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List of Abbreviations

ABS	Asset-Backed Security
Alt-A	Alternative A- paper
CA	Creditanstalt
CDO	Collateral Debt Obligation
CDS	Credit Default Swap
EMEA	Europe, Middle East and Africa countries
FASB	Financial Accounting Standard Board
FICC	Fixed Income, Currencies and Commodities Division
GSE	Government Sponsored Enterprise
ICG	Institutional Clients Group
QSPE	Qualifying Special Purpose Entity
SIV	Structured Investment Vehicle
SPE	Special Purpose Entity
SPV	Special Purpose Vehicle
UBS	Union Bank of Switzerland
VIE	Variable Investment Entity

1 Introduction

Bank failure is not a new subject in the economic literature. Past events like the great depression in 1930, failure of the Austrian Creditanstalt, Nordic Banking crises or the Asian crises in the nineties led to several bank failures that have shown that most of the cases of bank failures are closely connected with financial crises and in most cases cannot be seen as separated events.

The recent experience of bank failure in the banking sector worldwide showed how the financial sector is unstable and prone to failure during a financial crisis. Surprisingly, also banks with long tradition and stable growing business were hit by the subprime mortgage crisis and needed to turn to governments for support and bail out options.

In addition, this paper tries to identify the losses, the structure of the losses and the affects the subprime crisis had on the performance of the banks. Consequently, describes the actions that have been taken by these two banks UBS and Citigroup according to their problems. In addition it tries to explain and compare the role of regulators and their interventions before and during a banking crisis, previous and the current one. Comparison with the banking crises from the past allows identifying similarities and parallels.

Why did I choose to analyze these two banks? In the first place they have been traditionally the leaders in the banking business. Past performance of the banks showed stable growth and outstanding profits. We can compare and learn from the different legal regulations, in Switzerland and the United States of America (USA), that have been applied in the two different systems of regulation to avoid future downturns.

The thesis is structured as follows: In Chapter 2, the theory of economic crisis, financial crisis and bank failures are outlined. Chapter 3 deals with the previous major financial and banking crises and compares with the

present financial and housing market crisis that dominate the present, Chapter 4 looks into the issue of identifying the general differences, advantages and disadvantages of universal and separated banking systems, Chapter 5 outlines the key risk that financial institutions face , an area of extreme importance in terms of risk management, Chapter 6 gives details of the impact and the possibilities that the regulation has on the banks and the prevention of bank failure, Chapter 7 provides a detailed survey of the subprime mortgage crisis and its impact on financial institution. Chapter 8 and 9 give a detailed overview of the performance and losses of UBS and Citigroup with regard to the subprime mortgage crisis and Chapter 10 concludes.

2 Economic crises, financial crises and bank failures

2.1 Bank Failure

There are two ways how to look at a bank failure. On one hand we can assume that each crisis has the same symptoms and anatomy. The other view assumes that there exist wide differences between bank failures. Does each bank failure have particular features or is there a unique set of circumstances?

As the reality is multidimensional the answer can be justified on the basis of the point of view or depth of perception.

Bank failure is part of a financial crisis. It is important to understand that the banks do not fail only by the endogenous shocks or circumstances, but as part of the whole economy they are influenced by several exogenous macro or microeconomic forces.

The most important thing is to think about bank failure not as a separated event; furthermore it almost always appears as part of a financial crisis. It is impossible to analyze bank failure without understanding the financial or economic crisis.

The type of the exogenous or endogenous factor varies from one speculative boom to another. To list some, it may be the outbreak or an end of war, the widespread adoption of an invention (e.g. canals, rail roads, automobiles etc.), political events (change in political system, change of government etc.), debt conversion, government debt or asset market collapse just to name a few.

2.1.1 Position of a bank in a financial crisis

According to Hyman Minsky, events that lead to a financial crisis start with displacements in the economic system. Sources that lead to changes in economic outlook open up new opportunities to profit in a sector of the economy. In the case of UBS and Citigroup it was the field of CDOs¹. Displacement is especially important for banks. If they concentrate largely on one product or debt to a special sector, that does not have positive and growing economic outlook, it will be difficult for the financial institution to remain profitable.

Displacement brings opportunities in some new or existing lines and diminishes others. As a consequence, business firms and individuals with savings or access to credit take advantage of the new opportunities. If the new opportunities dominate those that lose in importance, investment and production accelerate. In this situation, banks tend to expand credit and enlarge the total money supply. The money supply of the bank can be expanded whether by the issue of bank notes from the central bank that lends it to the commercial banks, or by borrowing in the form of additions to bank deposits. Credit remains risky and unstable. In case of monetary expansion and the following credit boom, risk rises and it is more difficult to control and to forecast the possible downturns. Increased demand for goods and financial assets makes price increase and attracts more investors and firms to new profit opportunities. At this stage of a boom part of the economy starts to speculate (buying for resale rather than use in the case of commodities, or for resale rather than income in case of financial assets). Velocity of circulation and prices continue to rise.

At some point a few insiders decide to take their profits and sell out. Prices begin to level off, because no new participants are willing to move into speculation. The rush for liquidity (out of assets into money) leaves some speculative borrowers unable to pay off their loans leading to the increase of bankruptcies.

¹ See chapter 9.3 for an overview on the role of Collateral Debt Obligations

Banks as the largest credit and loan providers feel the financial distress at first. At this point a bank might be in danger, depending how much of its assets were invested into the new sector and how it was leveraged with other assets and its deposits. If the leverage is not managed very well or the bank cannot rely on other financial sources, the bank might fail. A bank can look for other financial sources either to borrow from other banks or turn to the lender of last resort (in most cases government or the central bank). Lending from other banks is at this point usually very difficult as they might be also in distress and short on money. That is why there is in such a situation high pressure on the government or the central bank, lenders of last resort, to react and to make decisions which banks should be rescued and which should fail in order to stabilize the banking sector which is one of the important pillars of a healthy economy.

2.1.2 Causalities of bank failure

It is pure idealism to think that there is a manual, guidance, an instruction book, early warning signals to prevent bank failure. There is a full range of causalities and different combination of causes. Additional problems can be identified on the level of development of a financial market. Emerging market economies and developing countries tend to have different causes of bank failures than more established and more experienced financial systems, which have been already confronted with various misadventures and failures. Supervision and control is to the largest part formed by experience and the aftermath which is turned into learning experience and is then transformed into a legal framework. Nevertheless there are some factors which occur repetitively in different variations:

- a) Incompetent banking
 - b) Inadequate market discipline
 - c) Weak banking legislation and supervision
 - d) Inadequate macro policies
-
- a) Incompetent banking

Poor lending practices, excessive risk taking, poor governance, poor risk management system, lack of internal control, focus on market share rather than on profitability, currency and maturity mismatches in the bank itself, or the borrowers etc.

Moral hazard of bank managers, whose personal responsibility is not adequate to the excessive risk that they are taking, is always present in a financial crisis or a bank failure. The main implication of moral hazard is that the negative development in profitability does not lead financial intermediaries to be more cautious in risk taking in lending, and to allow financial strategies reducing the overall riskiness of their portfolios. In the case of UBS and Citigroup the moral hazard played a great role. The investment banking business which bears high risks has not been adequately governed. The incentives were too great for the managers. Instead of the quality of the investments, quantity was the goal for the managers, because they were remunerated by the fees. This was not leading to a sustainable development.

b) Inadequate market discipline

Transparency and disclosure are key factors for the exertion of discipline by the creditors on the bank managers or owners. Proper auditing and accounting practices, collateral valuation methods are necessary for passing on information about the capital adequacy.

c) Weak regulatory and supervision framework

Each financial system needs sufficient, well qualified and trained staff. Since authority is responsible for supervision and early identification of possible threats. It is of high importance to construct a legal, judicial and institutional framework that enables competent supervision.

d) Macro policies and macroeconomic developments

Not all of the macroeconomic controls can be regulated by the authorities, especially not in the interlinked internationalized markets.

Lending booms, excessive capital inflows or outflows, real estate equity price bubbles, slowdown of export or growth, reduction of export markets or shrinking of domestic markets due to competition or changes in the structure of market, growing excess capacity or falling profitability in real sector, lower overall investment, rising fiscal and or current account deficits, weakened public debt sustainability, sharp changes in exchange rates and real interest rates, etc.², just to name few. All these factors can have direct or indirect impact on the performance of the bank; therefore, banks need to monitor all these factors. Consequently, they have the opportunity to adjust continuously all the time to macro policies or macroeconomic development and implement ongoing changes. The dangers and the chances lie within the adaptability of a financial institution.

2.1.3 Early warnings of banking crises

As mentioned before, banking crises are in most of the cases present during financial crises. Of course, banking crises can also occur without endogenous factors, but these cases do not appear to be very common. More significantly, if just one or two banks are close to a failure, within good working financial systems the bailout or other restructuring can be applied and executed very easily.

According to the Aftermath of financial crises by Reinhart and Rogoff, who compared the banking crises world wide and extended their research with the newest ongoing, the following similar indications of banking and financial crises could be identified:

There are similar patterns in macroeconomic indicators such as housing and equity prices, unemployment, government revenues and debts.

- Asset market collapses are deep and prolonged

² Ingves, S., (2002)

Real housing prices decline 35 per cent at average, stretched out over six years, while equity prices collapse 55 per cent at average over a downturn of about three and a half years.³

- Declines in output and employment

The unemployment rate rose on average by 7 percentage points over the down phase of the cycle, which lasts on average over four years. Output falls (from peak to trough) on average by 9 per cent, although the duration of the downturn, averaging roughly two years, is considerably shorter than for unemployment.⁴

- Real value of the government debt tends to explode

In the post World War II period, the government debt rose on average by 86 per cent. The main causes of the debt are not widely cited costs of bailing out and recapitalizing the banking system. Bailing out costs are difficult to measure but even the estimates from competing studies do not show comparable high numbers on the amount of public debt that is dedicated just to the bailing out of financial institutions.

³ Reinhart, M., Rogoff, S., (2008)

⁴ Ibid.

3 Historical comparison

The comparison with the Asian, Latin American or Russian crises is not applicable to such an extent as with the Great Depression and the Nordic banking crises.

Emerging and developing countries tend to have different risk concerning bank failure. In developing countries the financial system is weak and does not provide as much legal framework compared to experienced and more capitalized markets. A special feature of the developing and emerging banking crises is the high threat of moral hazard. Due to the lack of a strong legal framework and enforcement moral hazard is crucial to bank failure. These could be observed for example in the Asian⁵ and Russian 1998⁶ banking crises.

One of the main problems in the Latin American countries is the fragility of the financial systems. Even relatively mild shocks to the banking industry can quickly result in sharp reduction of the deposit base.⁷ This is a large difference to the more developed financial systems in countries where UBS and Citigroup are settled in.

Due to the large differences in the level of development of the financial sectors and the factors that have triggered the downturns within many financial and banking crises that have occurred in the past we select these crises which have related environments and causes. The best examples for comparison can be found analysing the crises in the USA in the 1930s, the Nordic banking crises of early 1990s, and the Credit-Anstalt (CA) crises of 1931.

3.1 The Great Depression of the 1930s

Similar causes of the downturn between the depression in the thirties and the financial crisis of 2008 can be identified as followed: in an economic crisis the chronology of reaction is being started with the contraction of

⁵ Corsetti, G., Pesenti, P., Roubini N, (1999)

⁶ Stylin, K.A. (2005)

⁷ Hausmann, R., Rojas-Suárez L., (1996)

production, secondly financial markets react (widespread bank failures) followed by rise in unemployment.

Compared to the great depression of the thirties the magnitude of the effects on the economy today is not as large as then.

The great depression was similar to the financial crisis of 2008 also as to the international aspects. Not just the American market was in crisis but the impact of the downturn was observable also in other parts of the world as Europe or South America.

- Failure of financial institutions

In the 1930s the collapse in production and wealth led to bankruptcies and the decline of the number of banks in the United States from 26,751 in December 1926 to the low point of a total number of 14,440 of banks in December 1933.⁸ Nearly half of American financial institutions disappeared. In between October 2002 and October 2009 the Federal Deposit Insurance Company registered 149 failed banks.⁹

One can assume that not appropriately managed banks in the United States did already fail in between the years 1926 and 1933; therefore such a vast number of failures should be not observable anymore.

On the other hand if all the bad managed banks have already failed the regulators would have to learn from the previous mismanagement, and supervising authorities should be able to create a legal framework that would early enough identify unhealthy banks, and what is more important, make it possible to intervene to prevent further damage in identified banks. Not only the possible threats to the depositors and investors matter, one has also to prevent the possible spread of a bank run.

⁸ Board of Governors of the Federal Reserve System (1943)

⁹ Federal Deposit Insurance Corporation (2009) ,
<http://www.fdic.gov/bank/individual/failed/banklist.html>

- Consumers and business cut down their investments and turn heavily to saving. In October US consumer spending fell by 1 per cent, the largest decline since 2001.¹⁰
- Rise in unemployment

While in the 1930s unemployment reached nearly 25 per cent¹¹, the unemployment rate in the USA rose from 4.4 per cent in March 2007 to 9.4 per cent in July 2009. Since the recession began in December 2007, 5.1 million jobs have been lost, with almost two-thirds (3.3 million) of the decrease occurring in the last 5 months up to July 2009. Job losses are large and widespread across the major industry sectors.¹²

- International magnitude of the crisis today and in the 1930s

The contraction in production and the changes of the unemployment rate have a major impact on the whole national economy. Chances that the recovery could be supported by worldwide demand are not very high and optimistic. During the a few past months the fall in demand for consumption and the employment decrease has spread also to Europe and Asia.

The greatest difference in comparison to the great depression was the way how the government was viewing banks and dealing with the weakened banks. Franklin Roosevelt let the banks fail, nowadays the preference of the government is to prevent large banking houses from failing and to bail them out by injecting money. The reason to do so is to protect the overall stability and prevent further bank runs. In the 1930s the FED thought weak banks should fail. Borrowers suffer during deflation because their debts are fixed in value, but creditors benefit because the dollars they get back will buy more. Debts cannot adjust to the falling prices because interest rates cannot go below zero.

