The fall of Lehman Brothers

A literary overview of the internal and external factors that lead to the largest bankruptcy in history

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Abstract: The collapse of Lehman Brothers is the largest bankruptcy in history. Their bankruptcy was the result of poor business decisions due to moral hazards in the firm for top executives, as well as poor corporate governance practices. Lehman attempted to withhold information about its actual financial condition to sustain important funding sources. Eventually it could no longer sustain confidence from counterparties and did not have sufficient liquidity to operate.
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1 INTRODUCTION

In this chapter I provide a summary of the paper and explain the method by which I intend to analyze Lehman Brothers. I also present the scope of the thesis and why it is a relevant issue to discuss.

In 2008 the world was plunged into financial chaos. The United States real estate market had completely collapsed, with giants such as Fanny Mae and Freddy Mac going down with it. With a deteriorated real estate market its investors were in trouble. Bear Stearns, at the time the biggest (in percent of total assets) issuer of Collateralized Debt Obligations (CDOs, further explained in section 3.3.1) was the first bank to display real trouble in the turmoil of the market. The investment bank was acquired by JP Morgan Chase. This was a clear sign that the real estate crisis was spreading into the financial sector. But the real proof of the actual state of the financial sector came a few months later. A Wall Street giant, a financial innovator and one of the largest investment firms in the world, Lehman Brothers, filed for Chapter 11 bankruptcy. On 15th of September 2008, after more than 150 years of business, the bank that was too big to fail did just that, and the global economy plummeted into financial chaos.

Lehman Brothers was one of the four largest investment banks in the world before its collapse in September 2008. The financial impacts of its collapse were enormous and sent a shockwave through the world’s financial sector. Very few people saw any chance of this happening to a firm of this size, nor could anyone predict the implications such a collapse would have on the global economy. So how did this happen? What factors caused one of the largest, “too big to fail” banks to collapse? There are many different theories as to why they failed, from excessive exposure to the subprime market, poor risk management, bad business decisions, power hungry top management focusing only on personal benefit, and bad luck.

The general state of the world economy in the years leading up to the financial crisis set the playing field for what was to come. Low interest rates globally created an abundance of cheap credit making it easier and cheaper than ever to borrow money, for individuals and institutions alike. It also made traditional investment opportunities, such as government bonds, unattractive investments due to their low rate of return. Combined
with an increased competition in the financial sector due to recent deregulation, the
demand for new innovative investment opportunities was enormous.

Simultaneously, the low interest rates created a booming real-estate market. Investors
seeing this dramatic increase in prices wanted a piece of the action, but it was not always
convenient to purchase a house just to get into the real-estate market. Enter:
Securitization. Investment banks and other financial institutions saw the demand for real-
estate investments and the booming housing and invented a way to connect the two.
Mortgage backed securities, such as Collateralized Debt Obligations, became a huge
phenomenon, and satisfied the need of all market participants. The prospecting home
owners got a home, the mortgage lender could sell the mortgage payment stream for a
nice fee, the investment bank could pool these payments streams, slice them up and sell
them, also for a nice fee, and the investor who sought a better return on his investment
than government bonds got just that. Everyone was satisfied as everyone got what they
wanted.

But then something happened. Everyone wanted more. The home owners wanted bigger
houses, houses they could not afford. The mortgage lenders wanted to sell more
mortgages, and so began giving mortgages to people who could not afford them. The
banks wanted to make more money and continued to buy mortgage payment streams,
even though the quality of them was very poor. Lower quality meant higher risk, but
higher risk meant higher potential returns so investors still wanted to buy the products,
despite being backed by poor quality assets. Soon everyone in the market had a piece of
the cake, a cake they soon realized was turning bad.

Lehman Brothers was one of the largest underwriters of these mortgage backed
securities. But when the market went sour, Lehman did not stop. They saw the real-estate
bubble as a temporary crash, and that the market would recover. And when it did, would
make Lehman Brothers hugely profitable. Thus, Lehman continued to operate within
these business segments, simultaneously hiding that fact from all market participants.
Their business model made them vastly dependent on short term funding, and to retain
access to such funding sources it was crucial that the market had confidence in Lehman
Brothers, confidence that, if Lehman’s actual state had been known, would be lost
immediately. Therefore Lehman had to turn to unconventional methods, sometimes
legally questionable ones in order to retain that confidence. (Valukas, 2010) Altering the
balance sheet before a quarterly report is just one example, one which Lehman’s board of directors claims to have no knowledge of. Lehman’s corporate governance did not function adequately in the years prior to the crisis, and the moral hazards created by recent deregulation, increase of competition in the market and the general state of the world economy had corrupted top management into taking on extremely excessive risk, only to generate short term profits.

Previous studies have discussed several different aspects that explain parts of the financial crisis. A journal article written by Petersen and Wiegelmann, suggest that Corporate Governance practices in the financial industry in the years leading up to the crisis were not adequately followed, and created agent-principal problems within the industry. Moreover, other moral hazard issues arose due to the market conditions at the time. (Petersen and Wiegelmann, 2013)

In this thesis I will analyze the fall of Lehman Brothers from the perspective of the aforementioned theories to understand why Lehman went bankrupt. First a historical foundation will be presented, explaining the underlying factors that created the market environment before the financial crisis. Then a literary overview of previous research on the subjects of the agent-principal theorem, corporate governance and moral hazards will be presented. The findings from this overview will then be applied to the internal proceedings of Lehman Brothers. To conclude this thesis I will present my findings and suggest measures than can be taken to prevent similar disasters in the future.

To answer the question of what factors led to the largest financial meltdown in recent history can give valuable lessons in how to prevent a future crisis of this scale. Many aspects of the financial crisis have previously been analyzed and discussed. The focus of this thesis will be limited to the US when explaining market conditions and the analysis will be limited to the investment bank Lehman Brothers, one of the catalyst of the financial crisis. Suggestions for further studies include analyzing more investment banks in depth to understand if Lehman Brothers were alone in the utilizing the business practices that led to their collapse, as well as comparing the financial crisis of 2008 with the recent European banking crisis, to find similarities.
2 HISTORICAL BACKGROUND

Here I present the history of Lehman Brothers to give the reader a sense of the importance Lehman Brothers has had for the prosperity of the United States. The facts presented are based on The Historical Archives of Lehman Brothers from Harvard Business School ("History of Lehman Brothers" 2008)

2.1 HISTORY OF LEHMAN BROTHERS

Lehman Brothers was founded in 1844 by Henry Lehman, an immigrant from the German town of Rimpar, in Montgomery Alabama. There he established a small store selling groceries and other supplies for the local cotton farmers. His two brothers Mayer and Emanuel had joined him by 1850 and the company was renamed the Lehman Brothers. A few years later, in 1855, Henry Lehman passed away leaving the firm to his two brothers. They continued to run the business for four decades and implemented an employment policy meaning that only members of the Lehman family were permitted as partners to the firm. This policy was in effect until the 1920s.

Shortly after the establishment of Lehman Brothers the firm changed its focus from general merchandising to commodities trading, namely cotton trading. They formed a brief partnership with a cotton farmer by the name of John Wesley Durr to form “Lehman & Durr” and built a warehouse enabling them to expand their business and compete with bigger players in the market place. In 1858 Lehman opened a New York office giving them a stronger presence in the commodities trading business as well as a foothold in the financial community.

As the cotton industry was strongly tied to the southern economy Lehman was heavily affected by the hardships endured during the civil war. The firm did however, survive the war and focused its post war operations on New York where, in 1870, they spearheaded the establishment of the New York Cotton Exchange. As the business grew to include other commodities as well, Lehman ministered in the establishments of the New York Coffee Exchange and the New York Petroleum Exchange. In 1867 Lehman Brothers was elected fiscal agent to of the Alabama government, and appointed the task of selling Alabama state bonds. Even bearing in mind Lehman Brothers southern heritage
and northern connections, this was not an easy task considering the general credit ratings of southern states at the time. Furthermore, Lehman Brothers was assigned to facilitate the state’s interest payments, debts and other obligations. This was the starting point of Lehman’s long tradition of municipal finance.

