A CONSERVATIVE INVESTMENT APPROACH AS REMEDY FOR FINANCIAL CRISES:

USING VALUE INVESTING TO INVESTIGATE THE DOT-COM CRISIS AND THE GREAT RECESSION.

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A thesis submitted for the degree of
Master of Arts

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Word count: 14939
January 3rd, 2021

ABSTRACT: Research has shown that major causes of financial crises, like leverage and the overvaluation of financial assets, are due to the recurring problem of excessive financial risk-taking in financial markets. This thesis examines whether using a more conservative investment approach could make financial crises less likely - and to do so, I focus on value investing as the example of a conservative investment approach. Value investing is a small, but persistent niche in the financial markets, whose core ideas are inversely correlated to some of the main causes for financial crises. It cautions against large amounts of debt, argues for conservatively valuing financial assets, and warns that humans are fallible beings that don't always behave rational in financial markets. Using the dot-com crisis and the Great Recession of 2007-2009 in the United States as study cases, I find that there is compelling evidence that a conservative investment approach can potentially make financial crises less likely by reducing exposure on over-leveraged assets, avoiding overvalued assets and counter the misleading assumption of human infallibility in the financial markets.

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CHAPTER 1: INTRODUCTION

The first decade of the 21st century was historic for anyone interested in financial crises in the United States. First, the dot-com bubble deflated in the first year of the third millennium. Seven years later the financial world was teetering on the brink of collapse. The first one was a speculative bubble in IT-related assets. The second, the subprime mortgage crisis, was a leverage fueled real estate bubble that created the Great Recession. These two high-profile crises have spurred economists and government officials to find better answers to why and how financial crises happen.

In theory, these financial crises were at least partially preventable. Among the most important leading causes of the financial crises were excessive leverage, gross overvaluation of assets and the human tendency to overestimate its ability to assess all critical factors to correctly value financial markets. By that, a crisis happens because many players in the financial markets, be it individual investors, financial institutions or funds, acted not conservative enough in basic risk assessments concerning valuing assets, using leverage and judging financial markets.

This thesis investigates whether using conservative investment approaches could have helped financial markets prevent these leading causes of financial crises. The research question is:
Why can conservative investment approaches make financial crises less likely?
The three causes that will be investigated with regard to this question are leverage, financial risk and human fallibility.

To answer the research question properly, a specific example of a conservative investment approach will be used, named value investing. Value investing has existed for a long time and has a long record of being a vocal opponent against some of the practices that have been proved to help cause financial crises. The dot-com crises and Great Recession will be used as cases to see what value investors proposed to do in the run-up to these crises compared to what actually happened.

In conclusion, the analysis shows that value investing, as a conservative investment approach indeed has the potential to make financial crises less likely in the area of the three plausible explanations. Especially, in the areas of leverage and financial risk-taking in the form of overvaluing assets.

CHAPTER 2: BACKGROUND

Financial crises are devastating socio-economic events. In the 21st century the two biggest crises have been the dot-com bubble of 2000-2001 and the subprime mortgage crisis of 2007-2009, which turned into the Great Recession. The dot-com bubble was caused mainly by overly optimistic financial markets during the 1990s in response to the rapid growth of the internet and its increased importance (Kindleberger, 2005, p.161-162). In 2000, the bubble in the overvalued financial markets deflated and the U.S. entered a recession. The U.S. recovered relatively quickly from the dot-com crisis and subsequent recession. However, a housing boom, caused housing prices to rise to unsustainable levels. Combined with lots of debt being taken on by financial institutions, it caused the subprime mortgage crisis of 2007. This turned into a financial panic in 2008 and the U.S. entered the biggest economic downturn since the Great Depression. This crisis caused enormous economic damage, both on a systemic level as well as for many individuals (Rich, 2013)

These two crises created renewed interest in financial crises as well as the appreciation of some older works on the topic[1]. This renewed interest has greatly enhanced our understanding of why financial crises happen and what underlying causes create them.

Financial Crises have been a recurring issue in human society for centuries. Whether caused by currency debasement, sovereign debt, or banking institutions, financial crises have been a recurring theme in world history (Reinhart & Rogoff, 2009, pp. xxv-xxvii). While financial crises happen frequently, they do not happen regularly. The difference between 'frequently' and 'regularly' here is financial crises will *surely happen* in the future, but *not at set times*. A country might have no meaningful financial crises for decades only to get two in one decade thereafter. Another country might experience a financial crisis every decade like clockwork for 50 years only to be spared from one the next 5 decades. But when a financial crisis hits the consequences are usually devastating for the stricken country as well as its citizens caught in the crosshairs (Reinhart & Rogoff, 2009, pp. 224-225;228-230).

[1] The works of Walter Bagehot and Hyman Minsky received a lot of renewed interest during and after the Great Recession of 2007-2009. Charles Kindleberger work "Mania's, Panics, and Crashes" saw a lot of revisiting as well.

Value Investing

This thesis will look at value investing as the example of a conservative investment approach. Value investing originated from Benjamin Graham with his authoritative work 'Security Analysis' (1934), which was the first scientific book on security analysis (Morris, 2015, pp. 175-176). His aim was to write a book that would teach people how to invest with scientific rigor so that a crash like the one in 1929 would not be repeated (Graham & Dodd, 1940, pp. ix-x). When the memories of the 1929 crash and World War II started to fade in the 1960s, so did value investing. The approach was deemed too conservative and rigorous for many as investors started to advertise more novel ways of investing with the promise of getting rich quick (Hubbart & Palia, 1999, pp. 1131-1133).

Proponents of value investing have long argued for principles and approaches that are usually not followed in the run-up to a financial crisis. Examples are value investors calling for low levels of leverage, conservative valuations for securities and caution for overconfidence in financial markets.[2]

In the multi-trillion-dollar financial markets, value investing is just a small niche. In the early 2000s, value investor Bill Ruane estimated that 5% of all professionally managed money was managed by value investors (L. Lowenstein, 2004, p.20). However, Ruane's estimate leaves out individual investors. It is highly unlikely that individual value investors would constitute a larger share of the market than professional value investors. Therefore, if we use Ruane's estimate as a proxy we can derive that 5% of the total market value in the early 2000s was managed by value investors, even though that estimate is likely to be on the high end. If the estimate of 5% would still be justified the total size of value investing in 2020 would be approximately $1.75 trillion as shown in Table 1.

[2] See: Buffett (letters to shareholders 1977-2019) Graham (1940, 2003), Klarman (1991), Kaufman (2008) and Schloss (1993, 1994).

	1990	1995	1999	2000	2001	2002	2005
Total value of U.S. stock markets (in trillions of $)	3,09	5,14	14,78	15,11	13,98	11,05	17,00
Managed by value investor if share would be 5%	0,15	0,26	0,74	0,76	0,70	0,55	0,85
	2007	2008	2009	2010	2015	2019	2020 (as of 30/6)
Total value of U.S. stock markets (in trillions of $)	19,92	11,59	15,08	17,28	25,07	37,69	35,50
Managed by value investor if share would be 5%	1,00	0,58	0,75	0,86	1,25	1,88	1,78

Table 1: Value of U.S. stock market and estimated share of value investing (Own work based on literature). [3]

If we add up a selection of the biggest institutional value investing funds and companies their total market cap/assets under management is a little shy of $800 billion (see Table 2). I constructed Table 2 by making a summary of some of the most well-known and, most importantly, biggest firms. Its main aim is to show that the estimate of value investing being 5% of the market is definitely not too low. It is important to note that Table 2 is an incomplete overview of all value investing firms and funds. Especially as this selection does not include smaller value funds and the combined assets of individual value investors. These latter two groups are impossible to quantify.

Value investing fund/company	Market captialization/ value of fund as of or closest to 30/6 2020 (in billions of $)	Source:
Berkshire Hathaway	500	Zacks, (2020)
Oaktree Capital	140	Oaktree Capital, (2020)
Vanguard Value Index FundsAdmiral Shares	95	Best, (2020)
The Baupost Group	32	PrivateFundData, (2020)
Gotham Asset Management	8	WhaleWisdom, (2020)
Pershing Square Holdings	11,5	Pershing Square Holdings, (2020)
Greenlight Capital	2,6	Parman, H. & Fineman, J. (2020)
Tweedy Browne	10,8	Tweedy Browne, (2020)
Total	799,9	

Table 2: Overview of largest Value investment firms and funds (Own work based on literature).

[3] Sources from Worldbank, 2018; Siblis Research, 2020. Table made by author

CHAPTER 3: LITERATURE AND THEORY

3.1 CONCEPTUAL FRAMEWORK

3.1.1 Value investing as a conservative investment strategy

The clearest definition of a conservative investment approach is a strategy that focuses mostly on preserving the principal amount of the invested capital (the value) as opposed to more aggressive growth strategies focused on achieving above market returns (Gad, 2019). There are many ways to achieve this goal.

Examples are the popular approaches of "dollar-cost averaging" and investing in low-cost index funds. The first employs a method where the investor is free to choose his preferred security, for example common stocks, but limits himself by buying a fixed amount every month or quarter. In this way, the investor will mitigate the risk of buying securities at overvalued prices (Graham & Zweig, 2003, p. 118). The strategy of investing in low-cost index funds, limits an investor even more. One just buys a low-cost index fund of, for example, the S&P 500 and keeps one's money in the index fund for the long-term (Bogle, 2017, pp. xv-xvi). Both are well-known conservative investment approaches that have performed well. However, the main aim of these strategies is to mimic the average return of the markets at a minimal cost. They are designed to be agnostic regarding the future of financial markets.

For this thesis, a conservative approach that more actively invests in the markets and values companies is needed. In effect, this is an approach with a stronger opinion and theory on how financial markets behave and operate. A conservative approach that fits this description well is called value investing. Value investing is a good approach to use as it is a holistic investment strategy concerned with both protection of principal as well as generating solid investment returns. Below, value investing and its theoretical underpinnings will be discussed.

Value investing is grounded in one **key principle**. Warren Buffett stated it best in 1984 when he tried to explain value investing to its critics: "The common intellectual theme … is this: they [value investors] search for discrepancies between the *value* of a business and the *price* of small pieces of that business in the market" (Buffett, 1984).

This idea is the philosophical underpinning of value investing in theory and practice. Graham called it paying less than *'intrinsic value'*, which is the phrase that will be used from now on (Morris, 2015, p. 165).

Figure 1 gives a general overview of the value investing theory and its main ideas, which are all derived from the 'intrinsic value' principle.

