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Excess Cash Best in Class?

Which Firms Managed Better Stock Returns During The Financial Crisis?

Authors:
Cavdarovski Jove
Ragnvid Martin

Supervisor:
Vilhelmsson Anders

Date:
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ABSTRACT

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AUTHORS: Cavdarovski Jove and Ragnvid Martin

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RESEARCH QUESTION: How well do U.S. diversified firms perform on the stock markets, relative to their U.S. focused cash-rich peers? Further, is the relative performance contingent on the state of the economy?

THEORETICAL FRAMEWORK: Free Cash Flow Hypothesis, Precautionary Motive, Transaction Motive, Long Purse Hypothesis, Real Options, Agency Theory, Market Frictions, Internal Capital Markets, Debt Co-Insurance, Diversification Discount.

METHOD: Quantitative approach, using multiple regressions for determining excess cash. Further, measuring abnormal stock returns with the help of Jensen´s Alpha and dividing firms into portfolios.

CONCLUSIONS: During the normal periods in absence of crisis, diversified firms without any excess cash as a whole, outperformed focused firms holding excess cash. During the Financial Crisis from mid 2007 to early 2009 on the other hand, focused firms holding excess cash outperformed less diversified firms and diversified firms as a group, where diversified firms with more than 2 SIC codes performed equally good compared to focused firms with excess cash. Main reasons include lower positive skewness and higher leverage in diversified firms, while higher capital expenditures in focused firms are deemed as factor for focused firms with excess cash.

KEY WORDS: Excess Cash, Diversification, Abnormal Returns, SIC-codes, Financial Crisis

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1. INTRODUCTION

In this first chapter, the background and further problem discussions related to the topic are given. The research purpose is then defined. The chapter ends with a short delimitation and a thesis outline.

1.1. BACKGROUND

In 2006, non-financial and non-utility firms in the U.S. held aggregate cash holdings, i.e. cash and short-term investments, of amazing $ 1.7 trillion[1] (Duchin, 2010). According to Bates, Kahle and Stulz (2007), the average cash-to-asset ratio for industrial firms in the U.S. increased by a total of 129 percent from 1980 to 2004. Ever since Modigliani and Miller´s influential paper from 1958, about the irrelevance of firm capital structure, this has been a hot topic among academics and practitioners in corporate finance and management. In (ideal) perfect capital markets, capital structure is indeed irrelevant. However, in reality, markets are affected by imperfections, such as information asymmetries, agency problems, transaction costs, costs of financial distress, et cetera. These imperfections drive some firms to hold substantial amounts of cash on their balance sheets (Ferreira and Vilela, 2004).

Holding large amounts of cash is a way for managers to reduce the risks of financial distress arising from unsuspected future events and external shocks. This was first coined as the precautionary savings theory by John Maynard Keynes back in 1936, who argued that firms stack money during good times for the purpose of having an extra cash cushion in worse times. This allows them not to miss out on important investment opportunities during economic downturns. However, holding a substantial amount of excess cash on the balance sheet can also give rise to a number of potential risks; management might, for example, use cash for their own perquisites, and overinvest in poor projects that instead reduce the value of the firm (Jensen, 1986).

Another hot topic in corporate finance is corporate diversification strategy, i.e. segmental and/or geographical diversification, which allows firms to spread their operating and/or financial risks across different segments and geographies with imperfectly correlated cash flows (e.g. conglomerates such as General Electrics). Here is another way for firms to reduce the risks

[1] Equals more than Germany´s total state budget for 2013 (CIA World Factbook, 2013)

arising from future unexpected events. "Don´t put all your eggs in one basket"[2] is a frequently used phrase in the world of finance. Conglomerates, two or more companies engaged in completely different businesses but members of the same corporate group, were particularly common during the 1960s and 1970s (Kuppuswamy and Villalonga, 2010). Under the 1980s and 1990s there were more negative views on conglomerates, and many were therefore dismantled (ibid.). However, some researchers believe conglomerates have the potential of making a comeback after these last periods of financial crisis (Rudolph and Schwetzler, 2013).