¹⁰ Big Drops in US consumer Spending, <http://news.bbc.co.uk/2/hi/business/7750465.stm> [May 5, 2009]

¹¹ Bureau of Economic Analysis <http://www.bea.gov/national/nipaweb/SelectTable.asp?Selected=Y,Table1.1.3> [June, 2009]

¹² Bureau of Labor Statistics, <http://www.bls.gov/news.release/pdf/empst.pdf> [April 3, 2009]

The other aspect to the bail out of the banks is the responsibility for the risk that has been taken. If the future, management of an important bank can count on the alternative that in case of a bank failure the government or the central bank as a lender of the last resort is going to intervene, it will act much more risk friendly. These individuals in the management might be more inclined to lend more money to projects with higher or not predictable risk with the knowledge that they will not have to be taken into account for failure in the future.

3.2 Nordic Banking Crises of the 1990s

The Nordic banking crises of the early 1990 were the first systematic crises in industrialized countries since the 1930s, if the banking problems directly related to the devastation of the Second World War are excluded.¹³

In the Nordic countries economies and financial systems were well organized. So how could such problems occur?

The causes presented in the introduction can be found also to different degree in the Nordic banking crises. But compared to the other crises Nordic countries are usually well developed at the micro level compared to emerging markets and developing economies e.g. Argentina or some Asian countries. This environment is almost ideal for crisis management and bank resolution. If the microeconomic structure is in place, even in turbulent times it is not necessary to provide a systematic resolution framework or a regulatory framework for dealing with problematic banks. It was relatively easy to take over and recapitalize a bank, lend or guarantee funds to a private bank, set up limited liability companies for dealing with problematic assets –transactions that have been proven extraordinarily difficult in many other countries.¹⁴ The table 3-1 below gives an overview of the regulations that have been introduced in the Scandinavian countries and the effects that occurred after their implementation.

¹³ Ingves, S., (2002)

¹⁴ Ibid.

Regulation	Effects
<p>Interest rate regulations</p> <p>Lending rates were controlled and were tied to money market and/or central bank base rate (changed infrequently).</p> <p>Deposit rates were linked to the base rate in Finland, but not in Norway and Sweden.</p> <p>Quantitative restrictions</p> <p>Reserve requirements</p> <p>Funding quotas from central bank</p> <p>Direct credit ceiling</p> <p>Liquidity ratios (bond investment obligations)</p> <p>Controls on capital flows</p> <p>Prudential regulations</p> <p>No strict enforcement of capital adequacy requirements.</p> <p>No regulations on cross ownership between financial and nonfinancial institutions.</p> <p>Other</p> <p>Foreign banks were not allowed to establish subsidiaries.</p>	<p>Limited price competition</p> <p>Led to competitive advantage of banks vis-à-vis other financial institutions in Finland, as only banks were allowed to issue tax-exempt deposits.</p> <p>Promoted extensive branch networks.</p> <p>Shifted portfolio compositions of banks in favour of government and housing bonds rather than loans to private</p> <p>Prevented banks from resorting to foreign funds.</p> <p>Banks held low equity capital.</p> <p>Led to holdings of direct equity stakes in nonfinancial companies by foreign banks.</p> <p>Prevented competition by foreign banks.</p>

Table 3-1: Banking Regulation and Its Impact on the Financial System¹⁵

Historic parallels between UBS and Citigroup can be found with the crises in the Nordic countries in the 1980s. To compare the UBS and Citigroup failure we need a comparable industry environment. As a matter of course, there are similar factors which can lead to a bank failure as in emerging and developing countries but in our case it is much clearer and better to compare UBS and Citigroup with bank crises at the same level of industry development.

The Nordic banking crises and the bank failure of UBS and Citigroup have many things in common.

- Industrial countries with a strong financial system
- Both went through a period of market deregulation

¹⁵ Drees, B. , Pazarbasioglu, C., (1998)

- Removal of restrictions on capital movements and economic deregulation
 - In the case of Nordic banks it was the change of the lending rate regulations. More precisely, during the 1980s explicit limits of average lending rates were imposed in Norway, Finland and Sweden. Nevertheless, loan rates did not primarily reflect the perceived credit risk of the borrower, but instead depended largely on the closeness of the borrower's relationship with the bank.¹⁶
 - Similarly, for UBS and Citigroup an important role played the changes in the American financial market. More precisely it was the deregulation of capital requirements. In 2004 the Securities and Exchange Commission (SEC) removed rules that hold leverage at 15 to 1 for investment banking companies.¹⁷ These changes allowed the management of the banks to shift the leverage and by the shift; banks find themselves more vulnerable to default. Repeal of the Glass-Steagall Act of 1933 in 1999, which separated banks according to their business into commercial or business banks, allowed Citigroup to get involved into investment banking and merge with Travelers insurance group.
- Financial innovation (in case of UBS and Citigroup Collateral Debt Obligations, more details in the chapter under 9.4.1)
- Increased competition in financial services
- Unfavourable economic development
- Delayed policy responses
- Banks inadequate internal risk-management controls

¹⁶ Drees, B., Pazarbasioglu, C., (1998)

¹⁷ Gandel, S., (2009)

A banking crisis in the aftermath of financial liberalization does not automatically imply that the crisis was caused by the deregulation. In the Nordic case it was deregulation in combination with significant domestic overheating, declines in income, unfavourable macroeconomic developments and depressed asset markets.¹⁸

3.3 The Crisis of the Austrian Creditanstalt 1931

The crash of the Austrian Creditanstalt in 1931 might bear comparison to the subprime mortgage crisis of 2006. The world and the level of development in the financial sector of 1929 were in many respects different but there are many similarities to present world situation.

Collapse of Creditanstalt happened also due to the worldwide crises that had its origin in the American market. The depression spread from the USA worldwide and Creditanstalt experienced the first European bank run in 1931. But the depression was not the only factor. Problems originated already from several sources:

- The dismemberment of the Habsburg Empire in 1919 after the Treaty of Trianon
- Post-war inflation
- The League of Nations stabilisation with its 1922 protocol that required League approval for Austrian borrowing and any departure from gold
- Austrian bank and speculators participation in the 1924 attack on the French franc that produced thirty bank failures in Austria
- The failure of the Bodenkreditanstalt in 1929 and its absorption by Creditanstalt, without adequate provision for its bad loans¹⁹

All these factors contributed also to the failure. The management of the Creditanstalt claimed that it was initially unaware of the real extent of the losses of the Bodenkreditanstalt, Austria's second largest bank, which only

¹⁸ Drees, B. , Pazarbasioglu, C., (1998)

¹⁹ Good, D., (1993)

emerged in 1931.²⁰ The newest research work found out that an intricate system of cross-deposits was set up by the Austrian Central Bank covertly to direct funds to the Creditanstalt via American and British banks to compensate it for taking over the bankrupt Bodencreditanstalt, suggesting that the received accounts of the collapse of the Creditanstalt need to be revised.²¹

The similarities that can be observed on both sides between present US banks and the Creditanstalt are the huge losses that have been made public in their balance sheets. For both banks the CA and Citigroup the real losses were much higher than expected. Also as in the case of Citigroup the National Bank of Austria helped the CA when the first liquidity problems occurred. Nevertheless, this fund injection of a total of 708 million Schillings still could not help to restructure its balance sheet. At the end CA has lost 1,068 million Schillings in total. Analogous to the problems of UBS and Citigroup, CA crisis can not be viewed as an isolated event. It was a central occurrence of the Austrian bank crisis between 1925 and 1936. All in all, Austrian government and the Austrian National Bank spent 1,137 million Schillings during the bank crisis in the period between the First World War and the Second World War on Austrian banks. For a detailed breakdown see table below.

Postal Savings Bank	200 Million Schilling
Central bank of the German Savings Bank	80 Million Schilling
Credit Anstalt	708 Millions Schilling
Viennese Association of Banks	55 Million Schilling
Lower Austrian Escompte Company	94 Million Schilling
Total	1137 Million Schilling

Table 3-2: Financial help to Austrian banks in between 1925 – 1936 from the Austrian government²²

²⁰ Aguado, I., (2001)

²¹ Ibid.

²² Stiefel, D., (1989)

The communication of the losses to the public played a pivotal role. Similar to the CA, Citigroup was trying to procrastinate to report losses in order to win time to look and find other financial source to cover up for the losses that have been made or the credit losses that were close to default.

Time plays a very important role in the financial world. Sensitive information had and still has an immediate impact on the stock prices and ratings.

In both cases the total amount of the write-down has been visible after the peak of the financial crises, but only two or three years.

4 Universal and separated banking system

It is important to understand and examine two cases of the banking system. This will show the advantages and disadvantages of both types of banking a universal and a separated banking system. Later on the example of UBS which is a European, Swiss bank and Citigroup a traditional American banking group, we can observe and compare possible advantages in handling risk.

This distinction in two banking business models does exist solely in the USA. This specification is based on the Glass-Steagall Act from 1933, which created separated banking systems. The aim of the act was to prevent commercial and investment banks from operating as a single institution. Nevertheless due to the Economic Crisis in 2008 the universal banking system might once more change or will be adjusted to the aftermath and causes of the crisis.

There are certainly advantages and disadvantages to both systems the universal and the separated banking system. Following arguments are as listed below.

Arguments for a separated banking system:

- Commercial banking is less risky than investment banking; therefore a separated banking system secures the deposits of the bank depositors in a better way than the universal bank.
- Commercial banks in the separated banking system do have access to cheap deposits. With the introduction of a universal banking system, this would create an unfair advantage over investment banks.
- Existing conflict between granting loans and emission back up can be solved in case of separated banking system via competition.

- Universal banks have the possibility to replace poor credits by bonds which are placed in the market to detach their credits.

Arguments against a separated banking system:

- Due to the new financial products and internationalization the banking sector cannot keep up with the separated system.
- Competition in the field of emission is much wider, if the emission is not restricted just to a group of banks.
- Balance of risk can be managed better in a universal bank.
- Universal banks possess better subvention opportunities (temporarily) to unprofitable or failed banking transactions or operations.
- A separated system is not efficient, because no matter whether it is a commercial or an investment bank, both have to enforce credit ratings.

Now a day in the internationalized financial environment the banking regulatory systems cannot control a bank in its foreign activities. After the tremendous losses accounted for Citigroup, the management of the company decided to separate again the banking system not to cumulate the risk. In this case a company has more oversight and can better control the risk. For Citigroup universal banking might not be the right way to unwind risk management. Therefore a separated banking system might prevent or at least reduce the losses it had to account for in 2008 and 2009.

5 Types of key risks in a financial institution

5.1 Introduction

Banks and other financial service companies are seen as conservative risk-averse organizations. In reality, nothing could be further from the truth. The core business of banks consists of seeking opportunities where the market price for accepting risk is higher than their own assessment of its likely costs. There are many ways to look at the different risks. Different literature sources list various risks and also the definitions vary. As an example:

- **Credit risk**

Failure of the counterparty to meet its obligations.

- **Market risk**

Risk that the prices of financial instruments, such as equities in which a bank has positions, falls.

- **Interest rate risk**

In bank balance sheets assets and liabilities are listed with fixed or floating rates which do change continually over time. A bank makes a lot of fixed rate loans (e.g. car loans, equipment loans) funded with floating rate deposits. It is exposed to the risk that interest rates rise. This will push up costs of funds while the returns on its assets will remain largely unchanged.²³

- **Operational risk I**

It is challenging to find a simple definition of operational risk. Many different approaches can be found in literature. The Basel Accord

²³ Frost, S., (2004)

defines it as risk arising from execution of a company's business functions.

- **Foreign currency risk**

Foreign bank that borrows in home currency is exposed to exchange risk. The main risk is that home currency appreciates against local currency leaving it with a liability that in local currency terms is greater than the value of its matching assets.

- **Liquidity risk**

Banks are usually funded with relatively little liquidity, with short-term deposits which are lent out long term as loans. Loans are inherently illiquid. Companies and individuals rarely borrow unless they have a financing need. Banks face the risk that a large portion of their depositors will demand their funds back at the same time. Management has to determine the appropriate balance between holding low yield, but liquid assets such as government securities that can be readily sold and higher yielding, but illiquid assets such as loans.

- **Model risk**

Banks use models to estimate the value of diverse instruments and to assess the level of risk that the bank is exposed to in its trading activities. These models are complex and errors in these models pose a risk to banks. They overpay financial instruments or underestimate the level of market or trading risk being taken.

- **Regulatory risk**

Banks are highly regulated organizations. They are at risk from regulatory and legislative changes that increase the costs of doing their business and may even prohibit them from undertaking it at all.

They may breach regulatory requirements and be fined, finally losing their license or suffer loss of reputation.²⁴

- **Country risk**

A bank with operations in a foreign country is, for example, at risk from the impositions of capital controls preventing it from remitting any profits or other funds it has in that country. In extreme cases foreign banks may even have their assets appropriated.

We could list many more problems, depending on the view and the categories (e.g. actuarial risk, performance risk, political risk, replacement risk, settlement risk, judicial and legal risk etc.). Many of the risks do overlap or influence each other to a high extent. Therefore, it is important to keep focus on the ones which cause the highest losses or are difficult to measure.

The most common primary cause of bank failures is insolvency arising from credit losses. This is followed by failure to manage interest rate risk and foreign exchange risk. Failure arising from operational risk (e.g. fraud), market risk, and liquidity risk tend to be more visible by press monitoring and are more severe but the first two factors are more common.

5.2 Credit Risk

Credit risk is the first of all listed risks in terms of importance. Risk characteristics differentiate debtors; a small manufacturing company is differently exposed than a large one. The challenge for the bank is to determinate a pricing structure for its products that is competitive but compensates for the underlying risks.

The major source of risk is the default risk of customers. Counterparty that owes or potentially owes bank, can fail to meet its obligations. They might fully or just partly fail to comply with their obligations to service debt. Default might also increase, when the risk of a decline in the credit standing of an issuer becomes higher. Deterioration of credit standing of a borrower

²⁴ Frost, S. (2004)

does materialize into loss because it causes an upward move of the market yield to compensate the higher risk and triggers a value decline. The view of credit risk differs for the banking and the trading portfolio.

Banking Portfolio

Credit risk is critical since the default²⁵ of a small number of important customers can generate large losses, potentially leading to bankruptcy or insolvency. Simple payment delays do not count automatically as default; many are resolved within a short period of time. Credit risk is difficult to quantify when using the ex ante data, because of the necessary assessment of the likelihood of a default event and of the recoveries under default, which depend on the context. Context refers to all factors influencing loss under default, such as the outstanding balance of debt at default, the existence of guarantees, or the policy of all stakeholders with respect to the debt.