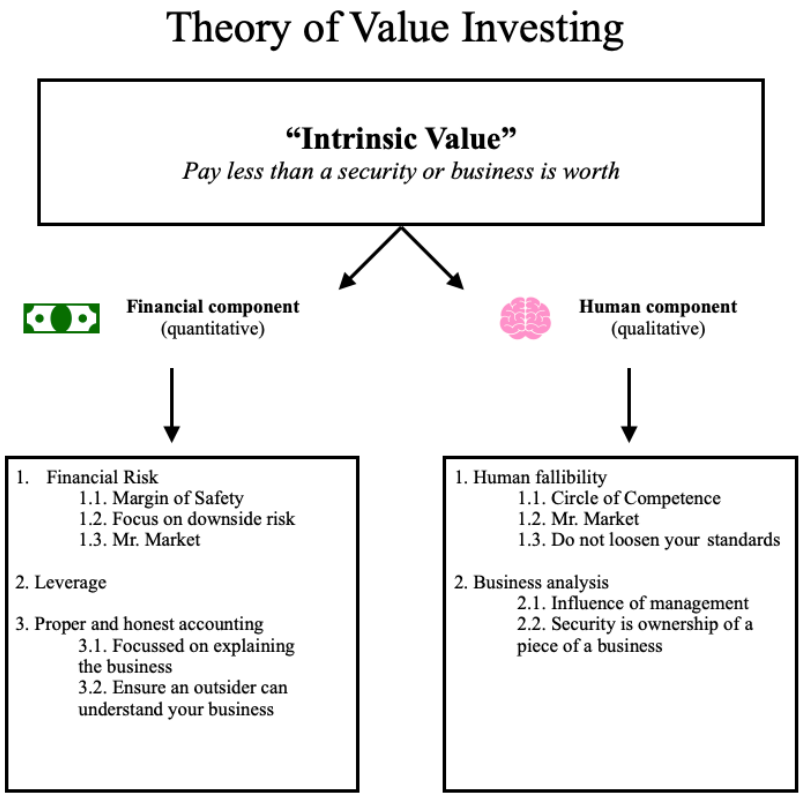

Figure 1: The Theory of Value Investing (Own work based on literature).[4]

A two-legged theory

When investing in a business or security, it might sound redundant to call out both the human and financial part of investing. However, the distinction between the two is not universally accepted. Value investing acknowledges security analysis is part art, part science (Klarman, 1991, p. 104). Most people will recognize the 'science' part in finance where balance sheets and cash flow statements need to be analyzed, economic data interpreted and leverage ratios need to be calculated. The need for thorough financial analysis when buying securities or businesses is a widely accepted principle.

[4] Sources used for making the framework are mainly from Buffett (letters to shareholders 1977-2019) Graham (1940, 2003), Klarman (1991) and Schloss (1993, 1994).

The focus on the human component, and especially our own fallibility, is the more novel contribution of value investing. Specifically, because the assumption of human fallibility runs counter to the notion of economic rationality, the bedrock of economics and finance. Value investing dismisses economic rationality as an *ever-present* trait in human and institutional actors (Kaufman, 2008, pp. 382-392). They agree that humans aim to behave rationally, but fail to do so a substantial amount of time. A good example of human fallibility are of course financial crises. These events per definition defy the assumption of rationality. The dot-com bubble that burst in 2000 might be the best contemporary example for decades to come[5].

"Mr. Market" and other key concepts

Value investing is built on the premise that financial assets are not always priced efficiently, it is one of the original ideas of Graham that markets are not always efficient. He used the analogy of Mr. Market to describe the idea that defined how value investing saw financial markets. Mr. Market is Graham's analogy for the continuous movement in prices in financial markets. Mr. Market is identified as the 'persona' of financial markets. Graham describes the concept as follows: "One of your partners, named Mr. Market, is very obliging indeed. Every day he tells you what he thinks your interest (in a stock or business) is worth … Sometimes his idea of value appears plausible and justified by business developments and prospects as you know them. Often, on the other hand, Mr. Market lets his enthusiasms or his fears run away with him, and the value he proposes seems to you a little short of silly." (Graham & Zweig, 2003, p. 204-205)

The Mr. Market approach argues that one should not blindly trust the markets prices, but instead see them as a useful indication to determine whether the market in general is overly optimistic or overly pessimistic (Klarman, 2000).

The concept of Mr. Market argues the opposite of established economic theories like the Efficient Market Hypothesis (EMH). Proponents of the EMH believe that financial markets are based on complete and accurate information. Value investors are more concerned with the valuation of an asset individually compared to what the market says it is worth. If the price of an asset drops substantially below the value the investor determined it was worth, the value investor will happily buy the asset (Graham & Zweig, 2003, pp. 197-200; 205-206). An investor

[5] Roger Lowenstein's "Origins of the Crash" and Jason Zweig's commentary in the revised edition of Graham's "Intelligent Investors" hammer this point home.

believing in the EMH is more likely to avoid an apparently undervalued asset as he is wary that the drop-in price shows that the all-knowing markets have a better insight or more information than he does (Malkiel, 2011, pp. 508-510).

A key concept that is related to Mr. Market is the *"circle of competence"* coined by Buffett. It is a simple proposition that one should not invest in financial products or businesses someone does not understand (Buffett, 2000). The founder of IBM, Thomas Watson Sr. summarized this idea the best: "I'm no genius. I'm smart in spots, and I stay around those spots.". (Kaufman, 2008, p. 65). It is a practical addition to the Mr. Market concept as the circle of competence underscores the belief that one cannot know every section of financial markets. Therefore, you should not invest in a sector you do not know enough about, even if others make large profits by investing in that sector.

Two concepts of the financial component of the theory are worth mentioning. The most important the *"Margin of Safety"* (MoS). In short, Graham argues that whenever someone buys a security or business there should be a substantial discount between price paid and determined value of the investment. The MoS argues the discount should be substantial in a way that your downside risk, or loss of principal, is limited (Graham & Zweig, 2003, pp. 512-515). This concept is not only a cornerstone of prudent investing, but also another example why security analysis is not a purely quantitative exercise. Human judgement is involved to decide what MoS is satisfactory.

Lastly, we need to mention the concept of *"leverage"*. Leverage, or debt, is a straightforward and much used instrument in business and finance. The contribution of value investing on this topic is straightforward, but important in that they explicitly warn for the adverse effects leverage can have in business and finance. Especially, large amounts of leverage. Linked to the concepts of MoS and downside protection, many leading value investors have cautioned for taking on a lot of debt. (Graham & Zweig, 2003, p. 53; Schroeder, 2009, pp. 437; 447)

3.1.2 Consensus on the cause of Financial Crises

Over the years a strong consensus has developed regarding why and how financial crises arise. A few main reasons for financial crises are commonly agreed upon. This thesis has grouped them in three categories: Financial, Psychological and Regulatory. Individual causes of financial crises can be usually placed in one of these three categories as seen in Figure 2.

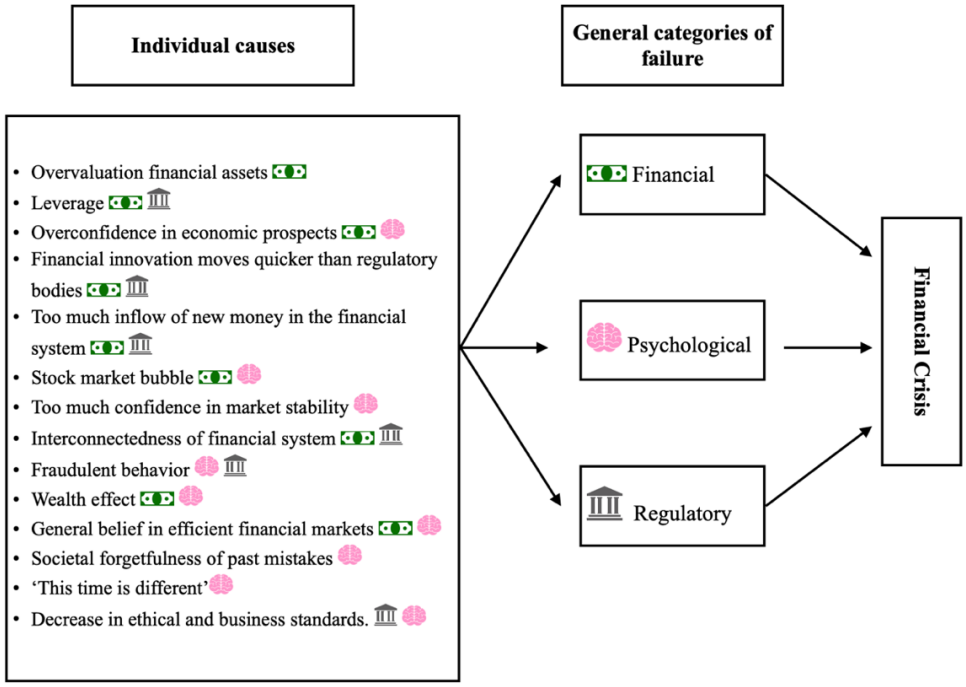

Figure 2: Identified causes of financial crises (Own work based on literature).[6]

The most important cause of all in general is *'excessive leverage'* within an economy or specific industry. Whenever there is an abundance of credit outstanding within an economic system it easily causes bubbles and a subsequent bust when overleveraged borrowers default (Reinhart & Rogoff, 2009, pp 291-292; Kindleberger, 2005, pp. 25-29; Minsky, 2008, pp. 232-238, 268-269).

Secondly, human nature also has a large influence in causing financial crises. For example, stock market bubbles during a period of economic progress or failure to pay attention to market excesses, fraud and instability within markets. People get euphoric or start trusting the mood of the market blindly, without analyzing the underlying fundamentals (Dalio, 2018, pp. 14, 17; Kindleberger, 2005, pp. 10-14).

Thirdly, financial crises are partly caused by failures within the regulatory system. For example, due to slow implementation of new rules or easy regulation regarding amounts of debt companies, investors or countries can take on (Reinhart & Rogoff, 2009, pp. 277-278, 281-282,

[6] The input for this chart comes from the works of: Dalio (2018), Kaufman (2008), Kindleberger (2005), Minsky (2008), Reinhart & Rogoff (2009), Roubini & Mihm (2011) and Shiller (2008).

287-290; Roubini & Mihm, 2011, pp. 213-215; Shiller, 2008, pp. 20-23) It is important to note that it is always an interplay between a plethora of individual issues that cause a financial crises.

The overview above provides a synthesis of the most common causes identified in the literature. This synthesis above will be used in combination with value investing in the analysis. For convenience sake, when speaking about this body of literature later on it will be referred to as the **'consensus'.**

3.2 PLAUSIBLE EXPLANATIONS TO THE RESEARCH QUESTION

3.2.1 Linking the theory on financial crises and value investing

The main difference between the academic literature on financial crises and value investing is that the former mainly revolves around macroeconomics, as financial crises are macroeconomic events, while value investing is predominantly focused on microeconomics. This is potentially problematic when answering the research question as value investing will be used to see if the likelihood of financial crises can be reduced.

