



New theories to underpin financial reform[☆]

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ABSTRACT

Before 2007, financial crises were not widely studied in economics and finance. The lack of importance ascribed to financial stability and our limited knowledge of this topic were significant contributors to the crisis. This paper suggests five areas where new theories are needed. These are asset price bubbles, central bank checks and balances, global imbalances, banking regulation, and competition in financial services.

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1. Introduction

As Carmen Reinhart and Kenneth Rogoff remind us in the title of their book, *This Time is Different: Eight Centuries of Financial Folly*, financial crises are nothing new (Reinhart and Rogoff, 2009). However, they often come as a surprise to many people because in most countries they appear only periodically. The current crisis has come as a particular shock partly because it has been over seventy years since the Great Crash of 1929 and the Great Depression that followed. There have been crises in many other parts of the world in the last few decades. Many of these were in emerging or middle income countries such as Argentina, Mexico, and Turkey, but not all. The crises in Japan, Scandinavia and Asia in the 1990s stand out as being particularly severe. However, these crises had little impact on mainstream economics. Despite being the second largest economy in the world and the large severity of the shock, the Japanese experience during the 1980s and 1990s was very little studied by

macroeconomists.¹ The Asian crisis of 1997 was studied by international economists but much of their focus was on currency crises. The Scandinavian crises did not receive much attention. Banking crises were little studied in major economics departments and the design of financial regulation to prevent them and ameliorate their effects was regarded by most economists as an anachronism.

The recent crisis has underlined how important market failures in the financial sector are and the need for theories of such failures. In this paper we focus on five areas where new theories are needed to allow the design of effective intervention in the financial system.

1. Asset price bubbles
2. Central bank checks and balances
3. Global imbalances
4. Banking regulation
5. Competition in financial services

We argue that the basic cause of the recent crisis was the bubble in real estate in the U.S., Ireland, Spain, and elsewhere. Such bubbles are not exceptional. As Herring and Wachter (2003) and Reinhart and Rogoff (2009) document, collapses in real estate prices are the most common cause of banking crises. We therefore need good

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¹ A notable exception is the work of Hoshi and Kashyap (2004).

theories of asset price bubbles. What are the market failures that lead to bubbles? What is the role of monetary policy in causing bubbles? Section 2 considers these and other issues concerned with bubbles.

A number of people have suggested that central banks played a significant role in causing bubbles through monetary policy that was too loose in the early years of the century after the bursting of the dot.com bubble. While central bank independence has worked well for the control of inflation, it does not appear to have worked well for financial stability. While a return to political control is certainly not desirable, this does not mean that there cannot be checks and balances designed to improve central banks' ability to perform their role in maintaining financial stability. The design of such checks and balances is considered in Section 3.

A second important factor in the growth of real estate prices at the heart of the U.S. financial crisis was the easy availability of funds. It has been argued that this was due to global imbalances, and in particular to the large reserves accumulated by Asian central banks. Section 4 discusses the types of theories of global imbalances that would be helpful.

Banking regulation is different from most other forms of regulation in that there is no widely agreed underlying theoretical framework. The main way in which banks have been regulated in recent years is through capital regulation. These regulations have mainly been laid down by the Basel agreements. One of the most surprising things about these, perhaps, is that they are not based on theory. There is no position taken on the nature of the problem that they are trying to solve and there is no justification for the particular measures or the numbers in the regulations. Section 5 considers theories of banking regulation, focusing mainly on capital regulation.

There has been much discussion in the recent crisis of controlling the compensation of bankers because the amounts they are paid are so large. Such controls will be difficult to implement in practice. A more interesting issue, perhaps, is how is it that financial services firms can afford to pay so much to their employees? In particular, are these high earnings due to some form of monopoly power? While the usual price setting form of monopoly power is probably not a serious issue in many of these markets, other forms of monopoly power based on asymmetric information and transaction cost factors may be important. Theories of how financial institutions make such large returns are discussed in Section 6.

2. Asset price bubbles

Herring and Wachter (2003) and Reinhart and Rogoff (2009) have demonstrated that banking crises are very often caused by the bursting of bubbles in real estate prices. For example, in the 1980s and 1990s in Japan, Scandinavia, and Indonesia, Thailand, South Korea and other countries involved in the Asian Crisis, real estate bubbles played an important role.

