Université de Strasbourg

Institut d'Etudes Politiques de Strasbourg

Bank failures mechanisms, and tools for their prevention

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Mémoire de 4ème année

Direction du mémoire : WEILL Laurent, Professeur des Universités

Mai 2014

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Content

Introduction

Bank failures can have multiple origins, and depending on the bank and the period, the mechanisms of failures are not the same. Series of bank failures coincide with periods of financial crisis, which can be defined as a significant disruption in the flow of funds from lenders to borrowers[1]. To summarize the mechanism briefly: banks cannot recover the value of their claim, and so do not have the funds to pay back their creditors. These financial crises can have various reasons:

In 1929 for example, panic is known as one of the main reasons of the financial crisis, leading to several financial institutions failures during the Great Depression era. The 1920's have been a period of important economic growth, especially in manufacturing industries, such as automobiles, building construction, or steel production. This was supported by post-war optimism, and also led to the boom of stock-exchange speculation. More and more Americans invested in the stock market by borrowing money to finance their purchases. As share prices rose, the mechanism was profitable, and people were not buying shares for the potential dividends that it may pay, but to sell them later at a higher price, and profit from the capital gain. But when this speculative bubble burst, the shares lost their value, and the stock market crashed in October 1929. Banks saw the value of their investments go down. As depositors suspected the potential risk of not recovering the value of their deposits, they began to

[1] Hubbard, G. and O'Brien, A., *Money, Banking, and the Financial System,* International Edition, Pearson, 2012, p.348

withdraw their money. Banks began to have difficulties meeting the depositors' cash withdrawal demands. They had to sell their liquid assets, and when they had not any liquid assets left, they had to sell their illiquid assets at a fire sale price, that is, at a price way below their actual value. Many of them filed for bankruptcy in the process. The bad news spread, leading to runs in several banks. This process led to a bank panic, with many banks failing because of their incapacity to deal with runs.

Before 1933, the United States government did not implement any deposit insurance system. So, when the depositors were losing trust on their bank's ability to handle their money, they had an incentive to withdraw their money in the form of cash. This is why the risk of bank panics was higher before this date. The Banking Act of 1933, referred to as the Glass-Steagall Act, changed that. The Glass-Steagall Act brought two main changes to the banking system, among other things. It has separated investment banking from commercial banking to protect the depositors from the excessive risk taking of investment banks. Besides, it has created the Federal Deposit Insurance Corporation (FDIC), a system of bank deposit insurance that ensured deposits up to $2,500. The FDIC is a government corporation operating independently, acting as a lender of last resort when banks are facing financial troubles. Following the 2007-08 financial crisis, the FDIC guarantees deposits up to $250,000 in member banks, which represent more than 6,700 institutions[2]. In the European Union, the deposit insurance represents €100,000 per bank per depositor[3]. The creation of that deposit insurance is justified by the depositors' incentive to withdraw their money in troubled times. The

[2] FDIC insured institutions, Key Statistics, Federal Deposit Insurance Corporation website, http://www2.fdic.gov/idasp/

[3] De Watripont, M., *European Banking Bailout, Bailin, and State Aid Control*, International Journal of Industrial Organization (2014)

aim of the FDIC is to prevent bank runs from happening, and thus to stop the probability of bank failure through the bank panic channel. But why should we save a bank from a potential failure in the first place?

The problem with banks is contagion: when one of them fails, it does not mean good news for the others. As we saw, contagion is the process by which a run on one bank spreads to other banks, resulting in bank panic[4].

This is one of the features that differentiate banks from other companies. In the soft drink industry for example, if a company like Pepsi fails, it will create an expansion opportunity for other companies, especially Coca-Cola, which is positioned in the same segment. In that case, the Coca-Cola Company would have the quasi-monopoly of the soft drinks industry.

The banking system does not have the same characteristics, as banks are interconnected. Banks are rivals too, but the nature of their activity also leads them to need each other to pursue their activities. They lend money to each other, take participations in each other, securitize their assets that they sell to each other, and to other financial institutions, and so on. This is why almost all banks rely on other banks or financial institutions when it comes to recovering the value of their assets. When the asset of one bank corresponds to another bank's liability, the first bank has an interest in the survival of the second.

To protect themselves from the specific risk of one bank's failure, banks diversify their portfolio by expanding their activity to several other banks: they lend to other banks or take participations in it. Therefore, banks will always have more than one

[4] Hubbard, G. and O'Brien, A., *Money, Banking, and the Financial System,* International Edition, Pearson (2012), p.349

stakeholder. They are all more or less interconnected, making of the failure of one bank a loss in the assets value of its stakeholders. The failed bank would not be able to pay back its loan, or would not create any value for the shareholder, who could be another bank. Diversification is set up to mitigate that potential loss. The principle of diversification is that losses in some assets are offset by earnings in other assets, or at least represent a small fraction of a bank's total assets. If banks diversify their assets, and thus protect themselves from the specific risk of another bank's failure, then theoretically it would not cause them a big disturbance. At least, the disturbance would not be big enough to justify the authorities' intervention to save the troubled bank from failure. So, the question remains: why is it important to save a bank from failure?

Some banks have expanded their activities to a point where they have a presence in several banking activities, almost all financial activities for the biggest ones. These universal banks do commercial banking, as well as investment banking; they may also offer insurance services, among other financial services. They grew to earn a leading position in the banking sector, and their failure would cause a shock to the entire financial system. These banks have diversified their activity enough to endure most of the shocks, but if their failure actually happens, a wide range of activities in which they are involved would be affected. Other banks and financial institutions could suffer losses in their assets value, even if their portfolios are diversified. This is explained by the important place of universal banks in the financial system, in terms of the volume of their activities, but also their large geographical presence. This too-big-fail theory will be explained in more details in the first part of this dissertation.

We made a short summary of how banks could fail in the late 1920's and early 1930's. But today the context is different, and even if we can see some analogical mechanisms with the past, current failures also have different causes. How do we prevent a bank from failing? This dissertation aims at spotting and explaining contemporary causes for financial crisis, the channels through which it provokes bank failures, and see through which methods we can prevent these failures.

The first part of this dissertation will focus on the explanation of bank failures mechanisms with the 2007-08 financial crisis as an example; the second part will concentrate on the most frequently used method to prevent a bank's failure, i.e. bailing out the bank; and finally, the third part will point out an alternative way of saving banks, namely the bail-in.

Part I - The 2007-08 financial crisis example to explain bank failures mechanisms.

To puzzle out the mechanisms of bank failures, we will have a look at the financial crisis of 2007-08, the period in which bank failures sharply rose. However, we will not focus much on the failing banks, but more on the large financial institutions with weakened situations, but which cannot be allowed to fail. Their example is more relevant, as the following parts will describe the methods to prevent bank failures, and the latter are used for too-big-to-fail institutions. This part thus explains how the financial crisis happened, but also spots the channels through which it affected banks' financial health.

Banking industry changed a lot at the end of the 20th century. Through concentration, banks became large and complex financial institutions. Some of them grew to the point of becoming systemic: their failure can cause the collapse of the financial system, leading to dramatic effects for the economy. They became too important for the State to let them fail. The first point will explain how the banking regulation allowed banks to become these large, complex financial institutions. This situation led to moral hazard in these banks, but also governance issues. We will see in the second point how these two features led to excessive risk taking in these large institutions, and how this attitude materialized in the market, leading to the financial crisis. Finally, the third point will explain why banking regulation let these mechanisms take place, and thus failed in preventing the crisis from happening.

A. The premises of the financial crisis: banks become TBTF

The financial crisis of 2007-08 has several direct causes that are explained in the second point of that part. Here, the focus will be on the warning signs that would have allowed foreseeing financial troubles. As we evoked in the introduction, some banks became too-big-to-fail; we are going to see how they came to that point and how this meant danger for the financial system.

1. The path to growth

In the US, one of the reasons for banks expansion was the McFadden Act in 1927. The McFadden Act gave national banks the opportunity to develop branches in the city where their headquarters were established. Before 1927, those banks had to operate within a single building. These national banks are the banks operating under corporate charters granted by the federal government, those who were insured by the FDIC. But, the McFadden Act had a limit for them: the national bank could open a branch in the city of its home office only if the state law allowed branching for the other banks too, meaning the state banks, those who operate under corporate charters granted by state governments[5].

[5] Richardson G., Park D., Komai A., and Go M., *McFadden Act of 1927,* Federal Reserve History, http://www.federalreservehistory.org/Events/DetailView/11

The McFadden Act was a big change for banking, as branching enables banks to diversify their deposits and loans over a wider customer base[6]. Branching had the effect of reducing bank failures: according to Friedman and Schwartz (1963), during the Great Depression, the severity of bank panics was higher in states where branching was not possible[7]. So, it had a positive effect on financial stability. But it did so by allowing another effect: the possibility for national banks to strengthen their position in several states. National banks were present in many states, whereas state banks were only present in states in which they were created. Allowing national banks to open branches too increased their influence. With more banks capable of opening branches, the banking competition intensified, and the weakest banks were acquired by other stronger banks, or liquidated. Branching then favors the consolidation of banking, as the strongest banks become stronger, and the weakest banks disappear[8].

This is how branching favors financial stability: as there are fewer banks, which also became stronger thanks to consolidation, they grow more resistant to shocks, such as bank runs. But the price for that financial stability is the rising influence of banks. Other provisions of the McFadden Act also reinforced this influence: the possibility of owning and operating subsidiary corporations, or the possibility of expanding the size and types of granted loans[9]. The McFadden Act thus favored the enlargement of banks:

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[6] Carlson, M. and Mitchener K., *Branch Banking*, *Bank Competition, and Financial Stability,* Washington, D.C., Federal Reserve Board (2005)

[7] Friedman, M. and Schwartz, A.J., A *Monetary History of the United States, 1867-1960,* New York, National Bureau of Economic Research (1963)

[8] Carlson, M. and Mitchener K., *Branch Banking*, *Bank Competition, and Financial Stability,* Washington, D.C., Federal Reserve Board (2005)

[9] Richardson G., Park D., Komai A., and Go M., *McFadden Act of 1927,* Federal Reserve History, http://www.federalreservehistory.org/Events/DetailView/11

it had the effect of transforming simple banks to complex corporations. Yet the McFadden Act posed a limit to banks expansion: it prohibited interstate branching. Indeed, national banks could only branch within the state in which they were originally located[10]. To summarize, under the McFadden Act, branching in the city of its home office was possible for national banks as long as the state did not forbid it, but interstate branching was not allowed.

2. Expansion of activities: quantitatively and qualitatively

The Riegle-Neal Interstate Banking and Branching Efficiency Act was signed in 1994 and renewed the legal environment. It allowed interstate branching and the consolidation of one bank with another. Prior to the Riegle-Neal Act, banks needed to establish separate subsidiaries in other states as a relay of their activity outside their original state[11]. It was also illegal for banks to accept deposits from any customer outside their state. The new law enabled considerable geographical expansion potential for banks by removing these barriers, and opened the way to broader deregulation in the banking system that increased their consolidation.

The Gramm-Leach-Bliley Act in 1999 is the most noteworthy. If the Riegle-Neal Act allowed banking consolidation through geographical expansion, the Gramm-Leach-Bliley Act enabled consolidation of financial activities. The GLB Act aimed at

[10] Freeman D., *Interstate Banking Restrictions under the McFadden Act,* Virginia Law Review (1986) p. 1119

[11] Becher D. and Campbell T. (2005), *Interstate banking deregulation and the changing nature of bank mergers,* The Journal of Financial Research

repealing some of the provisions of the Glass-Steagall Act, notably the prohibition for institutions to combine several financial activities. Financial institutions could not act as a commercial bank, an investment bank, and an insurance company at the same time. While Commercial banking involves lending to individuals or businesses, investment banking includes several activities, such as providing advices on new securities or M&A deals, underwriting securities, financing M&A, financial engineering, proprietary trading, etc. With the GLB Act coming to force, the consolidation of banks took a step further. From the depositor's point of view, it allowed to do both savings and investments at the same institution. From the bank's point of view, it was a new opportunity to diversify its sources of income.

Geographical and activities diversification in the 1990's accelerated the bank's transformation into large, complex financial institutions (LCFIs) in the US. LCFIs were doing commercial banking, investment banking, asset management, and insurance. They became systemic, meaning that their failure could have contagious effect on other financial institutions, a depressing effect on asset prices, or a reduction in market liquidity[12]. That implied that they could be allowed to fail only at the cost of severe damages for the financial system. This new feature also implied that the government would be there to save the bank, if financial troubles were to happen, by injecting money in it.