For example, value investing has nothing special to say about the interest rate policy of the Federal Reserve or the inflow of money into the U.S. financial system from abroad. These are macroeconomic events that in the past have contributed to the occurrence of financial crises. Value investors are not agnostic regarding factors like interest rates, money inflows or currency crises. On the contrary, value investors have in the past been very vocal about these kind of factors (Loomis, 2013, pp. 227-235; Marks, 2019). On a whole, there is no indication that value investors have an intellectual edge in calling out whether these 'macro factors' are good or bad for the economy or whether they might trigger a financial crisis.[7]

There are, however, other factors and causes of financial crises that can be connected to value investing. Examples are lax industry regulation, excessive leverage, overvaluation of assets and inefficient markets. In principle, these are still 'macro factors' that can contribute to causing a financial crisis. However, these individual factors are solidly based in the behavior of the individual players in financial markets themselves as opposed to the 'macro factors' mentioned earlier.

[7] An example is Buffett's repeated acknowledgement he has been wrong with his predictions on interest rates and he feels he has not good insight to know what interest rates will do in the future he said in an interview with Andy Serwer (2020).

For example, one of the main reasons for the Great Recession was the excessive leverage taken on by banks, hedge funds and investors. This was a 'macroeconomic' trend that contributed to the crisis. However, this trend was caused by thousands of individual 'microeconomic' decisions by individuals or institutions. Where every bank had no choice but to follow the Federal Reserve's policy of low interest rates between 2001-2005 that fueled the housing boom, these same banks did have a choice how much leverage to use during this period. Which in turn resulted in banks with a relatively low-leverage ratio, for example, J.P. Morgan Chase and Wells Fargo, weathering the crisis relatively well while Bear Stearns and Lehman Brothers imploded (Sorkin, 2010, p, 81; Wells Fargo, 2009).

Thus, value investing is concerned with 'microeconomic decisions' an investor can make in the financial market. Value investing as a theory is agnostic about 'macro factors' that are determined by the market in aggregate, such as interest rates, as compared to individual choices, such as leverage. Value investing is instead laser focused on a rigid set of beliefs and concepts, as shown in Figure 1, which trump any other factors over which value investors believe they have no influence. The theory is therefore ideally positioned to help explain at least these causes of financial crises which are rooted in microeconomics.

3.2.2 Plausible Explanations

To answer the research question of this thesis, I derive three plausible explanations from Figure 1 and 2. When discussing value investing, Figure 1 aimed to summarize the theory into five main aspects. It consists of three financial components, financial risk, leverage and proper accounting; and two human components, human fallibility and business analysis. Out of these five there are three principles that are best suited as plausible explanations for the research question. "Financial risk", "Human fallibility" and "Leverage".

1. **Leverage:** The limited use of leverage is an important principle in value investing, but for this thesis it is arguably even more important with its link to financial crises. Because, as mentioned earlier, excessive leverage is a key cause for many financial crises. From Graham onwards, leverage has been viewed by value investing as toxic, dangerous and a key warning for systemic risk if used excessively in the markets (Marks, 2008).[8] Value investors have been wary of excessive leverage for a long time

[8] Dalio's *"A Template for Understanding Big Debt Crises"* is a recent authoritative work on leverage.

which coincides with the ‘consensus’ view that it is one of the main causes of problems in financial markets and businesses (Graham & Zweig, 2003, p. 513; Buffett, 2009).

Plausible explanation 1: If more people in the financial markets would have followed the approach of value investing to leverage the problem of excessive leverage in financial markets could have been reduced. If investors and financial institutions, especially in periods leading up to a financial crisis, would have followed value investing’s conservative approach to using leverage and always erring on the side of caution with regard to debt, the crises itself could have been way less severe.

2. **Financial Risk:** For value investing, buying and selling securities is strongly linked to the concept of intrinsic value. Value investing argues that investors should focus on their downside risk, their estimated possibility of loss, the independent assessment of a security regardless of market price and a sufficient MoS. Looking back at the ‘consensus’ view on the causes of financial crises we can see that these concepts are the opposite of some causes of financial crises. Like overvaluation of assets, overconfidence in rising market prices and buying securities without looking at the possibility of permanent capital loss (Dalio, 2018, pp. 14, 17; Kindleberger, 2005, pp. 10-14). For instance, many financial crises are caused by overvaluation and too much optimism in the future prospects of businesses and the macro-economy. The rules of the past seem to no longer apply during these times of euphoria and many will proclaim that ‘this time it is different’ (Reinhart & Rogoff, 2009, pp. 290-292).

   Plausible explanation 2: With value investing’s core principle of intrinsic value, mitigating financial risk when investing is of prime concern. Value investing’s approach of buying at a discount to intrinsic value, insisting on a large MoS and conservatively assessing your downside risk could have helped avoid excesses in the run-up to financial crises.

3. **Human fallibility:** Value investing believes strongly that humans are inherently flawed in financial decision making. As people influence each other, times of mass confidence or fear can result in irrational and illogical market situations. This core belief has resulted in concepts like Mr. Market, having a circle of competence and the idea that you should not loosen your standards if markets behave differently than expected. For

example, overconfidence in bubble periods and extreme fear is something that is present in most financial crises (Dalio, 2018, pp.17-19). Value investors have warned for these mass hysteria or panics. Be it Graham with his Mr. Market analogy or Buffett saying "Be fearful when others are greedy, and greedy when others are fearful." (Buffett, 1987). Furthermore, the concept of Mr. Market is the antithesis of the EMH that many mainstream financial players and academics champion and has been a contributing cause to financial crises.

Plausible explanation 3: Value investing believes that people are incapable of always being rational in financial markets. Value investing argues that people can become too euphoric or depressed about financial markets. Value investors also believe that people tend to overestimate their ability to assess novel investment decisions they are unfamiliar with, which can bring them or their firm in trouble when unforeseen risks surface. Value investing argues strongly against the EMH. Value investors reason Graham's Mr. Market analogy more accurately depicts the true nature of financial markets. If more people in the financial markets would approach the markets less as an infallible decision-making system, while being more aware of their own flaws in decision making, financial crises could become less likely.

3.3 EMPIRICAL METHODOLOGY AND STRATEGY

Based on the literature and theory, the best way to answer the research question is by studying a "crucial case". A crucial, or critical, case means that one researches a case that is either going to be most likely to prove or to disprove the theory or research question that is proposed (Bryman, 2016, p. 409).

The crucial cases chosen for this thesis are the financial crisis of 2000-2001 and 2007-2009. While in principle two separate cases, both will be used for the following reasons. Firstly, since this thesis aims at studying the years before a financial crisis hits, the period of analysis is relatively long. The initial key causes of the great recession of 2007-2009 already started to form in the 1990s. Secondly, some of the unresolved issues of the 2000 dot-com bubble actually contributed to the 2007-2009 crisis as well (Roubini & Mihm, 2011, pp. 31;65;72-74).

Moreover, both are excellent crucial cases. Firstly, because these two crises coincided with the most recent literature on value investing and an increased public posture of value investors, mainly due to the rise of digital communication. Secondly, at the Federal Reserve, FED chairman Alan Greenspan was a constant factor serving from 1987 till 2006, thereby presiding over the period during which both crises developed.

The focus is on the three plausible explanations outlined earlier. The aim is to investigate whether value investing can indeed reduce the likelihood of a financial crises regarding the causes described in the three plausible explanations. Figure 3 aims to explain where the focus of the research lies.

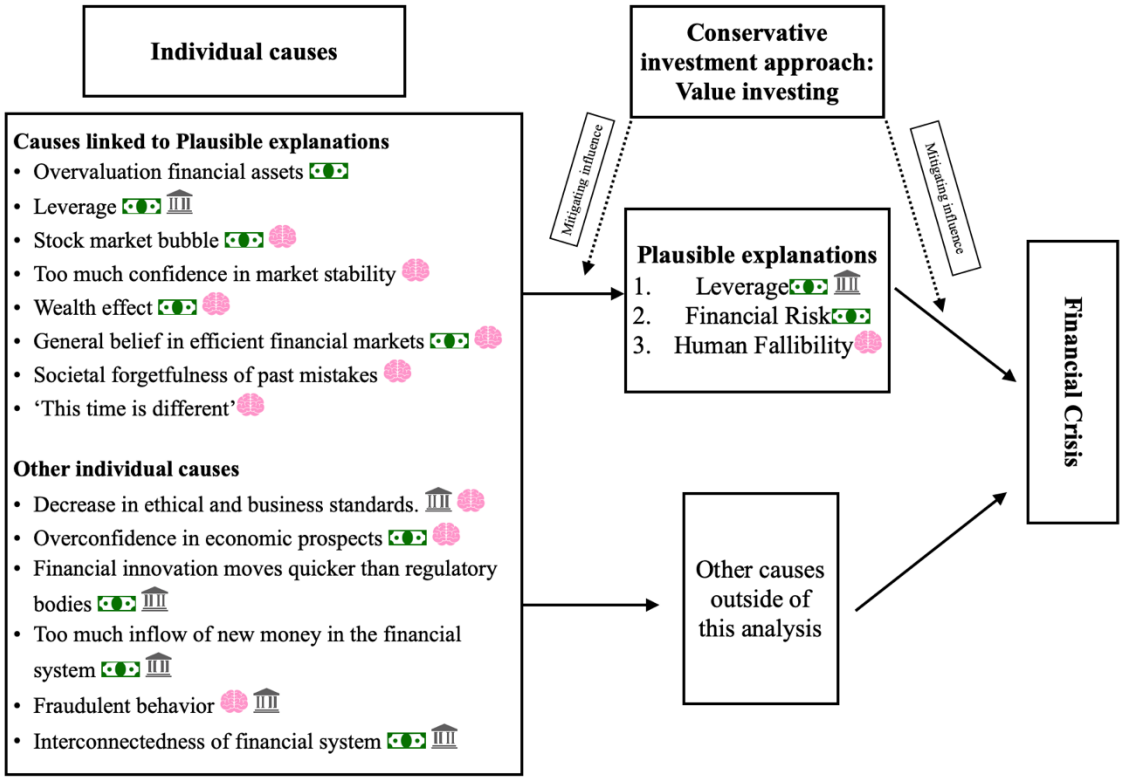

Figure 3: The potential relation between Value investing and Financial Crises (Own work based on literature).[9]

The figure shows the focus of the research. Both the dot-com crisis and the Great Recession were created by a combination of the individual causes stated above. The hypothesis of this research is that using value investing as an investment approach might partially mitigate the three big causes from the plausible explanations. In an ideal outcome, the empirical analysis will show that if financial markets would have used a more conservative framework like value investing, issues of leverage, financial risk and human fallibility would have been less likely to cause the dot-com bubble and Great Recession.