Diversification enables firms to get access to an internal capital market between their different segments, which can be used for investments (Higgins and Schall, 1975). According to the literature, this internal capital market is one of the strongest reasons for firms to diversify, since it can reduce transaction costs and costs of information asymmetry related to external financing (Stein 1997; Doukas and Kan 2008). However, diversification might also be driven by opportunistic purposes, managerial empire building and entrenchment (e.g. Jensen and Meckling 1976; Jensen 1986; Shleifer and Vishny 1989). This managerial behaviour can become value decreasing for the firm and its shareholders. After all, shareholders can diversify away the idiosyncratic risk on their own by going straight to the capital markets, investing in a portfolio of imperfectly correlated stocks[3] (Koller, Goedhart and Wessels, 2010).

1.2. PROBLEM DISCUSSION

There is an extensive literature on the impact of firms' excess cash holdings and diversification. Researchers in the field of corporate finance have for decades tried to determine both the benefits and the disadvantages of excess cash holdings and firm diversification.

Starting off with the literature in excess cash. Miller and Modigliani (1961) present their ideas regarding frictionless financial markets, where firms regardless of the market conditions, can adjust their capital structure and therefore, have a completely costless financial flexibility when

[2] According to the Ecclesiastes, one of the 24 books that make up the old testament, in ca. 950 BC King Solomon gave his recommendation to diversify with his words: "give a portion to seven, or even to eight, for you know not what disaster may happen on earth".

[3] Corporate diversification is analogues to portfolio diversification in Modern Portfolio Theory (MPT) introduced by Harry Markowitz in the fifties (Markowitz, 1952). The risk in a portfolio of securities is increasingly reduced the more the securities are negatively correlated with each other, and hence, have a negative correlation coefficient ($\rho_{i,j}$). This can be seen by the variance formula for a portfolio of two securities: $\sigma_p^2 = w_i^2 \sigma_i^2 + w_j^2 \sigma_j^2 + 2\, w_i\, w_j\, \sigma_i\, \sigma_j\, \rho_{i,j}$ where σ_p^2 stands for the portfolio variance, w_i and w_j are the security weights in the portfolio, σ_i and σ_j is security volatility while $\rho_{i,j}$ is the correlation coefficient between them. Negative correlation will thus reduce the total idiosyncratic risk stemming from the securities.

investing, which makes excess cash holding irrelevant. However, market financial frictions are common in the real world. Denis (2011) claimed that cash holding should be seen as something positive when the firm faces higher costs on external capital markets in periods of a financial crisis. This is also consistent with prior studies from Denis and Sibilkov (2010); Faulkender and Wang (2006); Pinkowitz et al. (2006); who show a higher marginal value of cash holdings for constrained firms with higher external cost of capital, compared to firms with low costs for external financing. Keynes (1936) argue that both transaction cost motives and precautionary motives favour cash holdings, arguments that Meltzer (1963); Frazer (1964); Miller and Orr (1966); Vogel and Maddala (1967); later also agreed on[4].

The Long Purse hypothesis is another motive for stacking excess cash, since it might benefit firms with predation behaviour, to run constrained competitors out of business (Bolton and Scharfstein, 1990). Cossin and Hricko (2000) argue that holding cash can be seen as a real option with timing effects, which allows managers to hold on their investments to the right time. Jensen (1986) on the other hand, argues for the Free Cash Flow hypothesis, i.e. that managers with large excess cash invest in value destroying properties. These findings are acknowledged by Harford (1999), Dittmar and Mahrt-Smith (2007), and Harford et. al. (2008).

However Tong (2011) and Duchin (2010) show that cash holding is highly dependent on firms´ grade of diversification. Tong argues that the value of holding cash decreases significantly when firms go from focused to more diversified. Duchin (2010) finds that multi-segment firms optimally hold half as much cash as focused single-segment firms, while Subramaniam, Tang, Yue, and Zhou, (2011) argue that this can be traced to two hypotheses. First, diversified firms might be able to reduce the level of financing frictions, and thus large cash holding might be less beneficial for these firms. Second, agency problems in diversified firms may well be correlated with the multidivisional firm structure and thus lower the value of cash holding.

If then turning the attention to diversified firms, Chandler (1977) presents the visible hand, which suggests that value creation through production can be obtained more efficiently in multidivisional, in contrast to stand-alone firms. Stulz (1990) and Stein (1997) on the other hand

[4] There is also the third motive, called the speculations motive; firms stack cash in order to speculate in interest rates, exchange rates and price fluctuations on products and commodities.

argue that a larger internal capital market gives managers a real option[5] and an opportunity of "winner picking," i.e. to allocate internal funds within the firm in such way that those divisions that are believed to be able to generate profitable investments, also receive the most funds. Thus, it would reduce underinvestment problems in the profitable divisions, resulting in increased value for the shareholders.