The rapid development of the US railroad was a catalyst in the economic growth of the country after the civil war. As the construction of the railroad was very costly, companies turned to the financial markets to raise capital. This created enormous activity on Wall Street and players such as Leman Brothers saw great profits. The leading financial advisors and underwriters to the railroad industry at the time were Kuhn, Loeb & Co. They were involved in many of the major railroad builds at the time, such as the Chicago and North Western railroad, the Pennsylvania Railroad, the Baltimore & Ohio, the Great Northern and the Union Pacific. Lehman Brothers merged with this company nearly a century later.

Because of the hugely costly nature of constructing the railway underwriters could no longer rely on conventional funding methods. To increase the span of potential investors’ financial firms began to restructure the railway bonds into many smaller, more affordable ones as to allow individuals to invest in the railway. This was previously unheard of as only companies or wealthy individuals had enough capital to invest, and brought many first time investors to the market. Lehman Brothers, well aware of this trend, started securities sales and trading operations and in 1887 became part of the New York Stock Exchange effectively taking Lehman Brothers from a commodities trader to a merchant banking firm. Additionally, Lehman was becoming increasingly involved in financial advisory services which lay the foundation for the underwriting business in the early 1900s.

In 1906 Emanuel Lehman’s son, Philip, together with Henry Goldman formed an alliance to fund emerging retail businesses. Together the two firms underwrote securities issues for some of the most iconic retail firms today including Sears, Woolworth Co. and R.H Macy & Co. Philip’s son, Robert began his employment at the firm in 1920 as a partner and quickly climbed the ranks. From 1925 until his death in 1969 he ran the firm and did so very successfully. His beliefs were centered on the idea that consumption, not production, would decide America’s future prosperity. He steered the company in this direction by supporting emerging industries focused on mass consumption. His
commitment to identifying emerging markets led the firm to finance airline companies, cinemas and other growth markets, while continuing to support the expansion of the retail industry.

Lehman Brothers was one of the earliest and biggest supporters of the entertainment business, motion pictures in particular. Lehman advised in the consolidation of the two biggest companies in the cinema industry, Kieth-Albee and Orpheum theaters. The unification of these companies in 1920 created the biggest vaudeville circuit in America. Lehman continued aiding the expansion of the motion picture industry for a long time and aided in the funding of Paramount Pictures and 20th Century Fox among others.

The communications industry was one which Lehman was highly involved as well during the 1930s and underwrote the very first initial public offering (IPO) for a television company as well as raising funds for the Radio Corporation of America.

The 1930s depression Lehman Brothers was one of the first firms to adopt private placement funding techniques. With the fragile economic climate at the time funding was very difficult to obtain, even for well established, historically safe, companies. Therefore loans from private lenders were required to raise the necessary funding. Today this practice is well used, but at the time was very innovative.

Lehman Brothers was also highly involved in the rapid growth of the oil and gas industry in the first half of the 20th century financing the TransCanada pipeline and other large players in the industry.

The 1950s saw a shift in the factors driving the economy. Technological advances had led to the first computers and IT companies were a large contributor to the North American economy. Lehman Brothers were quick to find investment opportunities in the area and aided in several of the IPOs for computer manufacturers, such as Litton Industries and Digital Equipment Corporation.

Lehman’s capital markets trading capabilities were greatly expanded in the 1960s and led to Lehman Brothers becoming an official dealer of US treasuries. As its businesses expanded, in 1970, a time when many US companies started expanding abroad, Lehman Brothers opened its first overseas offices in Europe and Asia. The merger with Kuhn, Loeb & Co further enhanced Lehman’s international stature.
In the 1970s the computer industries took off “for real” and drove the economic expansion of the decade. Lehman sought investment opportunities within the high-tech industry and invested, for example, in Qualcomm and Loral Corporation. As many American companies expanded further during the 1980s, merger and acquisition (M&A) services became the heart of financial advisory. Lehman Brothers M&A department aided in many domestic as well as overseas mergers, such as Chrysler/American motors, General Foods/Philip Morris and Bendix/Allied.

The era of the personal computer arguably began in the mid-1980s and saw a boom in the high-tech industry, from microchips and memory modules to videogame consoles. Large investments were going into research and development of the high tech industry which enabled it to grow at a very fast pace. Some start-up ventures seemingly grew from garage-projects to multi-billion dollar corporations overnight. Lehman was, not surprisingly, part of the rapid growth of the IT companies and backed companies such as Intel, the manufacturer of the world’s first microprocessor.

Biotech-companies were also a large growth industry during this time and Lehman was highly active in the raising of capital to fund the R&D of companies such as Cetus.

American Express acquired Lehman Brothers in 1984 and was merged with Shearson, the Amex retail brokerage, to form Shearson Lehman Brothers; however, shortly after, Amex began divesting the firm and in 1993 Lehman Brothers was spun off to once again be known solely as Lehman Brothers. Richard Fuld was appointed CEO of Lehman Brothers and remained at the helm of the firm until the end.

One year after Lehman Brothers celebrated its 150th anniversary their head office in the World Trade Center was destroyed in the 9/11 attacks. Lehman moved to its new headquarters in midtown Manhattan in 2002 where they remained until their collapse on the 15th of September, 2008.
3 SETTING THE PLAYING FIELD OF THE CRISIS

In this section I explain the factors that created the market environment prior to the financial crisis regarding deregulation, the general state of the global economy and the actions of the Federal Reserve. I also give examples of innovation in financial derivatives, specifically securitization of mortgage backed securities and why these exacerbated the real estate crisis.

3.1 REGULATION AND DE-REGULATION

In the aftermath of the great depression in the late 1920s and early 1930s, a set of regulations for the banking system were set up by the US congress as a response to the banking crisis of 1929, in order to minimize the risk of similar crises occurring in the future. This gave rise to the Banking Act of 1933, commonly known as the Glass-Steagall Act (GSA). The actual Glass-Steagall Act is actually only a small part of the more comprehensive Banking Act of 1933 and consists of the four provisions that prohibited commercial Federal Reserve member banks from:

- dealing in non-governmental securities for customers
- investing in non-investment grade securities for themselves
- underwriting or distributing non-governmental securities
- affiliating (or sharing employees) with companies involved in such activities

Effectively these four provisions ensured “The separation of investment and commercial banking” (Preston, 1933). It was enacted as an emergency response after the failure of nearly 5000 banks just prior to the great depression. After the 1929 crash it was believed that close ties between commercial and investment banking activities meant a conflict of interest that could potentially lead to more speculative trading and unprofitable loans. The GSA was also implemented because banks were allegedly taking on too much speculative risk; thus, risking their depositors money. Separating investment banking activities from commercial banking meant lowering the risk of a future banking crisis affecting the general economy as much as it had previously been able to do. The Banking Act of 1933 also created the Federal Deposit Insurance Corporation (the FDIC), to guarantee bank deposits up to a certain amount. Again, this was to avoid the risk of a future banking crisis spreading from the financial sector.
The GSA saw heavy resistance from many major banks in the years after its implementation and sequentially lost its potency. Different ways around the GSA were constantly found, especially in the 1980s as competition in the banking system had increased. (Schwartz, 1990) One of the largest opposers was Citibank as they sought to merge with Travelers to create Citigroup in 1998. This merger was a direct violation of the GSA. Citibank, as one of the largest commercial banks in the US, and Travelers, a brokerage firm and insurance unit were not allowed to operate under the same roof. However, the deal went through as the two corporations were confident that the GSA would soon be revoked. (Randy, 1998) In 1999, under the Clinton administration, exactly that happened. The Gramm-Leach-Bliley Act, or the Financial Services Modernization Act revoked the GSA, allowing financial institutions to operate within commercial banking, investment banking, securitization and insurance freely within the same company. Some even call this act the “Citigroup Relief Act” (Koppl, 2014) as the previously illicit merger became legal with the passing of the bill. (Gramm, Leach, Bliley, 1999) Many argue that the repeal of the GSA is what finally lead to the financial meltdown of 2008 as it was once again possible for financial institutions to make speculative investment decisions with depositor’s money. As depositors varied so greatly the dependency on the stability of the banking sector increased dramatically.