Therefore, in the analysis the three plausible explanations will be the main focus to investigate whether the difference in behavior between value investors and the rest of the financial markets was notably different in the run-up to the dot-com bubble and Great Recession.

[9] Individual causes based on same literature as figure 2.

CHAPTER 4: DOT-COM CRISIS

There was a long run-up to the financial crisis of 2000-2001. After a minor recession in 1991 the U.S. economy recovered quickly and turned towards unprecedented growth during the remainder of the 1990s. The technological boom of the internet, sustained economic growth and increased investing in the stock market are just a few reasons for investor enthusiasm and with that rising asset prices.[10] The result was a major stock market bubble, especially in, IT-related securities. Chart 1 shows the NASDAQ rising approximately 9-fold during the 1990s, only to decline more than 70% from its 2000 peak in 2002, sparking a recession. In turn, the S&P 500 also rose to unsustainable levels, albeit less so than the NASDAQ. The S&P 500 declined almost 50% from its high. This showcases the severity of the crash as the U.S. 500 most valuable companies apparently where worth 50% less in 2002 than they were just two years earlier.

Chart 1: NASDAQ and S&P 500 stock market returns during the dot-com bubble (Macrotrends, 2020).

[10] More underlying causes can be found in Lowenstein's "Origin of the Crash" and Shiller's "Irrational Exuberance".

4. 1 FINANCIAL RISK

4.1.1 The speculative bubble and value investing's response

There is widespread agreement that the dot-com crisis was caused in large part because of rampant speculation in financial markets. People became increasingly euphoric during the 1990s that the stock market would rise indefinitely as they believed that new internet companies would soon take over as the new U.S.' business leaders (Weller, 2002). This segment shows that value investing identified the overvaluation that helped caused the dot-com bubble. The case of Amazon.com will be used as an example.

As the markets rose, valuations of businesses and securities increased to unprecedented levels (Easton, 1999, pp. 1-4). Value investors found very few opportunities to invest. They passed upon all the new technology stocks that were offered to the market in unprecedented amounts (Pzena Investment Management, 1999). Finding businesses that fit the criteria of value investors was becoming increasingly harder. However, instead of relaxing their valuation standards, most value investors kept steady and only invested in businesses that fit their standards (Ceron, 2001; Greenberg, 1999). This meant they held more liquid assets during this boom period.

A good example of this attitude comes from renowned value investor Seth Klarman. His Baupost fund was only for 29% exposed to the U.S. stock market because it was generally so overpriced. He warned for the undiscriminating euphoria regarding the internet and the effect this new technology had on stock prices (Klarman, 1996). His warning was the opposite of the general sentiment in the market in 1996. But Klarman's contrarian stance was not because of some one-time special insight or a 'lucky call' on an overvalued market. Klarman was operating from a rigid value investing framework. He elaborates on this himself:

"We know the current mania will end badly; we do not know when. We will not stray from our rigid value investment discipline. We buy absolute bargains when they become available, and sell when they are no longer bargains. We hold cash when there is nothing better to do, and we hedge against the risk of a dramatic and sustained downturn in the market…" (Klarman, 1996).

Klarman is a good example of how value investors operated during the bubble period. While value investors knew they were missing some of the returns from the 'bull market' they reasoned the euphoric sentiment was not based on fundamental value.

Howard Marks proved the market overvaluation convincingly. He did a few valuation examples to show how excessively priced many IT-related companies were. For instance, Yahoo with a valuation of $119 billion being worth more than General Motors and Ford together. Marks finishes with a more expansive example that truly shows the irrationality in the market:
"…you could have bought America Online and Microsoft for $625 billion and gotten $25 billion of sales and $7 billion of earnings. Alternatively, for $635 billion you could have bought 70 industrial, financial, transportation and utility companies including Bank of America, Chubb, Federated Department Stores, Litton, Philip Morris, Ryder and Whirlpool and gotten $747 billion of sales and $43 billion of earnings…" (Marks, 2000)

Companies like Microsoft at least had a bright future ahead of them. Others like America Online were not only extremely hyped, but even fraudulent, and any investors using a value investing approach would have shunned these companies.[11] Marks' example truly shows the excessive valuation of IT-related securities at the height of the bubble. It also shows that value investors were able to identify and avoid the overvaluation and thereby the bubble

There was no MoS nor were you paying less than 'intrinsic value' for any of these hyped-up securities. In turn, it was nothing more than logical that value investors tried to protect their principal investment amount first, even if that meant keeping it invested in cash.

4.1.2 Amazon.com: A valuation case-study

To underscore the arguments above a more detailed example will be given to show how big the difference in approach between value investing and the consensus during the end of the 1990s truly was.

This example concerns Amazon.com which was a sincere internet company with a solid business model, honest reporting and a long-term business view. With this attitude it was an exception. Many internet companies actively hyped themselves up or even tried to deceive and lie to get private and institutional investors to believe their 'story' (Lowenstein, 2004, pp. 160-163). Most investors did not discriminate between promising start-ups and likely failures. Every

[11] Read the commentary by Zweig in *"The Intelligent Investor"*. Zweig gives dozens of examples on fraudulent and overpriced dot-com bubble companies.

internet company got a sky-high valuation, regardless of its prospects. Amazon stock as well was bid up by investors to prices unjustified by any normal business valuation.

Founded in 1994 it is arguably the best example of a 1990 internet company that survived the crisis and thrived afterwards. Furthermore, Bezos was one of the few that actually tried to deter investors from overestimating Amazon's chances of success. Bezos told his investors early on that Amazon's chance of failure was 70% (Stone, 2013, pp. 29, 35). In Amazon's annual report the first few pages are also dedicated to the company's focus on the long-term goals instead of profitability in the short-term (Amazon, 2000, p. 2-7). Amazon was really an exception in its aims and communication during the bubble period. On top of that, we now know, with hindsight, that Amazon had the right ideas and strategy to succeed.

As an example, let us look at Amazon's financial performance of 1999, the last year before the dot-com bubble deflated.

AMAZON.COM, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)

	Years Ended December 31,		
	1999	1998	1997
Net sales	$1,639,839	$ 609,819	$147,787
Cost of sales	1,349,194	476,155	118,969
Gross profit	290,645	133,664	28,818
Operating expenses:			
Marketing and sales	413,150	132,654	40,077
Technology and content	159,722	46,424	13,384
General and administrative	70,144	15,618	6,741
Stock-based compensation	30,618	1,889	1,211
Amortization of goodwill and other intangibles	214,694	42,599	—
Merger, acquisition and investment-related costs	8,072	3,535	—
Total operating expenses	896,400	242,719	61,413
Loss from operations	(605,755)	(109,055)	(32,595)
Interest income	45,451	14,053	1,901
Interest expense	(84,566)	(26,639)	(326)
Other income, net	1,671	—	—
Net interest income (expense) and other	(37,444)	(12,586)	1,575
Loss before equity in losses of equity-method investees	(643,199)	(121,641)	(31,020)
Equity in losses of equity-method investees	(76,769)	(2,905)	—
Net loss	$ (719,968)	$(124,546)	$(31,020)
Basic and diluted loss per share	$ (2.20)	$ (0.42)	$ (0.12)
Shares used in computation of basic and diluted loss per share	326,753	296,344	260,682

AMAZON.COM, INC.

CONSOLIDATED BALANCE SHEETS
(in thousands, except per share data)

ASSETS

	December 31, 1999	December 31, 1998
Current assets:		
Cash	$ 116,962	$ 25,561
Marketable securities	589,226	347,884
Inventories	220,646	29,501
Prepaid expenses and other current assets	85,344	21,308
Total current assets	1,012,178	424,254
Fixed assets, net	317,613	29,791
Goodwill, net	534,699	174,052
Other purchased intangibles, net	195,445	4,586
Investments in equity-method investees	226,727	7,740
Other investments	144,735	—
Deferred charges and other	40,154	8,037
Total assets	$2,471,551	$648,460
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 463,026	$113,273
Accrued expenses and other current liabilities	126,017	34,413
Accrued advertising	55,892	13,071
Deferred revenue	54,790	—
Interest payable	24,888	10
Current portion of long-term debt and other	14,322	808
Total current liabilities	738,935	161,575
Long-term debt and other	1,466,338	348,140
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.01 par value:		
Authorized shares — 150,000		
Issued and outstanding shares — none	—	—
Common stock, $0.01 par value:		
Authorized shares — 1,500,000		
Issued and outstanding shares — 345,155 and 318,534 shares at December 31, 1999 and 1998, respectively	3,452	3,186
Additional paid-in capital	1,195,540	298,537
Note receivable for common stock	(1,171)	(1,099)
Stock-based compensation	(47,806)	(1,625)
Accumulated other comprehensive income (loss)	(1,709)	1,806
Accumulated deficit	(882,028)	(162,060)
Total stockholders' equity	266,278	138,745
Total liabilities and stockholders' equity	$2,471,551	$648,460

See accompanying notes to consolidated financial statements.

Table 3: Statement of Operations and Balance Sheets of Amazon.com from its 1999 annual report (Amazon, 2000, pp. 33-34)

If we look at Table 3 from the lens of a value investor the conclusion is quite clear: a true value investor would have never invested in Amazon.com during this period. While the company showed amazing revenue growth through the years, its losses grew just as dramatically. On top of that, Amazon had a negative tangible book value (total assets minus goodwill and intangibles minus total liabilities).

Still, at the height of the bubble in 1999 Amazon's market capitalization topped $37 billion, when the bubble deflated Amazon's valuation dropped to below $5 billion (Lowenstein, 2004, p, 158). It was one of the most overvalued companies in the market and it took the company till 2007 to reach the 1999 valuation, which at that time was a lot more justified (Amazon, 2008).[12]

[12] While Amazon still had a lofty valuation at that price in 2007 the company was now solidly profitable and had more cash than debt.

Even if a value investor would have had the feeling Amazon would do very well in the future, he or she would not have invested a dime. The data backs this up. Table 4 is an example of how well the stock of Amazon.com performed compared to the stock picks from renowned value investing firms. The height of the bubble, at the end of 1999 is chosen as a start date till the end of 2001 when the U.S. was no longer in recession.