As Kaminsky and Reinhart (1999) document, these bubbles in asset prices typically have three distinct phases. The first phase starts with financial liberalization or a conscious decision by the central bank to increase lending or some other similar event. The resulting expansion in credit is accompanied by an increase in the prices for assets such as real estate and stocks. This rise in prices continues for some time, possibly several years, as the bubble inflates. During the second phase the bubble bursts and asset prices collapse, often in a short period of time such as a few days or months, but sometimes over a longer period. The third phase is characterized by the default of many firms and other agents that have borrowed to buy assets at inflated prices. Banking and/or foreign exchange crises may follow this wave of defaults. The

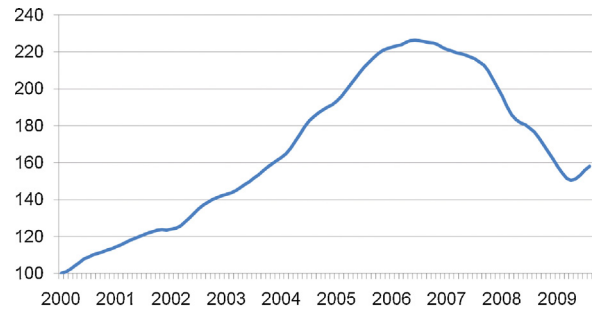


Fig. 1. The Case-Shiller 10 Cities composite index.

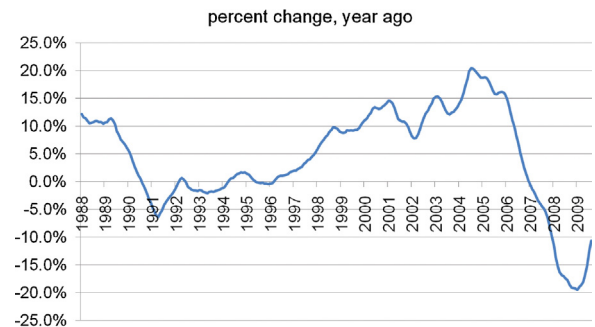


Fig. 2. Changes in the Case-Shiller 10-city composite index year-on-year.

difficulties associated with the defaults and crises often cause problems in the real sector of the economy which can last for a number of years.

It can be argued that the basic problem that caused the recent crisis was that there was a bubble in real estate in the U.S. and also in a number of other countries such as Ireland and Spain.² When the bubble burst, the result was the huge problems in the securitized mortgage market and in the real economy. Fig. 1 shows the Case-Shiller 10-city index since 1990. The figure illustrates the dramatic acceleration in house price increases in the early 2000s and their fall since July 2006. Fig. 2 shows the year-on-year change in this index.

What caused this bubble? We argue that there were two main causes. The first is the low interest rate policies adopted by the Federal Reserve and other central banks after the collapse of the technology stock bubble. The second is the appetite of Asian central banks for dollar and euro denominated (debt) securities that led to the easy availability of credit. We discuss this factor in detail in Section 4 below. Here we focus on the first factor.

One of the important reasons that the bubble was so big in the U.S. was the policies of the Federal Reserve in 2003–2004. To avoid a recession after the collapse of the tech bubble in 2000 and the 9/11 terrorist attacks in 2001 interest rates were cut to the very low level of 1%. Taylor (2008) has argued that this was much lower than in previous U.S. recessions relative to the economic indicators captured by the “Taylor rule”. During 2003–2004 housing prices were already rising quite rapidly. For example, it can be seen from Fig. 2 that the Case-Shiller 10-city composite index was growing at a rate above 8% throughout this period. The Federal Reserve created a significant incentive for people in many parts of the country to borrow at 1% and buy houses going up at a much higher rate. In addition

² Problems exacerbating the effects of the crisis include poor regulation of the shadow financial system, short termism in executive compensation, the too-big-to-fail problem and conflicts of interests in rating agencies (see, e.g., Cukierman, 2011).

there were various other public policies that made it advantageous to buy. These included the tax advantages of being able to deduct interest on mortgages compared to the non-deductibility of rent payments, plus a number of other policies to encourage poor people to buy houses. All these factors created a large demand for houses that led to increases in house prices as shown in Fig. 2. Even when the Fed eventually started to raise interest rates in June of 2004, it was still worth borrowing because house prices continued to rise at a rate above 8% until 2006 as shown in Fig. 2. Thus the Fed's low interest rate policy was the first factor that really caused prices to take off.

The U.S. was not the only country that experienced a bubble in property prices. Spain and Ireland also had very large run ups in property prices. Taylor (2008) argues that these countries also had loose monetary policies relative to the Taylor rule. He points out that Spain, which had the largest deviation from the rule, also had the biggest housing boom as measured by the change in housing investment as a share of GDP. Other countries in the Eurozone such as Germany did not have a housing boom because their inflation rates and other economic indicators were such that for them the European Central Bank's interest rates did not correspond to a loose monetary policy. A current concern with policies of quantitative easing in the U.S. and expansion of credit elsewhere is that they are leading to asset price bubbles in Asia and particularly in China. The rate of property price increases in many cities in China fell below zero in 2008 and then rose to 10% in 2009.³ It appears that a significant part of the increased lending in China went into property and this is the reason property prices have increased so much. There is also speculation that carry trades of \$1.5 trillion based on borrowing at low rates in the U.S. and investing elsewhere have helped fuel Asian property bubbles.⁴

Arguably the most important reform to prevent future crises is to design policies that ensure that asset price bubbles are minimized. In order to do this we need tractable models of bubbles that can be used as a basis for policy analysis. Developing such theories has so far proved a difficult task.