Matsusaka and Nande (2002), Dimitrov and Tice (2006) and Yan, Yang and Jiao (2009) argue that investments in financially constrained diversified firms are less affected by credit shocks in the external capital market, compared to focused firms. Their results are explained with diversified firms´ smaller dependence of external capital markets, due to their ability to finance investments with the help of internal capital allocations within the firm. Hence, they can substitute internal capital for more costly external capital. These findings are also in line with Gertler and Gilchrist (1994), Kashyap, Lamont, Stein (1994), and Almeida and Campello (2007) who argue that firms with reduced access to capital markets also exhibit larger investment sensibility in credit market conditions.

Stulz (1990) have more negative explanations as to why firms choose to diversify. He argues that firms make investments in different business segments with inferior potential and thus destroy shareholder value. This was something Rajan, Servaes and Zingales (2000); Gertner, Powers and Scharfstein (1999); Scharfstein, (1998); Shin and Stulz (1998); Scharfstein and Stein (2000) refer to as socialism within diversified firms due to cross-subsidization issues. Jensen (1986) also predict the same value destroying behaviour, and that diversified firms invest more in projects with negative NPV than stand-alone focused firms, due to agency problems. Meyer, Milgrom, and Roberts (1992) also claim that diversified firms´ cross subsidization can result in unprofitable divisions being kept, which would not be the case if the division was a stand-alone, separately from the firm. Shleifer and Vishny (1989) discuss entrenchment difficulties and managerial desecrations related to diversification, and argue that managers in diversified firms are entrenched by the diversification due to manager-specific investments, and, therefore, appear to be more valuable for shareholders. The replacement of them can thus be more costly for the firm.

[5] Real options refer to the flexibility in decision-making, regarding an option to respond, react or postpone upcoming events or investment decisions (Trigeorgis, 1996).

Prior research has mainly been focused in determining the reasons for, and the effects of, firms´ diversification and excess cash holdings. It has also largely been built on variables that measure internal value creation from a managerial perspective, such as investments by diversified or cash-rich firms, the marginal value of excess cash holding, and the efficiency of internal capital markets in diversified firms. Even though there is a positive relationship between internal value creation from a management point of view, and external value creation from an investor point of view, less focus has been on the latter. Admittedly, some studies have found that firms with these two characteristics trade at discounts in the capital markets due to the negative effects mentioned above while other studies also answer whether diversification-discount firms have higher expected returns than their focused peers in order to compensate investors for offering less upside potential (Mitton and Vorkink, 2010). Prior research has also indicated that these two firm types could be beneficial during uncertain economic conditions (Rudolph and Schwetzler, 2013; Stone and Gup, 2013); Kuppuswamy and Villalonga, 2010; Harford, Mikkelson and Partch, 2003). However, to the best of our knowledge, there is no prior study that focuses on the comparison of these two firm types and how they impact firms' stock returns in different states of the economy.

With the above-mentioned one can conclude that there is a research gap that needs to be filled. With regards to the distinction in previous research between focused firms that hold large amounts of excess cash, and diversified firms that generally hold less cash, it has not previously been measured how these firm characteristics perform relatively on the stock markets, prior, after and under the 2007-2009 Financial Crisis. It is thus interesting to explore whether one type of firm manages higher stock returns than the other type of firm, and if this outcome changes during the crisis period.

1.3. RESEARCH QUESTIONS

The purpose of this study is thus to answer the question:

- How well do U.S. diversified firms perform on the stock markets, relative to U.S. focused cash-rich firms? Further, is the relative performance contingent on the state of the economy?

1.4. DELIMITATIONS

Due to time limitations for data treatment, this study has only focused on firms traded on the U.S. stock exchanges. The study is also limited to segmental diversification, and has not focused on geographical diversification[6].

1.5. OUTLINE

The remainder of this thesis is structured in the following way:

- *Litterateur review:* The reader will be guided through some of the relevant theoretical frameworks, literature and models connected to this field of research.