Company/Person/ Index	Stock/Index	31-12-1999	31-12-2001	Absolute Return	Sources	Justification for case
Technology Stock	**Amazon.com**	US$ 76,00	US$ 10,80	-85,8%	Macrotrends, 2020	-
Market Index	**S&P 500**	1469	1148	-21,9%	Macrotrends, 2020	Main index for 500 largest U.S. companies
Market Index	**Nasdaq Composite**	4069	1950	-52,1%	Macrotrends, 2020	Main stock Index with all IT-related stocks
Berkshire Hathaway	**Berkshire Hathaway**	US$ 36,60	US$ 50,50	38,0%	Macrotrends, 2020	As Berkshire Hathaway is one of the few publicly traded value investing company their stock is used in this comparison.
Berkshire Hathaway	**Coca Cola Company**	US$ 16,48	US$ 13,72	-16,7%	Berkshire Hathaway, 2000, p. 15; Macrotrends, 2020	Berkshire Hathaway's Coca Cola pick was made because it was their largest holding at the time.
Baupost Fund	**Chemfirst**	US$ 21,80	US$ 23,97	10,0%	Klarman, 1999; Chemfirst, 2000 & 2002	The Baupost fund pick was made because there was sufficient quality data for Chemfirst to make a good comparison.
Howard Marks	**Ford Motor**	US$ 14,00	US$ 8,99	-35,8%	Marks, 2000; Macrotrends, 2020	Howard Marks' pick was an example given by him as he and his firm do not publicly disclose their holdings. His Ford Motor example compared to Yahoo was done on January 2nd 2000. It therefore does fit the timeframe.
Michael Burry	**Apple**	US$ 0,34	US$ 0,33	-2,9%	Burry, 1999; Macrotrends, 2020	Burry's Apple pick is measured from a start date of 17/5/1999 as he did not file annual disclosure forms. The $0.34 start price is thus measured from May 17th 1999 and not 31/12/1999. While some may consider Apple a technology stock, it was not perceived as such during the dot-com bubble as it had been around for two decades already and was struggling during the 1990's precisely because it was seen as 'outdated'.

Table 4: Performance of the stocks of value investing firms compared to Amazon.com and the market (Own work based on literature).

In the end, all stock picks of the value investors outperformed Amazon.com and the technology-focused NASDAQ, while only Howard Marks' example of Ford underperformed the S&P 500. Surprisingly out of these value investing examples compared to Amazon.com the best performing, the stock of Buffett's Berkshire Hathaway, was available for all people that wanted to invest their money. During this period everyone could have bought Berkshire stock without restrictions or difficulties and made 38% in three years during a time when the dot-com bubble collapsed and the U.S. entered a recession. The example of Berkshire Hathaway's performance underscores that the general market sentiment that technology stocks would massively outperform 'old economy' stocks was false.

In conclusion, value investing had success in identifying the overvaluation in the market during the dot-com bubble. By sticking to their financial parameters in valuing companies instead of believing the narrative that the internet had changed the rules of valuing companies, value investor shunned these technology companies in favor of more ordinary, but undervalued firms.

Despite the pressure on value investing when it was underperforming due to the bubble, its conservative approach came out on top when the U.S. came out of the recession in 2001 as Table 3 showed.

4.2 LEVERAGE

While leverage was less a problem for investors and banks than it would be in the debt fueled Great Recession of 2007-2009, leverage almost brought down the financial system during the dot-com bubble (Financial Crisis Inquiry Commission [FCIC], 2011, pp. 47-48). In 1998, Long-Term Capital Management (LTCM) failed. LTCM is the most influential case as it could have been a warning for the market since its failure was 2 years before the height of the dot-com bubble. On top of that, LTCM almost created a financial panic among large financial institutions similar to the 2008 Lehman Brothers failure. Furthermore, value investors, most importantly Warren Buffett, played a sizable role in LTCM.

4.2.1 The example of Long-Term Capital Management

LTCM was founded by John Meriwether and a group of former Salomon Brothers employees. The investment strategy of LTCM was to focus solely on arbitrage trades (Lowenstein, 2001, pp. 19-22). The hedge fund operated from 1994 till the fall of 1998 when it spectacularly collapsed, even though its founders were all extremely intelligent, highly skilled in mathematics and quantitative finance (Lewis, 1999)[13].

Their business plan was to use the most state-of-the-art financial models and risk management formulae to create a portfolio of arbitrage positions. The firm would bet that the price of two securities, that were highly related to each other but were selling at a slightly different price, would converge. They did this by selling the most expensive security short and going long the cheaper security (Lowenstein, 2001, pp. 43-45). As the profit potential on such a trade was very low, LTCM used large amounts of leverage to increase their potential returns on these kind of arbitrage trades. To make these huge trades LTCM leveraged its capital up to 30-1 (Loomis, 1998; Lowenstein, 2001, p. 234). For every $3 million LTCM invested with its own capital it would use up to $97 million in debt.

[13] This article by Lewis describes the main figures in the LTCM drama and captures the era of the dot-com bubble well.

To make a bet using 30-1 leverage someone is basically betting that the investment will never lose more than 3% of its value as a larger drop would mean you are bankrupt. Value investors would argue it is impossible to be certain that an investment will not drop more than 3% during the period one is invested (Marks, 1998; Schroeder, 2009, p. 548). To value investors there is always the possibility of unexpected events that can make financial markets highly volatile. As Marks said in his account of LTCM in 1998: *"Volatility +Leverage=Dynamite"* (Marks, 1998). It caused value investor Seth Klarman to be very skeptical of the firm in 1994, the year LTCM was founded. Klarman was not only doubting LTCM's strategy he was mostly concerned with the large amounts of leverage they planned to take on to increase returns. "Given its (LTCM's) projected leverage, even a single serious mistake would put a "Major dent" in the fund's capital. Two Major errors at the same time, of course, would be catastrophic". (Lowenstein, 2001, pp. 59-60).

It is telling how in one sentence Klarman summarized LTCM's potential downfall when it had just been founded. 4 years later, Klarman would be proven right. There were other factors that led to LTCM's demise besides leverage, but leverage was the most potent causal factor (The President's Working Group on Financial Markets, 1999).

4.2.2 Munger and Buffett's involvement in the rise and fall of LTCM

Buffett, as CEO and Chairman of his own investment conglomerate Berkshire Hathaway first had to deal with Meriwether and his arbitrage group when they were still working at Salomon Brothers. Berkshire had a large investment in Salomon that was threatened. In 1991 Salomon almost had to file for bankruptcy due to fraudulent behavior of one of Meriwether's subordinates (Schroeder, 2009, pp. 473-483).[14] Buffett was brought in to become interim CEO of Salomon to restore trust in the firm, which was charged with fraud, and resolve the issue with the U.S. government. During Buffett's short tenure he stabilized the firm and prevented it from going bankrupt. Meriwether was forced to resign and with him most of Salomon's arbitrage group left to join Meriwether in starting LTCM (Lowenstein, 2001, pp. 20-21).

Over the four years that LTCM was in business, they had multiple encounters with Buffett. First of all, when LTCM came to him in 1994 to inquire whether Buffett was willing to invest in the firm. Charles Munger, Buffett's partner, said about this meeting:

[14] Schroeder's account of Buffett's involvement is described in detail in chapter 48 and 49.

"We thought they were very smart people." … ". But we were a little leery of the complexity and leverage. We were very leery of being used as a sales lead. We knew others would follow if we got in." (Schroeder, 2009, p. 545).

Buffett and Munger were mainly very uncomfortable with the high leverage of LTCM combined with their steadfast belief that they could not lose a substantial amount of money on their trades. LTCM never contemplated their portfolio could drop more than 20% (Loomis, 1998)

The next time Buffett was involved with LTCM came during its downfall. When during the summer of 1998 LTCM's portfolio started to fall dramatically and its capital dwindled, they made repeated calls on Buffett to invest in the fund on more generous terms or buy parts of the portfolio, but Buffett declined (Schroeder, 2009, p. 547). To him, the risk was still too high because of the enormous amounts of leverage. His MoS was not yet big enough. Only when LTCM was on the verge of failure in September 1998 did Buffett become interested. At this point LTCM had lost 90% of its capital, a stunning figure knowing that they considered a loss larger than 20% impossible (Schroeder, 2009, p. 545). With LTCM's capital down to less than a billion, from $4.7 billion at the start of 1998, Buffett was willing to pay a paltry $250 million for the complete portfolio of LTCM. It was a low offer, but at that point in time LTCM had little negotiating power, as it was on the verge of collapse (Lowe, 2000, p. 201; Lowenstein, 2001, pp. 202-204).

Buffett made this offer because his assessment was that LTCM's assets itself were solid. The problem was the leverage LTCM took on to increase their returns. As their assets declined during the fall of 1998, it meant these assets were actually becoming cheaper. One could buy them for less than intrinsic value and with a larger MoS. For a value investor like Buffet it made perfect sense to step into LTCM then. He could take over the fund for practically nothing and recapitalize LTCM with Berkshire's money, which had more than $13 billion in cash at the end of 1998 (Berkshire Hathaway, 1999). After the possible takeover Buffet thought that LTCM's positions would recover and he could profit handsomely. If LTCM's positions declined further, Buffett had the capital available to ride out the storm. On top of that, he funded only ¾ of the bid, with the rest coming from Goldman Sachs and AIG, ensuring that Buffett had ample protection of his principal investment, while he stood to gain a lot if the take-over went well (Loomis, 1998). In the end the buy-out led by Buffett failed and a group of banks put up money

under direction of the Federal Reserve to save LTCM and avoid a widespread financial panic that was feared to have the potential to topple the banks themselves (Lowenstein, 2001, 214-218).

LTCM, is the best example of overleveraging during the dot-com crisis. LTCM actually failed two years before the big bust arrived and could have served as a warning for the state of the market and the ease with which banks took on exposure from large clients. They thought their quantitative models were so sophisticated they could look for miniscule spreads between bonds or equities, make a huge leveraged bet and come out on top. They did not look for a MoS in their trades and combined with the leverage this caused a disastrous result for LTCM.

4.3 HUMAN FALLIBILITY

4.3.1 Attitude towards the 1990s bull market: EMH and Greenspan

The EMH has been the leading theoretical underpinning for how modern finance and academia view the financial markets. The EMH argues in essence that all financial assets are priced correctly at all times as they always reflect what is publicly known at that time (Shiller, 2000, p. 171) When the theory was formalized and popularized by Eugene Fama in the 1970s it became the bedrock upon which many other theories in finance would be based (Fama, 1970).[15] Universities, politics and economics all became convinced of the inherent truth of the EMH. The confidence in the idea that 'the market' was always right had big implications for investing as well as academia.

The EMH is also the one consensus financial wisdom that value investing has fiercely argued against (Klarman, 2005, pp. 561-562; Williams, 2008, pp. 10-17). Since, if the EMH were to be right, value investing would not exist and if value investors are able to consistently outperform an 'efficient market' the EMH cannot be correct (Buffett, 1985; Greenwald, 2005, pp. 9-11; Lowenstein, 2005, p. 3).[16] Value investors see crisis like the dot-com bubble and the Great Recession as precisely the events that debunk the EMH (Toarna & Cojanu, 2015, p. 387; Williams, 2008, pp. 13-14).