Various default possibilities:

- Delay in payment obligations
- Restructuring of debt obligations due to major deterioration of the credit standing of the borrower
- Bankruptcies

Trading Portfolio

In contrast to loans the credit risk of traded debts is also indicated by the agencies' ratings, assessing the quality of public debt issues, or through changes of the value of their stocks. Credit risk is also visible through credit spreads, the add-ons to the risk-free rate defining the required market risk yield of debts. The capability of trading market assets mitigates the credit risk since there is no need to hold these securities until the deterioration of credit risk materializes into effective losses.²⁶

²⁵ This means any situation other than a simple delinquency.

²⁶ Bessin, Joël, (2002)

5.3 Market Risk

5.3.1 Definition

Market risk is an adverse deviation of value during a certain liquidation period. Tradable assets have random variations. Their distribution results from observable sensitivities of instruments and volatilities of market parameters. Depending on the market factors we can distinguish between:

- Equity risk (change in stock prices)
- Interest rate risk (change in interest rate)
- Currency risk (foreign exchange risk)
- Commodity risk (change in the price of commodities e.g. metal, oil, agricultural products)

To define the potential adverse deviation of the portfolios market value mathematical models are needed. The VaR methodology captures the maximum adverse deviation of prices during a preset period for liquidating assets, considering the changes in the market parameters.

Controlling market risk means keeping the variations of the value of a given portfolio within given boundary values through putting upper limits on imposed risk, and hedging for isolating portfolio from the uncontrollable market movements.²⁷

5.4 Operational Risk

Operational risk management has its origin in the military and nuclear technology. The operational risk is a not negligible factor. In the financial services sector it is far higher than the market risk for most banks, and thus it is the second biggest risk category after credit risk.²⁸

Risk and hazard is involved in the operations of most of the enterprises, but banks are an exception. The position as a borrower and lender in its intermediary function has a central role in the whole economy and society.

²⁷ Bessin, Joël , (2002)

²⁸ OeNB and FMA , (2006) p.7

Therefore, misjudgement of risk, incompetency, fraud, criminal tendencies, unavailability or loss of employees, diverse process mistakes (account entries, settlement, valuation etc.) and failure of technical systems represent potential causes of failure. All these examples are internal effects, but bank is interacting to a high level with other entities and actions of these can be also source of potential damages to the financial institution. For example external effects like violence, crime, white collar crime, physical threats, natural disaster, legal risk or political changes can trigger operational risk. The potential can be multiplied by the complexity of banking, expanding into new markets and changing business activities, progressive and fast growing internationalization, implementation of automatic information technologies, and last but not least introduction of new more complex financial products.

5.4.1 Definition of Operational risk

It is of a great importance to understand and analyze operational risk, because it is one of the key factors that have contributed to the default and losses in the example of the two major banks UBS and Citigroup.

Operational risk should not be mixed up with risks of operations. Being the risks of errors appearing in complex systems and processes, it is a subset of operational risk. Operations risk does not include fraud, model or serial risks (legal risk). In the broader sense we understand under operational²⁹ risk all the potential losses associated with operating

Operational risk exists as soon as a company uses employees or systems in processes or is subject to external interaction. Naturally, this evolves long before the credit and market risk are present or can be evaluated. After all, it is not the consequence but the cause of a loss event that, by definition, determine whether it is an event of operational loss. Operational risks can appear directly or indirectly through a market or credit risk at different levels:

²⁹ From Latin *operare* = work, operate, create.

- People
- Processes
- Technical equipment
- Information technology

People risk is designated by human errors, lack of experience or expertise, fraud, lack of compliance with existing procedures and policies.

- Inadequate procedures and controls for reporting, monitoring and decision making
- Inadequate procedures on processing information, such as errors in booking transactions and failure to examine legal documentation
- Organizational differences
- Risk surveillance and excess limits: management deficiencies in risk monitoring, such as not providing the right incentives to report risk , or not abiding by the procedure and policies in force
- Errors in the recording process of transactions
- The technical deficiencies of the information system or the risk measures

As experience made in the past fifteen years show, operational risks are a major source of financial loss in the banking sector. If we examine closer the past cases of failure, a significant share of loss events recorded by banks that are attributed to market or credit risk are actually at least related to operational risk.

5.4.2 Operational Risk under the Basel Accord

According to the first Basel Accord operational risk is defined as residual risk, when credit risk and market risk are excluded from the business risk of a bank.

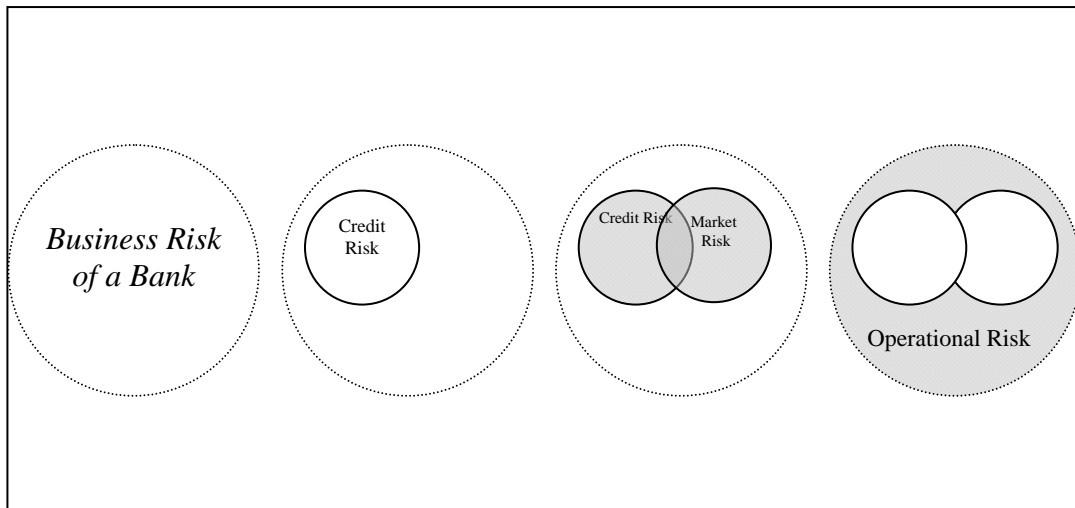


Figure 5.1: Operational risk as complementary risk (residual risk defined by exclusion)

According to this definition, business risk includes operational risk although it constitutes the enterprises risk of management decisions and, therefore, is beyond risk manager's control and competences.³⁰

The Basel Committee on Banking Supervision³¹ is advocating more focus on the operational risk in banks by imposing a regulatory charge for other risks. The reason behind this regulation is that in fact the capital, held as a cushion against residual risks, including operational risk, was increasingly reduced by the more sophisticated and accurate measurement of credit risk. This was also one the reason why the Basel Committee specified operational risk further. In the year 2001 the definition focused on the causes of (potential) loss events in order to differentiate operational losses from events falling in other categories:

“Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk.”

³⁰OeNB and FMA (2006)

³¹ Basel Committee on Banking Supervision (1999)

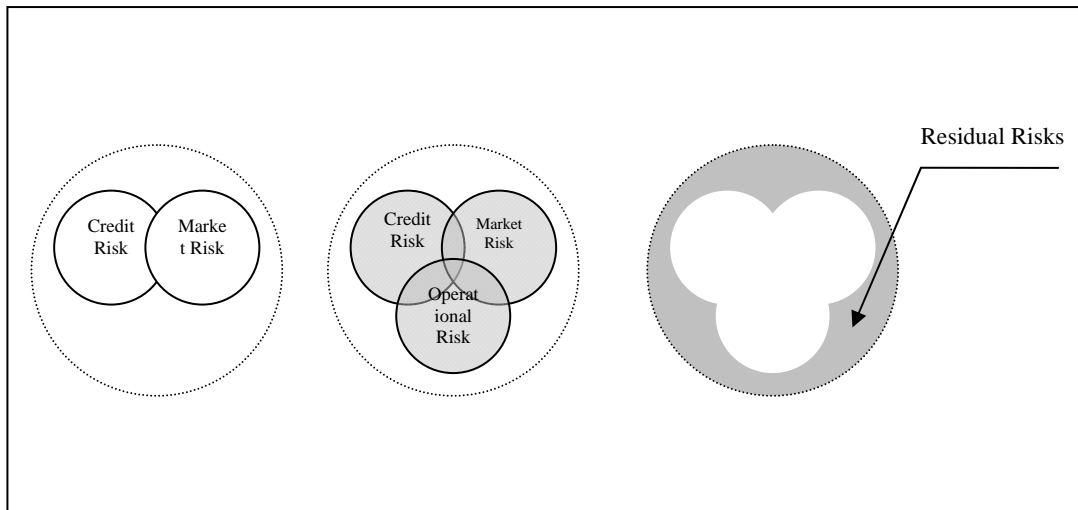


Figure 5.1: Residual risk

Under residual risks we can mention strategic or reputational risk.

6 Theory of Regulation

6.1 Introduction

The banking sector is compared to other commercial sectors heavily regulated. A set of regulations accompanies a bank from the formation of a company to the point of close down. In some countries banks and financial institutions are being supervised and control led by more than just one body, each one responsible for regulation and supervision of a particular segment of financial services. The regulation varies from country to country but mostly it is divided between commercial banking, the securities business (investment banks, brokers and fund managers) and insurance companies (both life and non-life).³²

Other parties such as accounting standards bodies and auditors also have an important role to present financial transactions and ensure the accuracy of data released by the companies.

Bank crises are closely related with equity losses. Since the state usually cannot evade his responsibility as the “lender of last resort “, it is highly interested to avoid or to mitigate bank crises.

Regulation is a contaminant in a free market, which is based on the idea and interaction of market forces. The theory of perfect markets is based on the combination of particular market actors. Their aspiration towards individual returns and benefit maximization leads at the same time to publicly efficient resource allocation. In practice, markets are not perfect but that does not mean that regulation is necessary.

6.2 Main subjects of regulation

More important is who we want to favour or protect through the regulation. Primary objectives are maintenance of a safe and sound financial system, consumer protection and to establish and communicate clear guidelines.

³² Frost, S., (2004)

6.2.1 Maintain safe and sound financial system

The passive potential of banks for money generation has a great influence on the money supply in the economy and therefore also on price stability. Both of these factors would be without regulation subject to high fluctuation. This is directly unfavourable for the stability of the economy and the overall development.

The threatening or incurred instability can easily lead to loss of assurance of the deposits' security. Eventually this can cause a bank run, first few banks collapse, than like a domino effect the whole banking system is engaged. A breakdown of the banking system leads not just to loss of capital but in most cases also the state is involved and is urged to take part. As an example the bank crises in Norway cost the state in the beginning of the 90ties \$16 billions, The US government spent in 2009 as much as \$2.5 trillion - \$350 billion³³, Swiss National Bank agreed to inject \$5.23 billion³⁴ and UK government committed up to £50 billion of taxpayer funds for a partial nationalisation of stricken banks.³⁵

Also in the case of one bank downturn the state cannot entirely avoid not to be involved. This is the case of large banks that are far too important and "too big to fail". This applies to Citibank and UBS, two worldwide largest banks.

6.2.2 Consumer protection

Consumer protection from abuse by financial institutions ensures that they are treated in a fair way. There is clearly the need for protection of depositors, because on average they do not possess the knowledge and the information of the complicated and interwoven financial service, complex

³³ Calmes J., *Revised U.S. bank bailout plan gets lukewarm reception*, (February 11, 2009), The New York Times, <http://www.iht.com/articles/2009/02/11/business/geithner.php> [March 13, 2009]

³⁴ Swissinfo.ch, *Swiss bank bailout announced*, (October 16, 2008), http://www.swissinfo.ch/eng/specials/finance_crisis/Swiss_bank_bailout_plan_announced.html?siteSect=23451&sid=9853818&cKey=1227790179000&ty=st [May 25, 2009]

³⁵ Naughton, P., *Brown and Darling commit £500 billion for bank bailout*, (October 8, 2008), Times Online, <http://www.timesonline.co.uk/tol/news/uk/article4905637.ece> [May 20, 2009]

contract relations and institutions. Naturally the depositors can protect themselves by using other bank houses or keep the savings at home, but in this case the economic efficiency that results from the financial relations would not take place. Protection of creditors does not mean the protection of the deposits at any costs. Rather the unobstructed unwinding of financial business between the institutions and the customers should be encouraged.

6.2.3 Establishment and communication of clear guidelines

In order to ensure that the safe and sound financial system can be maintained and at the same time consumer protection is ensured, financial institutions implement and follow the rules that should ensure it is crucial to establish and communicate clear guidelines and procedures.

Regulation is not the cure for all mismanagement and will also not secure a fair treatment for all the parties. Legislators and regulatory authorities are not at all times omniscient and benevolent. Moreover, they are not that well informed about the situation and the actual problems that need to be given attention to. The subject of the regulation and the information asymmetry often leads to not compatible goals of the regulators and the good of public benefit. On one hand we face the failure of the market and on the other hand the failure of the government administration.

6.3 Responses to banks that are close to failure

During the collapse of the financial system central bank and the government should try to stabilize the economic environment to prevent much deeper depression.

People tend to react in crises typically with a follower approach. Media and news play a pivotal role in the reaction that the public will exercise to prevent their savings or investments to devalue. The worst case for the central bank and the government is a bank run. Depositors are afraid and

want to switch and withdraw their money or relocate to different products. In this case even a relatively healthy bank can cause distress or a failure.

6.4 Regulation responses from the top

The regulation can try to minimise the systematic risk to which all the banking institutions are exposed. They can try to avoid a bank run, which destabilizes the bank and can cause its bankruptcy. If this is the case for more banks, as it usually is, this can lead to much larger and more severe financial crises followed by economic depression. Protection can be achieved by the following instruments used by the regulators and government. These instruments can be distinguished into two groups, based on the time the action is taken:

Ex ante action

- Equity requirements
- Posting reserve ratio requirements
- Regular reporting
- Audit by the governmental agencies

Ex post action

- Temporary suspension of withdrawals
- Protection of deposit insurance systems³⁶
- Additional financial injection, taking a stake in the vulnerable institution
- Central bank or government acts as a lender of last resort, allowing short term loans to banks (in this case it is not absolutely sure if the change in the money multiplier will also enhance the cash flow. The idea is to deliver more money into the system but other scenarios exist. If the banks hold the money as reserves which were intentionally determined for the public, the effect will not be the outcome that the initiators planned.