Much of the early theoretical literature was concerned with showing that bubbles do not arise in standard models. Tirole (1982) argued that with finite horizons or a finite number of agents bubbles in which asset prices deviate from fundamentals are not consistent with rational behavior. Santos and Woodford (1997) have argued that the conditions under which bubbles arise in standard general equilibrium frameworks are rather special.

Building on the overlapping generations model of Samuelson (1958), Tirole (1985) showed that bubbles could exist in infinite horizon models in which all agents are rational. A large literature based on developments of this model has developed. Recent contributions include Caballero and Krishnamurthy (2006), and Farhi and Tirole (2010). An important issue with these models is the extent to which the OLG framework is consistent with the kind of bubbles in real estate and stock markets that are documented in Kaminsky and Reinhart (1999) and elsewhere where bank credit appears to play an important role and the bubbles grow very quickly.

A second branch of the bubbles literature builds on asymmetric information models where everybody rationally believes that they may be able to sell the asset at a higher price even though it is above its fundamental. Allen et al. (1993) developed a discrete-time, finite-horizon model where the absence of common knowledge led to bubbles in asset prices. However, the model is not very robust.

Conlon (2004) and Dobles-Madrid (2009) develop more appealing versions of this kind of model that are more robust.

A third branch develops agency theories of bubbles. Allen and Gorton (1993) constructed a model with continuous time and a finite horizon in which an agency problem between investors and portfolio managers could produce bubbles even though all participants were rational. Allen and Gale (2000) develop a model with an agency problem in discrete time where bubbles arise as a result of an expansion in credit. Barlevy (2009) extends this kind of model to allow for more general debt contracts and dynamic considerations. Allen and Gale (2004, 2007) and Adrian and Shin (2008) explicitly focus on the relationship between lending and asset price bubbles.

The difficulty in reconciling bubbles with rational behavior resulted in many authors such as De Long et al. (1990) developing asset pricing models based on irrational behavior. Recent contributions in this strand of the literature that involve slight deviations from rationality and provide appealing models of bubbles include Abreu and Brunnermeier (2003) and Scheinkman and Xiong (2003).

All of these models remain difficult to work with for the purpose of analyzing policy. New, more tractable theories would be helpful in analyzing the extent to which increases in real estate markets and stock markets in Asia and other countries are bubbles or reflect solid future prospects.⁵ If they are bubbles, then such models should be helpful in analyzing what central banks and governments can do to prevent them in the future. There is in fact some empirical evidence of a positive effect of inflation targeting on real house price growth and the house-to-rent ratio (Frappa and Mésonnier, 2010).

3. Central bank checks and balances

Going forward, what should central banks and governments do to minimize the risk of a future financial crisis? There has been a tremendous focus on the private sector and what the private sector did wrong in terms of taking excessive risk. However, if the basic cause of the crisis was the real estate bubble and central banks played a role in creating that, it is really the public sector that took the main risks by setting low interest rates at a time when real asset prices were rising quickly thus fueling the bubble. If there had not been a bubble in real estate prices there would not have been a problem with subprime mortgages. If property prices had remained stable or continued to rise at slow rates the default rate would have been manageable and the financial system would not have been affected. It is therefore important to try to prevent central banks from taking risks that create a similar problem going forward.

In a report on the Second Bank of the United States, John Quincy Adams wrote "Power for good, is power for evil, even in the hands of Omnipotence."⁶ This statement reflected the considerable distrust of the concentration of power that central banks represented. The controversy over whether a central bank was desirable came to a head in the debate on the re-chartering of the Second Bank in 1832. Although the bill was passed by Congress it was vetoed by President Jackson and the veto was not overturned. There was no central bank in the U.S. from 1836 until 1914.

There were many serious financial crises during the period the U.S. had no central bank. The severity of the recession following the 1907 banking panic led to a debate on whether or not a central bank should be established in the U.S. The National

³ See "Fears of China Property Bubble Grow," *Financial Times*, March 11, 2010.

⁴ See "Fears Rise for Future of Dollar Carry Trade," *Financial Times*, February 24, 2010.

⁵ The difficulty of distinguishing ex ante between a fundamental based expansion and a bubble is also made by Cukierman (2011).