[15] Later on in his career Fama actually presented evidence that 'value' stocks actually outperformed the market over time, an apparent contradiction to the EMH. Read for example Fama & French: Value vs Growth: The International Evidence (1998).

[16] Burton Malkiel's "A Random Walk Down Wall Street" is one of the most popular recent works that argues in favor of the EMH and specifically tries to rebuke value investing..

When financial markets were priced increasingly higher during this period, believers in efficient markets saw the booming asset prices as proof that America's prospects in the new millennium would be great and that internet would truly revolutionize business. Many financial analysts argued that the boom of the 1990s would be the new normal (Malkiel, 2003, p. 28). As prices rose, more and more people, professionals and amateurs, came to believe that they should not miss out on a market that kept on rising. They reasoned that the market, in the aggregate, was right in its bullish course. The further the market rose, the more difficult they found it to disavow the market (Glassman & Hassett, 1999).

An example was FED Chairman Alan Greenspan. At the end of 1996, a few years before the biggest bubble madness, he spoke the words "*irrational exuberance"* when he tried to describe the stock market (Shiller, 2000, p. 3). However, when markets kept on rising, instead of doubling down on his, correct, assessment of irrational exuberance, Greenspan backtracked his argument. He turned more bullish on the market within a half a year of his comments as the markets kept rising (Shiller, 2000, p.14; Uchitelle, 1997). Greenspan himself has even said himself he thought his irrational exuberance call, basically stating that the markets were overvalued, was poor. In 2016 he said on this topic: *"If you rate me on my irrational exuberance forecast, I get a C,"*. (Russolillo, 2016). Greenspan conceded right after his forecast that he was wrong because the market kept on rising in 1997 and beyond.

Greenspan's attitude has everything to do with his belief in efficient markets as we can consider Greenspan a proponent of the EMH. Greenspan and many others that adhere to the EMH do not belief the market is right 'all the time'. They generally agree bubbles can pop up or markets can get temporarily depressed or euphoric (Malkiel, 2003, pp. 33-34). However, they believe so strongly in efficient markets they cannot imagine markets are wrong for more than a very short period. Greenspan's example shows this.

4.3.2 Value investing: Defying the EMH during the bubble

Value investors on the other hand saw the bubble years in a completely different light. They were confronted with elevated prices for securities and saw little opportunity to invest (Klarman, 1998; 1999). Newspapers, magazines and business TV declared the 'death of value investing' as value investing badly trailed the stock market indices during the boom period (Barry, 1999; Cooley, 2000; Pulliam, 1999). However, value investors were undeterred.

Buffett, for example, made a prominent speech in 1999 where he stated that the then current market overvaluation could not last. To support his statement, he used an example that touched upon the EMH. He began by saying how the market can stay irrational for a very long time. Alluding to how the U.S. economy grew fivefold between 1964 and 1981, but the Dow Jones was at 875 point at the end of 1964 and still at 875 points at the end of 1981. He argued this was market irrationality in its purest form. The market must have been wrong in either 1964 or 1981. Buffett then compared this period to the bull market of the 1990s. He argued how the 1990s was a similar example but with the opposite effects. This time the U.S. economy had grown a lot slower than the stock market returns implied, still almost everyone in 1999 thought the stock market would keep on rising. Buffett said: "In the short run, the market is a voting machine, In the long run, it's a weighing machine." (Schroeder, 2009, p. 15). Financial markets over the long-term were relatively efficient. Buffett concluded that markets could stay irrational for a long-term and he warned that they were certainly irrational in 1999 (Schroeder, 2009, pp. 12-22).

Klarman also made repeated calls on the market overvaluation during this period. At the end of 1999 he talked about the broad market irrationality in technology stocks and the strong belief that investors cannot beat the market. He spoke about how unfavorable value investing as a strategy was perceived during this time, even though Klarman thought it was obvious value investing would definitely overperform the market after the technology bubble would burst (Klarman, 1999). However, Klarman not only called out the market inefficiencies he also acted upon his beliefs. With his Baupost fund holding more than 30% of its assets in cash prior to the crash. On top of that, Klarman explained in great detail where he believed the undervalued stocks were in 1999. Klarman's investments in this period were, among others, in a funeral home company, a company that processes wool and a manufacturer of automobile parts (Klarman, 2000) Furthermore, Klarman also bought out of the money market put options for

years during the 1990s to protect his hedge fund against a sudden popping of the bubble (Klarman, 1995-2000).

When the dot-com bubble crashed, Klarman was able to invest a lot more money in new bargains. His cash assets dropping to 15%, while the Baupost fund returned 22,4% return compared to the S&P 500 with a 6% return (Klarman, 2000).

On a whole, the EMH thesis arguably had its worst decade in the 1990s. Later on, the market bulls citing the market strength to prove critics wrong got busted when the bubble blew up. As detailed earlier, value investing took considerable heat for the later part of the 1990s only to be vindicated in the first year of the new millennium.

CHAPTER 5: THE GREAT RECESSION

Relatively quickly after the U.S. was trying to recover from the dot-com bubble a new financial crisis was being created. This time the crisis did not originate in something exotic like technology, the housing market was the culprit. This subprime mortgage crisis that triggered the Great Recession originated from a speculative bubble in the real estate market (Shiller, 2008, p. 29; FCIC, 2011, p. xvi). This resulted in a subsequent market crash where the Dow Jones Industrial Average declined almost 50% from its 2007 high as Chart 2 shows. Even worse was the recession that followed and badly hurt the U.S. economy. Real GDP fell more than 4% during the recession, unemployment hit a high of 10% and U.S. households and nonprofit organizations lost $14 trillion in net worth (Rich, 2013).

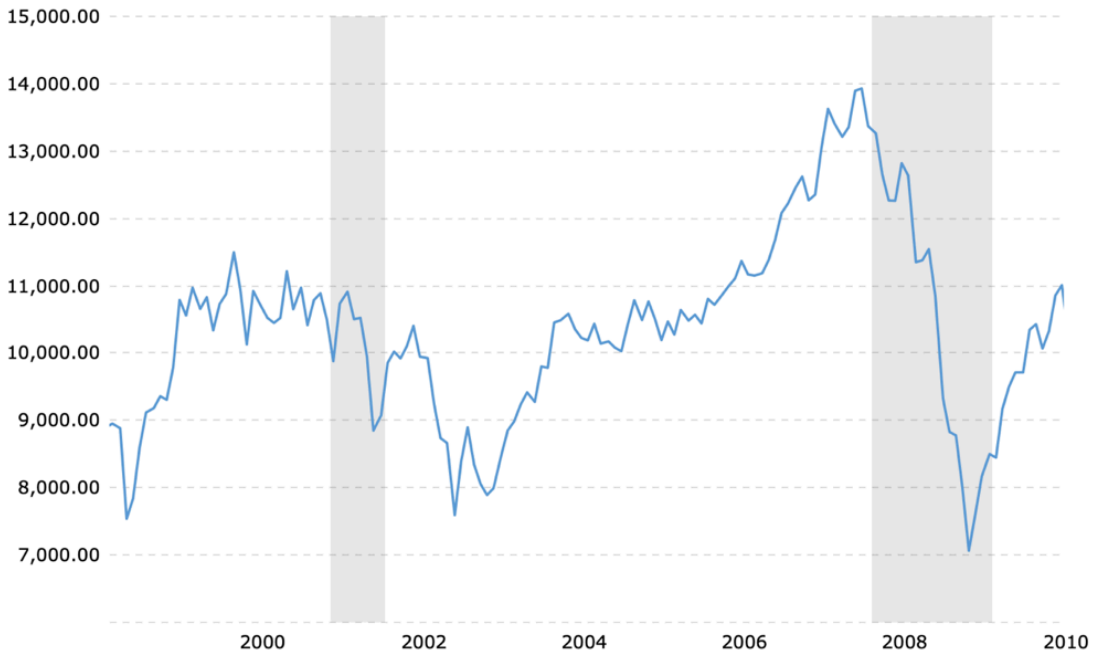

Chart 2: Dow Jones industrial Average stock market index from the dot-com bubble till the Great Recession (Macrotrends, 2020).

5. 1 LEVERAGE

First of all, there was an abundance of debt within large financial institutions during the final years before the Great Recession.[17] Secondly, homeowners themselves took on enormous amounts of leverage during the mortgage boom of the 2000s (FCIC, 2011, p. 5). Together, so-

[17] The prime example was Lehman Brothers that was leveraged 30.7-1 in the spring of 2008, meaning that for every dollar in capital the firm had $30.7 in debt. A mere 3% decline in total assets would eat up its entire capital stake (Sorkin, 2010, p, 81).

called Wall Street and Main Street fueled an enormous boom in leverage that would come to topple the financial system in 2007 and 2008.[18]

Two issues regarding excessive leverage will be discussed for this thesis. Excessive leverage caused by new, complex derivatives and household borrowing. Value investing successfully identified the former, but failed to spot the latter.

5.1.1 Hidden leverage caused by derivatives and value investing's warnings

The large boom in new, complicated derivative instruments during the 1990s and early 2000s was a large contributor to the crisis. Many of these derivatives were aimed at the housing market to make big bets during the boom period. These derivatives were also bought and sold to disguise the extra leverage financial institutions were taking on. Financial institutions did not need to buy the actual security anymore, which would be financed with debt, but you just needed to enter into a derivative contract. For these derivative contracts, firms usually did not need to post collateral. In essence, financial institutions were making big leveraged investments, but because they used derivatives the leverage would be invisible unless their derivative would decline in value (FCIC, 2011, p. 49). Furthermore, these derivative contracts also linked all the big financial institutions to each other. If one firm would hit trouble or could no longer post collateral if their derivative contracts failed, the counterparty institution would essentially hold a derivative that was worthless. Therefore, one big failure of a bank or insurer had the potential to bring down the whole financial system as all institutions were linked together through these big derivative contracts[19].

The toxic derivatives financial institutions created originated from mortgage backed securities (MBS). MBS pooled thousands of mortgages together and sliced them up into tranches ranked by risk. The lowest ranked mortgage was put in the lowest tranche and the best mortgage where pooled together. In the event of a downturn, the lowest tranche would default first. As it was the riskiest it also carried the highest interest rate (Lewis, 2010, pp. 17-18; Morris, 2015, pp. 255-260).

[18] The unraveling of the market is captured in great detail in the FCIC's report in Chapters 12-20.