[12] Saunders, Anthony; Smith C. Roy, and Walter, Ingo, "Enhanced Regulation of Large, Complex Financial Institutions" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), p. 139

3. Banking expansion in Europe

In Europe too, there was a movement of LCFIs creation, through European Union Directives:

In France, in 1945, at the end of the war, several retail banks were nationalized. This movement was initiated during the Vichy regime already through the setting up of supervisory authorities. This regulation brought separation of commercial banking and investment banking in France, and lasted approximately 40 years. Investment banks in France could not receive deposits from individuals or households, only from businesses. Thus, their financing came from equity and long-term debts. On top of that, they had to host Government Commissioners during their board of directors' meetings. That harsh regulation for banks was reformed in 1984, with a banking law[13]. The latter was transposing a EU Directive of 1977, and authorized banks to pursue several types of activities, putting an end to commercial banks and investment banks separation.

In fact, this First Banking Coordination Directive applied for all the EU member States, and thus marked the end of banking activities separation in the EU. The directive abolished barriers for banking services along Member State borders, and allowed Member States' banks to establish branches in other Member States after asking authorization to banking authorities of the host Member State. The 1977 directive however left some restrictions to banking activities.

[13] Loi n° 84-46 du 24 janvier 1984 relative à l'activité et au contrôle des établissements de crédit, http://www.legifrance.gouv.fr/jopdf/common/jo_pdf.jsp?numJO=0&dateJO=19840125&numTexte=&pageDebut=00390&pageFin=

The Second Banking Coordination Directive of 1992 continues to build more freedom for banks by removing restrictive features of the First Directive: banks do not have to ask for authorization to establish branches anymore. Moreover, the 1992 Directive removes restrictions that host Member States could place on the ranges of activities that foreign banks' branches could pursue. It also removes the earmarked endowment capital that banks had to provide its branches, as they were new financial institutions[14]. These features allowed some European banks to become LCFIs too.

4. The rise of LCFIs and their effects on the financial system

Moreover, during the 1990s and the beginning of the 2000s, several merger and acquisition (M&A) operations have been undertaken in the USA and in the EU; for example:

- Lloyds Bank and TSB Group merged in London in 1995, creating Lloyds TSB.
- Citicorp and Travelers Group merged in New York in 1998, creating Citigroup Inc.
- BNP and Paribas merged in Paris in 2000, creating BNP Paribas.
- JP Morgan & Co and Chase Manhattan Bank merged in 2001, creating JP Morgan Chase & Co.

[14] Gruson, Michael and Nikowitz, Werner, *The Second Banking Directive of the European Economic Community and its Importance for Non-EEC Banks,* Fordham International Law Journal, Volume 12, Issue 2, Article 3 (1988)

All these movements in regulation in the USA and the EU contributed to the creation of LCFIs. The figure below shows a list of the world's biggest LCFIs, in terms of assets, income and subsidiaries as of 2007[15]:

Table 8.1. Overview of Large Complex Financial Institutions

1 LCFIs	2 Total assets (billions of $, year end 2006)[1]	3 Total subsidiaries[1]	4 % of foreign subsidiaries	5 % of net foreign income before taxes (2006)[2]	6 HHI—business lines revenues (2006)[3]	7 Number of countries[4]	8 Subsidiaries in OFCs, number[5]	9 Subsidiaries in OFCs, %[5]
UBS AG	1,964	417	96%	62%	2,903	41	38	9%
Barclays Plc	1,957	1,003	43%	44%	2,179	73	145	14%
BNP Paribas	1,897	1,170	61%	51%	1,843	58	62	5%
Citi	1,884	2,435	50%	44%	4,122	84	309	13%
HSBC Holdings Plc	1,861	1,234	61%	78%	3,945	47	161	13%
The Royal Bank of Scotland Group Plc	1,711	1,161	11%	34%	1,966	16	73	6%
Deutsche Bank AG	1,483	1,954	77%	80%	3,931	56	391	20%
Bank of America Corporation	1,460	1,407	28%	12%	4,256	29	118	8%
JPMorgan Chase & Co.	1,352	804	51%	26%	2,086	36	54	7%
ABN AMRO Holding NV*	1,300	670	63%	77%	1,381	43	37	6%
Société Générale	1,260	844	56%	46%	4,128	60	64	8%
Morgan Stanley	1,121	1,052	47%	42%	4,476	46	203	19%
Credit Suisse Group	1,029	290	93%	71%	3,868	31	53	18%
Merrill Lynch & Co., Inc.	841	267	64%	35%	4,089	25	23	9%
Goldman Sachs Group, Inc.	838	371	51%	48%	5,391	21	29	8%
Lehman Brothers Holdings Inc.	504	433	45%	37%	7,807	20	41	9%

Note: Year end 2007 (unless otherwise specified).
*After the most recent list of LCFIs (Bank of England, 2007b) was published, a consortium of three banks (RBS, Fortis, and Santander) acquired ABN AMRO.
[1] Bankscope. Data on subsidiaries refer to majority-owned subsidiaries for which the LFCI is the ultimate owner with a minimum control path of 50.01%.
[2] Annual reports for each LCFI. Net income before taxes with five exceptions: net income after taxes for Citi, and net revenues for Barclays Plc, BNP Paribas, Lehman Brothers Holdings Inc., Merrill Lynch & Co., Inc.
[3] Oliver Wyman. The Herfindahl-Hirschman Index ranges from 0 to 10,000 and it is calculated on the percentage of revenues per business line. Higher values indicate a higher degree of specialization. Lower values imply a higher degree of diversification.
[4] Number of countries in which the LCFI has at least one majority-owned subsidiary.
[5] Offshore Financial Centers identified by the Financial Stability Forum (2000). We exclude Swiss subsidiaries for Credit Suisse and UBS and Hong Kong subsidiaries for HSBC. Four subsidiaries were allocated to OFCs on the basis of locations designated in their names even though Bankscope did not specify a home country.

One problem that arises when some banks or financial institutions become LCFIs is asymmetric information, meaning that one party at the transaction has information that the other does not. As financial institutions become more complex, these asymmetries increase. Herring and Carmassi (2012) have spotted two types of asymmetric information: between shareholders and creditors, and between shareholders and managers.

[15] Herring R. and Carmassi J., *The Corporate Structure of International Financial Conglomerates,* Oxford University Press (2012), p. 199

Shareholders and creditors do not have the same payment functions: the creditors are paid first, but they receive a fixed payoff; whereas shareholders could potentially take all the earnings left, if there are. Creditors' payoff is defined by contract before the actual payment, while shareholders count on the firm's profitability to define the amount of their earnings. Shareholders' position is more risky, but has a higher profitability potential, and as the financial principal states, the higher the risk, the higher the return. Thus, shareholders will usually prefer riskier investments, whereas creditors will want the firm to do safer investments. Creditors' payoff is fixed, but if the firm fails, their return is not guaranteed. Even if they are paid first, if the firm took too many risks and failed, it will not be able to pay the creditors back. So, a conflict of interest arises between shareholders and creditors on the level of riskiness of the firms' investments. To reassure the creditors, banks may place their riskier activities in separate subsidiaries, so that creditors know that these activities will be operated limitedly[16]. But the creditors cannot know the relations between the LCFI and its subsidiaries; the money lent by the creditor might be used in the risky subsidiary. LCFIs are complex, and difficult to regulate, and it can be hard for an outsider to assess the level of riskiness that the bank's investments represent. The only people who know how risky the investments really are, are the insiders: the managers.

There is an asymmetric information problem between shareholders and managers too. In LCFIs, there is a separation between ownership and control. Shareholders have the ownership while managers exert the control on the firm's activities. As the financial

[16] Herring R. and Carmassi J., *The Corporate Structure of International Financial Conglomerates,* Oxford University Press (2012), pp. 201-202

institutions became bigger, shareholders became more dispersed, and there usually is no dominant owner. In this framework, managers can have a freedom of control that may not serve the interests of owners in the best way possible. They can look for ways to protect their position in the firm by doing the safest investments possible for example[13]. That way, the risks that they are getting replaced are lowered, but as risk and profitability go together in finance, the potential earnings are below those that come with riskier investments. Owner thus sought ways to align managers' interests with theirs: it is a principal-agent problem. This is how incentives, through compensation regimes, were established in the banking sector. With banks becoming bigger and bigger, the best way for the shareholders to monitor the managers is to align their interest, by setting up variable income systems. Indeed, on top of their fixed salary, managers were eligible to variable income that took the forms of bonuses mainly, but also stocks, options, tax reimbursement, among others[17]. Bonuses encourage managers to maximize the earnings, while stocks bind their earnings to the firm's health and profitability. That way, managers have an incentive to increase the firm's value, which goes along with shareholders' interests. But we will see later that these incentives, combined with the lack of control led to a suboptimal situation.

To summarize, banks becoming too-big-to-fail knew that they would be helped if things would go wrong, so they took excessive risks to maximize their earnings. This feature allowed the mechanisms of the financial crisis to take place.

[17] Clementi, Gian Luca; Cooley F. Thomas, Richardson, Matthew; and Walter, Ingo, "Rethinking Compensation in Financial Firms", in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), pp. 206-207

B. Failure mechanisms through the excessive risk taking materialization.

The 2007-08 financial crisis is due to a large increase of granted credits on one hand, and the housing bubble burst on the other. These two factors are known as the crisis direct causes, but other features of the financial system allowed them. They are the result of excessive risk taking in the banking sector. This point aims at understanding how the risk-taking attitude materialized in the financial sector, and to see through which channels the failures happened.

1. Incentives for high returns

As we have seen earlier, asymmetric information between owners and managers leads shareholders to encourage managers to generate high returns on their investments. They do so by creating incentives. Managers thus had a high risk-taking attitude, motivated by their variable income. The other reason for that excessive risk taking is that traders were not using their own money to make the deals, but other people's[18]. The subprime lending market was the materialization of that excessive risk-taking attitude. Subprime lending consisted in making mortgage loans to households that might have difficulties to pay their loan back because of their financial situation. Some financial institutions were specialized in these kinds of lending. They were motivated by the high returns expected, as they could charge high interest rates to these risky households:

[18] Lo W. A., *Reading about the Financial Crisis: A 21-Book Review*, Journal of Economic Literature (2012)

above prime rates. But the risk of not recovering the value of the loans back was also higher with these households than with households qualified to get prime rate loans. And as the number of households contracting debts increased, the value of houses rose, so as the value of loans and the amount of interests. So, the mechanism became more and more profitable as housing prices rose. Moreover, the possibility for financial institutions to seize the properties of indebted households, in a debt repayment incapacity scenario, was reinforced by these rising prices in the housing market. On the other hand, the Fed gave banks the opportunity to borrow money at low interest rates. Banks thus saw an arbitrage opportunity: they could borrow money at low interest rates on one side, and lend money at high interest rates on the other, by lending to financially vulnerable households. There was an opportunity to get high return-on-equity, as this ratio increases with high earnings and low financial costs. Karl S. Okamoto defines this "carry trade" strategy as "taking low-cost borrowings and investing them in higher-yielding assets in order to capture the spread, or carry"[19]

$$\text{ROE} = \text{ROA} + (\text{ROA} - \text{RD})\,\frac{D}{E}$$

We can see on this formula that, on one hand, the return on equity relies on the return on assets, which corresponds to the net income divided by total assets; and on the other on the difference between the ROA and the cost of debts RD, multiplied by the leverage $\frac{D}{E}$. With high yield on subprime lending and low costs of borrowing, there was

[19] Okamoto S. Karl, *After the bailout – regulating the systemic moral hazard,* UCLA Law Review 183 (2009)

an important difference between ROA and RD. So, to maximize the ROE, they had to increase their leverage.

2. Securitization: risk transfer and leveraging

So, besides investing in subprime lending, financial institutions transferred the risk posed by the granted loans. They did it thanks to securitization, a credit risk transfer mechanism: they transferred their assets off their bank balance sheet, to other investors. Off-balance-sheet financing consists for a bank to originate residential mortgages and other loans that are financed by selling them to a special purpose financial corporation under its control, and that was set up only to purchase these loans. These special purpose vehicles issue debts that third party investors can invest in, so that the SPVs can buy the credit from the sponsoring bank. So, through the use of mortgage-backed securities, tied to subprime mortgages, banks transferred the credit risk from their balance sheets to capital market investors, thanks to use of SPVs. Banks went from an originate-to-hold model, in which they kept the claims on loans for themselves, to that originate-to-distribute model. The SPVs' transactions were not included on the sponsoring bank's balance sheet, under certain conditions, as they were not its original activities. So, in addition to transferring the credit risks, banks bypassed capital requirements, as these SPVs, which did not hold enough capital compared to the amounts of loans granted, did not appear on the banks' balance sheets[20].