⁶ Timberlake (1978, p. 39).

Monetary Commission investigated this issue and finally in 1914 the Federal Reserve System was established. The initial organization of the Federal Reserve System differed from that of a traditional central bank like the Bank of England. It had a regional structure and decision making power was decentralized. This meant it was ineffective at managing crises. In 1933 there was another major banking panic which led to the closing of banks for an extended period just after President Roosevelt took office. As a result of this, the Federal Reserve was reformed in the Banking Act of 1935, which centralized power in the Board of Governors.

During the recent episode, the Federal Reserve System managed the crisis well. However, they did not do a good job in terms of preventing the crisis. In fact, as argued above, the case can be made that they were to a large extent to blame for the bubble that caused the crisis by setting interest rates so low at a time of rapidly rising real estate prices. The centralization of power particularly in the Board of Governors and the Chairman means that there are very few checks and balances.

After the inflationary experiences of the 1970s, many countries made their central banks independent. The rationale was that if they are independent, they will not succumb to political pressure to cut interest rates and cause an inflationary boom every time there is an election. This independence has worked very well for preventing inflation. However, this crisis has demonstrated that central bank independence may not be good for financial stability. There are a few people making decisions that are very important and there is very little in the way of checks and balances. In the case of the Federal Reserve, it seems that one person, Alan Greenspan, played a large role in the decision to cut interest rates to 1% in 2003 and to maintain them there until 2004 so as to minimize the effects of the recession. According to reports at the time there was not much dissension within the Board of Governors in terms of votes against the position he took. The low interest rate policy worked in the short run, but at the cost of a real estate bubble and an enormous recession several years later.

Another example of the lack of checks and balances relates to quantitative easing. This refers to the action of many central banks, and in particular the Federal Reserve, of creating money to buy back long-term government bonds and other securities. Quantitative easing has not been used much before, and yet there has been very little discussion on its potential benefits and costs. For example, how likely is such a policy to increase inflation? Does it increase the likelihood of another crisis, this time perhaps a currency crisis? When it was used in Japan in the 1990s, quantitative easing did not solve the problems the economy was facing but neither did it lead to inflation. Probably, though, it led to a larger yen carry trade than would otherwise have occurred.

A good illustration of the deficiencies of the current system is provided by Chancellor Merkel's June 2, 2009 speech in Berlin concerning quantitative easing. She heavily criticized the Federal Reserve and the Bank of England for their programs of quantitative easing arguing that this kind of unconventional monetary policy could sow the seeds of the next crisis. It is highly unusual for a German Chancellor to discuss monetary policy so this was a significant break with tradition. The next day Chairman Bernanke issued a statement that he respectfully disagreed with the Chancellor's views. In subsequent weeks there were stories in the press that there were internal doubts in the Fed about quantitative easing because of the inflation risk. This unusual sequence of events shows that more formal checks and balances are needed to prevent the Federal Reserve and other central banks from taking large risks. The current governance arrangements in the U.S. break with its long tradition of checks and balances within government.

Political control of central banks is not desirable as this would just be a return to the old system before independence.⁷ Another possibility is to create a Financial Stability Board with its own staff and resources separate from the Federal Reserve that would not be dependent in any way on them. Representatives from this Board could participate in Federal Open Market Committee meetings and could be given several votes. Since their focus would be on financial stability issues they would necessarily focus on the risk created by the public sector. The Federal Reserve would be independent from politicians but there would be checks and balances provided by the Financial Stability Board.

There are clearly many other possibilities. We need to develop theories of central banks that allow the design of checks and balances while at the same time maintaining their ability to act decisively in a financial crisis, and their political independence.

4. Global imbalances

The second important factor in the real estate bubbles in the U.S., Spain and elsewhere was the easy availability of credit as a result of global imbalances.⁸ Why are there such global imbalances? This is a complex issue. However, we will argue that an important factor was the Asian Crisis of 1997. Many Asian economies, which had done very well, like South Korea, Thailand, and Indonesia, fell into serious difficulties. In the case of South Korea, for example, it was because its firms and banks had borrowed too much in foreign currency. They quickly ran out of foreign exchange reserves and turned to the International Monetary Fund (IMF) for help to see them through these difficult times.

In exchange for providing financial assistance, the IMF required South Korea to raise interest rates and to cut government spending. That is the exact opposite of what the U.S. and Europe have done when faced with a very difficult crisis. One potential reason why this happened is that the IMF is a European and U.S. dominated institution. The appointed head of the IMF up to now has always been a European while the head of the World Bank has always been an American. Asian countries are not represented at the highest levels. That was part of the arrangements that were made when the Bretton Woods agreement was negotiated at the end of the Second World War (even though it is not explicitly stated anywhere in the treaty), when Asian countries were not as important as today in the world economy. The Asian countries did not have much weight in the governance process and their quotas (i.e., effectively their shareholdings) were relatively small. All this implied that when the IMF imposed harsh policies on the Asian countries at end of the 1990s, there was no effective mechanism for these countries to protest and argue that they had fundamentally sound economies.