³⁶ For example the U.S. Federal Deposit Insurance Corporation

Volume and size stay crucial to monetary regulations and interventions. Without a clear framework and the cooperation of the financial institution the effectiveness of interventions will be much more unpredictable and difficult to maintain.)

The policies that can be applied to assure best practice remain still problematic. As we can see from the current and previous events, so far none of these actions could prevent the economic downturn.

7 Subprime mortgage crises

7.1 Introduction

The subprime mortgage crises which caused the ongoing financial crises worldwide in 2007 have their origin in the US. They started with a dramatic rise in mortgage delinquencies, foreclosures, bankruptcy of numerous mortgage companies, and a significant tightening in subprime lending standards with major consequences for the worldwide banking systems and financial markets.

7.2 Origins of the subprime mortgage market

About 20 per cent³⁷ of mortgages issued in the US in 2006, were made to subprime borrowers.

Subprime lending is lending of cash to clients who have very poor or no credit history at higher than normal repayment level. Subprime mortgages are residential loans that do not conform to the criteria for prime mortgages. Other than prime mortgages, subprime mortgages have a lower expected probability of full repayment. The probability of full repayment is assessed usually according to the borrowers' credit record and score. These are represented by the debt service-to-income ratio (DTI), or the mortgage loan-to-value ratio. Borrowers with low credit scores, debt service-to-income level above 55 per cent, or mortgage loan-to-value over 85 per cent are likely to be considered subprime. Alternative A paper loans (Alt-A) fall into grey area between prime and subprime mortgages. These began as more flexible alternative prime loans, mainly for borrowers who met all of the credit score, DTI and LTV prime criteria, but did not provide full documentation or more investment properties.³⁸

³⁷ Berry, J., *Subprime Losses Are Big, Exaggerated by Some*, (December 27, 2007), Bloomberg.com, <http://www.bloomberg.com/apps/news?pid=20601039&sid=am4LxWcQQbPQ> [April 5, 2009]

³⁸ Loans to prime-credit borrowers that have combination of non-traditional documentation, non-standard product structure, or a more liberal underwriting. Alt A pools generally have higher proportions of investor loans and lower average credit scores (690 to 715) than conventional conforming or prime jumbo pools.

The development of modern subprime mortgage market in the United States was facilitated by federal legislation and automated underwriting and securitization.

From 1982 lenders were allowed to offer adjustable-rate mortgages. Also the Tax Reform Act of 1986 left residential mortgages as the only consumer loans on which the interest was tax deductible.³⁹ This made home equity withdrawal a preferred means of financing home improvements and personal consumption relative to other forms of consumer loans.

During the 90s subprime lending helped to facilitate a substantial expansion of home ownership. These developments allowed a relaxation of credit rationing for borrowers previously considered too risky by traditional lenders.⁴⁰

7.3 Expansion of Subprime Lending

Until 2003, the majority of mortgage originations were prime conforming loans, which have been then purchased by two government-sponsored housing enterprises (Fannie Mae⁴¹ and Freddie Mac⁴²). However, by 2006 half of all originations did not meet the government-sponsored enterprises' (GSE) conforming criteria.

The transformation of the market was such that, of 2006 originations only thirty-six per cent were conforming loans, fifteen per cent were prime jumbo loans⁴³, three per cent comprised of loans guaranteed by the Federal

³⁹ Kiff, John/ Mills, Paul, *Money for Nothing and Checks for Free: Recent Developments in U.S. Subprime Mortgage Markets*, IMF working paper, 2007

⁴⁰ Ibid.

⁴¹ Fannie Mae is a government-sponsored enterprise (GSE) established as a federal agency in 1938, chartered by Congress with a mission to provide liquidity, stability and affordability to the U.S. housing and mortgage markets. Fannie Mae operates in the U.S. secondary mortgage market.

⁴² Founded by Congress in 1970 to provide liquidity, stability and affordability to the U.S. housing market.

⁴³ Jumbo loans are loans larger than the limits set by Fannie Mae and Freddie Mac. These limits are reviewed annually.

Housing Association and the Department of Veterans Affairs (VA) while the remainder comprised nonprime loans; Alt-A twenty-five per cent and subprime twenty-one per cent.⁴⁴

Increase of the subprime lending was boosted by more highly leveraged lending against rapidly rising house prices. Housing affordability level dropped and significant group of borrowers was able to obtain loan even if they were financially overstretching their financial resources. At the same time speculative borrowers who were expecting collateral appreciation would obtain loans without taking into account if they were able to make the required mortgage payments. Hence, average subprime borrowers credit score rose, it was due to the use of second lien loans. The second lien loans need not necessarily be declared to the primary mortgage lender.⁴⁵

At the same time, many financial intermediaries loosened their underwriting standards. This was driven by the strong appetite for higher yield securities. One of the difficulties of securitization is the fee-driven remuneration at each stage. Therefore financial intermediaries are rather interested generating loan volume rather than quality, even as the credit spreads on the resulting securities shrank. In this process credit risk is dispersed and makes it for the safeguards more difficult to monitor and ensure prudent lending.

As the market prices appreciation of houses begun to slow down and the house prices later started to decline, rapid deterioration started between 2006 and 2007. While prices were rising and the housing bubble was getting bigger, distressed borrowers had the equity to sell their homes and prepay their mortgages. However, as interest rates rose and house prices started to flatten and later begun to decline in certain regions, many of the speculative and stretched borrowers were left with no choice but to default.

⁴⁴ Kiff, John / Mills, P., *Money for Nothing and Checks for Free: Recent Developments in U.S. Subprime Mortgage Markets*, IMF working paper, 2007.

⁴⁵ Zimmerman, Thomas: *The U.S. Subprime Market: An Industry in Turmoil*, UBS Securitized Products Strategy Group, March 2007.

Eventually securities which were held by financial firms lost their value, because they have been backed by these subprime mortgages.

The financial crisis was caused by a mix of various factors which emerged over a number of years

- Risky mortgage products
- Investor rewarded growth during the boom even if it was not sustainable
- High personal and corporate debt levels
- Deregulation

7.4 Impact on the Financial Institutions

Between the year 2005 and 2006 default on subprime mortgages started to increase and affected mostly banks with subprime specialist subsidiaries (e.g. HSBC, Citigroup, UBS etc.) and a number of specialty finance companies. UBS and Citigroup have taken the biggest hits from the subprime crisis.⁴⁶

Some of the poorly capitalized companies, representing about 40 per cent of 2006 subprime organisations, have either closed down operations, declared bankruptcy, or been bailed or bought out.⁴⁷

Some of the financial intermediaries have been holding residual interests in the subprime securitization transactions, but losses have been limited in the beginning. Crucial is the timing of loss realization, not all loans have to default at the same time but in such a case the impact of the delinquencies can lead a financial institution to bankruptcy. Losses in the securitization

⁴⁶ Farrel, Sean: *UBS forced to seek bail-out after extra \$10 billion write-down*, The Independent (online), (December 11, 2007), <http://www.independent.co.uk/news/business/news/ubs-forced-to-seek-bailout-after-extra-10bn-writedown-764382.html> [May 24, 2009]

⁴⁷ Kiff, John/ Mills, Paul, *Money for Nothing and Checks for Free: Recent Developments in U.S. Subprime Mortgage Markets*, IMF working paper, 2007

process tend to appear delayed among the holders of unrated and lower rated mortgage backed securities and collateral debt obligations equity and mezzanine tranches.

The process of loss realization starts to crystallise in hedge funds specialising in lower-rated subprime asset backed securities⁴⁸ (ABS) and collateral debt obligations (CDOs).

⁴⁸ ABS is bond or note whose collateral is the cash flow from a pool of financial obligations such as mortgage, car loans, or credit card receivables

8 UBS

8.1 *History of UBS*

In June 1998, Union Bank of Switzerland and Swiss Bank Corporation (SBC) completed the merger announced six months previously.

Just two years later, UBS acquired the US brokerage firm PaineWebber, greatly increasing the size and scope of its business. Its history extends many generations into the past, particularly in Switzerland, the USA, and the UK.

The core components of today's UBS date back to the second half of the nineteenth century. Union Bank of Switzerland, SBC, and PaineWebber or their antecedents were all founded in the 1860s and 1870s. Phillips & Drew, the London stockbroker acquired by Union Bank of Switzerland in the mid-1980s, was founded in 1895. But Dillon Read, SBC's last acquisition before its merger with Union Bank of Switzerland, originated as early as 1832.

A central constituent of UBS Investment Bank, S.G. Warburg, was established just after the Second World War when acquired by SBC in 1995. The Chicago-based firms of O'Connor (founded 1977) and Brinson Partners (founded 1989) were upstarts when acquired by SBC in 1992 and 1994, respectively. In melding these varied firms into a single enterprise, UBS transformed itself in the course of the 1990s. SBC's alliance with O'Connor radically changed the firm's culture. For its part, the merger of Union Bank of Switzerland with SBC altered the competitive landscape. Then the PaineWebber acquisition in 2000 shifted the firm's centre of gravity decisively beyond Switzerland and Europe.

The effect of these moves was nothing less than to transform SBC and Union Bank of Switzerland, two predominantly Swiss banks, into the global institution that is UBS today.⁴⁹

⁴⁹ <http://www.ubs.com/1/e/about/history.html> [Retrieved January 29, 2009]

8.2 Core Business

Traditionally this Swiss banking institution was for a long time the leader in the national market managing money of private clients. Prudent risk management and financial expertise were the guarantee for its depositors and clients.

The main business relies on four areas listed by its importance:

- Global Wealth Management and Business Banking
- Investment Banking
- Corporate Centre (consists of its operational functions plus the information technology infrastructure and offshoring units)

8.3 Development of Business in Recent Years

UBS changed in a very short time from a company that is primarily operating in the Swiss home market to a global institution. This bares unknown risks in business where the bank does not have enough experience. The larger the step the easier it is to loose oversight and control, especially if it is highly important to recruit and carry out the oversight of a very risky and confident business. The distance between the operating units makes it more difficult to have control of the day to day business and shifting of responsibilities.

8.4 Loses and effects of the subprime mortgage crisis

UBS as the world greatest wealth manager has been traditionally conservative in operating with client deposits. Nevertheless with the expansion into new markets especially the American it entered new business in that it did not have a lot of experience. This new business ended up not to be as successful as the traditional core business lines.

8.4.1 Market entry in to the US mortgage market 2007

In 2006 American housing market predictions have been very optimistic. According to The State of the Nation's Housing Report 2006 from the Harvard University Joint Centre for Housing Studies, in spite of higher interest rates and home prices "sharp drop in the house prices are unlikely anytime soon".⁵⁰

Similar to other bubbles as discussed in the chapter 2.1.1 about the anatomy of a financial crisis, the entry of UBS into the US real estate market was based on the positive forecast and also on the steps that the competition was making. Unfortunately the risks that have been taken did not reflect the real possibility of the market and creditors. The policies of the bank risk caption, risk exposure and monitoring did not sufficiently help to stabilise the bank. Regulators have long had a lower capital requirement on loans that are not backed by deposits. But in 2004, the Securities and Exchange Commission (SEC) removed rules that capped leverage at 15 to 1 for investment banking firms. That allowed firms to vastly expand their lending activities without raising new capital. By that time the regulatory separation between investment banks and traditional banking had been removed. So traditional banks such as Citigroup shifted more and more of their lending operations to their investment banking divisions, and leverage took off. By the end of 2007, many banks were lending \$30 for every dollar they had in their vault. Change in the net capital rule is one of the leading contributors to the current financial crises.⁵¹

It is important to mention that the loss that have occurred, have been caused almost exclusively by the involvement in the US mortgage market. Other business groups and areas had positive performance. Unfortunately, the negative performance of one business group was so large that the whole group has recorded severe loss.

⁵⁰ Joint Centre for Housing Studies, *State of the Nation's Housing Report*, Harvard University, 2006

⁵¹ Gandel, Stephen :*America's Broken Banks*, TIME, February 9, 2009, p.19

Understandably, investment banking is usually the most risky business but therefore also the capacities which are involved in the management of these funds and assets should be able to manage these assets according to their volatility. Credit risk is the main risk in the banking business but in this case the combination with operational risk and overall breakdown of the US mortgage business even worsen the banks position.

The managers of the bank were not aware of the worst case scenario of a break down of the whole housing market. The riskiness does not lie solely in the participation in the securitization business, which was the fuse of the subprime mortgage crisis, but more to the extent to what the bank has exposed itself.

The later entry into the market than other big players in a hedge-fund venture in 2005 was also one of the reasons that did not make it a rentable business. Late entry made it much more difficult to attract and keep experienced top people who might be more successful in managing the department of an investment bank, not the core business of this financial institution.

8.5 Breakdown of the losses

The entry to the American market was carried out through the creation of alternative management venture Dillon Read Capital Management, established in June 2006. This step led to an overweight exposure to the US mortgage market.

Hence the profitable performance in the majority of other business wealth, investment banking and equity underwriting return on equity performance indicator (for the whole group) was negative 11.7 per cent in 2007, down from positive 23.9 per cent in 2006 first time in the past, the operating income in 2007 totalled CHF 30.6 billion with a negative net income .