- *Method:* A thorough review, where the reader gets a deep overview of the methods and preferences that forms the foundation of the research.

- *Empirical Analysis:* The results from the research are presented together with a brief review of those previous papers consistent with the result.

- *Analysis and discussion:* These results are then analysed more deeply and put into their context, with the help of relevant literature.

- *Conclusions:* A short conclusion is presented and a proposal for further research is given.

[6] The literature on geographic diversification is quite scarce, probably due to the low quality of data (Erdorf et al, 2013).

2. LITERATURE REVIEW & HYPOTHESES

In this chapter, some of the relevant literature and theoretical frameworks for the thesis are reviewed. Starting off with the literature in excess cash holding and diversification, the chapter then aims to give an understanding of the model used for measuring abnormal stock returns. Finally, the hypotheses are presented and motivated.

2.1. MOTIVES FOR EXCESS CASH HOLDINGS

Cash holdings in firms have been a widely discussed subject among academics. Miller and Modigliani (1961) suggested that cash holdings are irrelevant since one could expect frictionless financial markets, where firms, regardless of the market conditions, could adjust their capital structure and therefore have a costless financial flexibility for when to invest. This means that cash holding is irrelevant and one can expect firms to hold minimum amounts of cash. However, financial frictions in the market are present and cash holdings on the balance sheet can vary in over time and in different states of the economy. See figure in appendix 1 for an illustration of the cash-to-assets ratio in U.S. firms during 1990 - 2006. To provide readers a more extensive knowledge on how excess cash has introduces for both harmful behaviour but also useful real options in decision-making, the following section will provide some of the most important reasons from prior research to distinguish between firms´ choice of holding excess cash during different states of the economy.

2.1.1. PRECAUTIONARY MOTIVE

One of the oldest writings regarding cash holdings is Modigliani and Miller´s paper about Precautionary Motive, where cash serves as a safety margin and a financial reserve for unexpected future events. It is, however, often confused with Real Option theory where the difference lies in how these two theories look at cash holdings. Real Option focuses on the firm's option to defer investment at the right time while the precautionary motive emphasis on a strategic motive to reduce threats in financing due to a downturn in the financial markets. One may therefore see precautionary motive as part of a strategy to tackle threats of liquidity when markets face financial downturns, and thus it helps explain why some firms prefers to hold large amount of excess cash. Excess cash thus functions as a protecting shield against cash flows

shocks when idiosyncratic cash flow volatility increases. Bates, Kahle and Stulz (2009) provided evidence for these theories and showed how firms with higher idiosyncratic cash flow volatility also increased their cash compared to those firms who faced the smallest increase in idiosyncratic cash flow volatility. Opler, Pinkowitz, Stulz, and Williamson (1999) finds that firms who face limited market access to external financing together with risky cash flows also try to mitigate this with larger cash holdings. Furthermore, they also suggest a motive for their precautionary behaviour and argue that these motives are greatest in downturns when firms face high uncertainties and those uncertainties may be costly for firms with larger investment opportunities. One might, therefore, assume larger cash holdings in recent year due to the latest Financial Crisis.

Also, it may not be obvious, but a negative correlation between cash holding and firms´ ability to raise external financing during downturns in the economy might also very well be assumed. One may therefore expect constrained firms to face greater difficulties reaching outside capital relatively less constrained firms. Han and Qiu (2007) prove this argument and find that constrained firms with volatile cash flows also exhibit a greater propensity of large cash holding compared to less constrained firm. This would prove a negative correlation between constrained firms cash flows and the volatility in these cash flows and thus provide a further explanation for the willingness of firms to hold cash. Irvine and Pontiff (2008) also suggest that larger cash holding can be explained by higher cash flow volatility through higher idiosyncratic risk. Such increase would then also be related to the higher volatility in unhedged risks.