The consequence was that many Asian countries such as South Korea realized they had to become economically independent so that they would not need to go to the IMF to obtain relief from a crisis in the future. To achieve this independence, they accumulated trillions of dollars of assets. Fig. 3 shows this accumulation of reserves by Asian countries (here China, Hong Kong, Japan, Singapore, South Korea and Taiwan). In contrast, Latin American and Central and Eastern European countries did not increase their reserves during this period.

The motivation for accumulating reserves of China, which is the largest holder of reserves, is probably more complex than this. First, although they were not so directly affected by the Asian crisis,

⁷ Political independence is found to be strongly negatively correlated to financial instability (see, e.g., Klomp and de Haan (2009)).

⁸ The importance of global imbalances for fueling credit and house prices finds empirical support in Duca et al. (2010).

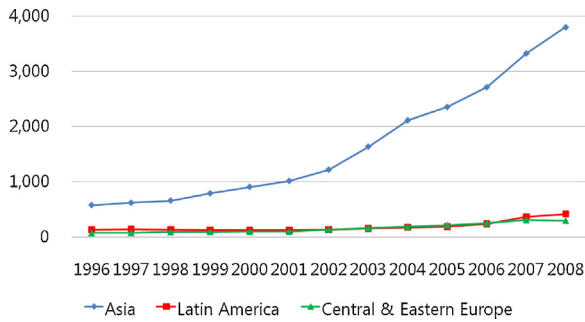


Fig. 3. A comparison of foreign exchange reserves in different regions.

similarly to other Asian countries, China realized that it would be risky to seek help from the IMF should they need it in the future. Second, it seems that China started accumulating reserves initially to avoid allowing its currency to strengthen and damage its exports. However, over time they realized that having such large reserves also gives them significant political influence, particularly over the U.S. and now with the debt problems in the Eurozone also over European countries.

As mentioned above, the IMF arguably exacerbated the problem of global imbalances through the harsh policies that a number of countries were forced to undertake in the 1997 Asian Crisis. There was no reliable mechanism to stop this because the Asians are underrepresented in the top levels of the IMF governance process. Today, the Asian countries have become much richer. They are the ones with very large reserves amounting to several trillion dollars. They are the countries with the economic power and this should be reflected also in the governance process of the important international organizations.

In the current crisis Asian countries such as South Korea have done much better than they did in 1997. Rather than raising interest rates and cutting government expenditure as the IMF forced them to do then, South Korea cut interest rates and allowed a large fall in the value of their currency. In contrast to the 1997 crisis when unemployment rose to more than 9%, it has only changed slightly in the current crisis. The reason that the Korean government was able to pursue these policies is that their large reserves meant that they could make their own decisions and did not have to approach the IMF. They ran their reserves down but they always maintained a large balance. The foreign exchange swaps implemented between central banks were also a significant help to them.

While it is individually advantageous for countries to self-insure by accumulating reserves, this is an inefficient mechanism from a global perspective. There are at least two ways they can accumulate reserves. The first is that the countries that are accumulating reserves must lower their consumption and there must be other countries that run deficits to offset these surpluses. In practice the U.S. was the main country that ran deficits. The resulting buildup of debt and its role in triggering the crisis meant that this was very undesirable. The second way of accumulating sufficient reserves is for the government to borrow long term and invest the proceeds short term. This is also costly as long term rates are usually higher than short term ones and so there will be a net cost. These costs of reserves raise the question of what are the alternatives to self-insurance through the accumulation of reserves.

The IMF can perform an important role by providing funds to countries that are hit by shocks. If countries could always rely on being treated fairly and equitably and not being forced to implement harsh measures, they would not need to accumulate large levels of reserves. In order for this to happen the IMF needs to reform its governance structure so that Asian countries play a much

larger role. This should be accompanied by an increase in Asian staff at all levels. Unfortunately, it seems unlikely that the IMF will be sufficiently reformed to make large reserves in Asia unnecessary in the short to medium run.

A number of Chinese officials have made proposals for a global currency to replace the dollar. This kind of approach has the great long run advantage that reserves can be created initially without large transfers of resources or distortions and the attendant risk of a crisis. All countries could be allocated enough reserves in the event of a crisis so that they could survive shocks. The problem with this proposal is that there would be a need for an institution to implement the currency. It would need to be like the IMF. There would again be the issue of whether Asian countries would be properly represented.