[19] An example was AIG who insured assets of other financial institutions mainly through Credit Default Swaps. Because of these transaction, firms could increase their leverage beyond normal regulatory requirements as they had 'insurance' from AIG. Not only did these transactions create huge amounts of extra leverage in the financial system, but it also linked the faith of AIG to all its counterparties. If AIG failed all the other firms would be in big trouble. This is exactly what happened during 2007-2008 (Roubini & Mihm, 2011, pp. 106-107;111; Sorkin, 2010, pp. 159-163).

Out of these MBS, financial institutions created instruments like the Collateralized Debt Obligation (CDO) and Credit Default Swaps (CDS) to make even bigger bets on the housing market. CDOs consisted not only of mortgage backed securities, but also other forms of debt like car notes or credit card debt. Financial engineers pooled these together to 'diversify' the risk and get a better rating from the rating agencies (Roubini & Mihm, 2011, pp. 65-67).

In turn, CDS were created to 'insure' when a specific bond would default. In the last stage of the mania the most toxic instrument was created, the 'synthetic CDO'. This was a CDO that consisted not of actual bonds (debt instruments) but a pool of CDS set to mimic the performance of these actual bonds (that would be in the normal CDO) (Dowd, 2017, p. 146-147).

It where these synthetic CDOs that ensured that financial markets lost any form of reality as they now needed no actual debt instruments to put into these complex financial instruments to create them. The synthetic CDO allowed all the big players to make unlimited bets on the housing market and for that matter any other debt market (Lewis, 2010, p. 66; Roubini & Mihm, 2011, p. 67).

These new leverage driven derivatives were one of the main causes of the Great Recession that value investing warned against strongly and often during the early 2000s. Warnings and concerns varied, but on a whole value investors warned against the new derivatives in general, CDO and their counterparts in specific and some value investors actively bet against these kind of instruments and publicly disclosed their short positions (Marks, 2006; Berkshire Hathaway, 2003b[20]; Burry, 2010, Klarman, 1991, pp. 89-90)

One of the first value investors to sound his disdain and distrust for the new innovations in the mortgage market was Klarman. In his book Margin of Safety (1991) he already warned for these new innovations. He was skeptical about the new MBS and voiced his concern of a predecessor of the CDO, the Collateralized Bond Obligation (CBO)[21]. He not only warned against the CBO, but also pointed out exactly what their main flaw was, the same flaw that would sink CDOs 15 years later. Klarman said:

[20] The specific question referred to is Question 38 titled: "Mild Wake Up Call" on Derivatives.
[21] Mainly used during the Leveraged buy-out era of the 1980's.

"The rating agencies performed studies showing that the investment-grade rating was warranted [for the CBO's]. Predictably these studies used historical- default-rate analysis and neglected to consider the implications of either a prolonged economic downturn or a credit crunch that might virtually eliminate refinancings. Under such circumstances, a great many junk bonds would default' even the senior trance of a CBO could experience significant capital losses. In other words, a pile of junk is still junk no matter how you stack it." (Klarman, 1991, pp. 89-90).

Klarman highlighted a few key flaws of the concept of CBOs/CDOs. Worth repeating is his most daring line: "…*a pile of junk is still junk no matter how you stack it.".* This was exactly what occurred during the collapse of 2007-2008, many of the AAA rated tranches of CDOs would turn out to be next to worthless. What should have been as safe as a high-grade corporate bond turned out to be a junk bond in everything but name (Roubini & Mihm, 2011, pp. 66-67).

Buffett also warned investors and the public about the steady rise in derivative trades and the increasing complexity of the instruments. In Berkshire Hathaway's 2002 annual report Buffett discussed derivatives. He talked about the wide array of uses financial engineers found to write derivative contracts and the difficulty in assessing their actual worth. Buffett attacked the *"mark-to-model"* use of accounting for derivatives famously calling them *"mark-to-myth"* (Berkshire Hathaway, 2003b, p. 13).

He discussed the problem of linkage and interconnectedness warning that a relatively small amount of parties wrote complex derivative contracts. In turn, he argued that one bankruptcy or downgrade could topple the whole financial system, that was full of these leveraged derivative bets.

He referenced to the LTCM debacle as an early warning that just that single derivative-rich hedge fund was able to almost set of a chain reaction of defaults in the American financial system (Berkshire Hathaway, 2003b, pp. 14-15). He ended his warning with the sentence: "The derivatives genie is now well out of the bottle, and these instruments will almost certainly multiply in variety and number until some event makes their toxicity clear" (Berkshire Hathaway, 2003b, p. 15).

When Buffett and Munger were questioned on this in the subsequent shareholder meeting they went even further, saying they aimed to make this a unique warning to the financial world that derivatives might blow up the system in the near-future. Buffett said it best when he summarized his response during the meeting: "… when you start concentrating risks in institutions which are highly leveraged, and who intersect with a few other institutions like that - all bearing same risks, all having the same motivations in the trading departments - to take on more and more esoteric things because they can book more and more immediate profits, you are courting danger." (Berkshire Hathaway, 2003a).

Munger actually went as far to predict that within 5-10 years there would be a *"significant blow-up"* of the financial system (Berkshire Hathaway, 2003a). Munger was wrong, 5 years was too rosy of a prediction, it only took 4 years for the big blowup.

Concluding, this part about debt through derivatives that resulted in the excessive leverage aimed to show how value investing has a high threshold for investing in these kind of new complex securities. Principles like the circle of competence and above all the rule to 'protect your principal' and insist on a MoS guard value investing from participating in schemes like (synthetic) CDOs. Even more so. value investors were in an excellent position to see the exuberance and irresponsible risk-taking in the financial system. When major financial institutions went off the rails and binged on these exotic products of leverage, value investors had studied these new instruments and warned about them (Burry, 2006).

5.1.2 Household borrowing: A macro-economic problem value investing missed

Another major issue of the Great Recession was the widespread borrowing by American homeowners. When housing prices kept rising and financial institutions increasingly profited from selling MBS' and CDOs, borrowing standards all across the U.S. declined. Realtors, banks and other lending institutions basically stopped caring whether a customer could afford a new mortgage or whether the customer would be credit worthy (Bernanke; Geithner & Paulson, 2019, pp. 16-17). Customers were famously offered NINJA loans, which stands for No Income, Job or Assets (Roubini & Mihm, 2011, p. 65). Anyone who wanted a new home, buy a second one or just get a second mortgage was unlikely to be turned down by America's institutional lenders. After all, these loans were the raw product that fueled the MBS and CDO machine (Shiller, 2008, p. 6). Chart 3 convincingly shows the borrowing spree of 'Main Street'.

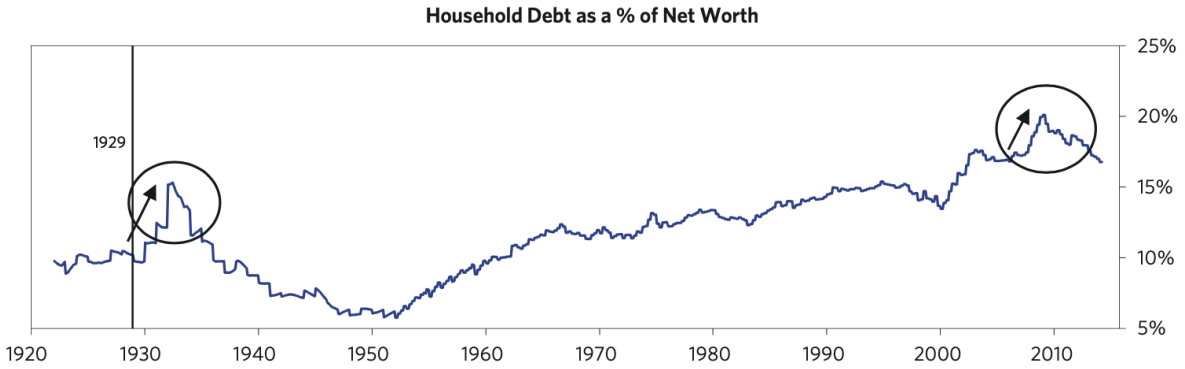

Chart 3: Historical chart of Household Debt as a % of Net Worth (Dalio, 2018, p. 26).

As Chart 3 shows, U.S. households drastically increased their own 'leverage ratio' as they borrowed to buy better or more houses. However, value investing did not spot this rise in household borrowing. This was a macro-economic problem that value investors had no special insight in. This increase in household borrowing did not directly show up on balance sheets of financial institutions. It happened outside the part of the financial markets that most value investors are focused on.

Nevertheless, there were enough regular economists and investors warning about bad lending standards and excessive borrowing by households.[22] There were some value investors that recognized this issue before the crisis hit, most notably Michael Burry, and actually shorted the housing market in the early 2000s. However, he was just one among other investors with different strategies who recognized this problem in advance (Lewis, 2010, pp. 37-38; 51). Value investing did not have special insights on this macro-economic problem.

5.2 Financial Risk

With regard to financial risk value investing had a mixed track record in the run-up to the Great Recession. On the one hand, value investors actively warned for excesses and overvaluation in the market after the dot-com bubble recovery. On the other hand, value investing did not identify the overvaluation in the financial service industry, in specific (investment) banks and mortgage brokers.

[22] Some of these people like Eisman, Roubini and Shiller will be discussed in the section on financial risk.

5.2.1 Broad market overvaluation

After a short recession due to the dot-com bubble and 9/11, stock markets quickly reached their dot-com bubble highs again and continued in an upward trajectory with the Dow Jones hitting a high of almost 14,000 in the autumn of 2007. With interest rates at a historically low point after 9/11, many financial analysts argued the high stock market valuations where justified. The optimism of the 1990s quickly returned as the housing boom accelerated (Bernanke, Geithner & Paulson, 2019, pp. 148-149). Value investors were not keen to go along with this bullish sentiment.

Howard Marks argued repeatedly against the bullish narrative during these 4-5 years till the crisis. In 2004 he opposed the prevailing narrative that stocks were not overpriced due to the low interest rates. Marks responded by arguing that interest rates had little room left to go down further while there was the real possibility of a rising interest rate from the very low base. He concluded that there was more downside in the general market than upside. He also gave investors advice what to do instead. He insisted on a sufficient MoS, only buying securities below intrinsic value and to not base your investment decision on macro-economic factors but only on the inherent merit of an investment (Marks, 2004). Marks provided investors with a classic response for a value investor. He would stand to do this many more times in his investor letters all the way up to the financial crisis.