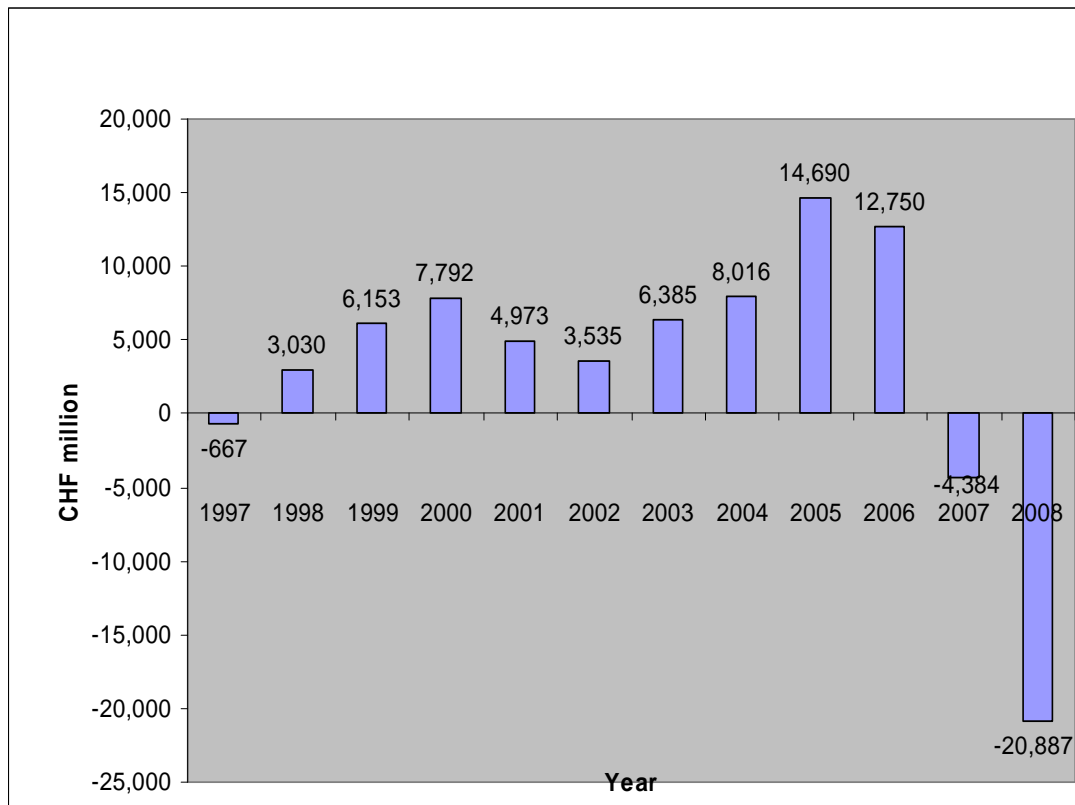


Figure 8.1: Net profit/loss attributed to the UBS shareholders

The group net loss in 2007 of CHF 4,384 million⁵² resulted almost completely from the exposure to the US residential real estate market through positions in mortgage-backed securities.

In the second half of 2007, UBS was severely affected by the progressive market dislocation. This led to total losses of approximately USD 18.7 billion (CHF 21.3 billion) on UBS's positions related to the US residential sub-prime and Alt-A real estate market, representing a combination of write downs, hedge gains and losses, realized losses from the scale of position and credit valuation adjustments on credit default swaps (CDSs) purchased from monoline insurers. Losses on securities related to US sub-prime residential mortgages totalled USD 14.6 billion, of which USD 9.2 billion were recorded on super senior tranches of collateralized debt obligations (CDOs). Positions related to Alt-A mortgages lost USD 2 billion due to spread widening towards the end of the year. Losses of USD 1.3 billion were

⁵² UBS Annual report 2007,
<http://www.ubs.com/1/e/investors/annualreporting/2007.html?template=layer&selected=125273> , [Retrieved July 28, 2009]

incurred on US structured credit programs. Total credit valuation adjustments on protection bought from monoline insurers were USD 0.8 billion in 2007, reflecting the degree to which UBS considers its claims against these counterparties to be impaired.⁵³

According to the annual report the losses were caused in two major business groups Global Asset Management and Investment Bank.

The total business group performance of Global Asset Management was positive but down by 6 per cent from 2006. The downward development reflected closure costs of CHF 384 million from Dillon Read Capital. This charge increased the total operating expenses and the final business group performance.

The negative performance of the Investment Bank business group for the year 2007 summed up to CHF -15,681 compared to the positive performance of CHF 5,943 in the year 2006 has been caused due to losses in fixed income (sale of debt securities), currencies and commodities (FICC) on sizeable positions related to the US mortgage market (figure 8.2). Performance in other areas remained strong. Equity revenues gained 13 per cent from 2006 and investment banking revenues were up by 39 per cent from previous year.

⁵³ UBS Annual report 2007,
<http://www.ubs.com/1/e/investors/annualreporting/2007.html?template=layer&selected=125273> , [Retrieved July 28, 2009]

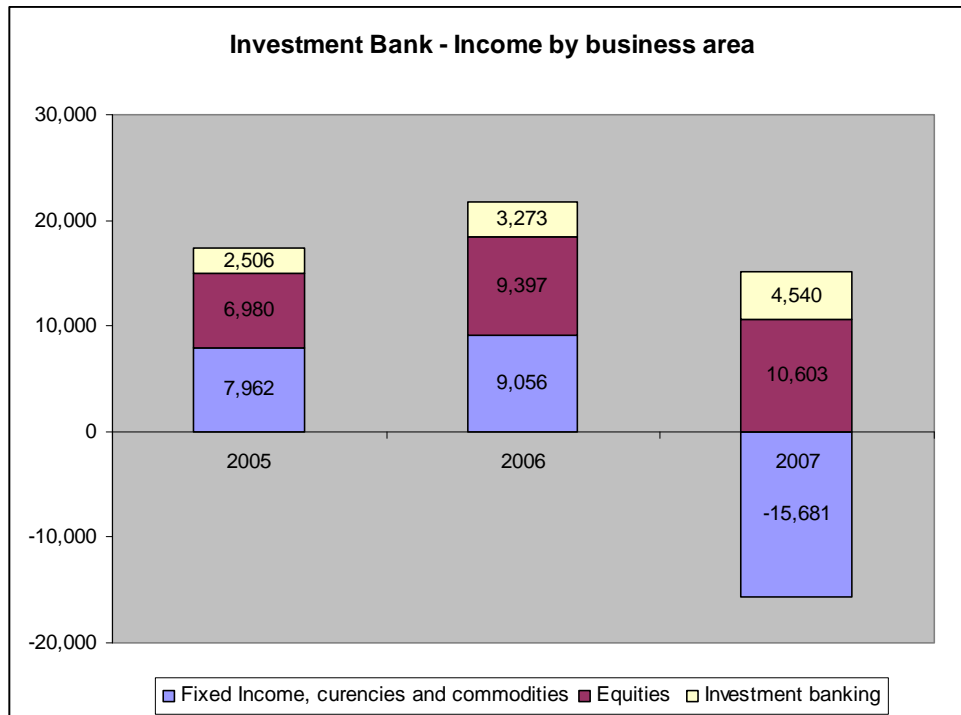


Figure 8.2: Income in the business area Investment Bank of UBS

8.5.1 Measures taken after reviewed losses in 2007

The investment in American mortgages was terminated on 3 May 2007 by closing alternative investment business Dillon Read Capital Management, with an estimated of loss around \$425 million.⁵⁴ The proprietary funds were being transferred from the Global Asset Management to the Investment Bank.

After the first great losses made in 2007 action has been taken to strengthen the traditional core business, wealth management. Doing so, involved two major investors: the Singapore Government Investment Cooperation, which is responsible for managing the state's foreign reserves and an unidentified Middle Eastern investor.⁵⁵ The major reason for the involvement of other investor was to strengthen the credibility. Credibility of the bank is

⁵⁴ The Economist, London: July 14, 2007, Vol. 384, Iss. 8537; pg.83

⁵⁵ Farrel , Sean: *UBS forced to seek bail-out after extra \$10bn write-down*, The Independent , (December 11, 2007)

<http://www.independent.co.uk/news/business/news/ubs-forced-to-seek-bailout-after-extra-10bn-writedown-764382.html> [Retrieved May 24, 2009]

depending on their ratings by the credit rating agencies. The bank as a safe place cannot afford to have customers have any doubts about its reliability and the safety of business.

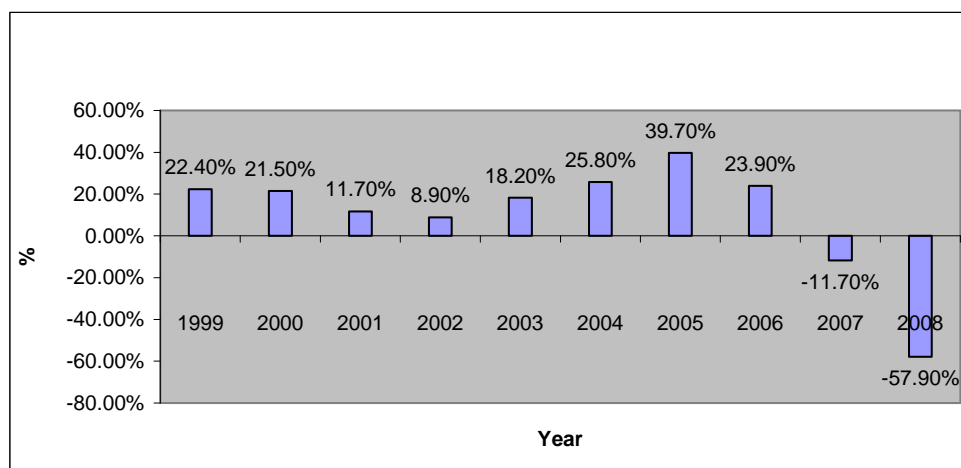


Figure 8.3: Return on shareholders equity UBS group

The following year 2008 credit losses that have been moved from the Global Capital Asset Management business division to the Investment Bank business division attributed to the overall net loss of CHF 20,887 million. This loss was the largest one in the past decade in the history of the bank. This significant risk position exceeded UBS's risk bearing capacity. Due to the significant weaknesses in UBS's risk management and control organization the company failed to assess adequately correlated risks and risk concentrations.

The Investment Bank recorded a net credit loss expense of CHF 2,575 million in 2008, compared with a net credit loss expense of CHF 266 million in 2007. The change was primarily due to losses on the risk positions in FICC (Fixed Income, Currency and Commodities).⁵⁶ The credit business in FICC delivered negative revenues, especially in proprietary strategies. Structured products results were down, especially in Europe and

⁵⁶ Annual report UBS 2008, <http://www.ubs.com/1/e/investors/annualreporting/2008.html?template=layer&selected=125276> [Retrieved June 22, 2009]

the US, reflecting the decrease in customer demand for complex derivatives transactions.

In May 2008 US residential mortgage-backed securities have been sold to a fund managed by BlackRock for proceeds of USD 15 billion and the agreement reached in October 2008 to transfer illiquid securities and other positions from UBS's balance sheet to a fund owned and controlled by the Swiss National Bank (SNB).⁵⁷

8.6 Bailout plan UBS

Similar to the circumstances in the American financial sector, UBS is of too great importance for the Swiss government to be let down. The structured bailout plan that was announced in October foresaw a capital injection. Swiss authorities took temporarily exactly a 9.3 per cent stake with a Swiss franc 6 billion capital injection.⁵⁸

The deal coordinated by ministers, the Swiss National Bank and the Swiss Federal Banking Commission injected \$60 billion into UBS. This included taking the last \$50 billion of its toxic assets into a special purpose vehicle of its books and owned by the Swiss National Bank.⁵⁹ This intervention drove up the capital ratio towards the new rule due from 2013.

At the core of the tripartite Swiss operation is the decision to take on \$49 billion of toxic UBS assets (\$31 billion in the US and \$18 billion of non US debt) into the new entity. The aim is to gradually sell off these illiquid assets, with the central bank receiving the first \$1 billion of any profits, and it and UBS sharing the rest on a 50-50 basis.⁶⁰

⁵⁷ Annual Report UBS 2008, <http://www.ubs.com/1/e/investors/annualreporting/2008.html?template=layer&selected=125276> [Retrieved June 22, 2009]

⁵⁸ Gow, David: *Switzerland unveils bank bail-out plan*, (16 October 2008), Guardian, guardian.co.uk/business/2008/oct/16/ubs-creditsuisse/print [Retrieved March 2, 2009]

⁵⁹ Gow, David: *Switzerland unveils bank bail-out plan*, (16 October 2008), Guardian, guardian.co.uk/business/2008/oct/16/ubs-creditsuisse/print [Retrieved March 2, 2009]

⁶⁰ Ibid.

These moves of removing toxic assets might bring UBS to a more normal operating mode.

8.7 *Regulation response*

After the turbulent bailout by the government also the regulation in the banking sector is undergoing a tightening change.

The Basel accord was already deemed to be too strict but after the crises it is clear that it was not enough. The agreement on the new capital rules includes the introduction of a leverage ratio and higher capital adequacy targets. Even though existing Swiss rules demanded extra twenty per cent over the Basel II rules that were already deemed conservative compared to the international standards, recent failure has shown there is still more space for more prudence.

The leverage ratio is a nominal cap on a bank's debt level regardless of the risks involved.

The new capital adequacy target ratio will be in a range of between fifty and hundred per cent above the international minimum requirement of Basel II, a risk-based capital framework that aims to ensure that the banks worldwide meet comparable requirements for matching reserves to the risks they face.

The timeline for the fulfilment of the new capital adequacy requirements has been set to the year 2013 but the deadline can be extended depending on the situation on the financial markets.⁶¹ Especially the weakened UBS already announced it will need more time to comply compared with Credit Suisse.⁶² The planned tier 1 ratio would have been 11.9 per cent at the end of September taking into account the state bailout.

⁶¹ Reuters on line UPDATE 2-Swiss regulators, big banks agree new capital rules, (December 4, 2008),
<http://www.reuters.com/article/rbssFinancialServicesAndRealEstateNews/idUSL447926320081204> [Retrieved January 20, 2009]

⁶² Ibid.

9 Citigroup

9.1 Introduction

Citigroup Inc. is a global diversified financial service company whose businesses provide a broad range of financial services.

On June 16, 1812, with \$2 million of capital, City Bank of New York (now Citibank) opened for business in New York City. In 1968, First National City Corporation (later renamed Citicorp), a bank holding company, became the parent of Citibank. In 1998, all Citicorp divisions merged with all divisions of Travelers Group to form Citigroup Inc. Citibank continue as under the Citigroup umbrella.⁶³

Citibank grew but since 2008 it has to reorganize and cut some of its activities to concentrate on its core business.