A more likely medium term scenario is that the Chinese Rmb becomes fully convertible and joins the U.S. dollar and the euro as the third major reserve currency. With three reserve currencies there would be more scope for diversification of risks and China itself would have very little need of reserves in just the same way that the U.S. and Eurozone countries do not need significant reserves. This is perhaps the most practical solution to the global imbalances problem. With the help of the U.S. and Eurozone governments, China should start moving in the direction of making the Rmb fully convertible.

We need new theories that allow us to consider the inefficiencies associated with large foreign exchange reserves and the best way to design the international financial architecture. This should include an analysis of the type of international organization that could provide insurance in the way that the IMF was originally intended to. An alternative is to have a system with multiple reserve currencies. A theoretical framework is needed to allow us to analyze the advantages and disadvantages of each of these possibilities and to explore other options.

5. Banking regulation

In order to design effective banking regulation it is necessary to have a clear idea of what are its benefits and costs. The benefit of regulation is that it can potentially stop very damaging crises; but the cost is that the regulation needed to prevent these crises may prevent the financial system from doing its task of allocating resources. In turn that slows down growth, innovation and ultimately damages efficiency.

A good example of what happens if there is not a clear idea of the benefits and costs of regulation is the Basel Agreements. It is not obvious what problem the agreements are trying to solve. Also there is no explanation as to why the capital requirement ratios are set at the level they are. It seems rather that they have been set at the ratios that banks had used in the past. Banks and governments have spent billions of dollars designing and implementing the agreements. Not surprisingly, however, the agreements did not prevent the crisis and seem to have had very little effect in reducing its severity. This is true not just of the Basel agreements but also many of the other banking regulations in various countries. These regulations were largely put in place historically as a reaction to the banking crises in the Great Depression and were not based on a coherent theoretical framework. Over the years they have been changed in response to circumstances. Most countries have ended up with a system that makes little sense. The lack of a coherent framework has meant that there is no agreement on what should be done to reform regulation. This is why there is such a vast array of proposals for reform both within and across countries. What is needed is a new theoretical framework

capturing the important market failures. This can then be used to design appropriate regulations.

Capital regulations have been the main tool for regulating banks in recent years. The traditional justification in the academic literature for capital regulation has been that it is needed to offset moral hazard from deposit insurance (for an exception, see Hellman et al., 2000). Because banks have access to low cost funds guaranteed by the government, they have an incentive to take significant risks. If the risks pay off they receive the upside, while if they do not the losses are borne by the government. Capital regulation that ensures shareholders will lose significantly if losses are incurred is needed to offset this incentive for banks to take risks.

This rationale raises the issue of why there is deposit insurance. The usual answer is that this is needed to prevent bank runs that result from multiple equilibria, or in other words, panics. If there are costs of liquidation and everybody believes there will be a bank run then it will be self-fulfilling. It is rational for each person to take their money out as quickly as possible so they get paid in full. If nobody believes there will be a bank run this will also be self fulfilling. However, in practice deposit insurance is only for small deposits, it does not cover large deposits or wholesale funding. As a result it does not solve the problem of multiple equilibria and panics. One possibility would be to guarantee all forms of short term debt. In this case there would again be a moral hazard problem. A better solution to prevent risk taking may be to remove deposit insurance and deal with the problem of runs through lender of last resort policies. If depositors know that the central bank will provide the needed liquidity if they attempt to withdraw early, they won't withdraw and there won't be a run. This again is an example where existing theory does not provide a good underpinning to current regulation.

Another rationale for capital regulation is the prevention of contagion and systemic risk (see, e.g., Allen et al. (2009) for a general survey of the literature on contagion and Upper (2011) for a summary of the simulation exercises to measure contagion risk). Contagion is the market failure that central banks often use to justify intervention, as, for example, in the case of the arranged takeover of Bear Stearns in March 2008. As Chairman Bernanke stressed in his speech at Jackson Hole in August 2008 (Bernanke, 2008), Bear Stearns would have defaulted if the Federal Reserve had not saved it. That would have led to a whole chain reaction where many other financial institutions would have gone bankrupt. There might have been a complete collapse of the financial system.

New theories of capital regulation based on preventing contagion and systemic risk are necessary. We need to understand the determinants of the optimal capital levels to prevent contagion. In general we need a deeper analysis of the appropriate design of macroprudential regulation. The micro approach to regulation, based on bank-specific risk, has turned out to be highly inadequate given the high degree of interconnections among financial institutions and the correlated risk to which they are exposed. Attempts in this direction can be found in Acharya (2009) and Rochet (2004). Much more work is needed in this area.