Deregulation did not only affect commercial banks, but investment banks as well. Less guidelines and rules to follow meant more freedom in potential profit generating activities. Deregulation created incentives to find new ways in which to get money which in turn created a new level of innovation in financial products. Further, several recent government bailouts in the aftermath of the dot-com bust had created a moral hazard. Financial institutions were expecting to be bailed out would they go belly up, which in turn led to financial institutions taking on substantially more risk. (Zingales, 2008)

Further, deregulation removed many entrance barriers to financial sector promoting higher competition. (Boyd and De Nicoló, 2005)

3.2 GENERAL STATE OF THE WORLD ECONOMY

The 1990 was a decade riddled with financial turmoil. Sweden saw its biggest banking crisis, Russia defaulted, East Asian economies collapsed and Brazil, Argentina and Turkey were in much stressed financial conditions. All these governments responded by
cutting down on foreign investments and cut down on spending. Many of these countries became net exporters of financial capital, much of which was absorbed by IT companies in the dot-com bubble. (Diamond and Rajan, 2009) After the burst of the bubble of 2000 and the terrorist attacks in 2001 the US was also plunged into financial turmoil.

Figure 1

The Federal Reserve Bank (FED) turned to monetary policy to get the economy back on track, lowering the interest rate at which banks could borrow money to rates unprecedented in the last 60 years. (“FRB: H.15 Release--Selected Interest Rates--Historical Data,”) By lowering the federal funds rate, the supply of money increases in the financial system, making it easier and cheaper to acquire financing. Including the credit available from foreign countries there was an extreme abundance of cheap credit.

Long term goals such as the FEDs goal of certain inflation and unemployment levels are difficult to retain. In these cases it is often helpful for policy makers to follow a rule. “A rule can often help when attempting to stick to a goal requiring a long term commitment, especially when deviating from them could result in a temporary, short term gain.” (Carlstrom and Fuerst, 2003) The Taylor rule is one such rule. It is designed to help policy makers determine the optimal federal funds rate to ensure long term stability and is used as a benchmark. It calculates the optimal federal funds rate given current market conditions, namely two variables - inflation and deviation from potential output. Despite policy makers often being reluctant to bind themselves to a mathematical formula, the Taylor rule has had a big impact on economics and monetary policies. The Taylor rule
successfully tracks federal funds rate movements from 1987, as shown in the graph below suggesting policy makers actually have used it as a guideline. (Carlstrom and Fuerst, 2003)

![Graph showing federal funds rate and Taylor rule](image)

*Figure 2 – The red line is the actual federal funds rate. The blue line is the optimal federal funds rate according to the Taylor rule.*

However, the actual federal funds rate does deviate from the Taylor rule calculated rate significantly in two periods; between 1995 and 1999, and from 2002 onward. Both of these periods are pre crisis periods, the first leading up to the dot-com bust in 2000 and the second leading up the credit crisis of 2008. If the federal funds rates deviation from the Taylor rule was the leading cause of these crises or if it even exacerbated them is still a debated subject. Some market participants argue that the FED, after the dot-com bust, held interest rates too low for too long, and that they lowered the rates too much to begin with. Previous studies have shown that the federal funds rate after 2002 continued to deviate from the Taylor rule optimal level until late 2006 / early 2007, and did not follow the same pattern as the previous two decades. (Taylor, 2007) The following graph shows the deviation between the actual federal funds rate, and the federal funds rate had the
Taylor rule been followed. As is clearly shown, the federal funds rate is significantly lower that the Taylor rule calculated as an appropriate rate and also stays low for much longer then the Taylor rule would predict.

**Figure 3 – The black line illustrates the actual rate. The grey line shows the optimal rate according to the Taylor rule.**

The low interest rate in the US gradually pushed the economy back into a prosperous state; however, investors who had previously invested in government bonds, the safest possible investment, were no longer satisfied with the low interest rates the Federal Reserve was now giving. Instead, many different players, private and corporate investors alike, sought new investment opportunities with a better rate of return. (Gambacorta, 2008)

At the same time the housing market in the US was flourishing as borrowing money was now cheaper than ever. When banks have easy and cheap access to credit, they could afford to lower interest rates on mortgages and other loans. This meant that borrowing money for a home was also cheaper than ever. As mortgage rates went down, housing prices went up, building further on a steady trend of increasing house prices since the 1950s. (Glaeser et al., 2005) The mortgage industry became an increasingly large part of the US economy as the housing industry grew.

As the interest rates were so low, both in the US and abroad, the government bond market was virtually dry as no one saw it profitable to invest there. The stock market was still considered to unsafe to invest in after the bust of the dot-com bubble. Thus the demand for new investment opportunities was high. As the housing market was booming, being
able to invest in real-estate, without necessarily having to purchase a house became increasingly demanded.

### 3.3 INNOVATION IN FINANCIAL PRODUCTS

#### 3.3.1 CDOs

Large investment firms such as Lehman Brothers saw a way to connect the mortgage payers with the investors seeking higher return on their investments than government bonds. By purchasing the payment streams of the mortgage takers from the providers, such as Fanny Mae and Freddie Mac, the investment banks could bundle these payment streams together to create a type of asset-backed security known as a Collateralized Debt Obligation, or CDO. These CDO were essentially thousands of monthly mortgage payment streams combined into one security, and then split into three different tiers, each with a higher risk and higher return than the previous. (Bates Group LLC, 2012)

<table>
<thead>
<tr>
<th>Tier 1: Senior</th>
<th>Typical credit rating: AAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 2: Mezzanine</td>
<td>Typical credit rating: BBB</td>
</tr>
<tr>
<td>Tier 3: Equity</td>
<td>Typical credit rating: Unrated/Junk</td>
</tr>
</tbody>
</table>

*Figure 4*

The first tier is the least risky and the first to receive payments from the underlying assets. Only once the first tier has fully received payments does the payment stream begin to saturate tier 2; thus, making the second tier more risky. The third tier is the first to absorb losses if certain assets in the collateral pool miss payments or default. It is only filled when the two previous tiers are full, making it the most risky. The bottom tiers act as cushions absorbing losses leaving the senior tier untouched, at least up to a certain level of defaults. (Benmelech and Dlugosz, 2009)

This method of packaging loans meant that the first tiers could be rated as very low risk securities making them suitable for even the most risk averse investors, such as pension funds. The investment banks also insured the top tier of CDOs, either in house or through
a third party (such as AIG), using Credit Default Swaps (CDSs), and further reducing the risk of the highest tier becoming worthless. This essentially guaranteed the senior tier to receive the highest possible credit rating, AAA. This enabled investment banks to reduce the quality of the underlying payment stream.

### 3.3.2 CDSs

Another important financial instrument used in the time before the crisis was the Credit Default Swap or CDS. CDSs were used to insure the value of a certain derivative, such as a CDO. Were that CDO to fail, the CDS issuer would pay the investor the predetermined value of the CDO. Insurance companies and banks with in-house insurance divisions saw these CDSs as a great way to generate profits. ("Credit Default Swap (CDS) Definition," 2015) As previously stated, CDOs were almost exclusively rated AAA, the highest possible investment grade. This meant that insuring such an item was considered nearly risk free. Also, the insurance premium for insuring an AAA rated product was relatively low. This meant that more parties wanted to get the insurance, and the insurer wanted to sell more of them as to increase profits. However, unlike conventional insurance, where one must own the asset to be insured, in the case of CDSs, anyone could purchase a CDSs that would pay if a certain CDO were to default, without having to own that CDO. Before these CDOs lost their value, this business practice generated huge amounts of income for the issuers of these CDSs. However, as soon as things went south, the amount that had to be paid out to the CDS holders was enormous. One of the biggest issuers of CDSs was AIG. AIG needed to be bailed out by the government for USD 170 billion to stay afloat.