Global Cards	Consumer banking	Institutional Clients Group	Global Wealth Management	Corporate/ Other
<ul style="list-style-type: none"> - MasterCard, Diners Club, private label and American Express - Sales finance 	<ul style="list-style-type: none"> - Retail Banking - Consumer Finance - Real estate lending - Personal loans - Retail banking - Investment services - Auto loans - Small and middle market commercial banking - Primerica Financial Services 	<ul style="list-style-type: none"> • Securities and Banking (S&B) <ul style="list-style-type: none"> - Investment banking - Debt and equity market - Lending - Private equity - Hedge funds - Real estate - Structured products - Managed futures • Transaction Services <ul style="list-style-type: none"> - Cash management - Trade services - Custody and fund services - Clearing services - Agency/trust 	<ul style="list-style-type: none"> • Smith Barney <ul style="list-style-type: none"> - Advisory - Financial planning - Brokerage • Private Bank <ul style="list-style-type: none"> - Wealth management services • Citigroup Investment Research <ul style="list-style-type: none"> - Equity and fixed income research 	<ul style="list-style-type: none"> - Treasury - Operations and technology - Corporate expenses - Discounted operations

Figure 9.1: Organizational structure of Citigroup

⁶³ <http://www.citigroup.com/citi/corporate/history/citibank.htm> [Retrieved January 29, 2009]

9.2 Subprime crises and its impact on the consumer business

From the detailed credit loss experience in the US consumer market over the last few years it is visible that the deterioration of the housing prices and the following subprime crisis heavily affected the losses in the consumer business section. As we can see from the table 9-1 below the rapid increase of credit loss in the consumer business happened largely due to the deterioration in the US market where Citi is primarily active. The lax lending practices allowed lending money to customers that had lower credit scores or did not provide a sufficient documentation of credibility. This resulted in large delinquencies. Unfortunately annual report does not provide detailed information on the lending practices. For a comprehensive analysis more information also from other banks in the market would be needed to identify the problems in the structuring and the lending practices.

On the other hand, the observed large incline of the corporate credit losses in 2008 shows the impact of the financial crises that has spread from the US to the rest of the world. In the corporate segment the losses are ten times higher than year ago mainly due to loans to financial institutions in offices outside of the US and commercial and industrial credit in and outside of the US .

<i>In million</i>	2004	2005	2006	2007	2008
Consumer in U.S. offices	\$6,927	\$5,829	\$4,413	\$5,766	\$11,676
Consumer in offices outside of the U.S.	\$3,304	\$2,964	\$3,915	\$5,150	\$7,172
Corporate	\$632	\$915	\$312	\$948	\$9,094

Table 9-1: Credit loss experience consumer & corporate business at Citigroup⁶⁴

The subprime crises in the U.S. housing market led also to higher unemployment rates. Higher unemployment rate have a direct impact on the loan delinquencies. These in turn raise the credit costs of the banks. The credit costs in North America, where Citigroup is holding the main position compared to the rest of the world, increased by \$7,300 million from 2007.

⁶⁴ Annual Report 2008 Citigroup

The increase was caused by \$5.1 billion increase in net credit losses and a \$2.2 billion increase in loan loss reserve builds, for the expected losses due to the negative economic development.

EMEA credit costs increased by 33 per cent mainly in the Western European countries. In Latin America credit costs increased \$394 million reflecting higher net credit losses in Mexico and the Asian credit costs increase of 27 per cent was mainly driven by the credit costs in India.

Cards credit costs increased \$1.9 billion, due to an increase of \$916 million in net credit losses and an increase in reserve build-ups of \$936 million. ICG increased \$2.2 billion, reflecting loan losses reserves for specific counterparties, a weakening in credit quality in the corporate credit environment and an increase in net credit losses associated with loan sales.

It is expected that in 2009, not just the U.S. market but also the rest of the world that has been negatively affected by the financial crisis will operate in challenging credit and economic environment (bankruptcy, rising unemployment rate, lower residential real estate prices, political and regulatory developments). Deterioration is expected for credit costs in all products, particularly in the mortgage portfolios as Citigroup is still holding a large portion of these positions due to the deflation of the prices in the market.

9.3 Indicators of financial health

Citigroup started as other American banks with a traditional bank operating model. The pivotal role plays the leverage between the deposits and loans. The mix of deposits that have relatively low interest rate and credits that have higher interest rates makes a bank profitable in the long run.

But starting in the 1970's, banks began funding less and less of their lending in the original more prudent way and the bank deposits were backed no longer by 90 per cent of the deposits but lowered to 60 per cent.

Another factor which loosened the prudence was the changes in the banking regulations. In 2004 the Security and Exchange Commission (SEC) removed the rules that settled the leverage at 15 to 1 for investment banking companies. After this action taken, firms consequently expanded vastly their lending activities without raising new dollars of capital.

This was a misjudgement of the regulators. The aim of the regulator is to watch companies Tier 1⁶⁵ capital ratio and require a well capitalized holding company to hold at least 6 per cent Tier 1 capital. In the case of large, important or rapidly expanding financial institutions it is expected to have significantly more. Even if the capital ratio of the Citigroup was higher than the 6 per cent over the last 5 years (see figure), it still was not appropriate for the risks that have been taken. At this point we have to clarify that the calculated tier 1 capital ratio is based just on the on-balance sheet assets. If we would include also the off-balance sheet assets, the tier 1 ratio would be even lower as the off-balance sheet vehicles recorded vast losses or their assets became illiquid after the deterioration of the market for certain financial products. More detailed overview of the impact of off-balance sheet activities is presented in the part 9.6.

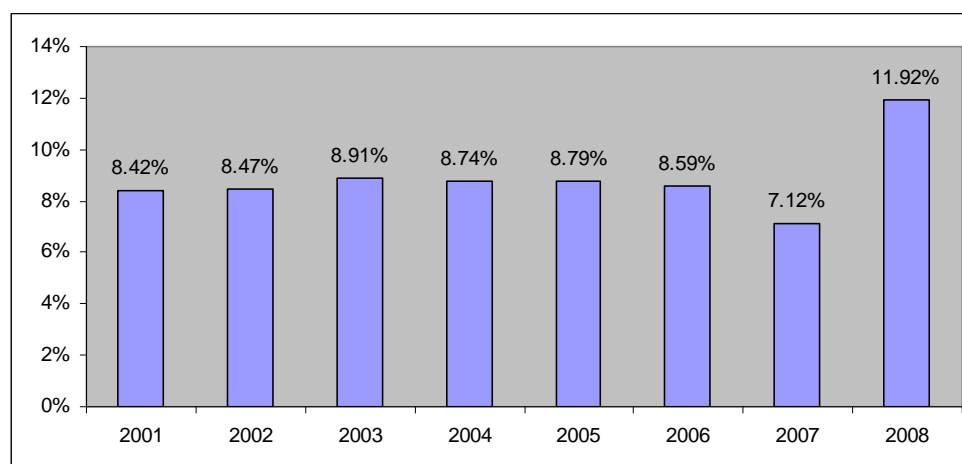


Figure 9.1: Tier one capital ratio Citigroup

Balance sheet and the requirements of the SEC reporting give us also a good picture of the financial soundness of Citigroup. With the adoption and

⁶⁵ Percentage of stockholders equity and other stocks against total assets, after risk adjustments.

introduction of a new valuation technique in 2007 by SEC and FASB to serve the need for increased consistency and comparability in fair value measurement assets and liabilities are divided into 3 levels based on whether the inputs to the valuation are observable or unobservable. The implementation of the new rule of SFAS 157 was adopted by Citigroup in the fiscal year beginning January 1, 2007.

According to the available numbers for 2007 and 2008 (table 9-3) Level 3 assets make up \$133,447 million of total assets. In conjunction with just a slight loss in Level 2 assets Citigroup would be insolvent. In the following year 2008 the situation is even more complicated where equity is lower than the assets in the Level 3 group. Additionally assets classified as Level 2 rose by more than half from the previous year.

Assets (<i>in million USD</i>)	Level 1	Level 2	Level 3	Equity
2007	\$223,263	\$938,578	\$133,435	\$113,447
2008	\$144,547	\$1,444,117	\$145,947	\$141,630

Table 9-2: Assets by class- Citigroup⁶⁶

In comparison with Bank of America whose Level 3 assets represent only 33, 55 per cent of total equity (see table 9-3.). Citigroup's Level 3 assets are equal or higher than its common shareholders equity.

Assets (<i>in million USD</i>)	Level 1	Level 2	Level 3	Equity
2007	\$65,387	\$ 781,805	\$31,470	\$146,803
2008	\$74,876	\$1,504,539	\$59,409	\$177,052

Table 9-3: Assets by class - Bank of America⁶⁷

As there is no available data for the previous years we can just assume that the classification of the assets has been very similar to the available data. Based on this assumption, Citigroup needs to shift more assets to the Level

⁶⁶ Annual report 2008 Citigroup, http://www.citigroup.com/citi/fin/data/ar08c_en.pdf [Retrieved August 20, 2009]

⁶⁷ Annual report 2008 Bank of America, http://media.corporate-ir.net/media_files/irol/71/71595/reports/2008_AR.pdf [Retrieved September 13, 2009]

1 and decrease the holding of Level 2 and Level 3⁶⁸ assets to control its exposure to the unpredictable risks. As for modelling risks more reliable and larger data is required.

9.4 *Business growth and acquisitions*

Citigroup is said to be too big to function. In the last decade it merged with many other financial institutions and became world leader in the US and world banking sector. As the world's greatest financial service network with over 200 million customer accounts in more than 100 countries, it is one of the world's largest banking institutions by revenues. Unfortunately writedowns that the bank had to record forced the top management to split this bank into two separate units.

The idea of the management was to create a banking institution which can serve customers in all needs that a banking customer can require, like a huge financial supermarket that unites everything from traditional consumer banking, wealth management, and securities trading to global investment banking.

Even though it was the largest bank in 2005 it ranked just fifth in terms of domestic deposits, according to the annual data released by the Federal Deposit Insurance Corp. With just 3.5 per cent of the country's \$5.9 trillion in deposits Citigroup was behind Bank of America, JP Morgan Chase & Co., Wachovia Corp. and Wells Fargo & Co. At that time its main focus was to expand in the US market. With the expansion Citigroup hoped to generate revenue by getting traditional savings and checking-account customers to sign up for its mortgages, credit cards and financial services or products.

⁶⁸ Level 1 - Quoted prices for identical instruments in active markets. Level 2 - Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs and significant value drivers are observable in active markets. Level 3 - Valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

Expansion does not always imply that with the growth the bank will also get more profitable. With the growing size also the expenses of the financial institution will rise. In addition Citigroup was growing through mergers. Acquiring a branch-heavy bank is not a simple process. Most important, bank acquisitions require substantial investments in order to integrate deposit systems and other products. Furthermore, bringing two or in the case of Citigroup more than two bank systems under one roof can cause disruption for customers, who may then flee to another bank.

The pace at which Citigroup was heading to the top of the US market resulted in some disadvantageous decisions. Already with the acquisition in November 2000 of the Dallas-based Associate for \$27 billion Citigroup got involved into the high risk lending business. With this acquisition Citigroup became US largest subprime lender or provider of finance to high-risk customers typically rejected by mainstream banks.⁶⁹

In comparison to Citigroup other banks that have managed better to go through and get out of the financial crisis with better results like Wells Fargo, which was named as the World's safest US bank 2009, these banks are not following such an aggressive acquisition politics. Wells Fargo's global presence is concentrated only in India operating under the name Wells Fargo Indian Solutions which is a wholly owned subsidiary of Wells Fargo. It seems to be more adequate for a financial institution to concentrate on its strength rather than to be present in every business line or in as many countries as possible.

9.5 Oversight and control

The other danger that rose from the extensive network is the problematic oversight and control. Risk management has to be independent and it cannot be assured that this was the case with Citigroup. If you are a financial institution of this size you need to have installed controls, have established the right culture and have most important people accountable for the risk that they are willing to take. A big bank with a large network should

⁶⁹ Beckett, P., Wall Street Journal, New York, N.Y.: Mar 7, 2001. pg. B.15

understandingly strive toward aggressive oversight and is keen on looking over any shoulder and guard against trading or lending excesses.

This was not the cause with Citigroup. Corporate culture at Citigroup made it possible for one executive to carry too much weight. Close ties between the traders and the oversight made it possible to execute many high risk businesses which would not be possible under proper oversight and control.⁷⁰ The downfall of the banks was not triggered by the mortgage crisis; the financial crisis just enhanced already present problems with lax lending practices. Managers responsible for the management and risk management system did not investigate deeply and accurately enough. Their judgment was clouded by longstanding ties between managers. Risk managers at Citigroup did not investigate deeply enough to locate the troubled mortgages and deals that have been made by the other managers. Early in 2008, the Federal Reserve has sent a report to Citigroup, where it disclosed poor oversight and risk controls.⁷¹

Besides the expansion in the US market Citigroup was striving for a leading position in the worldwide financial arena. But operating in more than hundred countries requires a strong and reliable infrastructure. Unfortunately it seems that Citigroup did not invest enough in technology and infrastructure. If you are a financial institution of this size you need to have installed controls, have established the right culture and have most important people accountable for the risk that they are willing to take.

9.6 Off balance sheet vehicles and its impact on the overall performance

Analyzing Citigroup profits over the past few years remains highly complicated. This is because the financial statements to determine the revenues and losses development values may be unreliable.

⁷⁰ Ibid.

⁷¹ Appleton, M.: *Citigroup Saw No Red Flags Even as It Made Bolder Bets*, (November 23, 2008) , <http://www.nytimes.com/2008/11/23/business/23citi.html> [Retrieved January 5, 2009]

Even though during the past 10 years its business has been growing steadily every year till 2006 when profit started to decline (see figure 9.2), the realisation of the profits is not adequate to date to show when the losses actually occurred. The revenues peaked in 2005 with \$24,589 millions and according to the annual report 2008 Citigroup recorded loss of \$27,684 millions. Unfortunately the numbers do not give real pictures of the financial health of the company because many of the off balance sheet activities have not been included in the years between 2001 and 2006. These off balance sheet activities have been consolidated in the Citigroup balance sheet starting in 2007, when the profits dramatically dropped.