One of the major problems in designing capital regulation is in modeling the costs of equity finance for financial institutions. The literature assumes typically that equity is more costly than other forms of finance (see, for example, Gorton and Winton, 2003). This also justifies the need for capital regulation as in its absence, banks would simply minimize their capital holdings and hold more debt. However, it is not at all clear what this higher cost is due to. One simple answer is that it is privately more costly because in many countries debt interest is tax deductible at the corporate level but dividends are not. If this is why there is a desire to use debt rather than equity, then the simple solution is to remove debt interest deductibility. We do not know of any good public policy rationale

for having this deductibility. It seems to have arisen as an historical accident. Interest was regarded as a cost of doing business in the same way that paying wages to workers was a cost. However, from a modern corporate finance perspective, this is not the correct way to think about it. Equity and debt are just alternative ways of financing the firm. If removing interest deductibility means financial institutions are willing or can be induced through regulation at little social cost to use more equity, then financial stability would be considerably enhanced.

Other possible rationales for the high cost of equity are agency problems within the firm. According to this rationale the cost of equity is that it does not provide the correct incentives to shareholders or managers to provide the right monitoring. High leverage is needed to ensure this. There is little empirical evidence of this problem. For example, leverage in private equity and venture capital firms where the agency problem seems much greater is typically less than in banks. This lack of a convincing rationale for the social cost of equity is an important deficiency of current theories.

One important shortcoming of the explanation based on the tax deductibility of debt interest is that it does not explain the difference in capital holdings across industries. Simple evidence shows indeed that non-financial firms hold around 30–40% of their liabilities in the form of capital whereas the financial firms operate with only 10% of capital on average in normal times. The tax subsidy to debt in the form of interest deductibility holds for all industries. Why should it explain the higher cost of capital in the financial industry but not in the others? A more plausible explanation is that debt is implicitly subsidized in the financial industry through government guarantees and bailouts (see also Admati et al., 2010). If this is the case, the removal of the public guarantees and the design of clear resolution schemes would enhance financial stability substantially as it would improve banks' incentives to take risks and induce higher capital holdings.

Another important issue in current capital regulation is that it is based on accounting book values rather than market values. When Wachovia failed during the recent crisis its accounting capital was well above regulatory limits even though the market was no longer willing to provide funds. There is no existing theory that we are aware of that suggests why capital regulation should be based entirely on accounting book values and not at all on market values. We clearly need to develop theories to investigate the extent to which capital adequacy regulation should be based on market capital rather than accounting capital. A related literature is the one on the use of mark-to-market accounting for financial institutions (e.g., O'Hara, 1993; Allen and Carletti, 2008; Plantin et al., 2008; Heaton et al., 2010). This literature highlights the trade-off involved. Valuing banks' assets at market prices has the advantage of reflecting the true value of their balance sheets. However, if markets are flawed it may also lead to important inefficiencies in terms of increased price volatility and contagion, suboptimal real decisions and reduced liquidity creation. Such inefficiencies should be taken into account in investigating the extent to which capital regulation should be based on market capital.

As long as a financial institution can maintain its required regulatory capital, then it will survive. An important issue is what happens when it cannot do so. Should it be allowed to fail or should it be bailed out? One of the most important principles guiding policy during the current crisis has been that large institutions are "Too big to fail." The notion is that if Citigroup is allowed to fail, this is going to cause many other institutions to fail all through the financial system. This is the contagion problem discussed earlier. The way that this policy has been implemented is that governments have bought preferred shares and common stock in many institutions that would otherwise have failed. They have made clear that these institutions will be provided with the capital that they need

in order to survive. The effect of this type of intervention has been to provide a guarantee to long term bondholders as well. There is very little in the way of current theory to justify these policies.

It can be argued that current approaches are the wrong way to deal with the “Too big to fail” problem. As Lehman Brothers’ demise illustrated, contagion is a very real problem and large banks and non-bank financial institutions should not be allowed to simply go bankrupt. However, “Too big to fail” doesn’t mean that these institutions should be allowed to survive. It’s a very bad precedent to provide failing banks with the funds they need to survive. In the future, it is likely that banks and other financial institutions will grow and become large knowing that they will not be allowed to fail. These banks will be willing to take large risks since they receive the payoffs if the gambles are successful while the government bears any losses.

“Too big to fail” does not mean “Too big to liquidate.” Financial institutions should definitely be prevented from failing in a chaotic way. The government should step in and take them over in order to prevent contagion. But rather than allowing them to continue, these institutions should be liquidated in an orderly manner, even if this may take several years. That would allow the other institutions that didn’t fail and that were well-run to expand and take over the failed institution’s business. Propping up the weak ones that did badly is not a good idea in the long term. It rewards risk taking and, perhaps more importantly, it prevents prudence from being rewarded. Well-run banks that survive should be allowed to benefit.