[20] Duffie D., *How Big Banks Fail, And What to Do about It,* Princeton University Press (2011), pp. 20-21

This feature allowed banks to increase their leverage considerably. As we saw, credit risk transfer mechanisms allowed two things: the credit risk transfer, but also the avoidance of capital requirements. The first one increases the contagion risk in case of a solvency crisis, and the second one increases the risk that an economic shock quickly wipes out the bank's capital base. The ability to securitize assets was the cause of poor subprime lending decisions: as banks knew that they could transfer the credit risk to other investors, they did not hesitate to lend to financially weak households. And, as their capacity to increase their leverage maximized their ROE, they had an even bigger incentive to continue with that scheme.

However, according to V. Acharya and P. Schnabl, banks' second use of these mechanisms, i.e. to get around regulatory requirements, made the financial crisis far worse: once they faced the financial troubles through the non recovery of their assets linked to subprime lending, they did not have enough capital to face it. For example, Lehman Brothers had a leverage of more than 30 to 1, meaning only $3.30 of equity for every $100 of loans. This means that a drop of 3,3% in Lehman Brothers' assets value would have been enough to wipe out its capital base and make it insolvent. Lehman's strategy was to finance a large part of its assets (more than 50% in 2007 and 2008) with short-term debt. The low interest rates made that strategy profitable, but it was still very risky since the bank would face a liquidity risk if the short-term loans were not renewed. Lehman Brothers was thus consciously taking risks: it was taking the risk of bankruptcy in case of a bank run[21]. If Lehman's case is extreme, it was not the only bank that used excessive leverage and short-term borrowing. The same financial

[21] Zingales L., *Causes and Effects of the Lehman Brothers bankruptcy*, Before the Committee on Oversight and Government Reform, United States House of Representatives (2008)

structure existed in other banks and financial institutions. If confidence on banks was lost and short-term borrowers refused to renew their loans to these banks, they could not finance their important level of assets. And if these assets lose their value, their capital base would be wiped out quickly because of their leverage level.

Table 6: Lehman Brothers Liabilities and Shareholders' Equity

PERIOD ENDING	31-May-08	29-Feb-08	30-Nov-07	31-Aug-07
Current Liabilities				
Accounts Payable	70,888,000	96,148,000	80,346,000	68,986,000
Short/Current Long Term Debt	163,148,000	428,555,000	359,415,000	336,456,000
Other Current	29,355,000	28,829,000	29,363,000	24,935,000
Total Current Liabilities	-	-	-	-
Long Term Debt	349,765,000	207,671,000	199,449,000	207,106,000
Other Liabilities	-	-	-	-
Deferred Long Term Liability Charges	-	-	-	-
Minority Interest	-	-	-	-
Negative Goodwill	-	-	-	-
Total Liabilities	**613,156,000**	**761,203,000**	**668,573,000**	**637,483,000**
Stockholders' Equity				
Misc Stocks Options Warrants	-	-	-	-
Redeemable Preferred Stock	-	-	-	-
Preferred Stock	6,993,000	2,993,000	1,095,000	1,095,000
Common Stock	61,000	61,000	61,000	61,000
Retained Earnings	16,901,000	19,880,000	19,698,000	18,915,000
Treasury Stock	-4,922,000	-5,149,000	-5,524,000	-5,658,000
Capital Surplus	11,268,000	11,129,000	9,733,000	9,802,000
Other Stockholder Equity	-4,025,000	-4,082,000	-2,573,000	-2,482,000
Total Stockholder Equity	**26,276,000**	**24,832,000**	**22,490,000**	**21,733,000**
Leverage ratio (assets over equity)	**24.6**	**32.7**	**30.7**	**30.4**
Short term ratio (short term debt over assets)	**25.51%**	**54.59%**	**52.05%**	**51.09%**

Source: Lehman Annual Reports.

3. What caused the end of this scheme?

The combination of a growing number of delinquencies and the decrease of houses' values in 2006-07 led to the beginning of the financial crisis. Indeed, many of the banks and the financial institutions' assets were linked to subprime lending. They began to lose their value, along with the fall of housing prices.

The problem that arose with the credit risk transfer mechanism is that, in some of their conduits, banks provided investors the possibility to have recourse to them in case the quality of the assets deteriorated. That possibility was given by the liquidity and credit enhancements. These enhancements aimed at making the investments in structured investment vehicles more attractive for investors, but they turned against banks during housing bubble burst when they had to bailout the vehicles. These vehicles were not included in balance sheets, but they were actually representing a risk for the bank, because of the possibility of recourse from investors. Thus, the risk was not systematically transferred, and the first purpose of securitization was not entirely fulfilled[22].

This possibility of recourse led to bank runs, not through depositors this time but through other banks or financial institutions that wanted the value of their assets back. Contrary to 1929, bank runs happened in dealer banks through over-the-counter derivatives, repos, prime brokerage activities, and clearing banks. According to Darrell Duffie, dealer banks are banks that have a central position in the financial system, as

[22] Acharya V. and Schnabl, Philipp, "How Banks Played the Levereage Game" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), pp. 83-99

they are involved in many kinds of activities (securities, derivatives, underwriting, etc.). Their failure could cause major troubles to the financial system, such as losses in assets' values, or inability to provide credits and liquidity to market participants[23]. The following table shows a list of these dealer banks:

TABLE 2.1
Major dealers participating at the New York Federal Reserve Bank meeting on over-the-counter derivatives market infrastructure held on January 14, 2010.

BNP Paribas
Bank of America
Barclays Capital
Citigroup
Commerzbank AG
Credit Suisse
Deutsche Bank AG
Goldman, Sachs & Co.
HSBC Group
J. P. Morgan Chase
Morgan Stanley
The Royal Bank of Scotland Group
Société Générale
UBS AG
Wells Fargo

Source: New York Federal Reserve Bank.

4. Bank run channels

When the dealer bank is facing difficulties, its OTC derivatives counterparties will look for ways to reduce their exposures to this bank. Derivatives are contracts, which transfer risk from one investor to another. An OTC derivative is contracted

[23] Duffie D., *How Big Banks Fail, And What to Do about It,* Princeton University Press (2011), p. 9

directly between two parties, without any supervision. The derivative's value is determined by the performance of an underlying entity, which can be an asset, an interest rate, or an index. The encompassed contracts by derivatives are futures, forwards, options, and swaps. Dealer banks are one of the two counterparties in most of the OTC derivative contracts[24]:

Table 2

Exposures of dealers in OTC derivatives markets by asset class, counterparty type, and single versus multi-name credit default swaps (CDS), as of December 2008. Net exposures do not include CDS.

Asset class	Exposure ($ billions)
CDS	5,652
Commodity	955
Equity Linked	1,113
Interest Rate	18,420
Foreign Exchange	3,917
Unallocated	3,831
Total	33,889
Total after netting	5,004
CDS by Counterparty	
Dealer to dealer	3,177
Dealer to other financial institutions	2,377
Dealer to non-financial customers	98
Total	5,652
CDS by type	
Single name	3,695
Multi-name	1,957
Total	5,652

Source: BIS, May, 2009.

So, dealer banks were highly exposed to a potential fall of the underlying assets' values. If the other counterparty fears a potential solvency crisis of the dealer bank, it

[24] Duffie D., *The failure mechanics of dealer banks*, BIS Working Papers, Bank for International Settlements (2010)

will try to reduce its exposure to the bank. It can do so by several methods, such as borrowing from that dealer bank, entering new derivatives contracts with that dealer in order to offset some of the exposure, or also through novation to another dealer, i.e. the its replacement by another participant. The novation procedure can get difficult when news about the dealer bank's financial troubles begin to spread. A high number of novation requests could mean a liquidity drain for the dealer bank. Indeed, counterparties that leave withdraw their cash collateral from the dealer banks, which did not operate segregation between these collaterals and their available cash, meaning that the collaterals' removal lowers the dealer's liquidity. For example, the exposures of OTC derivatives counter-parties to Citibank, after netting the collaterals, fell from $126 billion in March 2008 to $81 billion in March 2009[25].

To summarize, reducing exposure to OTC derivatives increases dealer banks' liquidity problems. As a high number of exposure reduction attempts usually occurs when the dealer is facing difficulties and when the information about it begins to spread, we can identify this phenomenon as bank run: a run on OTC derivatives[26].

There was also a run on the repurchase agreements' (repos) market. A repo is an agreement between two parties, where one party sells a security to the other and agrees to repurchase it in the future, and the other party buys the security and agrees to sell it back to the first party in the future. The security is thus used as collateral in repos, and the value of the collateral in excess of the value of the cash exchanged in the repo is called the haircut. The haircut is what the borrower pays for the cash to the

[25] Singh M. and Aitken J., *Counterparty Risk, Impact on Collateral Flows, and Role for Central Counterparties,* IMF Working Paper (2009)

[26] Duffie D., *The failure mechanics of dealer banks*, BIS Working Papers, Bank for International Settlements (2010)

counterparty. The run on repos phenomenon materialized through the rapid increase of haircuts, reflecting the assets' loss of value. Repos are short-term agreements, sometimes with a term of one day called "overnight repos", often having money market mutual funds as counterparties. So, when the counterparty knows that the borrower is facing financial difficulties, it can either renew the repo with a considerably higher level of haircut, or it can decide not to renew the repo. In both case, it causes a liquidity problem to the borrowing bank. When confidence on a bank's future is lost, assets of that bank can lose even more value than the initial loss caused by subprime lending defaults. If the bank fails to pay its loan back, the repo counterparty has to sell the asset used as collateral as quickly as possible, before it completely loses its value.

Other activities jeopardized by bank runs are prime brokerage. Prime brokerage activities consist of financial services aimed at special clients, such as hedge funds. These services include securities lending and borrowing, or cash management, among other things. Prime brokerage activities generate fees for dealer banks, but they also represent a source of cash: banks can indeed finance themselves with the cash and securities that clients have in their prime brokerage accounts. If a bank or a financial institution that is holding prime brokerage activities is facing financial difficulties, prime brokerage clients encounter a risk to not be able to claim their assets that were not segregated in their accounts. Banks could use them to meet their immediate financial needs, as they would be considered as banks' available cash. Thus, in difficult financial times, clients have an incentive to withdraw their money or assets from their prime brokerage accounts. Such run on prime brokerage accounts could happen through clients moving to other banks, or placing their money in regular accounts in the same

bank. The effect is the same: it reduces the sources of liquidity for the bank. Sometimes, banks can use the assets in these accounts as collateral for borrowings. So their flight could represent a serious liquidity problem. Furthermore, clients holding prime brokerage accounts are high quality clients: their flight gives a negative message to markets and could cause runs through other channels, and reduce the bank's ability to raise additional cash somewhere else[27].

Another run could be for a clearing bank to refuse granting overdraft privileges to the dealer bank. A clearing bank acts as an intermediary between commitments of buyers and sellers: it transforms promises of payments into actual movements of money from one bank to another. If the client is known to be safe, the clearing bank can authorize him to bring his clearing account below zero. This is a way for the dealer bank to meet its commitments, and to reinforce its liquidity. But, here again, when confidence on that bank is lost, the clearing bank could simply refuse to allow this privilege again[23].

Each case is part of the vicious circle that takes place when suspicion about the dealer bank's solvency are growing, leading to liquidity deterioration: the bank loses the clients and privileges that it has gained by its good reputation.

So, one of the differences between the financial crisis of 2007-08 and the 1929 crisis is that banks faced runs through several new types of channels. Indeed, from an individual depositor's point of view, there was no incentive to run on the bank anymore,

[27] Duffie D., *The failure mechanics of dealer banks*, BIS Working Papers, Bank for International Settlements (2010)

as the FDIC insured his deposits up to certain amount. As the depositors run were responsible for the 1929 financial crisis, measures to prevent it from happening again were taken. But, this time, bank runs happened through these new channels. To face these runs, and so to meet the requirements of their clients, banks had to recover the value their assets. And, as recovering them by asking to the subprime borrowers to pay back their loan did not work, and as the houses used as collateral for these credits were losing their values because of the housing bubble burst, banks had to sell their toxic assets to other investors. They experienced a forced sale of their assets. As news of these sales and deteriorating financial conditions spread, more and more banks began to sell their assets to try to recover as much value as possible, and assets were thus losing their values. This mechanism can be found in the principles of adverse selection explained by Akerlof (1970): the buyer knows less about the assets' actual value, so he has to buy it at a price that makes up for its informational disadvantage[28]. Thus, assets' decreased values were not enough to meet banks' liabilities. Because of this context, as in a classical bank run through depositors, banks also had to sell non-toxic assets at a fire sale price. Different channels, same mechanisms.