### 3.4 Subprime Lending

Because mortgage providers were selling their mortgage payment streams to investment banks and other financial institutions they were already covered for their expenses in the event that a payer default; thus, the failed mortgage payment would no longer affect them as the risk of default was now held within the banks. In addition to this, US housing prices had been increasing steadily for a very long time and showed no indication of breaking this trend. This meant that even if a borrower was to default on his mortgage, the issuer/bank or other investor would now own a house more valuable than when it was purchased. By simply putting this property up for sale their losses would be covered as well. It was a win/win situation for all parties involved. Even the credit rating agencies,
responsible for determining the quality of an investment, had financial incentives to give high ratings. As they were compensated by the financial institutions issuing these securities, the higher the ratings the higher the compensation. (Strier, 2008)

As mortgage backed securities had become so profitable the demand for mortgage payment streams was increasingly large. However, the supply of mortgages was not large enough to satisfy the market. The lending companies knew that they would be able to sell the mortgage payment streams and there by eliminate the risk of a default affecting them.

These factors meant that issuing a mortgage was essentially risk free. When there was no risk involved, less precautions were necessary. Many individuals who were previously unqualified for a mortgage could now receive one, without any proof of income or other financial statements. (Investopedia, 2008) These mortgages are known as Subprime mortgages, the riskiest type of mortgage. But as there was no risk for the mortgage issuers in grant subprime loans, and because the investment banks could also sell them, and because investors as well as all other parties involved saw huge profits in CDOs, there general consensus of the market was that there was no reason to stop utilizing them. However, in retrospect, these business practices were a ticking time bomb.

Additionally the investment banks packaged subprime mortgage CDOs in the same ways prime (regular, safe) mortgage CDOs. The way these CDOs were packaged still meant that the top tier of the CDO still received very high investment grades.

Previous studies have shown that a large majority, even of subprime mortgage-backed CDOs were rated AAA. In the sample of Benmelech’s and Dlugosz’s research, 85 % of subprime mortgage backed CDOs were rated AAA despite the fact that the underlying assets on average had a credit rating of approximately B, far below investment grade. (Benmelech and Dlugosz, 2009)

As previously mentioned, one or a few defaults within a large pool of monthly payments would barely affect any of the parties involved. However if many payments within the pool were to default, the losses could be very large for the loan issuer, investment bank and investor alike. Add to this the fact that insurance companies insured the top tier, and a completely failed CDO means large losses for many players.
3.5 **THE TURNING POINT – SUBPRIME CRISIS**

This was exactly what happened. More and more home owners defaulted on their mortgage payment and those homes were put up for sale as the owners left their homes. Eventually the supply of available houses exceeded the demand, and naturally, prices start to drop. As prices started to drop, even those who could afford to pay off their mortgage left their houses in foreclosure, as they were now paying off a mortgage of maybe USD 200 000 while their house is only worth USD 100 000. This meant that the payment stream coming in to these CDOs became essentially non-existent.

The subprime crisis pulled the entire real estate market with it and soon all commercial mortgage backed securities saw huge reductions in value.

One of the areas where the housing market took the biggest hit was California’s Inland Empire. Land holdings in this area had been written down to “pennies on the dollar”. (Einhorn, 2008) One of the largest contractors in the area was Sun Cal, which Lehman Brothers was heavily invested in.

3.6 **SUMMARY OF EXTERNAL FACTORS**

The world’s economic state, the recent bust of the dot-com bubble, the 9/11 terrorist attacks, low interest rates, deregulation and an overall risk ignorant philosophy within the financial sector all contributed to the market conditions that culminated in the financial crisis. The abundance of cheap credit and the lower introductory barriers to the financial sector had also increased competition in the market. If one market participant was making large profits, even if it was also accumulating huge risk, other market participants followed, as they would otherwise fall behind. This meant that many of the, in hindsight, questionable business practices were widespread across all participants. In fact in many cases these practices were even encouraged by the board of directors and shareholders of the firm.
4 THEORETICAL FOUNDATION – LITERATURE REVIEW

In this chapter I provide a literary overview of the theories of Corporate Governance and Moral Hazards within the financial crisis. I also briefly discuss the implications of increased competition in the financial industry.

Modern theories have attempted to tackle the cumbersome task of explaining the financial crisis from several different aspects. Macroeconomic factors do play an important role in explaining the buildup to the financial crisis, such as low interest rates throughout the global economy, or, as Taylor put it; “Loose fitting monetary policy” (Taylor, 2009, p.2) Such factors affected all companies involved in the financial crisis in the same way, but the culmination of the financial crisis certainly did not fair in the same way for all players involved. Explaining why some companies got away nearly scot free while some lost everything is still a highly debated subject.

Moral Hazards are widely commented in previous literature regarding the financial crisis. A situation where an individual or group of people are responsible of preserving the interest of others, but could potentially have other incentives for themselves, creates a moral hazard. Leading up to the financial crisis examples of moral hazards are not difficult to find. Kevin Dowd in his paper Moral Hazard and the Financial Crisis states that:

“moral hazard played a central role in the events leading up to the crisis, and we need to appreciate this role if future reforms are to be well designed and prevent further disasters down the line.” (Dowd, 2009, p. 142)

The three most common forms of moral hazard observed in retrospect before the financial crisis are:

- Selling financial products while knowing the buyer has no interest in the product or is not financially fit to acquire it. (Dowd, 2009)
- Taking out excessive bonuses from funds managed on the behalf of others. (Dowd, 2009)
- Accumulating high levels of risk that others (such as shareholders) will have to bear. (Dowd, 2009)
Moral Hazards, such as those mentioned above, can be categorized as agent-principal problems. This type of moral hazard was common in the financial world as before the financial crisis and Principal-Agent problems are often held responsible for poor underwriting practices in the mortgage securitization market. According to Herring: “It is surely not difficult to find instances of sloppy due diligence, poorly designed incentives, inadequate monitoring, superficial analysis and outright fraud.” (Herring, 2010, p.273)

All of these shortcomings mentioned by Herring are examples of issues that arise due to moral hazards.

Securitization is another example of when a moral hazard can arise. In the old days a bank issuing a mortgage loan would be careful about who it would lend to, as they would bear the losses were the borrower to default. The incentives to lend money in the first place came from the interest paid by the borrower on the loan. With securitization however, the process is very different. The incentives of lending no longer come from the revenue generated by the interest on the loan, but by the fee acquired from securitizing and selling the mortgage. As soon as the lender sells the mortgage to a third party it no longer bears the risk of that mortgage defaulting. Effectively this meant that providing a mortgage was no longer associated with any risk. As there was no risk associated with providing mortgages, anyone and everyone could get one. The mortgage issuers accumulated enormous risk positions, but as they were able to reallocate said risk to other parties, they kept on doing it. This is just the first step in a long line of related, moral hazard issues, during this time. (Dowd, 2009)

Additionally, the compensation plans employed by most financial institutions rewarded its employees based solely on the revenue generated and did not take into account any accumulation of risk. (Bebchuk et al., 2009) (Bizer and DeMarzo, 1999) Partly, this was due to a number of recent government interventions where firms on the brink of collapse had been bailed out, such as the savings and loans crisis of 1989 where the government had to provide nearly USD 300 bn to keep the financial system afloat, and the bailout of the airline industry in 2001. Also, the FDIC insured bank depositors’ money. This meant that if a commercial bank was to suffer large losses they expected to be bailed out, and the deposits of customers were guaranteed by the government. If however they were profitable, the bank and its shareholders would take the profits. This created incentives
to take on as much risk as possible, even to the point of failure, as potential losses would not affect the shareholders or agents. (Boyd and De Nicoló, 2005)