2.1.2. REAL OPTIONS

Real options can be seen as the manager's flexibility with respect to future decision-making, where this flexibility also generates some value creation for the firms' investors. Furthermore to understand the value creation, one also needs to understand the underlying components in the option. The first component is the intrinsic value, better known as NPV of all future cash flows, while the second component is the time value. The difference between simple NPV calculations and real options is that NPV calculations ignore the options time value, also known as the flexibility, and hence its value to either cash in or cash out (Barbosa, Carvalho, Pereira, 2013). This flexibility in manager's decision-making refers to different options to respond, react or postpone upcoming events or investment decisions in the upcoming future. Barbosa, Carvalho

and Pereira (2013) further suggest that time value is highly dependent of the uncertainty regarding the investment, where higher uncertainty also tends to give managers options to postpone investment until more information is available and thus result in a more secure decision-making. One can, therefore, assume that real options flexibility and time value can be more valuable during downturns in credit markets when firms become more constrained and lack external financing options and thus also depend more on internal funding solutions. An assumption Inklaar and Yang (2012) confirms. Cash holding will in this case help avoid this problem and thus not force firms to more expensive financing solutions. This can also be assumed to explain the theoretical reasons why firms sit on large cash holdings instead of investing them or pay them out as dividends. Cossin and Hricko also argue that information asymmetry can create misevaluation and under-pricing in security issuance, which can make external financing even more expensive due to a misprice premium. Kisser (2013) on the other hand, suggests that firms with large cash holdings also have the possibility to postpone investments, however, incentives of delaying investments can be seen as extra strong during times when cash flow volatility or investment costs are low.

2.1.3. LONG PURSE & FEAR OF FIRE SALES

Another theory for cash holdings is the so-called long purse (or "deep-pockets") theory of corporate predatory pricing (Telser, 1966; McGee, 1958). In industries characterized with high rivalry, cash-rich firms can drive their financially constrained competitors out of business by reducing their cash flows. This is done by cutting the prices of their products and thus lowering price levels in their industry, to such levels where the constrained firm cannot continue to operate. This leads the constrained firm to bankruptcy, whereby the cash-rich firm then raises the prices and enjoys a monopoly on the market (op cit). This strategy can of course also work as intimidation against new industry entrants. An interesting example is the German retail chain for consumer electronics, Media Markt, which allegedly according to the tabloids had this strategy during its expansion on the Swedish market (Expressen, 2010).

Cash holdings are also connected to firms´ assets; Usman (2013) found that firms that have highly liquid assets tend to substitute cash holdings with these assets. In this case, the liquid assets can serve as a backup as asset sales when the firm faces an external shock. This presumes that the firm is confident that the assets can be sold to a fair value; Shleifer and Vishny (1992)

finds that when a constrained firm is forced to sell its assets because of financial distress in their industry, non-constrained players from outside the industry will step in and bid lower prices for these assets. The constrained firm is thus forced to make a fire sale.

2.1.4. TRANSACTION MOTIVE

Keynes (1936) transaction motive for holding cash is based on the view that cash-rich firms hold large amounts of cash, due to their relatively high costs of converting cash substitutes (assets) into cash, or alternatively raising funds on outside capital markets (Opler et. al., 1999). The firm needs liquidity for its daily operations and transactions, however, since raising funds is connected with high costs, it prefers to hold liquid asset holdings as a safeguard. These liquid asset holdings increase with factors that make the marginal cost of being illiquid, i.e. short of funding:

- Transactions costs of raising outside funds, e.g. underwriting fees, legal fees.
- Costs of raising funds through asset sales, dividend cuts, and renegotiation, e.g. firm-specific assets are harder to liquidate.
- Risk of giving up investment opportunities due to cash shortage.
- Costs of hedging instruments, i.e. high costs for hedging may raise the need for cash as backup.
- Length of cash conversion cycle, e.g. firms with low inventory/sales ratio needs less cash.
- Cash flow uncertainty, e.g. uncertainty in revenues.
- Absence of economies of scale in cash management, e.g. administrative costs.

A firm must therefore determine their optimal level of cash based on the marginal costs and marginal benefits of having excess cash (op.cit.). The marginal costs in this case refer to the lower expected returns from liquid assets, e.g. short-term interest rate, instead of investing it in profitable projects. One can therefore assume that different levels of excess cash also have different implications on firm value.

2.1.5. AGENCY PROBLEMS

When managers face lack of investment opportunities but hold a large stack of excess cash, managers often have different options. One option is to pay out a large one-time dividend and let shareholders invest in more value creating projects. Other possibilities might be to buy back

shares, which also can be a good thing for shareholder wealth. However Jensen and Meckling (1976) also see other issues and introduce agency problems, which mainly can be referred to as a conflict between firms' managers and shareholders or stakeholder. Jensen and Meckling argue that managers whose job is to maximize shareholder value rather come up with incentives to maximize their own welfare and mitigate their own problems, which not necessarily is in line with shareholder value maximization. Potential interpretation from an investor's point of view might therefore be that the market might punish firms with large excess cash holdings due to negative expectations, thereby providing negative return for shareholders in contrast to its true value.