To sum up, for most banks that faced financial disorder, the problem was not simply that their assets had less value than their liabilities. It is mainly that many of them had liabilities payables in the short term; they had to meet their commitments quickly. That means that if they faced a loss in the value of their assets, they could

[28] Akerlof G., *The Market for "Lemons": Quality Uncertainty and the Market Mechanism,* The Quarterly Journal of Economics, Vol. 84, No. 3. (Aug., 1970), pp. 488-500

easily face huge difficulties in meeting their short-term debts, and the forced sale of some assets to meet their commitments would deteriorate these values even more.

The risk-taking attitude that allowed this scheme to develop was caused by the failure of internal risk management. Indeed, before the crisis, traders took the place of risk managers in banks' risk management departments. So, on one hand there was an encouragement to maximize the return on equity, and on the other a lack of control of risks taken. In practice, it materialized as follows: subprime borrowers unable to pay back their loans, collaterals that were losing their values, banks' high levels of leverage leaving them in the incapacity to face the runs, counterparties trying to reduce their exposure to troubled banks that deteriorated their liquidity even more.

These mechanisms took place despite the capital regulations; the next point will focus on the failure of regulators in capital requirements.

C. The Failure of Regulation.

In financial regulation, G. Hubbard and A. O'Brien (2012) identify a regular pattern: first the crisis happens, then regulation intervenes; after that, financial firms respond to new regulations by financial innovation, and finally there is a counter response by regulators. This pattern could be applied to capital requirements. As we have seen earlier, moral hazards occur because of banks being too-big-to-fail: increasing capital requirements is one way of reducing that moral hazard for regulators.

Indeed, moral hazard occurs when banks use their equity capital in risky investments in order to increase their return on equity. So, the higher the amount of capital required to be kept by banks, the less this amount of capital can be used in risky investments. By increasing the minimum amount of capital to hold, regulators lower the potential for moral hazard.

1. The initial regulation

To assert the importance of capital requirements for financial stability, we can have a look at the pattern of regulation following the savings and loan crisis of the 1980s. A savings and loan association (S&L) is a financial institution that specializes in accepting savings as deposits and making mortgage and other loans. The S&Ls were financing long-term fixed rate mortgages with short-term deposits, creating a maturity mismatch. The rising market interest rates in 1979 caused increased the cost of financing and decreased the net present value of investments, as the mortgage loans had a fixed rate. These S&Ls also being highly leveraged, with their capital representing 3% of their assets on average, there was a wave of failures in the 1980s. This was caused by procrastination, i.e. the unwillingness of banks to recapitalize their liabilities[29]. Thus, following that crisis, regulators wanted to break that procrastination attitude and focused on the capital requirement issue: the Basel Committee on Banking Supervision developed the Basel accord to regulate capital requirements. The first Basel accord (Basel I) used the Cooke ratio, which calculates the amount of capital a bank should

[29] De Watripont, M., *European Banking Bailout, Bailin, and State Aid Control*, International Journal of Industrial Organization (2014)

have as a percentage of its total risk-adjusted assets. This ratio had to be greater than or equal to 8%. Under the Basel accord, banks' assets are separated into four categories, according their degree of risk. These categories allow regulators to calculate banks' risk-adjusted assets, by multiplying the value of their assets with the risk-adjustment factor. The Tier 1 capital Ratio in the following table represents the bank's shareholder's equity relative to its risk-adjusted assets. The total capital ratio uses Tier 1 and Tier 2, meaning we add the bank's loan loss provision, its subordinated debt, and other bank balance sheet items to the shareholder's equity[30].

Table 12.2 Measuring Banks' Capital Adequacy

Category	Description	Tier 1 Capital Ratio	Total Capital Ratio
1	Well capitalized	6% or greater	10% or greater
2	Adequately capitalized	4% or greater	8% or greater
3	Undercapitalized	Less than 4%	Less than 8%
4	Significantly undercapitalized	Less than 3%	Less than 6%
5	Critically undercapitalized	Less than 2%	—

Source: Federal Deposit Insurance Corporation.

Banks in category 1 can continue their activities without any restrictions; banks in category 2 have a few restrictions without being required to take actions to increase their ratios, while banks from the categories 3, 4 and 5 have to. Banks in category 5 could be shut down if they do not have any immediate plan to increase their capital. We can see that according to this table, the average 3% capital ratio before the S&L crisis would fit in the significantly undercapitalized category. This means that many of these

[30] Hubbard, G. and O'Brien, A., *Money, Banking, and the Financial System,* International Edition, Pearson (2012), pp. 369-370

S&Ls would have been forced to increase their ratios and some of them would have been closed, if the Basel accord were in force at that time.

The second Basel accord (Basel II) was signed in 2004 and was based on three pillars: minimum capital requirements; supervisory review; and market discipline.

- First pillar: deals with the capital requirements for three types of risks: the credit risk, i.e. the risk that the borrower will default; the operational risk, i.e. the "risk of a change in value caused by the fact that actual losses, incurred for inadequate or failed internal processes, people and systems, or from external events (including legal risk), differ from the expected losses"[31]; and the market risk, i.e. the risk that market prices of shares movements affect the bank's value negatively.
- Second pillar: allows national supervisory institutions to check that banks have enough capital in proportion of their assets.
- Third pillar: sets up disclosure requirements, which request of institutions to share information about their capital adequacy.

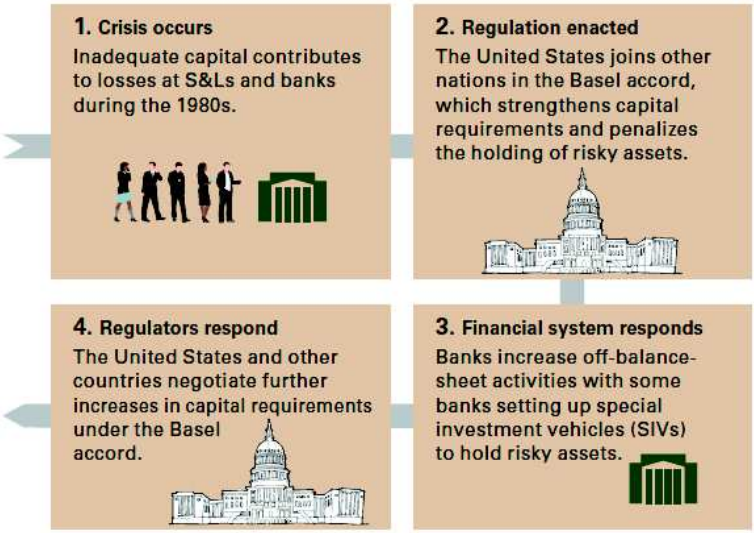
2. Responses to financial innovation

According to the regular pattern theory, following that regulation, there should be a response from financial firms to these regulations through financial innovation.

[31] Solvency II Glossary, CEA Insurers of Europe – Groupe consultatif (2007), p.43

And this is where SIVs become relevant for these firms. As we have seen, securitization not only allowed transferring risks to third party investors, but also to push assets off balance sheet. So they were not taken into account in the capital adequacy ratios, reducing the amount of assets; and thus increasing the ratio. Therefore, banks' leverage levels were way higher than what appeared in the ratios. Banks were riskier than what the ratios showed, and in a far worse state after the crisis than what it would have been if the visible ratios were the actual ratios. Bringing SIVs back to their balance sheets made their solvency crisis worse. The fourth step of the regular pattern is the regulators' response to these reactions, and so, a new agreement was found under the Basel accord in 2010: Basel III requires higher levels capital ratios. The following figure presents a summary of the regular pattern applied to capital requirements[32].

Figure 12.8
Capital Requirements: Crisis, Regulation, Financial System Response, and Regulatory Response



[32] Hubbard, G. and O'Brien, A., *Money, Banking, and the Financial System,* International Edition, Pearson (2012), p. 371

Basel III aims at requiring more capital from banks, and of a better quality. It does so by using higher risk weights on securitization and trading activities and higher overall capital ratio on one hand. On the other, it requires higher quality capital: it focuses on equity as the prime source of capital, and not convertible instruments anymore, as it was the case under Basel I and II[33]. Basel III capital requirements indeed impose banks to hold 4.5% of common equity (2% under Basel II) and 6% of Tier I capital (4% under Basel II) of risk-weighted assets.

We cannot be sure whether these new requirements will be efficient enough to prevent another crisis, as the next step after regulation is for managers to find ways of bypassing regulations through financial innovation.

To summarize, we have seen how banks became systemic, what it did imply for governmental behavior, the channels through which the crisis happened, and why regulation failed to prevent it. But if that financial crisis brought changes in the financial landscape by causing troubles to major financial institutions, almost no systemic institution failed during the process.

This is because when the failure is about to happen, there are three different possibilities of outcome:

The first one would be for the other actors to let the troubled bank fail, as we have seen with the infamous example of Lehman Brothers. This possibility will not be discussed

[33] De Watripont, M. *European Banking Bailout, Bailin, and State Aid Control*, International Journal of Industrial Organization (2014)

in details in this paper: given that the outcome of such a position would lead to a potential systemic collapse, and that this paper is focused on banks failures prevention, we will only evoke this possibility and will focus on the two other potential actions that could be taken.

The second possible outcome is the most common one, the bailing out of the bank: when a bank is about to fail, other actors put money in it through various forms (loans, bonds, stocks, cash) in order to avoid the potential consequences of its failure. This possibility will be discussed through the second part of this paper.

The third possibility that will be raised here is the bail-in, the recapitalization of banks from within.

Part II – The frequently used tool against banks' financial difficulties: bailout.

The process of bailout occurs when a bank or a financial institution, or a business in general, is about to fail. It consists in preventing the failure to happen by offering money to the troubled institution. The bailout can take several forms: cash, bonds, loans, or stocks. Bailout mechanisms may or may not imply a future reimbursement from the failing institution to the lender. In this case we are going to focus on the bailing out of banks and financial institutions deemed too-big-to-fail, in order to prevent the consequences of the downfall for the financial system balance. Governments usually lead these bailouts, even if they are not systematically financing them. This means that bailouts represent a cost for taxpayers, and this is where it can cause a first problem: what interest does the taxpayer have in saving a failing financial institution? The first point of that part will thus focus on the justification of the bailout. After that, the different mechanisms of bailout will be explained. And finally, the emphasis will be on the criticisms.

A. Why bailing out?

As we have seen earlier, some banks and financial institutions became too-big-to-fail. In the universal banking system, banks provide several services, such as commercial banking, investment banking, insurance services, etc. They also do proprietary trading, through which the bank makes profits directly from the market, instead of commissions. All universal banks are not systemic: a bank can be committed in several activities without having an important position in them. On the contrary, a non-universal bank can have systemic characteristics because of its important implication in one type of activity.

The necessity of bailout can be assessed through a counterexample: the effects of the infamous Lehman Brothers collapse, the largest bankruptcy in US History. What happened when the US Government decided that it would not save Lehman Brothers? The announcement was a tough signal transmitted to the markets. Panic spread in several financial institutions as they realized that they would not be automatically saved in case of solvability problems. When Lehman Brothers declared bankruptcy the 15th September 2008, panic materialized with the stock market crash. People wondered if too-big-to-fail theory was still up-to-date, or if the Government did not consider Lehman as part of this category. Anyway, the psychological effect followed: confidence was lost, and credit supply sharply fall as a consequence.

If the Government, or any other actor, refuses to do anything to prevent a financial institution from failing, the latter would probably declare suspension of

payments. In general, insolvency proceedings are not adapted to LCFIs. Indeed, LCFIs are companies with a lot of mixed activities: retail banking, brokerage, asset management, money market funds, hedge funds, corporations, insurance companies, etc. Thus, bankruptcy codes might not provide enough tools for an adapted process to these institutions.

In the US, Title 11 of the United States Code focuses on bankruptcies: it is subdivided into nine chapters. In the case of a financial institution, or other businesses in general, the two relevant chapters are chapter 7, which focuses on liquidation, and chapter 11, which focuses on reorganization:

- When a financial institution files for bankruptcy in a federal court under Chapter 7: in this case, the institution has to stop its activities, unless the designated Trustee decides to continue. The Trustee's role is to examine the business; he will usually sell the firm's assets in order to distribute the proceeds to the creditors. If there were residual amounts of cash left, they would be returned to the business's owners. When a large institution uses chapter 7, entire divisions could be sold to other companies at a price below their values; and chances are the direct effect would be that an important number of people would lose their job.