Containing the issue and reducing the risk of these becoming problems is where the big issue lays. Several measures to avoid these conflicts of interest are set in place by most companies. There are traditionally two measures used to ensure a homogeneous goal setting for shareholders and the board. The most common is to pay large portions of executive member salaries and bonuses in company stock or financial derivatives with the company stock as the underlying asset. Effectively this makes the executives shareholders as well, ensuring that their interest and goals are the same as those of the shareholders. Executives receiving these types of payments are not permitted to sell the assets until a certain period of time has passed, to ensure a long term goal, again in line with the shareholder goals. The second method involves obligating shareholders to hold large stakes against their will. This refers to regulators imposing compulsory capital requirements to limit the use of financial leverage. Even though such measures, to a certain extent, were in place at the time before the financial crisis, there is an ongoing debate on whether or not such regulations are effective. (Boyd and De Nicoló, 2005)

High competition in the banking industry leads to increased risk-taking, especially when banks are subject to limited liability. (Matutes and Vives, 2000) The risk appetite increases because firms seek to gain ground on their competition. As previously discussed, the late 1900s was riddled with deregulation culminating in the signing of the Graham Leach Bliley (GLB) act, which revoked the Glass Steagal Act (GSA) of 1933. Decades of deregulation and the GLB reduced the market barriers for new market participants in the financial sector as well as for existing firms wanting to expand their businesses. These reduced barriers promoted an increase in competition between financial institutions of all kinds. Without barriers such as commercial banking activities not permitted to operate under the same roof as investment banks or insurance companies, many firms sought to expand their business operations to include these sectors. Previous research concludes that an increase in competition in the banking sector leads to an increase in risk taking. (Matutes and Vives, 2000) As banks seek to gain ground on their competitors they take on higher risk. Additionally, innovation in financial derivatives and other products tends to increase with competition. (Allen and Gale, 2003) This creates new products that might have only been tested theoretically before, meaning
there real-world implications of utilizing these products may be unknown. One such product was a credit default swap or CDS (further explained in chapter 3.3.1). Essentially an insurance on a derivative, guaranteeing the buyer a certain return on investment even in the case of default. Some argue that CDSs were one of the factors that made the financial crisis so severe.

Corporate governance is another, highly debated subject in regards to the financial crisis. Corporate governance is the method by which a company is controlled. It includes factors such as communication between employees and managers, information processes and other mechanisms employed within a company, as well as the composition of the board of directors. Several key factors within corporate governance have been discussed in previous literature that has concluded that certain aspects, such as the composition of the board of directors, size of the board, compensation plans for managers, to name a few, impact a firm in a certain way. Most relevantly these factors impact the risk proneness of a firm. Previous research attempts to answer the following three questions: How board characteristics affect corporate profitability, how board characteristics affect observable actions of boards and which factors affect the composition of boards and their evolution over time (E. Hermalin and S. Weisbach, 2003). Their research regarding board composition and size conclude that these factors do affect the actions of the board. Firms with a higher number of outside directors are more likely to receive a more positive reaction from the market when using poision pills (measures to avoid a hostile takeover), attain a higher selling price in a potential acquisition, replace CEOs if the firm is underperforming and tend to have lower CEO compensation. The opposite is concluded to be true for firms with more homogenous boards. A smaller board of directors is concluded to be less prone to agent principal issues, have a strong relationship between firm performance and CEO compensation as well as monitoring CEO turnover with higher scrutiny.

Previous studies of corporate governance have shown that the companies that fared the worst during the financial crisis had a certain type of corporate governance, especially within financial management and financing policies. (Brunnermeier, 2008) A company with a more isolated and independent board of directors and with larger degree of institutional ownership were hit harder by the financial crisis. (Erkens et al., 2012) Erkens
argues that this could be explained by directors and institutional shareholders encouraging the firm management to maximize shareholder returns by increasing risk.

“Shareholders may find it optimal to increase risk because they do not internalize the social costs of financial institution failures and institutional arrangements such as deposit insurance may weaken debtholder discipline. In addition, because of their firm-specific human capital and private benefits of control, managers tend to seek a lower level of risk than shareholders (Laeven and Levine, 2009).” (Erkens et al., 2012)

According to Erkens, a significant contributing factor to the behavior of boards in financial firms were cost-benefit-tradeoffs made by the board and shareholders between selling off assets and raising fresh capital. (Kashyap et al., 2008) These trade-offs resulted in the firms risk management prior to the crisis as well as capital raising activities during the crisis. Funding large investment positions in subprime mortgage related assets with short term repo financing seemed, and indeed was, very profitable in the time leading up to the crisis, but also left firms heavily exposed to risk which in turn lead to huge losses in the crisis. Despite taking on heavy exposure these risk-taking practices were encourage by corporate boards and shareholders from approximately 2000 and forward, in other words, directly after the Graham Leach Bliley act was put into practice. Consistent with this conclusion, DeYoung finds that CEO compensation packages were largely built upon incentives to taking on more risk. These compensation plans strongly encouraged exploiting new growth opportunities that had arisen as a result of deregulation and the recent trend of debt securitization. (DeYoung et al., 2013) Additionally, equity capital raising during the crisis was very costly to shareholder, despite lowering the risk of the firm defaulting.

One of the most frequently discussed issues with the financial sector leading up to the financial crisis is that of the amount of risk a firm was able to take on. The Graham Leach Bliley act of 1999 cleared the way for commercial banks and investment banks to merge, and created large incentives to take on more risk. (Calabria, 2009) Also, as previously mentioned it broke down many barriers and opened new growth opportunities. It essentially changed the core business practices of banking. “The traditional banking model, in which the issuing banks hold loans until they are repaid, was replaced by the —originate and distribute banking model, in which loans are pooled, tranched and then resold via securitization.” (Brunnermeier, 2008, p.2) The new model by witch many
banks now operated was heavily dependent on fees from these securitizations. As previously mentioned, securitization had the ability reduce risk from one party by transferring it, through sales, to another party. These sales became a new, vital, source of income for all parties involved.

Another theory relevant to the build up to the financial crisis is the herd instinct. The herd effect suggest that one party making large profits on a certain product will attract other market participants to do the same thing, without necessarily taking the cost of trading with these products into account, so as to avoid missing out. (“Herd Instinct Definition,” 2015)(Chiang and Zheng, 2010) This can be applied on investment banks and financial derivatives. Despite the derivatives carrying large amounts of risk, these risk were overshadowed by the profits they generated. When one bank did it, all others followed as the business was so profitable. (“Herd Instinct Definition,” 2015)
5 ANALYSIS OF Lehman BROTHERS

This section aims to explain the internal proceedings of Lehman Brothers and analyze them through the theories discussed in the previous chapter.

Lehman Brothers was the fourth largest investment bank in the US. It operated globally with major offices in North America, Europe and Asia-Pacific. Its international presence accounted for approximately 50% of total revenue making it the most geographically diverse investment bank of it peers. Lehman operated through three major business segments; capital markets, investment banking and asset management.

Segment net revenue

- Capital Markets: 16%
- Investment Banking: 20%
- Investment Management: 64%

Geographic net revenue

- Europe and the middle east: 1%
- Asia-Pacific: 33%
- U.S.: 50%
- Other Americas: 16%

% of net revenue USD 19.4bn
All figures: year end 2007
Figure 5
At year end 2007 Lehman Brothers had USD 691 billion in assets, out of which 108.1 billion were mortgage backed securities of some variety. (Lehman Brothers AR - 07, 2007) In other words, Lehman’s exposure to the real-estate market accounted for a large portion of their total exposure.