Buffett and Munger also warned of overvaluation in the market. Although their warnings were more muted than during the dot-com bubble they often expressed that markets were still overvalued and there were little favorable investments they could make (Sivy, 2004; Dobbs, 2005; Berkshire Hathaway, 2005, pp. 16-17). The fact that value investors where once again cautious on the stock market in this period proved to be a prudent move. Buffett only started investing major amounts of cash during the market crash in 2008-2009, at one point being fully invested and having rescued or aided companies like Goldman Sachs, Dow Chemical and General Electric (Schroeder, 2009, pp. 686-692; Sorkin, 2010, pp. 488-490).

5.2.2 Financial service industry

Value investors did relatively well in calling out the general overvaluation of the market. However, they were unable to identify the widespread collapse of the financial services industry. Even though we have seen that value investors like Buffett, Munger and Klarman almost completely predicted the problems with derivatives and securitization of mortgages they

did not call out the financial service industry in general. On the contrary, Berkshire actually owned quite a few financial stocks that would drop dramatically during the crisis (even though they avoided the most toxic firms) (Berkshire Hathaway, 2008, p. 15). Value investor Michael Burry was a notable exception, but in general it were mostly other skeptics, contrarians and specialists in the industry with a negative outlook that saw the collapse coming. Examples are economist Nouriel Roubini, Robert Shiller, Steve Eisman and John Paulson (Roubini & Mihm, 2011, pp. 1-4; Lewis, 2010, pp. 13-30; Sender, 2009). These individuals were all well versed in understanding and combining all the key issues that caused the bust: the real estate bubble, derivatives, the linkage problem, and declining underwriting standards. Eisman as a subprime specialist since the 1990s (Lewis, 2010, pp. 13-14). Paulson as a cynical hedge fund operator (Leonard, 2009). Roubini being a leading economist focused on speculative bubbles and major macroeconomic events (Mihm, 2008; Roubini & Mihm, 2011, pp. 1-4). Shiller being an expert on speculative bubbles also saw the crash coming (Brand, 2005; Leonhardt, 2005).

Concluding, value investing is well suited to catch trends like broad overvaluation of the market as they can be spotted by bottom-up analysis of an array of individual cases. However, value investing is less suited for specifically making a call on one specific industry as the tendency of value investors is to shun an industry they see as incomprehensible or too difficult to make a judgement on. It were mostly economists or financial analysts who were well versed in the financial service industry that dug deep enough to find the big problems (investment) banks, financial insurers and mortgage brokers had.

5.3 HUMAN FALLIBILITY

This plausible explanation seems to hold a lot of potential regarding the subprime mortgage crisis. The Great Recession was caused in large part due to faulty reasoning, novel financial instruments, a speculative housing bubble and big human errors at the rating agencies.
Nevertheless, when investigating the empirical evidence, value investors mostly failed to notice the severity of the problems. They even made some of the same mistakes as the rest of the market. An example of such a mistake will be discussed.

5.3.1 Berkshire Hathaway and Moody's

Berkshire Hathaway was an investor in Moody's, a rating agency for securities during the run-up to the crisis. Moody's gave MBS and derivative instruments the best AAA-ratings while the underlying securities where either of poor quality or entirely worthless, like many CDOs (FCIC,

2011 pp. xxv; 3). Moody's was seen as complacent and complicit in the securitization scheme, fueled by derivatives, as they enabled financial institutions to argue to their clients that these new instruments were safe investments while they were not (FCIC, 2011, pp. 118-122). Moody's problems were most of all a striking example of human fallibility in an area that value investors could have noticed. By rating new complex housing securities and derivatives, Moody's was outside of its circle of competence. In the past Moody's mostly rated corporate and municipal bonds. Moody's did not have sufficient or correct data to adequately rate these new securities, nor did they have the proper models (FCIC, 2011, pp. 118-121).

Berkshire, as Moody's largest shareholder, might not have been able to know the details of Moody's problems, as they were not involved in the day-to-day operations. However, the fact that Buffett failed to notice Moody's declining standards in business and branching out into areas it did not know a lot about, being so keenly aware about the derivatives fueled leverage and overvaluation in the market, is startling. As Moody's profits during the boom years almost doubled, Buffett is sure to have been aware Moody's was doing new business, and as the largest shareholder he must have wanted to know what that new business was specifically about (Moody's, 2008, p. 98; Schroeder, 2009, p. 699). Furthermore, Buffett was also made aware there might be an issue with inflated AAA-ratings by Moody's regarding CDOs in 2003. The fact that he kept his investment in Moody's after that implicitly shows that he failed to see the merit of this warning (Tavakoli, 2009, pp. 107-109). It is not to say that Buffett and Berkshire should have correctly identified the issues Moody's, and other rating agencies, had. But the fact they did not notice is a prime example that value investors in general failed to spot the human errors in the run-up to the Great Recession the way they did during the dot-com bubble.

In the end, this case does show that value investing's focus on paying attention to how humans can make severe errors of judgement can pay-off. Watching for human fallibility can actually help avoid you making big financial mistakes, like trusting the AAA ratings of the rating agencies. On the other hand, we can also see that value investors not always are able to identify the specific errors themselves, even if they are aware of the potential that humans are fallible. If there was one value investor with the ability, insight and connection to the rating agencies to understand their faults it would have been Buffett, but as this example shows he did not.

5.3.2 Non-value investors and human fallibility

Where value investing mostly failed to notice the human errors in the run-up to the crises, the concept of human fallibility was usefully applied by others. Authors, economists and financial analysts that warned for (parts) of the crisis did recognize the human failing in the run-up to the Great Recession. These people were a minority of thinkers and industry specialists who witnessed the rapid rise of U.S. housing price with skepticism and a contrarian mindsight.

Roubini was one of the few mainstream economists who sounded the alarm, recognizing the speculative bubble arising in the market and the inability of market players to understand their own game or what the risks of it where (Mihm, 2008; Roubini & Mihm, 2011, pp. 1-3; 62-67). Shiller was another, starting to investigate the housing market in 2005 seeing the signs of crisis emerge when he started to investigate the housing bubble and actually made a database himself on the history of U.S. housing prices as no one seemed interested at the time what the historical implications of this boom were or what the current trends were (Shiller, 2008, pp. 31-32).[23]

A different but consequential source that gives insight in the people that saw this crisis coming is Michael Lewis' book The Big Short (2010). This popular account of the crisis is an insightful and detailed narrative of people who understood the problems in the system and the human inability to deal and recognize those issues. From value investor Michael Burry to a subprime mortgage trader at Deutsche Bank and an outcast financial analyst, they all recognized the issues that caused the crisis. In the book Lewis makes it abundantly clear that these people understood the delusional attitude of the major financial firms and the real estate brokers. They also saw how these people were way out of their circle of competence regarding the securities they traded like (synthetic) CDO's and CDS's (Lewis, 2010, pp. 136-137)

The people who acknowledged the fact that markets are not infallible all had similar views on the human ability to judge markets correctly. They all agreed that humans could not judge markets correctly and sometimes even misjudged the market severely. They did not believe in fully efficient markets. They did not believe in the competence of financial institutions to comprehend the clearly incomprehensible new derivatives they created. They correctly identified that humans make significant financial mistakes.

[23] The lack of a long-term database on housing prices is a good example of the inadequate data that rating agencies used to value MBS and other mortgage related securities.

CHAPTER 6: CONCLUSION

The question this thesis tried to answer is: **Why can conservative investment approaches make financial crises less likely?** In the analysis of the dot-com and Great Recession cases, I focus on three potential plausible explanations: Leverage, Financial Risk and Human Fallibility. The analysis showed that value investing, as an example of a conservative investment approach, can indeed potentially make financial crises less likely through these three channels - especially by reducing exposure on over-leveraged and financially riskier investments.

Firstly, with regard to leverage, there is evidence that using value investing could have indeed mitigated the excessive leverage used in the two crises. The example of LTCM showed, that value investors correctly identified the firm's main problem: the excessive leverage used to generate returns on LTCM's arbitrage investments. In the Great Recession, value investors correctly identified the new complex derivatives being used as a new and even more dangerous form of over-leveraging. Not only did value investing call out the dangers of derivatives, they also described in detail, before the crises hit, how these derivatives might cause a financial panic. However, value investing did miss the large increase in household borrowing in the run-up to the Great Recession. This was a leverage problem, that unlike the issue with derivatives, fell outside the realm of value investing.

Secondly, value investors also correctly identified the financial risk in the form of substantial stock market overvaluation for both the dot-com bubble and the Great Recession - where the evidence is strongest for the former. Not only, the amount of evidence is larger for this case, the warnings from value investors are more forceful and detailed. The evidence for the Great Recession is more mixed. The general overvaluation in the market was identified by value investors as they spotted the unsustainable price level of financial assets the years before the crisis. However, value investors failed to identify the even more distorted valuations in the financial service industry caused by the bubble in the housing market.

Thirdly, the evidence regarding human fallibility is mixed. Value investing has a strong case against the more dogmatic forms of the EMH. With its own approach of *Mr. Market*, value investing not only seems to have found a better way of correctly capturing the reality of financial markets, which are efficient in the long-term, but potentially (very) inefficient in the

short-term. In the dot-com crisis, value investing's approach was definitely superior to the narrative of the consensus that generally regarded the financial markets continuous rise as inevitably correct. On the other hand, value investing focus on human fallibility had a negligible influence in the run-up to the Great Recession. With the main bubble being in the housing market instead of the stock market, value investing failed to identify the former. In fact, the example of Moody's and Berkshire Hathaway showed how value investors sometimes actually made the same mistakes as the consensus. There were other financial specialists that did spot the faulty assumptions that seemed to justify the booming housing market. However, there were few value investors among them.

To sum up, using the cases of the dot-com crises and Great Recession in relation to value investing, I find that a conservative investment approach can indeed make financial crises less likely by reducing exposure to excessive leverage, financial risk-taking and human fallibility. Nevertheless, there are still other important factors that may contribute to the crisis such as macroeconomic policies, regulations, and political institutions, where value investing has shown to make minimal impact.

A few unresolved problems for this thesis need to be mentioned. Firstly, while the analysis aims to be thorough and balanced, the empirical findings are not all-encompassing. The analysis uses examples and illustrative cases as evidence to answer the research question due to a lack of systematic data on value investing and its proponents. Secondly, only a relatively small group of value investors, be it a firm, a person or both, have been studied. This is mainly because value investing is only a small part of financial markets, therefore there are few value investors with substantial financial assets that are required and, in the position, to make their opinions and investments public. Therefore, only the most well-known and largest value investors are included in this thesis as there is no, or very limited, data for smaller value investors.

With regard to further research, this thesis argues that subsequent research on conservative investment approaches, in specific value investing, and financial crises can potentially be beneficial. As the three plausible explanations analyzed are important causes of many financial crises in the past, the fact that conservative investment approaches might help investors avoid financial crises is an important conclusion. In the future, the research should use more (historical) data and try to incorporate smaller value investors.

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