- When a financial institution files for bankruptcy in a federal court under Chapter 11: contrary to chapter 7, with chapter 11 the debtor

> remains in control of the business, as the debtor in possession. The DIP has 120 days from the date of filing for chapter 11, to come with a plan of reorganization before any other party in interest may do it. After these 120 days, creditors may also propose a plan. Anyway, they vote to approve the reorganization plan in each case. The DIP acts as a Trustee: chapter 11 gives him tools to restructure its business: he can acquire loans on favorable terms by giving priority to new lenders on the business's earnings; or he can reject or cancel contracts, among other things.

Lehman Brothers filed for bankruptcy under chapter 11:

The 15th September, JP Morgan Chase & Co provided Lehman with $138 billion cash advances that the Federal Reserve Bank of New York paid right after the disbursement. The 22nd, Barclays acquired Lehman's investment banking activity along with its building in Manhattan[34], while Nomura Holding Inc. acquired its franchise in Japan, Hong Kong, and Australia, and its investment banking businesses in Europe and the Middle East.

As we have said earlier, banks are not just like any other companies, they are linked to each other, and their failure are not good news for other banks, as banking competition is not like competition among traditional companies. Bank hold positions in OTC derivatives, use repos, have prime brokerage clients, etc. The counterparties to all these transactions are other financial institutions, including mutual funds or insurance

[34] *Judge approves $1.3bn Lehman deal*, BBC news (2008) **http://news.bbc.co.uk/2/hi/business/7626624.stm**

companies; or also large traditional companies. If one systemic bank fails, the most likely situation is that a large part of their counterparties would not recover the value of their assets. Lehman Brothers' bankruptcy filing terminated swaps and other derivative trades, leading to the loss of value for its counterparties[35]. The following are some examples of value loss effect on financial institutions, due to Lehman Brothers' failure:

- RBS estimated its claims against Lehman at $1,5 - $1,8 billion[36].
- Wachovia Corp. had to support three Evergreen Investments money market funds to prevent their shares from falling.
- Canada's Great-West Lifeco's Boston-based unit, Putnam Investments, shut a $12.3 billion money market fund[37].

These are just a few examples of negative effects caused by the bankruptcy filing of Lehman Brothers. Therefore, judicial solutions are not adapted to LCFIs: their systemic nature and their complexity makes their failure dangerous for countries' economic stability. Their failure has a direct effect: employees lose their jobs. But the longer-term effects would be even worse: the incapacity to finance economic activity, leading to even more job losses, and thus, social disaster. So, beyond financial considerations, the incapacity for the financial system to finance economic activities caused by the loss of confidence, can lead to these negative macroeconomic effects.

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[35] Jianping Zhou, Virginia Rutledge, Wouter Bossu, Marc Dobler, Nadege Jassaud, and Michael Moore, *From Bail-out to Bail-in: Mandatory Debt Restructuring of Systemic Financial Institutions,* IMF Staff Discussion Note (April 2012)

[36] Chasan Emily, *RBS sees Lehman claims at $1.5 bln -$1.8 billion: lawyer,* Reuters (2008), **http://www.reuters.com/article/2008/09/18/us-lehman-rbs-idUSN1751719120080918**

[37] *Bank of New York restructures cash fund on loss,* Reuters (2008), **http://www.reuters.com/article/2008/09/18/bankofnewyork-fund-idUSN1838451820080918**

That said, we could still wonder why chapter 11 could not be adapted. Chapter 7 might be far from being adapted to LCFIs as liquidation is the worst option for bank's stakeholders, but why not use chapter 11, which allows reorganization of the company and could save some assets' value in the longer term? The answer is in the question: "longer term". Indeed, you cannot meet short-term needs with long-term solutions. Again, LCFIs are systemic and they possess a lot of short-term liabilities: to meet these liabilities, as well as still being capable of playing their roles, i.e., financing economic activities, LCFIs cannot wait for a long-term reorganization plan. Chapter 11 might be adapted for other, smaller, and non-systemic financial institutions, but LCFIs are too important for stability to have time to think about a plan. First the money, then the thinking.

Even the act of filing for bankruptcy is dangerous, because of the strong negative effect the announcement has on stock market indexes: Dow Jones lost 4,4% of its value the 15th September, its biggest loss since 09/11. This negative effect contaminates other listed companies, through the loss of confidence in the financial system, which again can lead to disruption in financing the economy. Therefore, LCFIs cannot be allowed to fail like any other business under chapter 7 or chapter 11. They cannot solve the problem on their own, at least not in the state of capitalization in which they were before the crisis. If one of these chapters is used by a LCFI, it already means that it failed, with all the implications that it has for financial stability.

This is why it is important: to keep the financial system stable, in a way or another. And the methods used to save banks from failures during the crisis were largely their bailout. The next point will explain the bailout channels.

B. How does the bailout take place?

The financial sector bailout following the 2007-08 financial crisis was performed through loan guarantees and recapitalization. The US bailout policy took the form of the Troubled Assets Relief Program. The TARP allowed the US Treasury to purchase troubled assets from financial institutions. "The term "troubled asset" is defined as:

(A) Residential or commercial mortgages and any securities, obligations, or other instruments that are based on or related to such mortgages, that in each case was originated or issued on or before March 14, 2008, the purchase of which the Secretary determines promotes financial market stability; and

(B) Any other financial instrument that the Secretary, after consultation with the Chairman of the Board of Governors of the Federal Reserve System, determines the purchase of which is necessary to promote financial market stability, but only upon transmittal of such determination, in writing, to the appropriate committees of Congress."[38]

[38] *The Troubled Asset Relief Program: Report on Transactions Through December 31, 2008,* A CBO Report (2009), Congressional Budget Office

TARP originally planned to purchase or insure up to $700 billion of troubled assets. This amount was reduced to $475 billion under the Dodd–Frank Wall Street Reform and Consumer Protection Act. According to the CBO, the disbursed amount for the TARP reached $431 billion in September 2012, and the estimated subsidy cost is at is $24 billion[39]:

Table 1.

Activities of the Troubled Asset Relief Program

	Billions of Dollars
Amount of Principal[a]	
Repaid	325
Written off[b]	27
Outstanding	65
Subtotal	417
Additional Disbursements Anticipated	14
Total[c]	**431**
Memorandum:	
Estimated Subsidy Cost[d]	24

Sources: Congressional Budget Office; Department of the Treasury.

Note: Transactions are as of September 17, 2012.

a. Other funds were made available through asset guarantee programs, but no disbursements were made from those funds.

b. Includes realized losses on sales of common stock. For mortgage programs, the amount represents disbursements to loan servicers.

c. Authority for the Troubled Asset Relief Program was originally set at a maximum of $700 billion; however, that total was reduced to $475 billion in the Dodd-Frank Wall Street Reform and Consumer Protection Act (Public Law 111-203).

d. The subsidy cost is estimated using procedures similar to those specified in the Federal Credit Reform Act of 1990, but with an adjustment for market risk as directed by the Emergency Economic Stabilization Act (Division A of Public Law 110-343).

[39] *Report on the Troubled Asset Relief Program,* Congressional Budget Office, (October 2012)

Viral V. Acharya and Rangarajan K. Sundaram (2009) three forms of intervention in the financial sector:

- A loan guarantee scheme by the FDIC.
- A bank recapitalization scheme by the U.S. Treasury.
- A Commercial Paper Funding Facility (CPFF) by the Federal Reserve[40].

They compare these bailout tools in the US to the corresponding program in the UK to spot the strengths and weaknesses of each of them:

1. The loan guarantee scheme

A guaranteed loan means that the Government will purchase the debt from the lending financial institution in case the borrowing bank defaults: the Government takes responsibility for the loan. As regards to the loan guarantee in the US, policy makers chose a unique pricing scheme, with little participation optionality: US financial institutions had one refusal option at the setting up of the scheme by communicating it to the FDIC, i.e. the administrator of the loan guarantee scheme. This scheme guarantees all senior unsecured debt that all US financial institutions issue, at the flat fee of 75 basis points per annum. Senior unsecured debt refers to a loan not backed by any underlying asset, which has the priority over subordinated debts in the

[40] Acharya V. Viral and Sundaram K. Rangarajan, "The Financial Sector Bailout Sowing the Seeds of the Next Crisis?" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), p. 327

reimbursement order. If the amount of liabilities exceeds 125% of the outstanding senior unsecured liabilities, the institution has to pay 37,5 basis points fee in addition.

The UK Treasury's loan guarantee scheme on the other hand opted for a market based fee structure in order to price the guarantee fairly. The UK market based fee structure's benchmark is composed of the median cost of insurance through 5-year CDS on the guaranteed institution's senior unsecured credit, based on the market's perception of its risk, plus 50 basis points:

TABLE 15.1 Credit Default Swap Fees and Loan Guarantee Fee for the UK Banks

Bank	Median 3-Year CDS Fee in Year Ending Oct. 7, 2008	Median 5-Year CDS Fee in Year Ending Oct. 7, 2008	UK Loan Guarantee Fee (Median 5-Year CDS + 50 bps)	"Fair Price" of Guarantee (Average 3-Year CDS Spread in Nov. 2008)
Abbey National	56.5	72.6	112.6	71.2
Barclays	66.0	81.4	131.4	135.7
HBOS	93.3	112.7	162.7	117.4
HSBC Holdings	48.5	58.8	108.8	102.1
Lloyds TSB	55.6	62.5	112.5	82.7
Nationwide	122.8	128.3	178.3	123.0
Royal Bank of Scotland	73.5	85.9	135.9	120.8
Std. Chartered	50.3	67.5	117.5	124.1
Average	**70.8**	**83.7**	**133.7**	**109.6**

Source: Datastream; CDS fees in bps.

A credit default swap is a swap contract between two parties, in which the buyer of the swap makes payments to seller, and in return the seller agrees to pay his debt back if he defaults. The CDS is thus what the financial institutions would use to protect themselves against insolvency without the Government's scheme, and this is why it is

relevant to use CDS indexes to define the loan guarantee fee and the "fair price" of guarantee.

We can see that fees vary from 108.8 bps for HSBC to 178.3 bps for Nationwide. These loan guarantee fees have to be compared with the "fair price" of guarantee to see the extent to which the Government subsidizes financial institutions through loan guaranties. We have to subtract the guarantee fee from the fair price: for example, the UK government subsidizes Standard Chartered at 6,6 bps per year. In fact, in almost all cases in the UK, loan guarantee fees are overpriced. The cost of the guarantee is on average about 24 basis points higher than the "fair price", i.e. the average three-year CDS spreads in November 2008.

Compared to that fair pricing, the drawback of the US pricing scheme is that it is set a very low level compared to the risk that the guaranteed financial institutions represent:

TABLE 15.2 CDS Fees and Loan Guarantee Fee for Selected U.S. Banks

Bank	Median 3-Year CDS Fee in Year Ending Oct. 7, 2008	Median 5-Year CDS Fee in Year Ending Oct. 7, 2008	U.S. Loan Guarantee Fee	"Fair Price" of Guarantee (Average 3-Year CDS Spread in Nov. 2008)
Bank of America	71.0	85.0	75	126.0
Citigroup	100.0	115.2	75	238.3
Goldman Sachs	109.0	107.0	75	321.0
JPMorgan Chase	70.6	85.0	75	115.8
Morgan Stanley	174.1	159.4	75	475.7
Average	**104.9**	**110.3**	**75**	**255.4**

Source: Datastream; all fees in bps.

The "fair prices" of these guarantees are way higher than the unique 75 bps offered to US financial institutions. This is where the cost for taxpayers comes from: while the net

tax in the UK pricing scheme is about £1,8 billion on a principal amount of £250 billion, the transfer of taxpayer wealth ranges between $13 billion and $75 billion in the US, with an amount closer to the second number. The higher the gap between the "fair price" and the loan guarantee fee, the higher the subsidies for the institutions; and taxpayers pay for a large part of these subsidies. Sometimes the subsidy can be huge: according to that table, Morgan Stanley receives a 400,7 bps subsidy per year. So, US loan guarantee fees are widely underpriced.

Moreover, while the US scheme gives only one opportunity to refuse the scheme, the UK scheme also gives more optionality. For example, Lloyds TSB had an advantageous median CDS spread, and thus, no incentives to ask for a government guarantee. Generally, banks with low credit risk did not have any incentives to ask for a government guarantee in the UK; this is why the UK scheme offered a considerable optionality. On the contrary, the US scheme, with a fixed guarantee fee of 75 bps, made its program very advantageous for each institution.