Lehman Brothers was one of the largest underwriters of subprime mortgage backed securities in the business at the time. They owned several real estate companies including Aurora and BNC and had large exposure through investments or equity provisioning in companies like Sun Cal. (Valukas, 2010) In 2007 alone Lehman Brothers accumulated a USD 85 billion portfolio of mortgage-backed securities, four times its shareholder equity. This was more than any other firm in the business. (Valukas, 2010)

Lehman Brothers followed a business model that made them heavily reliant on short term funding. Their assets were predominantly long-term while liabilities were largely short term. But this business model was not unique for Lehman. All of the major investment banks followed some variation of high-risk, high-return model that required substantial counterparty confidence to sustain. Were confidence in the firms to erode, for example from their clearing banks, the investment banks could potentially lose important funding sources. Additionally, the investment banks and Lehman in particular, had high leverage, low capitalization and a large concentration of assets in high risk investments, namely asset backed and debt backed securities of different kinds, such as CDOs and Collateralized Loan Obligations (CLOs). As shown in figure 6 below, Lehman Brothers asset side of the balance sheet consisted largely of long term assets, while the liabilities side was predominantly short term. As previously stated this made Lehman very dependent on retaining confidence from the market.

These high risk business strategies, funding long term positions using short term loans is an example of a very high risk model and was almost certainly an effect of the moral hazards created by the corporate governance structure of the banks. Add to that the herd effect and one investment bank doing it would lead to all of them doing it. While all investment banks did follow this model to some extent, Lehman seems to have done so most rigorously. The recent bailouts of Fannie and Freddie, as well as Bear Stearns most likely had Lehman’s top management believing they were too big to fail, and that any potential disaster would be covered by the government. This in turn would further
strengthen the claim that a moral hazard had arisen with Lehman’s top management as they did not believe they would have to handle the risk they were accumulating.

However, Lehman’s balance sheet showed a substantial gap in the maturity structure. The USD 74bn funding deficit (attributable to the difference between long term assets and liabilities) was mainly covered by short term funding, primarily through repo transactions. LB’s heavy reliance on short term funding made them extremely vulnerable to the risk of a liquidity crisis in the event repos stopped rolling day-to-day. Therefore maintaining favorable ratings and showing strong financial stability was crucial for LB’s retained confidence from the market and thus its survival.

![Figure 6](image_url)
The fall of Lehman Brothers

The fine remarks from rating agencies shows that Lehman managed to hide its actual financial condition for a prolonged period of time. Confidence was, as previously stated, of utmost importance for the continuation of short term funding and the survival of Lehman Brothers.

5.1 Lehman's Growth Strategy

“A financial intermediary that performs a variety of services. Investment banks specialize in large and complex financial transactions such as underwriting, acting as an intermediary between a securities issuer and the investing public, facilitating mergers and other corporate reorganizations, and acting as a broker and/or financial adviser for institutional clients.” (“Investment Bank (IB) Definition,” 2015)

However, in 2006, Lehman made a substantial change in its business strategy. Instead of dealing in traditional investment banking activities Lehman themselves began investing heavily in different securities, keeping these securities instead of repackaging and selling them. Essentially, Lehman went from a “moving business to a storage business” (Anton Valukas, 2010). This entailed making long term investments using their own balance sheet. Holding positions on their own balance sheet meant large increases in asset positions; thus, requiring more sources to fund these investments which in turn increased the amount of short term debt on the balance sheet. (Valukas, 2010)

Lehman saw the subprime crisis as a way to pick up ground on its competition. They followed a counter cyclical growth strategy, meaning they purchased large positions of assets that were, at the time, far below market value. At the time, such assets were subprime mortgage based securities. Lehman counted on the crisis being temporary and sought to make huge profits as soon as the marked swung back to a normal state. However, as we know today, that swing came much too late. (Valukas, 2010)

Lehman continued to aggressively pursue Commercial Real Estate (CRE) and Leveraged Loans (LL) transactions in the hopes that the marked would turn around. CRE, LL and Private Equity (PE) divisions saw huge increases in profit. However, they were relatively small compared to the risk accumulated by stockpiling these huge and potentially illiquid asset positions. In one year from the new business strategy implementation, Lehman’s
balance sheet had grown by USD 128 billion, most of which was somehow mortgage related.

Before Lehman’s change in business strategy, CRE, LL and PE divisions were relatively small and carried low risk in comparison with other divisions. So little risk in fact that they were not included in the monthly stress tests conducted to test Lehman’s ability to stay afloat in a stressed market environment, the results of which were presented periodically to the Board of Directors and Lehman regulators. Even after the change in business strategy the stress test continued to exclude these divisions, despite the fact that they now accounted for a substantial part of the potential losses in a stressed market environment. In 2008, retrospective stress tests were performed to determine the actual risk involved in these divisions. The results of these tests showed that a large majority of the overall risk laid within these business segments. (Valukas, 2010)

Due to the fact that these business segments were excluded from stress test there were few measurements taken to ensure a healthy risk appetite in these areas. Commercial real estate and leveraged loans risk limits were completely disregarded and ultimately exceeded by margins of 70% and 100% respectively. (Valukas, 2010)

These risk limits were most likely disregarded as a result of moral hazard issues that had arisen. More risk meant a higher potential upside and would generate enormous profits if the market turned in their favor, and would in turn provide large bonuses for top executives. If the market would not turn in their favor, they believed the government would bail them out, as they did Bear Stearns as well as Fanny and Freddie.

The firm wide risk limit was not followed either. When the risk limit was breached, instead of lowering positions of risky assets, the risk limit was raised as shown in the figure below.
Between May and August of 2007, Lehman omitted some of its largest risk from its risk usage calculation. One of the major deals that contributed to Lehman’s breach of its risk appetite was the acquisition of Archstone Smith, a Real Estate Investment Trust (REIT). Lehman Brothers together with Bank of America acquired Archstone in July 2007 for USD 24.3bn. LBs stake was 11.3bn, a stake it was planning on syndicating within a year. However, by the time they collapsed only USD ~5 billion Lehman had managed to syndicate. The remaining USD ~6 billion, Lehman failed to syndicate and it remained on the balance sheet. This deal was largely responsible for the firm wide risk limit breach.

Large portions of this deal were not included in Lehman’s risk appetite calculations. USD 2.3 billion in bridge equity positions in the Archstone Smith REIT were supposed to be included in the risk appetite, and would have increased the risk usage far beyond the risk limit. (Figure 7 has been adjusted to show the actual risk usage)

Top management was not informed of the risk appetite limit breach until 5 months after the fact (or so they claim). Executives at Lehman Brothers, driven by the high risk incentives of their payment plans combined with the (most likely) belief that they were too big to fail and in the event of an imminent default would be bailed out by the government, caused management to hide the actual condition of the firm, even to its board of directors, to avoid losing large compensation packages. When the board finally was informed, instead of lowering exposure, the risk appetite was increased. This suggests that the corporate governance employed by Lehman, at least in the sense of
information streams, was severely lacking as the board should be notified very quickly. Further, the fact that nothing was done to reduce the exposure suggest that the board of directors encouraged this extremely high risk business model and supported the continuation of risk accumulation.

