to soften the impact of the recession. Basel II should instead try to demand relatively large capital requirements during the expansive phases of the cycle when less credit is needed and relatively low capital requirements during recessive phases when more credit is needed to soften the recession. This could help to avoid the current problem of a major credit crunch, which can potentially magnify a recession, and prevent credit from skyrocketing during expansive cycles. Basel III is now trying to introduce regulation to make financial markets less leveraged and less procyclical.

Systemic Risk

The 12th and final failure detected in the 2008–09 financial crisis is the moral hazard created by the prominence of banking systems that are “too big and too interconnected to fail” or “too big to be saved” because they can create a systemic crisis in national and global banking networks with very serious economic consequences for the entire world economy. The large banks and their networks that know they will be bailed out by governments if ever faced with solvency issues have an incentive to take on greater risk than a bank or intermediary that fails with no entity to save it.

The challenge for these banks is very different from that of the banks that can potentially grow too big to fail, are bailed out by taxpayers in their country, but are not systemic to the rest of the global banking system. The banks that pose systemic risk need to be bailed out because the cost of losing them outweighs the cost of preserving them.

In short, there are some large banks that are not systemic and others that are. The first category is commercial banks, which mainly provide retail loans to small or medium-sized businesses and to their large wholesale clients; they are banks that are major and well-known corporations in the countries where they are located, that have most of their assets covered by deposits that are not leveraged beyond their minimum capital requirements, that have no special investment vehicles and conduits off balance sheet, that do not have any major positions in the interbank market in the short term or in the derivatives market, except on behalf of their clients. These banks have treasury

positions that are normal, do not speculate with proprietary positions, and their international presence is based on affiliates quoted on local stock exchanges with their own capital and reserves that they finance within their local market and under the control of their national regulators and supervisors.

The worst situation a country can encounter is having a few very large and universal banks that, in addition to being global, specialize mainly in wholesale and investment banking and are mainly funded in the wholesale markets and not with local deposits.

Due to these differences, the same rules that apply to banks considered “too big to fail” cannot be applied to other big banks that are completely different. The idea of mandating higher minimum capital regulatory requirements for this latter segment of banks would not be seen as equitable across the board since some have greater risk levels than others and are, therefore, more likely to require a potential government bailout funded by the taxpayers than those carrying greater risk levels but are much more diversified. This differentiation in risk levels and levels of capital regulatory requirements should be addressed by the central bank, the supervisory authority that is best suited to determining risk levels.

Another proposed alternative that is more market oriented is that each bank with these characteristics, in addition to maintaining their minimum regulatory capital, will be required to issue subordinated non-guaranteed 10-year debt as a variable percentage of the total assets that in turn serves to impose a greater discipline on those banks, since those that purchase them will be the last to be paid in an insolvency and thus will do everything possible to ensure that the bank avoids risk. Another discipline measure and one easier to implement is to require the creditors to convert their debt into equity when it is approaching zero.

Another proposal is that those banks should put up sufficient collateral in the form of equity to cover all their debt and every time the price of the underlying assets drop, as measured by the corresponding increase in the price of their credit in their credit default swap price, their shareholders will receive a margin call to cover the difference with new capital.

Yet another proposed alternative is the adoption of contingency insurance mandating the government to inject capital in the event of a crisis in exchange for the payment of an annual insurance premium. Another idea is to have the central bank issue insurance guarantees

on the balance sheets of these banks to make them transferable and negotiable on the market. Each of these guarantees would grant their holders the right to a central bank guarantee over all their assets during a systemic crisis.

Finally, it has been proposed that bank managers should send to the principal regulator and supervisor each year a plan explaining how they would address a potential crisis and its resolution. Such plans, called “living wills,” would be updated and improved yearly.

In conclusion, a global solution should be found as soon as possible to address this serious problem, but it must be done in ways that are customized to each individual bank’s systemic risk levels and global interconnectedness.

Conclusion

The causes of the series of market failures and government failures that led to the most serious financial crisis since the Great Depression will be debated for many years to come. It is hoped that the above analysis and discussion of the many errors by markets, governments, investors, regulators, central banks, and others will aid in the debate and necessary period of self-analysis and reflection that is already underway. After all, effective reform requires a thorough understanding of the causes of the Great Recession and of the financial crisis we are still living through. The failures that have been observed are of such scale and their economic impact has been of such magnitude that we cannot return to business as usual.

The reform process and response therefore must be robust and deliver real results. At this point, a great deal of work is being done at the national and international level to address gaps and weaknesses in financial markets and to better regulate and supervise those markets. As the reform process unfolds, care must be taken not to pile on layer after layer of potentially contradictory regulations that might stifle a still weak and fitful recovery. International coordination and consistency in regulatory and supervisory response are essential in this regard, albeit hard to achieve.

Whether markets, and especially supervisors, will learn lasting lessons from these myriad failures remains to be seen. Unfortunately, the former are often only too keen to engage in selective amnesia once economic calm returns, and the latter tend to demonstrate diminishing

vigilance as those with direct experience of a crisis depart or retire. Perhaps this time will be different and a lasting period of more efficient markets better regulated by vigilant supervisors will emerge. If not, investor and public anger over repeated crises will build and questions about the nature of the global financial markets will reverberate and intensify, and support for the liberalized market-based system may decline.

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