However, the US scheme has the feature of not revealing information about financial institutions' health to the markets. In the UK, the optionality of the scheme gives a signal to financial markets and might deteriorate credit conditions for the least healthy banks. By not opting out of the government loan guarantee program, financial institutions show the markets that they do not have a low credit risk. When an institution joins the program, chances are it is not in a healthy condition, as it cannot receive an advantageous loan guarantee price in the market. Information about

unhealthy situation is thus sent as a negative message to markets, and could cause difficulties for the financial institution to borrow at low rates later[41].

2. The bank recapitalization scheme

In the US, it was initiated by the Treasury, which purchased preferred stocks in banks. Preferred stocks refer to a type of ownership in a financial institution, or other types corporations, which has a higher claim on the assets and earnings than common stocks. The possibility to buy back these shares after three years were given to the recapitalized institutions, at the condition to have enough capital on their own. Through this channel, the US capital injection scheme provided $250 billion for financial institutions, including $125 billion to recapitalize the nine leading US financial institutions, namely JPMorgan Chase ($25 billion), Citigroup ($25 billion), Bank of America, Goldman Sachs, Morgan Stanley, Merrill Lynch, Wells Fargo, Bank of New York Mellon, and State Street. The latter were not given a choice in participation. However, optionality in participation was given to other financial institution, which many have accepted.

There has not been any serious restrictive measure following the capital injection. Government did not require any control on the firm, i.e. no replacement of top management, no limitation of executive pay, no voting rights in the board of directors.

The British recapitalization scheme on the other hand, with an amount of £50 billion, offers optionality to all financial institutions: participation is voluntary, even for the

[41] Acharya V. Viral and Sundaram K. Rangarajan, "The Financial Sector Bailout Sowing the Seeds of the Next Crisis?" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), pp. 329-335

largest banks. Besides, it is more difficult to access to this plan than in the US. Financial institutions that want to participate must have a plan for their long-term recapitalization through financial markets: that plan has to be credible, making the UK scheme not automatic. It is thus more restrictive than the US scheme, which may force the leading financial institution to participate, but do not interfere with their long-term plans[42].

3. The CPFF

This system was created as a substitute to the commercial paper market, which was freezing up. A commercial paper is usually an unsecured short-term debt issued by a financial institution, or other businesses in general. The Federal Reserve created that CPFF, which funded a special purpose vehicle that purchased at most $2.4 trillion of unsecured, but also asset-backed commercial paper from eligible issuers. All US issuers of commercial paper, even companies belonging to foreign companies, had the right to participate in that CPFF. However, only the highest rated commercial papers (by S&P, Moody's and Fitch) were purchased by the SPV. So, contrary to the US loan guarantee scheme, participation is not automatic: conditions are stricter. Yet, there is a unique pricing: 100 bps spread for unsecured commercial papers, and 300 bps spread for asset-backed commercial papers[43].

[42] Acharya V. Viral and Sundaram K. Rangarajan, "The Financial Sector Bailout Sowing the Seeds of the Next Crisis?" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), pp. 335-337

[43] Acharya V. Viral and Sundaram K. Rangarajan, "The Financial Sector Bailout Sowing the Seeds of the Next Crisis?" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), pp. 337-338

While bailout saved a lot of institutions from financial disaster, it also implied negative effects, both before and after the actual bailout policies were triggered. The next point identifies the side effects of bailout's existence.

C. Bailout's side effects.

The negative effects of bailout measures in general will be discussed first; and then we will see the side effects of bailout measures as they have been organized during the crisis.

1. Side effects of bailout policies in general

First of all, the existence of bailout measures in case of difficulties encourage banks to keep low capital ratios: as banks know that they would not have to face financial difficulties only with their capital, but also through governmental support, they are not encouraged to increase their capital ratios. This is why the Basel accord exists: to prevent moral hazard from arising because of that way of thinking. The simple knowledge of this feature, without the bailout having to occur, leads banks to increase their leverage. So, we can say that bailout policies foster the risk-taking attitude that led to the crisis. In other words, it creates moral hazard.

When the bailout is actually triggered, other problems arise. While bailout prevents the financial system from collapsing, and thus protects the flow of funds from the financial system to the economy, it also sends signals to people and markets.

If a bailout policy is announced, taxpayers know that they would be the ones that pay for it. Bailout means increased taxes: when the Government borrows funds from markets, it has to repay its loans in the future; and thus, either increase its income or reduce its spending. In both cases, it represents losses for taxpayers. In the US, the loan guarantee scheme alone represented a transfer of taxpayer wealth ranging between $13 billion and $70 billion[44].

This could create social tension in countries where bailout is decided. Indeed, bailout measures are perceived negatively among a large part of society. Taxpayers may perceive additional taxes as unfair, as they are not directly responsible for the crisis. However, bailout is necessary to keep the financial system, and so the economy, stable in the long-term: it has to be done if there are no other solutions left for banks. Taxpayers pay to keep the economy stable, and thus pay to keep their jobs and their way of life in the long-term. It is that same way of life that brought some households to contract subprime loans and become insolvent. Indeed, subprime lending was not only a way for bankers to bring 15% ROE to their institution, it was also a tool for households to buy houses that they could not have bought otherwise. We should not forget that subprime lending was directed towards financially vulnerable individuals. And, while bankers could be blamed for their attitude regarding the originate-to-distribute model,

[44] Acharya V. Viral and Sundaram K. Rangarajan, "The Financial Sector Bailout Sowing the Seeds of the Next Crisis?" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), p. 328

many households subscribed to these contracts, even though they knew that they might not be able to pay the loans back. Risk was taken on both sides, and it cannot be blamed, as, at the time it occurred, it was a win-win situation. But, finance is a sum zero game: when both sides win, somebody is going to lose. And both sides lost later on, when interest rates grew, and they had to pay for the financial disaster it provoked. Of course, all taxpayers are not former subprime borrowers, far from it. The majority of them were not involved in the process and had to pay for the bailout afterwards, but, either way, they were not paying for nothing: bailout measures largely contributed to support economic recovery.

Nevertheless, taxpayers' anger is understandable and some States anticipated that. They sent a positive signal to taxpayers by using bailout channels directly aiming for them. Alongside bailout measures directed towards banks, or other suppliers in general, some States also adopted used bailout measures for households, i.e. taxpayers, in order to calm down social tensions. France, among other bailout measures, took these types of decisions, such as:

- Cancellation of income tax for households earning between €5 852 to €11 673, i.e. the first taxable portion. This concerns about 2 million people;
- A €500 indemnity for people who lost their jobs without having the right to earn unemployment compensation.

Besides, bailing out a bank could also send markets the signal that it could be done again for other banks or financial institutions. It might be a positive signal to financial markets as it could prevent stock market indexes to crash, but it is not efficient to regulate moral hazard. Indeed, the actual bailout reinforces the idea that other banks would be saved too. So, again, banks have no incentive to make investments more cautiously.

On the other hand, the opposite signal sent by the non-rescue of a failing financial institution could be worse: learning that the Government does not systematically intervene to save a weak bank could lead to panic in the financial system. As we have seen previously, Lehman Brothers' bankruptcy announcement provoked a lot of losses for other institutions that had claims against Lehman. Fear of further losses would thus be created with such a signal: why would the authorities save another bank when they did not save Lehman? So, this opposite signal would not be more efficient. If authorities want to remove moral hazard from the financial sector, they have to announce that they will not be there to save banks in case of financial difficulties from the very beginning. They cannot let banks believe that they would save them from failure, and do nothing at all afterwards. But the problem is: bailout is implied by the very existence of these banks, in these shapes. Indeed, from the moment banking regulation helped banks expand geographically and diversify their activities, they were forcing themselves to intervene later, in case of a crisis. Banks became too important for financial stability, and thus for the entire economy. They could not be allowed to fail.

2. US bailout policies' drawbacks

Anyway, even if we acknowledge the fact that bailout measures should exist to protect these too-big-to-fail institutions, we could still discuss about the way bailout policies should be implemented. Edward I. Altman and Thomas Philippon (2009) identify four principles that should guide a bailout policy according to them:

- The market failure must be identified.
- The intervention should use efficient tools.
- Costs for taxpayers should be minimized.
- Government's intervention should not create moral hazard[45].

Did the US bailout plan comply with these principles when bailing out LCFIs?

The market failure was indeed identified, though financial innovation made the crisis more complex than previous ones. On the efficiency of the used tools, we can say that: the loan guarantee scheme offered very competitive pricing compared to the market prices; recapitalization through preferred stocks injected funds directly; and CPFF helped LCFIs reuse commercial paper as a way of financing. We can thus say that these tools were efficient in meeting LCFIs' needs: quick financing.

[45] Altman I. Edward and Philippon, Thomas, "Where Should the Bailout Stop?", in Acharya V. and Richardson M., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), pp.353-361

However, under the US bailout plan, through the loan guarantee scheme and the recapitalization scheme, costs for taxpayers were not minimized. Indeed, the amounts of subsidies were too high compared to the UK's program.

Moreover, no big restrictions were imposed to US financial institutions in exchange for the Government bailout: in a majority of cases, top managers that led to the crisis were not required to leave, Government did not use any right to vote after buying preferred stocks. The US bailout had thus no or few negative effect on moral hazard. Large financial institutions were not imposed to change their policy, regarding compensation regimes for example. It is the incentive scheme that encouraged excessive risk taking in the financial sector. And it is that risk-taking attitude that is responsible for the financial crisis. By providing no discouragement of that behavior through measures, Governments takes the risk that it might happen again. It did not regulate moral hazard efficiently. Bailout might gain long-term efficiency by not being a free saving package, but an opportunity to regulate financial markets.

Besides LCFIs, after the financial crisis, many traditional companies faced troubles too, and some were bailed out. If we bailout financial institutions, should we bailout traditional companies directly as well? What was not adapted to LCFIs could be relevant in this case: chapter 11 of the US Bankruptcy Code. Indeed, most traditional companies are not systemic, there is usually no emergency to save them: the rescue could take more time if it is needed. Chapter 11 allows the debtor in possession to come with a long-term plan to reorganize the company, and to borrow funds from other

actors, which would have super priority over all other existing debts[46]. On top of that, the provider of funds would receive a specific collateral making the chances of losing its investment low. Investing in a weakened company that already has difficulties paying back its existing creditors would be a terrible mistake otherwise. DIP financing also gives lenders the possibility to interfere in the firm's governance: when the terms of the loan require former managers to leave the Board of directors for example. It thus regulates moral hazard, contrary to the US bailout plan for LCFIs. Therefore, DIP financing under chapter 11 could be a good solution for traditional companies. For example, the Government provided DIP financing to General Motors. In total, GM raised $33 billion through bankruptcy financing[47].

Systematically bailing out a weakened company might not be a good solution: if it is an LCFI that needs quick financing, it is necessary, but regarding traditional companies, chapter 11 seems like a good alternative to bailout. Is there any alternative to bailout for LCFIs?

We just saw that, in troubled times, bailout measures for LCFIs were necessary to keep the financial system stable, but also that they implied important costs for taxpayers. How could we keep the benefits of a stabilized financial system without taxpayers bearing the costs of these policies? The answer is: by transferring the costs to other economic actors.

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[46] Altman I. Edward and Philippon, Thomas, "Where Should the Bailout Stop?", in Acharya V. and Richardson M., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009), pp.353-361

[47] De La Merced J. Michael, *G.M. Wins Final Approval of DIP Financing,* Deal Book, New York Times (2009), **http://dealbook.nytimes.com/2009/06/25/gm-wins-final-approval-of-dip-financing/**

Part III – An alternative way of preventing bank failures: bail-in.

Bail-in measures aim at recapitalizing a weak bank from within, instead of governmental intervention: it is a recapitalization through liability adjustment. The idea behind that is to make banks' bondholders share the burden of the banks' poor financial decisions. As we have seen in the second part, bank failures were avoided thanks to bailout measures. It materialized as the subsidizing of the financial sector by the Government, and taxpayers paid for it. While bailout was efficient in preventing the financial system from collapsing, it caused social tensions among society. Moreover, it did not solve the moral hazard issue. Thus, bailout is still subject to debate among regulators, and bail-in hypothesis to prevent bank failures are raised as potential solutions for financial stability. The first point will justify the existing debates about bail-in implementation. Then, mechanisms of bail-in tools will be explained. Finally uncertainties and criticisms about these new potential mechanisms will be reviewed.