5.2 Lehman Top Management Compensation Packages and Corporate Governance

As previously discussed corporate governance employed in firms during the financial crisis were one of the leading causes of why some firms fared worse than others during the financial crisis. The board of Lehman Brothers consisted of 10 board members with Richard Fuld as both Chairman of the Board as well as CEO of the firm, a common practice in the financial sector. In Lehman Brothers annual report for 2007 they state that “The Company’s Board of Directors currently consists of ten members. The Board of Directors has determined that, with the exception of Mr. Fuld, all of the Company’s directors are independent, and the Audit, Nominating and Corporate Governance, Finance and Risk, and Compensation and Benefits Committees are composed exclusively of independent directors.” (Lehman Brothers AR, 2007) Consistent with the findings of Erken, Lehman’s board of directors was highly independent and with large institutional ownership, the category of boards that fared worse in the financial crisis. (Erkens et al., 2012)

A common misconception regarding top management of Lehman Brothers is that they lost nearly their entire fortunes when the bank collapsed. Ideally, this should be the case, as it ensures that managers act in the best interest of the firm, and not for their own benefits. This is one way to tackle the issue of the agent principal problem; that management tends to put their own interest in front of the greater good of the firm. However, previous research concludes that the top management of financial institutions during the financial crisis, Bear Sterns and Lehman Brothers in particular, received substantially larger compensation packages than they would have the public, and indeed the authorities, believe. Between 2000 and 2008 the CEO of Lehman Brothers, Richard “Dick” Fuld, claims to have received less than USD 310 million and further stated that 85% of his compensation was paid in stock, stock that was now worthless. (“How Much
The fall of Lehman Brothers

Did Lehman CEO Dick Fuld Really Make?,” 2010) The real number on Fuld’s paycheck however, is closer to USD 525 million. This figure included the sale of 12.4 million shares of Lehman stock. Fuld had previously stated that he “had never sold Lehman stock”, a statement he later changed to; never sold “the vast majority” of his shares. (“How Much Did Lehman CEO Dick Fuld Really Make?,” 2010) The research conducted by Harvard Business School concludes that at Lehman’s failure, Fuld held 10.8 million shares, meaning he had in fact sold a majority of them prior to the firm’s collapse. (Bebchuk et al., 2009) This proves that even though measurements to prevent the agent principal problem were implemented in the firm’s compensation structure, they did not fully tackle the issue. Ultimately, this meant that the firm’s top management goals might not have been in line with the firm’s goals, and taking on risk greatly benefitted top executives while putting the firm and its shareholders at risk. (Petersen and Wiegelmann, 2013) In other words, this proves that the measures put in to place to avoid the moral hazard of an agent principal problem did not work, or were not adequately followed.

5.3 CRISIS OF CONFIDENCE — RETAINING CONFIDENCE AT ALL COSTS

Because of LB’s reliance on short term funding, confidence from the markets, investors, lenders, rating agencies and especially funding counterparties was crucial for LB’s survival. Reaching balance sheet targets and showing favorable firm-wide net leverage ratios was there for vital. With Lehman’s recently employed business strategy they were holding enormous positions of what were now illiquid assets, meaning reducing the balance sheet in conventional ways was very difficult, if not impossible, without attracting too much attention from the market.

The increasing pressure from market participants to shrink the balance sheet and lower leverage forced Lehman to turn to unconventional, or outright illegal methods, to reduce the firm-wide net leverage to avoid ratings downgrades and loss of confidence. However, this was not possible without excessive financial impact. Lehman’s sticky/illiquid inventory positions had grown significantly since implementing its aggressive growth strategy and exiting these positions would be extremely difficult without suffering substantial losses. Thereto, a fire-sale would reveal that Lehman had a lot of air in its marks which further would drain confidence in the valuation of the assets that remained on the balance sheet. Lehman’s reluctance to reveal this information to the market indicates that the firm knew that their business practices were not sound, even when
comparing to other firms utilizing similar business principals. Despite this Lehman continued to pursue mortgage related investments, disregarding the accumulated risk positions they entailed. Most likely, Lehman’s management believed the bank was too big to fail and that the government would never allow them to go bankrupt, a clear indication of a moral hazard issue within Lehman Brothers.

To hide their actual financial condition Lehman employed off-balance sheet devices known as Repo 105/108 transactions. These transactions were nearly identical to standard repurchase and resale “repo” transactions with the critical difference that Repo 105/108 transactions were accounted as “sales” based on the higher than normal haircut (105 and 108 % respectively of the securities value) “ (Valukas, 2010)

By re-characterizing Repo 105/108 transactions as sales, Lehman Brothers reduced its asset inventory by the sales amount and utilized the cash received to pay down short-term liabilities thereby reducing both total assets and total liabilities. Thus, by engaging in Repo 105/108 transactions and using the cash borrowings to pay down liabilities Lehman Brothers could illegitimately reduce its reported net leverage ratio. (Valukas, 2010)

The usage of Repo 105/108 transactions started in 2001 but escalated considerably in late 2007 and during 2008 (as LB’s financial stability deteriorated). LB’s only motive with these transactions was to temporarily remove inventory positions from its balance sheet with the overreaching goal to make the balance sheet look stronger than it actually was.

LB was unable to find a US law firm that would provide it with an opinion letter permitting these transactions be accounted as sales (as oppose to financing transactions) under US law. Therefore, Lehman Brothers conducted its Repo 105/108 transactions under the aegis of an opinion letter that Linklaters, a London based law firm, wrote for Lehman Brothers under UK law. Accordingly if US based Lehman Brothers entities wished to engage in a Repo 105/108 transactions the transferred their securities inventory to Lehman Brothers in order for Lehman Brothers to conduct the transactions on their behalf. (Valukas, 2010)

Market participants frequently inquired about the means by which Lehman Brothers was reducing its leverage. Lehman Brothers did not reveal its use of Repo 105/108 transactions but instead stated that lower leverage was made through the sale of less liquid assets. Lehman Brothers did its outmost to alleviate concerns and did not disclose
its comprehensive use of Repo 105/108 transactions to rating agencies, investors, regulatory authorities or other market participants. (Valukas, 2010)

<table>
<thead>
<tr>
<th>Leverage Ratios</th>
<th>(USD bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reported</td>
<td>Q4 07</td>
</tr>
<tr>
<td>Total assets</td>
<td>691</td>
</tr>
<tr>
<td>Total equity</td>
<td>22.49</td>
</tr>
<tr>
<td>Gross leverage</td>
<td>30.7x</td>
</tr>
<tr>
<td>Net Leverage*</td>
<td>16.2x</td>
</tr>
</tbody>
</table>

**Actual**

<table>
<thead>
<tr>
<th>Repo 105 amount</th>
<th>38.6</th>
<th>49.1</th>
<th>50.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross leverage</td>
<td>32.4x</td>
<td>33.6x</td>
<td>26.3x</td>
</tr>
<tr>
<td>Net leverage</td>
<td>17.9x</td>
<td>17.4x</td>
<td>13.9x</td>
</tr>
</tbody>
</table>

*Table 1*

Lehman also did not follow the market norms in pricing financial derivatives. Usual business practices such as marking to market (valuing a financial derivative to its market value) were disregarded by Lehman Brothers. Their explanation was that there was no market for derivatives in question, and that it was therefore impossible to evaluate them by marking to market. Instead Lehman chose to retain the original value of the derivatives in their books, or performing inadequate write-downs on them that where far smaller than the market norm. (Einhorn, 2008)

### 5.4 Lehman's Liquidity

According to Lehman Brothers their liquidity pool consisted of “cash equivalents, G−7 government bonds and U.S. agency securities, investment grade asset−backed securities and other liquid securities” *(Lehman Brothers AR - 07, 2007)*
The liquidity pool was intended to cover expected cash outflows for 12 months in a stressed liquidity environment and was readily available to mitigate the loss of secured funding capacity. (Valukas, 2010) (10-Q, Lehman Brothers, 2008)

Contrary to the Lehman Brothers definition the pool also consisted of essentially illiquid securities. CDOs included in the liquidity pool were marked at 100 (par), despite third-party pricing vendors marking them at ~50 or lower. These were priced, underwritten and structured by Lehman Brothers themselves and almost impossible to sell as the market was virtually dead. (Valukas, 2010)

Certain securities included in LBs liquidity pool were posted as collateral for LBs clearing banks. After the failure of Bearn Stearns, clearing banks started requiring larger haircuts on collateral to cover intraday exposures. (Valukas, 2010)

Due to the market condition at the time and LB’s largely overvalued collateral its clearing banks required larger and larger haircuts, at times only accepting cash. The posted

![Reported liquidity by ability to monetize](image)

*Figure 8*
collateral was still included in LB’s liquidity pool despite most of the assets being locked up with its clearings banks and not disposable by Lehman Brothers. (Valukas, 2010) On September 12th Lehman Brothers reported a liquidity pool of USD 32.5bn. USD 19bn of it attributed as collateral for clearings banks. A majority of the remaining assets in the liquidity pool were also encumbered or otherwise illiquid. (Valukas, 2010)

Figure 6

The highly monetizable proportion of the liquidity pool on September 12th, was only USD 1.5bn (0.23% of total assets), with an estimated USD16bn additional liquidity required to open for business the coming Monday. (Valukas, 2010)

5.5 THE GENERAL MARKET CONSENSUS REGARDING LEHMAN BROTHERS

Lehman Brothers were very non transparent in their actions leading up to the firm’s collapse. They did everything in their power to maintain confidence from the market in order to retain access to its important funding sources. The firm did so to such an extent that many of their proceedings are questionable, to say the least.