A major difficulty in designing a framework that allows financial institutions to be liquidated is how to deal with large complex cross border institutions. In particular, there is the problem of which countries should bear any losses from an international mismatch of assets and liabilities. This has proved a thorny problem for the European Union in designing a cross border regime to support its desire for a single market in financial services. For countries without the EU’s political ties, it is an even more difficult problem. Designing such a system is one of the most urgent tasks facing governments.

One possible way to proceed would be to eliminate cross border branching. Then any subsidiaries would be regulated by the host country. These regulators would be charged with ensuring that they were comfortable with any imbalances between assets and liabilities in their country. They could require collateral in the form of securities to be posted to cover any excess of liabilities over assets within the country. The regulators would be responsible for intervening should a foreign subsidiary or home institution come close to failing and would be responsible for covering any shortfalls of cross border assets and liabilities that failure would lead to.

We need to develop theories that allow the optimal bankruptcy procedures for financial institutions to be analyzed both in the domestic context and in the international context for multinational banks. What is the best mechanism to provide incentives for shareholders and managers to take the socially optimal amount of risks and provide the optimal flows of capital between countries? These are questions that have been little studied in the current literature. Answers are needed in order to provide sensible financial reform.

6. Competition in financial services

There has long been a tension between competition policy and financial stability (see Carletti and Vives, 2009). It is only in recent years that competition policies have been implemented in many countries. Often for stability reasons, countries have avoided implementing competition in the financial sector as rigorously as in other sectors.

An interesting question that has been raised as a result of the crisis is why is it that in normal times financial services firms make such large profits. The usual answer used to be that the shareholders and employees were taking large risks and the earnings were a compensation for the risk. Now it is clear that governments are bearing the risk. Another possibility is that it is because competition policy is not enforced properly. Although on the face of it financial markets are very competitive, the nature of deviations from perfect competition is rather different than in markets for goods. One simple example is “front running”. This is based on knowledge of order flow by brokers and other participants in the market, which is extremely valuable. For example, if a large buy order is executed then this will typically drive up prices because market participants will deduce that the buyer has good information. If the processor of the order can trade before the large buy order is executed then it is possible to make money. Aggregated over time this front running can be extremely profitable. In the equity markets in the U.S. this is illegal. There are very careful records kept of when orders are received and brokers can’t trade on their own account before they execute the customers’ orders. However, front running is not illegal in the U.S. bond markets.⁹ The large investment banks have set up trading platforms for bonds that give them an advantage in terms of knowledge of order flow. This has the potential to allow large profits from front running.

There are many other examples where information acquired by financial institutions in their normal course of business can be used profitably. Mehran and Stulz (2007) provide a survey of the conflicts of interest in financial institutions. These conflicts of interest often allow abnormal profits to be made. For example, if an investment bank’s analysts provide optimistic forecasts for the firms they cover, this can increase the underwriting business of the bank. Also, frequent buy recommendations by analysts can lead to an increase in the bank’s brokerage business. It is well known that initial public offerings are underpriced. The ability to allocate these underpriced offerings allows investment banks to favor certain customers on their personal investments. In return these customers have an incentive to have their firms hire the investment bank. Although conflicts of interest can be constrained by reputation and other mechanisms, these limitations are not perfect by any means. As a result, financial institutions often have the opportunity to make excess profits.

It is important that deviations from perfect competition such as front running and conflicts of interest be carefully investigated and regulated. For example, front running in the bond markets should be made illegal just as it is in the equity markets. There are many cases where deviations from perfect competition are different in financial services. These deviations need to be fully analyzed and prevented if possible.

7. Concluding remarks

There are many causes for the crisis. One of them is that the study of financial institutions was regarded by many economists as unimportant (Allen, 2001). Many models used by central banks for forecasting, for example, did not include financial institutions at all. Little effort was put into analyzing financial regulation. The prevailing view was that modern financial markets and institutions were close enough to perfection that they could be regarded as complete so that regulation was unnecessary. Advanced countries that suffered from crises such as Japan, Norway, Sweden and Finland, were not studied intensively by mainstream economists. As a result our

⁹ We are grateful to Krishna Ramaswamy for pointing this out to us.

understanding of such crises is limited. This was one of the reasons we failed to prevent the current one. Perhaps more importantly, it means there is very little agreement about how we should design reforms of the financial sector. This explains the vast variety of proposals and emphases on how reform should proceed around the world. What is needed now is an extensive theoretical effort combining the insights of finance with public economics. This paper has outlined some of the areas where current theories are lacking. Once new theories have been developed, empirical tests will be needed to determine the relevant ones that should underpin financial sector reform.

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