A. Why would bail-in be necessary?

Justifications for bail-in for a large part are the same as those for bailout: the aim is to save a bank from failure. But with bail-in measures, the recapitalization is done from within. This point thus aims at spotting how it could effectively respond to drawbacks of bailout.

The answer brought to financial difficulties during the crisis was largely bailing out the weak firms. This showed the unwillingness of authorities to let LCFIs fail. In order to contain the excessive risk taking induced by these ex-post guarantees, an alternative channel was thought of, by which LCFIs have to pay more attention to the level of risk of their investments.

Bailout was justified by the short time authorities and banks' top managers had to think of another solution. Indeed, the financial system's stability was at stake, needing a quick and efficient intervention. Apart from the Basel accord, no actual measures were set up in order to prevent such situation from happening prior to the crisis. And as we saw in the first part, Basel capital requirements were bypassed through securitization. Bail-in would serve as another instrument for prevention besides regulation. If it had been set up, maybe bailout would not have been needed afterwards.

Among the effects of bail-in measures, there is the positive signal that it could send to investors about an existing preventive policy, without being a burden for taxpayers ex-post. Indeed, bail-in refers to recapitalization tools that would make

bailout unnecessary, meaning that taxpayers' money would be spared. The existence of this type of tools would reassure investors about the bank's capacity to face financial troubles: they know that their money would be safe even in case of troubles.

Anyway, raising money without bailout seems difficult during hard times. If a financial institution issues shares to raise its equity during a period of financial troubles, no one would subscribe. Because of the debt overhang, investment on that institution becomes unattractive. Two effects are in play:

- First, debt overhang prevents the firm from investing in new projects through debt financing, as it already has its existing debt to pay back;

- Second, debt overhang dissuades potential investors to invest on that firm, as the latter know that the firm's earnings would be used to pay existing debt holders back, before paying dividend. And as we consider a troubled financial institution, chances are its debt level is too high to even think about paying dividends.

In this case, bailout seems necessary. Indeed, except for the Government, no other investor would have an incentive to possess part of this institution's equity. We must not forget that the costs are borne by somebody: capital injection during troubled times will not yield any revenues. It is strictly used to save the institution from failure theoretically. Thus, this injection has to be imposed to somebody, as no one would do it willingly. As we have seen, private investors have no incentive to do it. So, the idea

behind bailing in is: when there is not sufficient equity to face the solvency crisis, the financial institution could impose the recapitalization to its own bondholders or shareholders. Rather than the Government, i.e. taxpayers, paying for a bailout, the institution could be recapitalized from within.

The second point aims at describing the tools that could be used to make the bail in efficient.

B. What tools would bail-in use?

Two different bail-in tools will be developed here: Contingent Capital Certificates and Mandatory rights offerings of equity.

1. Contingent Capital Certificates

Mark J. Flannery (2009) describes a model with "Contingent Capital Certificates", and recommends systemic banks to issue those. These certificates would be issued as debt obligation, but would transform into common stock if the issuer's capital ratio fell below some critical, pre-specified value. Contrary to ordinary stock, common stock grants voting rights to its owner; the latter can participate to the board of directors' election, or the bank's policy determination. Thus, when the conversion is triggered, bondholders become stockholders having an influence on the bank's policy, but also bearing the costs of existing stockholders' previous policies. At the same time,

it provides a loss-absorption capacity to the bank. Here is an example of M.J. Flannery's paper[48]:

Table 1: CCC Example Ignoring (Incipient) Debt Overhang at t = 1/2

t =0

Assets	Liabilities
$100 Loans	$90 "Deposits"
	$ 5 CCC
	$ 5 Equity (5%)

N = 10 → P(stock) = $0.50

t=1/2

Assets	Liabilities
$97 "Loans"	$90 "Deposits"
	$ 5 CCC
	$ 2 Equity (2.06%)

N = 10 → P(stock) = $0.20

t = 1

Assets	Liabilities
$97 Loans	$90 "Deposits"
	$2.15 CCC
	$4.85 Equity (5%)

P(stock) = $0.20 → N = 24.25

In this example, at t=0, the financial institution finances its $100 assets with $90 of deposits, $5 of equity, and $5 of Contingent Capital Certificates (CCC). The

[48] Flannery J. Mark, *Stabilizing Large Financial Institutions with Contingent Capital Certificates,* University of Florida (2009), p. 27

institution has to maintain a 5% capital ratio, i.e. equity/assets. At t=½, the firm faces a loss of $3 value from its granted loans, which is absorbed by its equity that falls to $2, making its capital ratio fell to 2,06%. Thus, at t=1, the conversion of CCC triggers: $2,85 of CCC are transformed to equity, restoring the necessary proportion of equity compared to assets.

The amount of outstanding shares evolves accordingly:

- At t=0, there is 10 outstanding shares; each is worth 5/10 = $0,5.
- At t=½, as the $3 equity was used to absorb assets' loss of value, each share is worth 2/10 = $0,2.
- At t=1, $2,85 of CCC converts into equity, driving the number of outstanding shares to (2+2,85)/0,20 = 24,25. The new stockholders, former bondholders, will thus receive 14,25 shares after the conversion.

Darrell Duffie summarizes the idea through the following scheme[49]:

[49] Duffie, Darrell, *How Big Banks Fail, And What to Do about It,* Princeton University Press (2011), p. 47

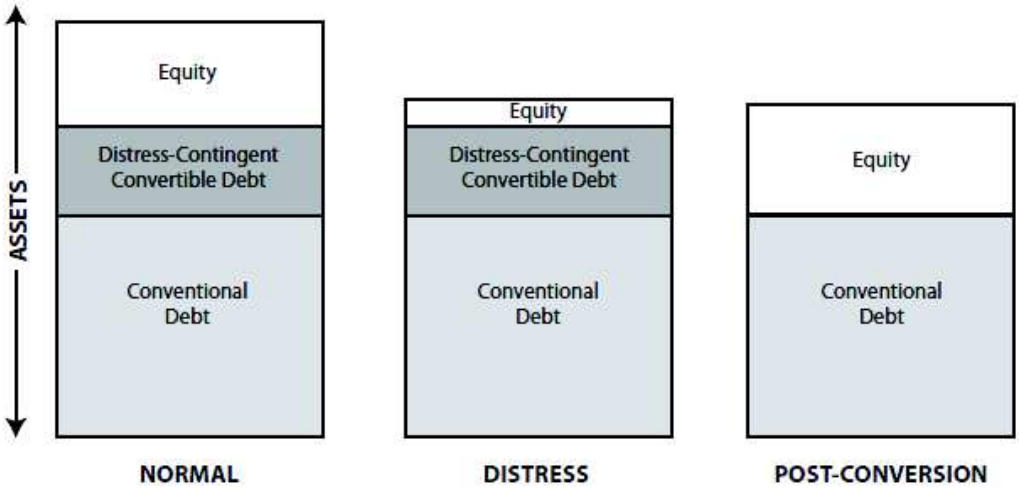

Figure 4.2. Distress-contingent convertible debt converts to equity when a bank's leverage hits a distress trigger level.

Under such a mechanism, banks make sure that capital ratio will not fall below the required rate. That way, capital requirement requested by Basel III is maintained.

The essential features of CCC contracts according to this model are: a minimum trigger point for CCC conversion; a target capital amount to reach through that conversion; a rapid conversion of CCC into equity; an automatic conversion when the minimum trigger is violated, regardless of the financial conjuncture or the firm's financial situation; a replacement of converted debts to secure the mechanism's functioning for the future; and a prohibition for systemic financial institutions to own CCC for their own account.

M. J. Flannery also suggests using a market-based trigger for conversion. Under US GAAP, historical costs can be used for accounting and managers are provided with several options regarding value changes inclusion. Before the 2007-08 financial crisis,

some managers manipulated ratios to go around regulatory requirements: they hid the actual leverage of their firm. If the CCC contract uses historical costs in its capital ratio and have as much optionality in value changes recognition as under the US GAAP, it might not be triggered when it needs to[50]. The accounting measures are more than relevant in the ratio: Citibank for example, at its weakest moment in December 2008, had a Tier 1 equity ratio of 11,8%[51], but faced considerable losses afterwards.s

The IMF staff discussion note takes the principle of CCC debt with contingent convertible bonds (CoCos). CoCos are "private financial contracts with principal and scheduled coupon payments that can be automatically converted into equity or written down when a predetermined trigger event occurs"[52] The discussion board's idea is to combine these CoCos with a statutory bail-in mechanism, which is a statutory power given to a resolution authority in order to restructure the liabilities of a distressed financial institution by writing down its unsecured debt and/or converting it to equity. CoCos would be triggered automatically as a "first line of defense", just before the resolution authority intervenes with its statutory power to convert unsecured debt into equity.

These tools protect taxpayers and solvent banks from bearing the issuer's losses, while still recapitalizing banks.

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[50] Flannery J. Mark, *Stabilizing Large Financial Institutions with Contingent Capital Certificates,* University of Florida (2009)

[51] Duffie, Darrell, *How Big Banks Fail, And What to Do about It,* Princeton University Press (2011), p. 48

[52] Jianping Zhou, Virginia Rutledge, Wouter Bossu, Marc Dobler, Nadege Jassaud, and Michael Moore, *From Bail-out to Bail-in: Mandatory Debt Restructuring of Systemic Financial Institutions,* IMF Staff Discussion Note (April 2012)

So we agree that bail-in could be effective to recapitalize weak banks, but would it be effective against bank runs? In other words, would bail-in reassure bank's creditors regarding the bank's preventive policy enough to convince them not to run? The answer is "no". If there is a liquidity crisis caused by financial difficulties in the bank, its counterparties will not be convinced just by the fact that the statutes of its liabilities have changed. However, it might not convince them to run, but it offers a better equity cushion to the ban to face the liquidity crisis. The idea is not to stop bank runs, but to fortify banks' defense against these runs, if they were to happen.

2. Mandatory rights offerings of equity

In addition to CoCos, another way of bailing in would be through mandatory rights offerings of equity, a proposed by Darrell Duffie (2011). Rights offerings consist in offering rights to existing shareholders to buy new shares at a price that is well below the current market price. It should be set up by a regulation that provides automatic rights offerings as soon as the institution faces financial difficulties. The price cut is needed because existing shareholders would not accept purchasing new shares when the institution faces financial troubles, because of debt overhang. Mandatory rights offerings have several different effects compared to CoCos:

- It prevents dilution: indeed, when CoCos convert to shares, existing shareholders are losing influence on the financial institution's decisions. With mandatory rights, existing shareholders bring the

capital, and thus consolidate their position in the firm. Therefore, even if the share price should be low enough to be attractive for existing shareholders, maybe it should not be that low, considering that existing shareholders also have an incentive to purchase the shares.

- It reduces liquidity crisis probability: contrary to CoCos, mandatory rights offerings bring additional cash to the financial institution. CoCos are about the conversion of existing cash in form of bonds to the form of shares. Mandatory rights offerings could thus be a relevant solution against liquidity crises[53].

These bail-in tools seem effective, but they are new and thus surrounded by uncertainties about some effects they could have.

C. Uncertainties and potential side effects.

As bail-in mechanisms are still on discussion, there are a lot of uncertainties about their potential framework. Technical issues regarding their implementation will be discussed first. Then, we will see the side effects they could have on governance.

[53] Duffie, Darrell, *How Big Banks Fail, And What to Do about It,* Princeton University Press (2011), pp. 50-52

1. Uncertainties about the framework

Main uncertainties are about the conversion ratio to use for the distress trigger, bit also about the share price to use for the conversion of bond to equity, i.e. the number of shares of equity to be received in exchange for each dollar of bonds.

First there are uncertainties about the conversion trigger, one of the main features of bail-in mechanisms. IMF discussions oppose insolvency related triggers to pre-insolvency related triggers. The first one would activate bail-in mechanisms when the bank risks liquidation of its assets, and it might be too late for bail-in to ensure the bank's rescue. Thus we will only discuss about pre-insolvency triggers:

The most likely trigger is based on capital ratios, but which one? We have already seen that accounting measures could fail to capture the true financial conditions of banks, and thus capital ratios could be manipulated in order to prevent the triggering. Darrell Duffie suggests using tangible common equity ratio against that possibility[54]. TCE excludes preferred shares and intangible assets such as goodwill and tax shields. Preferred shares are a class of ownership in a financial institution that has a higher claim than common stock on assets and earnings. Goodwill is an asset that arises when paying a premium for the acquisition of one company. Tax shield is reduction in taxable income for an individual or corporation achieved through claiming allowable deductions such as mortgage interest, medical expenses, charitable donations, amortization and depreciation. The latter are not really useful during a solvency crisis,

[54] Duffie, Darrell, *How Big Banks Fail, And What to Do about It,* Princeton University Press (2011), pp. 48-49

as they are intangible assets. In December 2008, Citigroup would have had 1,5% of TCE ratio. TCE ratio could thus prevent numbers manipulation as it excludes assets that are difficult to value, and less usable than tangible assets in a liquidity crisis.