The general market consensus of the state of Lehman Brothers in 2006 and 2007 was that the company was indeed not only healthy, but one of the strongest players “on the street”. Rating agencies deemed Lehman Brothers an excellent company in terms of risk profile. (Fahey et al., 2007)

<table>
<thead>
<tr>
<th>Credit ratings (year end)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008 (May)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short term</td>
<td>Long term</td>
<td>Short term</td>
<td>Long term</td>
<td>Short term</td>
</tr>
<tr>
<td>Standard &amp; Poor’s</td>
<td>A-1</td>
<td>A+</td>
<td>A-1</td>
<td>A+</td>
</tr>
<tr>
<td>Moody’s</td>
<td>P-1</td>
<td>A1</td>
<td>P-1</td>
<td>A1</td>
</tr>
<tr>
<td>Fitch Ratings</td>
<td>F-1+</td>
<td>A+</td>
<td>F-1+</td>
<td>A+</td>
</tr>
</tbody>
</table>

Table 2 - (Ratings are specific for each rating agency)

As the above table shows Lehman retained a high rating for a long time leading up to its fall. In 2007 Fitch Ratings not only affirmed Lehmans short term rating but even
upgraded Lehman’s long term credit rating from A+ to AA-. This happened despite the fact that the subprime crisis had already begun, and Bear Stearns, the investment bank with the most similar business model to that of Lehman Brothers, had recently been acquired by JP Morgan Chase.

According to Fitch Ratings the key factors contributing to the upgrade were;

- carefully executed expansion with subsequent improvement in revenue diversification
- stability of management
- reduced reliance on short-term funding
- stable capital levels and
- increased diversification of funding sources

Further, Fitch Ratings deemed Lehman's and Funding profile as “Excellent” saying that their funding sources are diversified to minimize reliance on any one liquidity provider as well as geographic diversification to minimize refinancing risk. (Fahey et al., 2007)

- Overall liquidity considered as structured so that even in a severe liquidity event the core balance sheet supporting its business would not have to be reduced for pure liquidity reasons.
- Risk Management - “Among Best in Class” - High market risk appetite, but in line with peers.

Fitch also stated that Lehman Brothers had:

- Strong financial performance
- Return on average equity generally above peer averages
- Strong management of balance sheet exposures

5.6 The Last Days of Lehman Brothers
In the period before their collapse Lehman Brothers did do many things to avoid their impending doom, however all those things happened to late. The measures Lehman took to avoid collapse were good methods, methods that are often used by firms in a much stressed condition. Lehman tried to raise new capital to refund itself and managed to raise USD 17.5 billion dollars in the period between July 2008 and September 2008. It was
however not enough to recapitalize the firm. Lehman also attempted to create a spinoff company, “SpinCo”, which would include 80% of the illiquid and otherwise distressed commercial mortgage based assets and thereby remove them from Lehman’s balance sheet. This was also unsuccessful.

Further they sought partners to acquire the firm. In the three months prior to Lehman’s collapse approximately 30 different private equity and sovereign wealth institutions were negotiated with about a potential acquisition of, or investment in, Lehman Brothers to avoid their bankruptcy. The discussions were mostly premised on a separation of LB’s commercial real estate assets. The most promising negotiations were held with Bank of America and Barclays, just two days prior to Lehman’s collapse. Bank of America were almost ready to seal the deal when Merrill Lynch approached them and got the deal instead. With Barclays a deal was even closer. Barclays had agreed to acquire Lehman Brothers but needed approval from the Financial Services Authority (FSA) and the UK Treasury, approval that they did not receive. Lehman was informed of this on Sunday, less than 24 hours before their collapse. (“CSI Lehman-Barclays,” 2010)

6 CONCLUSION

Lehman Brothers CEO, Richard Fuld stated in an interview that the collapse of Lehman Brothers was due only to present market conditions and that Lehman was simply a casualty of the crisis. The fact that Lehman Brothers tried as hard as they did to hide their actual financial condition and the business practices they endorsed, especially when all other investment banks were involved in similar business practices, is a clear indication that they knew their actions were not for the greater good of the firm nor the general economy. The incentives of large returns greatly overshadowed the enormous risks that accompanied them indicating that the moral hazards of flawed incentives for top management were large with Lehman Brothers. The short term incentives to show profits to the board and shareholders even in a stressed market environment played a large role in what eventually caused the collapse of the firm. These compensation plans were in turn designed by a highly independent board of directors without sufficient insight in the firm’s actual financial condition. Had the board of directors had better insight in the firm, perhaps by including more executive members from different areas of the firm, the
compensation plans might have provided more long term incentives for executives, and to a larger extent taken risk accumulation into account.

To avoid this type of behavior in the future the nature of compensation plans for top executives should be overlooked to ensure that executives are rewarded for long term stability and profitability rather than short term returns. Also, risk accumulation should be included as a factor when deciding compensation.

The composition of the board of directors in financial firms should also be overlooked. As studies have shown that firms with higher institutional ownership and an independent board of directors fared worse during the financial crisis, a more integrated board of directors with less influence from institutional shareholders might help to improve responsibility in the firm and ensure more long term goals and incentives for executives.

A study of whether or not these types of measures have been implemented today and what effect they have had would certainly add to the field of how to avoid moral hazards in the financial sector.

As previously mentioned, all investment banks were involved in the mortgage backed securities market and operated similarly to Lehman Brothers. A study of whether Lehman Brothers business model deviated significantly from its peers would be an interesting area to study and could provide insight in whether or not Lehman was, as Richard Fuld said “just a casualty” of the crisis and if they had not collapse another investment bank would have. By performing an empirical study of certain key ratios of investment banks this could most likely be answered. Also, analyzing changes of the financial industry today compared to those prior to the financial crisis would provide an indication of whether this issue is being properly dealt with, reducing the risk of corporate governance creating moral hazards in the future.

The market condition at the time certainly played a role in the collapse of Lehman Brothers, but ultimately it was the actions and business decisions of the firm that led to their collapse. Lehman’s employed corporate governance practices were deficient in communicating risk limit breaches and liquidity positions. Their compensation plans for top executives created incentives to take on excessive risk to earn short term profits, but also jeopardizing the long term stability of the firm. Lehman’s business choice of stockpiling large asset positions on their balance sheet created huge illiquid asset holdings that became impossible to sell, because of a dried up market. Under no
circumstances did Lehman want this information to become apparent to the market. Instead they attempted to fool the market, to maintain a charade displaying Lehman’s as solid, with assets no worse than any of its competitors, and an ability to turn profits even in stressed market conditions. It was all a desperate attempt to maintain the all-important confidence from the market, confidence which if lost, would certainly lead to its collapse. It was however a charade they could not sustain, and eventually the market understood the true condition of the firm. When Lehman finally attempted to fix its issues it was far too late and conventional methods did no longer work.

“If you get into a position where you’re late, then all of your choices are bad and all the classic avenues you can use to make yourself stronger make you look weaker. That’s how you get to the point of no return.” – Timothy F. Geithner

Eventually Lehman could no longer maintain the confidence from the market and lost its vital funding sources. Ultimately, Lehman Brothers collapsed due to insufficient liquidity.

Ironically, if Lehman had uncovered their actual financial condition, the very thing they feared the most, and dealt with the problems by the book, they would likely have instilled more confidence in the market. A move that could potentially have saved them from collapse.


7 REFERENCES

The fall of Lehman Brothers