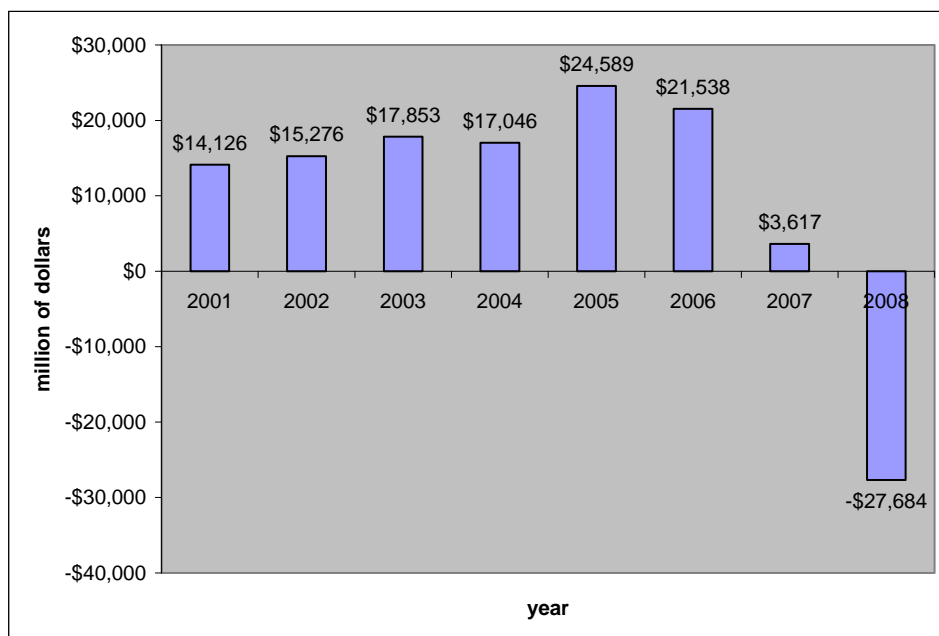


Figure 9.2: Net profit/loss Citigroup

Citigroup had been involved in many types of off balance sheet agreements as special purpose entities (SPE), qualified special purpose entities (QSPE) special purpose vehicles (SPV) and variable interest entities (VIE).

Such a special purpose entity may take the form of a corporation, trust, partnership or unincorporated entity. All these four names describe off balance sheet financing forms. These firms or legal entities are established by a sponsor to fulfil some narrowly defined, specific or temporary purpose.

Off-balance or on-balance sheet vehicles created by the sponsoring firms can be used in a variety of transactions:

- Securitization (e.g. mortgage securitization with CDOs, credit card securitization etc.)
- Risk sharing,
- Asset transfer (asset-liability management)
- Competitive reasons (especially in IT and other branches where intelligence technology is highly important)
- Financial engineering
- Regulatory reasons
- Property investing.

It is very difficult to predict what losses can be expected from these off-balance assets and liabilities. The disclosure for these assets and liabilities are much thinner than for balance-sheet assets.

In addition, Citigroup owns almost 25 per cent of the SIV (special investment vehicle) market. This is nearly \$100 billion of assets under management. Nominally, these off-balance sheet vehicles should be independent entities, but in reality they are closely tied to the bank. This speculation has been made possible by the repeal of the Glass-Steagall Act⁷² in 1999. The repeal made it possible for financial institutions to undertake investment and commercial banking at the same time. The end of the separation between the investment banking and traditional banking made it possible to shift more and more of the lending operations to their investment division and the leverage took off.

This is not the first time that the SPV have been used to hide losses or fabricate earnings. In 2001 there was the Enron scandal. Citigroup and JP

⁷² This act was passed by in 1933 by the U.S. Congress as a response to the large number of failed banks during the Great Depression. Established the FDIC as a temporary agency and separated commercial banking from investment banking, establishing them as separate lines of commerce.

Morgan Chase had been helping with another financial institution to cover-up the losses and manipulate financial statements by using not restricted financial engineering schemes.⁷³ Even if these schemes have been in order with the valid accounting principles it cannot be excluded that Citigroup introduced them to conceal important information to the investors. At the end Citigroup resolved claims and paid \$1.66 billion to the Enron Bankruptcy Estate which represented the Enron creditors.⁷⁴

Citigroup is not the only bank in the US market that uses off-balance sheet engineering to manipulate objective risk exposure. Unfortunately, Citigroup was involved to a much higher extent than other banks in the US market with off-balance sheet vehicles. Just for comparison Merrill Lynch had \$22.6 billion in VIEs, Lehman committed to guarantying \$6.1 billion of its VIEs, Bank of America which is comparable in size with Citigroup is exposed to SPE with \$81 billion and has unconsolidated \$49,651 in VIEs. According to the 2008 SEC filing, Citigroup hold \$320 billion in unconsolidated VIEs. Comparing these numbers shows that Citigroup was excessively moving riskier assets to its off-balance sheet vehicles, to a much higher extent than other banks in the US market, to avoid consolidation and the following reduction of the tangible common equity ratio⁷⁵, which indicates financial strength of a company. It has fallen from 4.3 per cent in 2006 to about 1.5 per cent in 2009 also due to the absorption of the off-balance sheet entities. Compared with Bank of America that is at 2.68 per cent in 2009 and JPMorgan with 3.8 per cent Citigroup's TCE it is still very low. Usually regulators wish the banks to achieve TCE of 4 per cent.

⁷³ Sapsford, J.; *Citigroup half Enron bei Buchungstricks*, <http://www.handelsblatt.com/archiv/citigroup-half-enron-bei-buchungstricks;548840> [Retrieved September 30, 2009]

⁷⁴ Dash, E.; *Citigroup settles with Enron creditors*, <http://www.nytimes.com/2008/03/27/business/worldbusiness/27iht-CITI.1.11463178.html> [Retrieved September 26, 2009]

⁷⁵ Total common equity ratio of a company is calculated by dividing tangible common equity by its tangible assets and gives a measure of financial health of a company. TCE ratio shows what owners of ordinary common shares would receive after the bank would be liquidated. TCE ratio is more conservative than Tier 1 capital ratio.

All these investments into CDO and off-balance sheet vehicles do not necessarily have to lead to not profitable businesses but Citigroup employed these instruments heavily in the US housing market. The collapse of the housing market just disclosed the highly speculative arrangements (conduits, SPVs, VIEs, and QSPEs) that were used to veil the amount of risk that the bank had taken on. With the seizing up of the market prices these hard to sell assets went down and were reflected in large writedowns.

Subsequently from 2007 onwards, Citigroup changed its methods of accounting for fair value measurement in the consolidated financial statements and for the absorbed balance sheet entities. Till 2009 the accounting standards did not compel US companies to consolidate off-balance sheet holdings. Previously, companies were required to consolidate only SPEs in which they had a controlling interest. Under the new rule, a response to the not reasonable use of these vehicles, which revise Statement 140 (FAS 140), previously exempt SPEs will no longer be exempt from consolidation on the parent company's balance sheet⁷⁶ With these steps FASB and SEC are trying to fill the lack of disclosure in the banking industry.

These bookkeeping rules were introduced by the SEC and FASB. Prior to this statement, there were different definitions of fair value and limited guidance for applying those definitions in GAAP. The statement number 157 obliges financial institutions to value securities that they hold at the lesser of two prices: the costs at which they originally bought the securities, or at the prices that can be obtained now in the market. Application of the market-to-market rules resulted in write downs that reduced the value of asset and also the stock prices declined. Therefore the writedowns that had to be undertaken reflected nothing more than poor economic judgment that has been made during the housing bubble.

The early warning models that have been used at Citigroup rely on mathematical regressions. Many of the banks and rating agencies are using

⁷⁶ Campbell, A., *New FASB standards threaten off-balance-sheet vehicles*, (May 19, 2009) <http://www.risk.net/risk/news/1518424/new-fasb-standards-threaten-balance-sheet-vehicles> [Retrieved September, 14, 2009]

very similar statistical models. These are mainly focusing on a very short period of time. For the forecasting and reliable early warning it is essential to account for longer periods. There are many examples for the past experience in the financial markets. The calculation used in Citigroup is based on internal credit risk rating system, risk ratings of major rating agencies, corporate portfolio database and historical default rates dating back to the 1970s. It is highly important to take variances from all the periods and not just to model on 40 years ex post data. These do not reflect all the imperfections and the risk that might occur in the banking business. For a more comprehensive risk rating model longer periods are necessary to estimate more realistic forecast of the losses.

As the banking business is a part of a more complex and imperfect world, this needs to be also taken into account. Solely to rely only on mathematical models and not to include external factors that have direct or indirect impact on the performance of the bank may lead also to failure or bankruptcy of a bank.

Citigroup models looked at mortgages in particular geographical areas but never accounted for the possibility of a national housing downturn, the case in which millions of homeowners could default on their mortgages. Unfortunately this was the case when the US house prices began to decline in 2006-2007. The figure number 9.7 below shows that the housing bubble started to grow very fast in 2004 and deflated later. The above figure shows the average and the median house prices over a 35 year period.

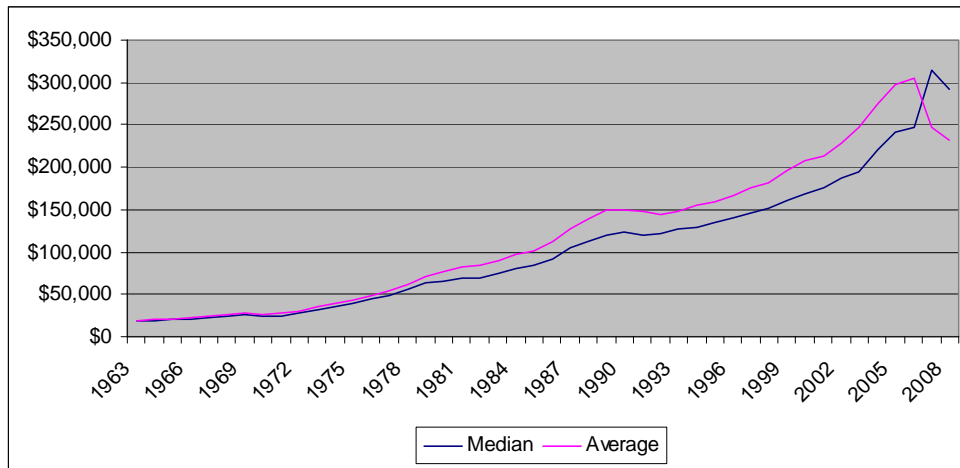


Figure 9.3: Median and average sales prices of new homes sold in United States (sales include the land)⁷⁷

Second reason is the moral hazard of managers who are in charge of the bank. The incentive structures encouraged focus on short term profits and excessive risk taking.

9.6.1 The role of CDO

Since late 2002 Citigroup got more and more involved in investment banking. One of the new instruments that it was using along with other financial institutions were collateralized debt obligations. Citigroup in comparison to the German Bank, which has a lot of properties on its books for which the demand is low at the moment, is holding like many other financial institutions worthless CDOs. As a part of the credit crunch the market for CDOs has seized up. As a consequence of the market, Citigroup is holding CDO positions valued by its own estimates, but these estimations do not correspond with the real value of these assets. CDO are valued at prices based on levels before the financial crises.

⁷⁷ U.S. Census Bureau, Annual average data, www.census.gov/const/upstream.pdf, [August 18, 2009]

9.6.1.1 Collateralized Debt Obligations

Collateralized debt obligations include many forms of bundled debt and are a type of structured asset-backed security (ABS) whose value and payments are derived from a portfolio of fixed-income underlying assets. Bundling many forms of debt can be tricky. Some parts could be sound, while others much more vulnerable to default. CDOs are assigned different risk classes, or tranches, whereby "senior" tranches are considered the safest securities. Interest and principal payments are made in order of seniority, so that junior tranches offer higher coupon payments (and interest rates) or lower prices to compensate for additional default risk.⁷⁸

The capital markets arena is much more aggressive than traditional banking. To earn higher profits you have to be willing to take higher risk. Managers have seen it a good time to build up the business in this sector. At that time housing business was booming in the USA making more and more space for mortgages that could be pooled together into new securities. Over the past few years the CDO business has grown very fast. It has peaked in 2006 and broke down in 2008. At that point CDO market dropped down issuing by more than 80 per cent (figure 9.4).

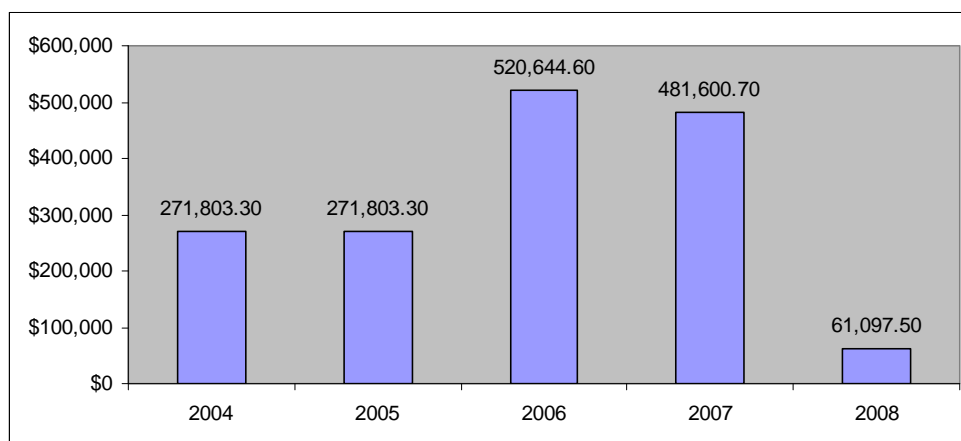


Figure 9.4: Total issuance of CDOs

⁷⁸http://en.wikipedia.org/wiki/Collateralized_debt_obligation [Retrieved March 2009]

More than 80 per cent have been issued in American dollars followed by EURO. Other currencies paid just a little role with an overall share lower than 10 per cent from the total amount, and relatively falling in 2006 and 2007.

	USD	EUR	YEN	STERLING	Other
2005	209,103.70	43,477.70	5,536.60	9,668.50	4,016.80
2006	411,946.60	92,749.50	4,959.30	6,106.10	4,883.10
2007	344,077.60	122,420.90	2,272.40	6,198.40	6,631.40
2008	22,713.70	30,297.90	451.4	2,881.20	4,753.30

Table 9-4: Total issuance of CDOs by currency

9.6.1.2 Business with Collateralized Obligations at Citigroup

From 2003 to 2005, Citigroup, compared to the trend in the worldwide CDO issuance (see figure 9.4), has more than tripled its issuing of CDO's. The issuance during these two years rose from \$6.28 billion to more than \$20 billion. This transformation helped Citigroup to become one of the industry's biggest players but has also put it under high risk. On the other side Citigroup could receive high revenues from the fees that it charged from this business. In 2005 alone it made up to \$500 million in fees.⁷⁹

In 2008, Securities and Banking (S&B) recorded losses of \$14,283 billion pre tax on its subprime related exposures from the total of \$31,794. The US subprime-related direct exposures consisted of approximately \$12 billion to senior tranches⁸⁰ of CDO's.