In that scheme, there are still uncertainties regarding the equity price to use for the conversion of bonds to shares. There are two possibilities: either using the contemporary outstanding share price, either a fixed, pre-established share price. They have different effects:

One danger with market values of shares is speculative attack. Indeed, short-sellers could be tempted to subscribe to CCC contracts, before short-selling the same firm's equity, making its market value fall. When the fall is important enough to trigger the CCC conversion into equity, short-sellers are provided with cheap equity, as the market values of the shares are low. Even the feeling that market values of shares are going to fall would encourage buying such instruments. The lower the price, the higher the dilution for existing shareholders, who are thus encouraged to buy their stock, while the convertible bond became attractive on the other hand. This is a "death spiral": it is a vicious circle that forces the share price to decline. Darrell Duffie thus suggests to use a trigger based on the average share price, i.e. the average closing price of the shares over the preceding 20 business days. That way, value losses of last days would be offset by share values 20 days before.

What about a fixed price for conversion instead? The problem here is to find the right price. Depending on the price, one of the parties to the contract will have an

incentive to trigger the conversion. With a high fixed conversion price compared to the market price, existing shareholders would be encouraged to trigger the conversion, to sell equity cheaply. And, in the opposite case, with a low fixed price, bondholders would try to trigger conversion to get equity cheaply. These strategic considerations would miss the initial goal of CCC contracts: stabilizing the bank's financial condition.

2. Side effects on governance

Anyway, strategic considerations are at the center of bail-in debates:

This mechanism seems efficient in protecting taxpayers, but why would a bondholder accept such a contract? Indeed, CCC contracts would stipulate that bondholders become shareholders only when the financial institution faces difficulties. This means that when everything is fine and shareholders receive dividends, the bondholder only receives his interest payments, but when the situation deteriorates and somebody has to pay to compensate the assets' loss of value, he has to bear the costs, as he became a shareholder. Potential subscribers could perceive this scheme negatively. Thus, regulators should find ways to make the adoption of CCCs attractive. One idea of incentive would be to make interest payments higher on that specific type of convertible bond than for usual bonds. But, when we think about it, there is an even bigger incentive with these types of contracts: becoming part of the equity of the distressed financial institution. It offers further rights on the bank's decision-making process. Thus, the conversion to equity could be an incentive in itself, when the equity fall is not

that important. If the liquidity crisis is too harsh, and the bank loses all its equity, it could be a problem for the former bondholders. Indeed, with their status of bondholders, they had a higher claim against the bank than with their status of stockholders. In the worst-case scenario, i.e. the bank's liquidation, this change of status could disadvantage them. However, the idea behind bail-in being preventing this worst-case scenario from happening by decreasing liabilities, investors could be reassured.

Existing shareholders on the other hand, would be right to complain. When recapitalizing a weak bank from within through convertible bonds, existing shareholders might be reluctant to see former bondholders become shareholders. While this status change forces new shareholders to bear the costs of the bank's financial losses, it also gives them powers that they did not have as bondholders: depending on the proportion of shares that they possess, they might participate to the board of directors' reunions, they might gain the right to vote, etc. In short, they gain influence on the bank's policymaking. And this is why existing shareholders might be unwilling to proceed to the change of status: to prevent their dilution from happening. Under bailout policies, at least the US bailout programs, Government did not interfere much in the financial institutions' policies. They bought preferred stocks without enjoying the privileges that it granted. While we see that the second solution is more advantageous for existing shareholders, we may wonder what the most efficient solution for long-term financial stability is. With the bailout, we have existing shareholders that let the bad decisions that brought financial disorder being taken, saved from bankruptcy, with no less power than before the crisis. On the other hand, with bail-in, we have new shareholders that have just borne part of the costs induced by existing shareholders' poor decisions, that

might want to influence next decisions according to their interests, i.e. not losing money again because of other people's decisions. Bail-in could thus have a resposibilizing effect on financial institutions' governance, on top of sparing taxpayers' money. It is no coincidence that the bail-in idea appears more attractive to public opinion.

An idea of incentive for the issuing firm would be to make interest payments on these kinds of instruments tax deductible.

Anyway, to prevent that dilution while still recapitalizing from within, there are the mandatory rights offerings of equity.

We thus see that post-conversion power distribution is a key question behind the use of bail-in tools. Existing shareholders could want to protect their positions, while outsiders could want to bid down equity prices through speculation in order to get equity cheaply. The choice of tools is thus essentially strategic, i.e. strongly linked with the governance issues.

In the case of bondholders getting the majority of shares in an institution, do all bondholders have the capacity to manage a systemic financial institution? They were not involved in the day-to-day management, and in "LCFIs", there is the word "complex". Thus, how good can they be at restoring financial stability in a complex company in which they did not have much responsibility before? They might not have enough knowledge of what has been done before them. They would need time to organize in a fast moving environment, which would be suboptimal. In this case, existing shareholders' organization could gain the upper hand on new shareholders' majority.

Conclusion

In the financial system's organization as it is now, large financial institutions are the financial system. LCFIs are ubiquitous: they are involved in all types of financial activities; and their failure is unconceivable without huge financial distress. Therefore, whether we should save banks from failure or not, is not the issue here. Instead, the real question behind the subject is: who pays for their prevention?

Several issues have been exposed throughout this paper, all of them having an influence on bank's financial health. Should banks be that big? Should capital requirements continue getting stricter? Should we create a bankruptcy chapter adapted to LCFIs?

But most importantly: should we bailout a failing bank, or set up bail-in safety mechanisms in banks, to be triggered automatically when the bank begins to face financial difficulties?

We have seen that letting a LCFI file for bankruptcy make other financial institutions, companies, and co. lose value, implying danger for the entire system. Even if taxpayers' money is spared, the longer-term danger is too important to let this happen, so this is not conceivable. In the case of a bailout, chances are taxpayers will largely contribute to the financing of subsidies to LCFIs. While through potential bail-in mechanisms, banks' insiders bear the costs of their own rescue.

More than just the choice between bailout and bail-in, it is the way in which they would be implemented in the future that raises several questioning: Should bailout give control to the rescuer? Would it regulate moral hazard? What should be the trigger for bail-in, and how do we prevent its manipulation through speculation? Who would be in control after bail-in? After conversion, how good would the new shareholders be in managing the firm?

Main causes of the financial crisis were: moral hazard leading to excessive risk taking, bank runs, liquidity risk, and contagion risk.

Bail-in responds to moral hazard in a better way. Bailout did not restrict it, at least not in the way it was implemented. Bailout might be effective in regulating moral hazard if the potential rescuer, i.e. the Government, announces that it would imply control. That way, shareholders and managers would fear for their positions. But this would mean nationalization.

Regarding bank runs, none of these two methods responds effectively. Though the presence of such prevention could reassure LCFIs' creditors, the amount of short-term creditors is too high for these solutions to be effective. Indeed, for short-term creditors, the flight to quality is really easy as their positions are cleared quickly.

On the other hand, both of them respond to a potential liquidity crisis, by providing cash directly to institutions, through additional equity or long-term debts. As for the contagion risk, it depends on the liquidity risk: if one bank cannot pay back another one, the latter could face difficulties too.

So, the main difference between these methods is about moral hazard, i.e. the main origin of the financial crisis: thus, theoretically, bail-in seems to win. But, there are only few examples of its implementation, and they did not have an opportunity to face a major crisis yet, to prove their efficiency.

Anyway, the choice between both solutions is not mutually exclusive: banks could set up bail-in tools, without the bailout being cancelled. But would it reduce moral hazard then? Wouldn't existing shareholders be tempted to manipulate the trigger ratio in order to prevent conversion from happening, as they know that bailout is still a possible option? The future of these tools is not yet clear.

Table of contents

Bibliography

Books

Acharya V. and Richardson M., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009)

Duffie D., *How Big Banks Fail, And What to Do about It,* Princeton University Press (2011)

Hubbard, G. and O'Brien, A., *Money, Banking, and the Financial System,* International Edition, Pearson (2012)

Contributions to collective work

Acharya V. and Schnabl, Philipp, "How Banks Played the Levereage Game" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009)

Acharya V. Viral and Sundaram K. Rangarajan, "The Financial Sector Bailout Sowing the Seeds of the Next Crisis?" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009)

Altman I. Edward and Philippon Thomas, "Where Should the Bailout Stop?", in Acharya V. and Richardson M., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009)

Clementi, Gian Luca; Cooley F. Thomas, Richardson, Matthew; and Walter, Ingo, "Rethinking Compensation in Financial Firms", in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009)

Saunders, Anthony; Smith C. Roy, and Walter, Ingo, "Enhanced Regulation of Large, Complex Financial Institutions" in Acharya V. and Richardson M. dir., *Restoring Financial Stability – How to Repair a Failed System,* NYU Stern, Wiley Finance (2009)

Articles

Akerlof G., *The Market for "Lemons": Quality Uncertainty and the Market Mechanism,* The Quarterly Journal of Economics, Vol. 84, No. 3. (Aug., 1970)

Becher D. and Campbell T., *Interstate banking deregulation and the changing nature of bank mergers,* The Journal of Financial Research (2005)

Carlson, M. and Mitchener K., *Branch Banking*, *Bank Competition, and Financial Stability,* Federal Reserve Board, Washington, D.C. (2005)

De Watripont, M., *European Banking Bailout, Bailin, and State Aid Control*, International Journal of Industrial Organization (2014)

De La Merced J. Michael, *G.M. Wins Final Approval of DIP Financing,* Deal Book, New York Times (2009), **http://dealbook.nytimes.com/2009/06/25/gm-wins-final-approval-of-dip-financing/**

Duffie D., *The failure mechanics of dealer banks*, BIS Working Papers, Bank for International Settlements (2010)

Flannery J. Mark, *Stabilizing Large Financial Institutions with Contingent Capital Certificates,* University of Florida (2009)

Freeman D., *Interstate Banking Restrictions under the McFadden Act,* Virginia Law Review (1986)

Friedman, M. and Schwartz, A.J., A *Monetary History of the United States, 1867-1960,* National Bureau of Economic Research, New York (1963)

Gruson, Michael and Nikowitz, Werner, *The Second Banking Directive of the European Economic Community and its Importance for Non-EEC Banks,* Fordham International Law Journal, Volume 12, Issue 2, Article 3 (1988)

Herring R. and Carmassi J., *The Corporate Structure of International Financial Conglomerates,* Oxford University Press (2012)

Jianping Zhou, Virginia Rutledge, Wouter Bossu, Marc Dobler, Nadege Jassaud, and Michael Moore, *From Bail-out to Bail-in: Mandatory Debt Restructuring of Systemic Financial Institutions,* IMF Staff Discussion Note (April 2012)

Lo W. A., *Reading about the Financial Crisis: A 21-Book Review*, Journal of Economic Literature (2012)

Okamoto S. Karl, *After the bailout – regulating the systemic moral hazard,* UCLA Law Review 183 (2009)

Richardson G., Park D., Komai A., and Go M., *McFadden Act of 1927,* Federal Reserve History, http://www.federalreservehistory.org/Events/DetailView/11

Singh M. and Aitken J., *Counterparty Risk, Impact on Collateral Flows, and Role for Central Counterparties,* IMF Working Paper (2009)

Zingales L., *Causes and Effects of the Lehman Brothers bankruptcy*, Before the Committee on Oversight and Government Reform, United States House of Representatives (2008)

Abstract

This dissertation aims at spotting the mechanisms that could potentially lead to bank failures. It does so by looking at the 2007-08 financial crisis' causes. The goal is to identify ways to restore financial stability in large financial corporations. Two main methods will be discussed throughout this dissertation: bailout and bail-in. Both aim at recapitalizing a weak bank: one from outside intervention, the other from within.

Résumé

Ce mémoire s'attache à identifier les mécanismes de la faillite bancaire, en se servant des causes de la crise financière de 2007-2008 comme support. Le but étant de trouver des solutions pour restaurer la stabilité dans les grandes institutions financières. Les deux principales méthodes qui vont être discutées ici sont le bail-out et le bail-in. Les deux méthodes cherchent à recapitaliser une banque en difficulté : l'une par l'intervention d'acteurs extérieurs, l'autre de l'intérieur.