With the expanding business the risk control should be even tighter and new or more oversight controls should be installed. In the case of Citigroup they have fallen behind. Collateral debt obligations are complex and it can easily happen that the risk involved can be underestimated. The banking managers

⁷⁹ Appleton, M.: *Citigroup Saw No Red Flags Even as It Made Bolder Bets*, (November 23, 2008), <http://www.nytimes.com/2008/11/23/business/23citi.html> [Retrieved January 5, 2009]

⁸⁰ Senior tranche is considered to be the safest security, because interest and principal payments are made in order of seniority.

have put faith into the grades that were issued by the major credit-rating agencies. These were also not counting with a national housing downturn.

9.7 Bailout plan for Citigroup

Citigroup was hit very severely by the subprime mortgage crisis in 2008. The beginning could be seen in the falling stock market prices that began in the summer of 2006.

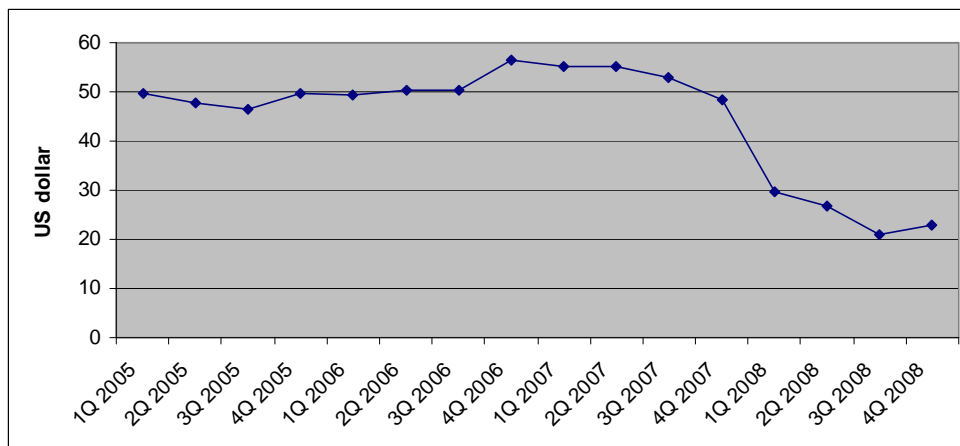


Figure 9.5: Stock price Citigroup

The intention of the government was to rescue one of the most important financial institutions of the American banking system and avoid the damage that the bankruptcy could cause. A huge bank run would not have just effects only on the one bank but definitely also on the other banking houses and on public wealth. Through a bailout, government might try to avoid a bank run. Preventing a bank run is less expensive than a bankrupt bank. The enormous funds that are injected in this one institution are being born by the taxpayers. According to the rescue deal by the US government Citigroup received \$25 billion in October 2008 and another \$20 billion of capital in November.⁸¹ Additionally to the direct investments Citigroup took part in the government's Troubled Asset Relief Program (TARP) and purchased insurance against \$301 billion of assets.

⁸¹ Wilchins, D.: *Citi breakup in sight after Morgan Stanley deal*, (Jan 14, 2009), <http://economictimes.indiatimes.com/quickieslist/articleshow/3977263.cms> [Retrieved February 12, 2009]

“With these transactions, the US government is taking the actions necessary to strengthen the financial system and protect taxpayers and the US economy”, the three agencies said in a statement.⁸² It is not sure if these actions will have the desired effect on the stabilization of the system. In contrast to the stabilization of the financial system the bailout action of the governments also bears exposure to danger. It could put millions of taxpayers’ dollars in jeopardy and encourage financial companies to take excessive risk in the belief that the government will again stand up for the mismanagement and losses caused by high risk deals with focus on the increase of the short-term earnings and not a sustainable growth.

Apart from the governmental support Citigroup is also making large changes in its own structure. These following changes, according to the annual report 2008, should stabilize and decrease risks across the organization.

- Increase of the Tier 1 capital ratio⁸³ to approximately 11.9 per cent.⁸⁴ In the previous years Tier 1 capital ratio was steadily growing but in 2007 fell down by more than one per cent. This is crucial for the stability and prevention of potential losses since this capital ratio represents the equity that is held by the bank against its risks. As an example, according to the Basel Convergence Accord on capital adequacy, its value should be at least four per cent of the bank’s risk-adjusted assets.
- Increase of structural liquidity (equity, long-term debt and deposits) to sixty-six per cent of total assets in the final quarter of 2008.⁸⁵
- Reduce assets from \$2.4 trillion down to about \$1.9 trillion and complete 19 divestitures⁸⁶ to continue its deleveraging.

⁸² US government reveals Citigroup rescue deal, The Independent , (24 November 2008), [www.independent.co.uk/news/business/news/us-government-reveals-citigroup-rescue-deal-1032556.html] [Retrieved February 2, 2009]

⁸³ Core capital or basic equity that serve as a buffer against losses; equity capital and disclosed reserves. Tier one capital is one element of risk-based capital.

⁸⁴ Annual report 2008 Citigroup, <http://www.citigroup.com/citi/fin/data/ar09cp.pdf> ,[Retrieved July 4, 2009]

⁸⁵ Ibid.

⁸⁶ Ibid.

- Reduction in the fourth quarter of 2008 of business expenses by 16 per cent in comparison to the fourth quarter of 2007 to \$12.8 billion.⁸⁷
- Reduction of commercial paper program from \$35 billion to \$29 billion.

9.8 Aftermath for Citigroup

Citigroup announced a restructuring of its large financial network under the pressure of the regulators. Citigroup is going back and focusing again on its core business. The aim is to stabilise and reduce the losses from previous years.

The reorganization changed its structure to segregate the risky business units and the traditional profitable business lines. The chief executive team had split the group into two new firms, Citicorp and Citi Holdings. Citicorp handles the company's traditional banking work, while Citi Holdings takes on the firm's riskier investment assets.

Citicorp inherits the more profitable and solid consumer banking interests. Approximately two thirds of Citicorp's balance sheet is deposit-funded. It has relatively low-risk, high-return assets and it operates in the fastest growing areas of the world.⁸⁸ Primarily it is comprised of the Company's Global Institutional Bank and the Company's international regional consumer banks.

Citi Holdings consists of the Company's brokerage and asset management business, local consumer finance business, and a special pool of assets.

This will enable Citicorp to return to profitability much quicker than it would have been possible for Citigroup as a single firm.

These steps might prevent and separate the risk that lies within a large corporation. Smaller units are usually easier to overlook and control.

⁸⁷ Ibid.

⁸⁸ Annual report 2008 Citigroup, <http://www.citigroup.com/citi/fin/data/ar09cp.pdf>, [Retrieved July 4, 2009]

This is just one of the steps that should stabilize this banking institution. The next on the way to make a significant progress in strengthening the organization involved reducing the balance sheet, expenses and headcount. More specifically starting with the reduction in headcount from 375,000 down to 323,000 and reorganization of technology and operations to create more streamlined organization.

Supplementary Citigroup signed agreements to sell CitiCapital, equipment finance unit in North America, and CitiStreet joint venture with State Street Corporation. The transaction for CitiCapital closed on July 31, 2008 with a sale of net assets of approximately \$12,500 million. The transaction of CitiStreet to ING Group on July 1, 2008 estimated to generate an after tax gain of \$225 million. The sales of some parts should help to make Citigroup leaner and more clearly arranged.

As a consequence to the mismanagement the top managers had to resign from their positions. Just 17 of Citigroup's 43 highest ranking executives in 2006 remain at the company.

10 Conclusion

The main focus of this thesis was to highlight the experience of losses of two large banking institutions during financial crisis in comparison with bank failure and financial crises in the past.

The aftermath of the financial crises has shown that the internationalized financial markets bear a lot more risks than are taken for granted. None of the regulators, be it in the case of Swiss regulation, the European model or the American model of legal regulation could prevent failure of the world's greatest banking houses. Especially, authorities in the US market responsible for the legal framework lowered or removed restrictions for financial institutions (e.g. repeal of the Glass-Steagall Act) and consequently banks took their opportunities to involve themselves in less prudent activities. Nevertheless, riskiness of activities like securitization, which was the fuse of the subprime crisis, does not lie solely in participation, but depends on the extent to which the bank has exposed itself to it.

By identifying the losses we can point out the main reasons for failure. The banks discovered new opportunities of how to generate profits from fees by building mortgages into securities, and selling these securities to investors. This enthusiasm was backed up by constantly rising home prices and the perceived stability of mortgage backed securities. Banks were trying to participate in the housing market boom and to follow the optimism of the market, but none of them was taking into account the risk that this business was bearing. Especially the involvement in off-balance sheet activities made it much more difficult to determine the real risk exposure at Citigroup. Only the following absorption of the losses on the balance sheet could give a real picture of the degree to which Citigroup was involved in the securities market related to mortgage and credit card securitization.

The main problems of bank failure and risk management seem to lie in the methods and the managers who are responsible for the oversight. More attention should be paid to the quality of the financial product and its

structure than to the quantity. Especially in the case of the two banks studied, remuneration and the introduction of more securitized products played a key role in risk-aversion and the exposure to risk. The complexity of structured finance made it difficult to predict how losses would cascade down the ladder of investors in securitized assets. Incomplete credit histories of subprime and alt-A borrowers made it more difficult to model default rates accurately. Forecasts made on these models underestimated the potential defaults. Additionally, banks were not aware of the total downturn of the housing market and this possibility was not taken into account in the statistical forecasting, even if the data of the available house pricing development has shown an inadequate increase that led to a housing bubble. Furthermore, remuneration was based generally upon fees that motivated business managers to concentrate on the quantity and they did not pay much attention to the sustainability of business. The key to success is to concentrate on the business lines which bring steady growth over longer periods of time rather than participate in high risk revenues during a short period of a speculative bubble. It is not always adequate to follow and compete with other financial institutions, for many banks which went through the financial crisis without such vast losses, this was the right behaviour. Even though both banks had very good funding and a stable circle of customers, the losses that they have experienced were so large that they had to be bailed out by governments.

The pressure to perform also in the new types of growing business distracted Citigroup and UBS from its core business, which was very stable and growing at an adequate pace. In such a situation it is more important to realize where the bank has a competitive advantage over rivals, not where it does not. Crucial to the sustainability seems to be also in that case compensation and growth itself. The security business was and in some banks still certainly is based on revenue, not on risk-adjusted returns.

Especially UBS underpriced its internal funding. Its investment bank that was not directly controlled by the Swiss directors and took advantage of the

bank's overall easy access to the costs of funds without paying an appropriate premium for the risk it was taking.

Regulators can prevent and control just to a certain extent but never assure absolute oversight. One of the reasons is the uneconomical burden that would arise from huge costs to finance the administration. Nevertheless, countries which managed to pick up the failed banks can avoid the negative effects and impacts that could occur (e.g. bank run, destabilisation of the whole financial system, deep recession etc.)

As a response to the failed bank industry, regulators already introduced more strict regulation (e.g. higher capital adequacy targets, higher tier 1 capital ratio, more objective valuation methods). Not only to prevent future failure of commercial banks but also to protect the injected funds. Governments are guaranteeing far more retail deposits than before the crisis.

Beyond contention the most severe financial crises, which was started by the subprime mortgage crisis in the US showed, that the globalization and the interconnection of financial business bears not just advantages but also large risks arising from these interconnections. Local governments need to force the important financial institutions, like UBS or Citigroup, which are pillars of a sound and healthy economy to take more responsibility and install more adequate measurements to ensure proper risk management and adhere to business ethics.

Appendix A - German Abstract

Bankenzusammenbruch am Beispiel von UBS und Citigroup (Zusammenfassung)

Bankenzusammenbruch und Bankenkrisen wiederholen sich immer wieder in der Geschichte der Ökonomie. Jedoch die letzte finanzielle Krise hat gezeigt dass es immer noch nicht gelungen ist die Risiken richtig abzuschätzen um schwere Verluste verhindern zu können.

Die vorliegende Diplomarbeit behandelt die Problematik des Bankenrisikos im Zusammenhang mit einer finanziellen Krise am Beispiel von zwei Banken Der schweizerischen UBS und der amerikanischen Citigroup. Es wird nicht nur ein Vergleich zwischen den beiden Banken vorgenommen, viel mehr wird auch der historische Vergleich mit anderen Finanzkrisen dargestellt.

Beide Banken haben durch die Subprime-Krise sehr hohe Verluste verbuchen müssen. Im näheren Hinblick auf die Verluste kannst festgestellt werden, wie unterschiedlich die Verluste in den Bilanzen aufgenommen wurden und wo die Probleme der Banken lagen. Anhand des Vergleiches wird es auch deutlicher was für einen Einfluss das Rechtssystem auf die Finanzinstitute hat und wo die Möglichkeiten der Behörden bei der Aufsichtsführung liegen.

Bankenzusammenbrüche können auch in der Zukunft nicht ausgeschlossen werde deshalb ist es wichtig aus den vergangenen Bankenkrisen zu lernen, um die möglichen Gefahren vorzeitig zu erkenne um anschließend rechtzeitig und angemessen zu reagieren damit Verluste minimiert oder verhindert werden können.

Appendix B - Curriculum Vitae

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Sep. 1997 - Mai. 2001 *Gymnasium Bilikova 24,* Bratislava
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Sep. 2008 - Dez. 2008 UNODC (United Nations Office on Drugs and
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Okt. 2003 - Jan. 2007 Faculty IT-Support BWZ Uni Wien
Studienassistentin
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Jul. 2006 - Sep. 2006 Tecnetcapital, St. Pölten, Österreich
Praktikum im Bereich venture capital

Okt. 2001 - Jan. 2006 AIESEC Wien
Internationale Austausch
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Veranstaltung von Weiterbildungsseminaren

Weitere Qualifikationen

Sprachen	Slowakisch	Muttersprache
	Deutsch	Fließend
	Englisch	Fließend
	Tschechisch	Fließend
	Spanisch	Fortgeschritten
EDV	Microsoft Office	Sehr gute Kenntnisse
	HTML, Java	Grundkenntnisse

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