Later on, Jensen (1986) introduced his Free Cash Flow hypothesis to explain this behaviour for firms with large cash holding. Jensen meant that managers show entrenched behaviour and in times of poor investment opportunities, managers try to maintain a steady cash holding instead of increasing dividends to their shareholders. The reason is that these kinds of payments rather reduce their ability to invest in new projects without transparency, since internal financing is difficult for the market to monitor. Instead, they have to ask the market for external capital when they find an interesting project, which gives rise to a greater monitoring opportunity for the market and damages their ability to keep up with their empire building.

Pinkowitz, Stulz and Williamson (2006) continue and suggest that managers in firms that suffered from poor investor protection also are expected to hold larger amount of cash, since managers in these firms also have more incentives in their decision-making for gaining control of the firm. Other suggestions from recent research imply that excess cash in firms with poor governance are valued below their true value. This is something Dittmar, Mahrt-Smith, and Servaes (2003) previously also had concluded when they pointed out managers' self-serving behaviour as extra severe in poor governance firms. Harford (1999) on the other hand suggests that this is not a characteristic due to poor governance but rather a characteristic in all corporations when shareholders also are well protected.

Dittmar and Mahrt-Smith (2007) argue that this problem will result in a devaluation[7] of cash, where cash holding is valued at a discount for poorly controlled entities. Dittmar and Mahrt-

[7] Pinkowitz, Stulz, and Williamson (2006) show that an extra dollar only is worth \$0.33 in firms with poor governance, but \$0.91 in firms with adequate firm governance.

Smith suggest that this is due to market confidence in the managers' behaviour and predictions of value-destroying interactions rather than value creation. Other research that contributes to more insights on agency problem, see Stulz (1990); Aggarwal and Samwick (2003); Staglianó, La Rocca and La Rocca (2013). As seen, firms with bad governance and large excess cash holding might therefore be assumed to introduce a price discount on the firms stock, to the extent that expectations of the firms management is negatively correlated with the firms excess cash holdings due to lack of monitoring possibilities for external share- and stakeholders.

2.1.6. EXCESS CASH AND STOCK RETURNS

On the other hand, Simutin (2010) explores whether firms with large excess cash holdings perform better on the stock market, during all states in the economy. Intuitively, in periods of a financial crisis and overall economic downturn, having a cash cushion may prove valuable and should be reflected in higher stock returns for these firms. However, Simutin finds that firms with high excess cash actually underperform their low excess cash peers. One probable explanation for this finding is that excess cash holdings correlate with growth opportunities and that these opportunities lose their value during periods of crisis. Excess cash, which therefore, is associated with future investments and future expected returns, lose its value as investors see it as redundant if the economy is in crisis and hence investment opportunities are unclear. The opposite applies during normal periods, i.e. firms with excess cash outperform their cash poor peers (op. cit.).

2.2. MOTIVES FOR DIVERSIFICATION

2.2.1. EFFECT ON FIRM VALUE: DIVERSIFICATION DISCOUNT?

Research from the past decades has diverged in whether diversified firms can create more value than focused, in favour of a more varied product segmentation and hence a spread in their risks. Consequently, it is not completely clear about the general effects of diversification on firm value, rather, the results are mixed and researchers have not yet managed to reach a consensus (Erdorf et al, 2013). It is thus more appropriate to consider in which situations a firm can gain from diversification, which is whenever there is a good match between the parent and the division (op cit). Prior research argues that firms with diversified product portfolios, for example have the opportunity to create an internal capital market in which the firm through internal resource allocation mechanism, more effectively may allocate capital generated within the firms product

portfolios to other parts of the firm (Staglianó et al, 2013). However, other papers suggest that cross-subsidization with internal power struggles and agency problems together with a less focused product segmentation outweigh the benefits from internal capital allocations. The seminal papers by Lang and Stulz (1994) and Berger and Ofek (1995), find significant diversification discounts in diversified firms. These papers measure the value of the firms through Tobin´s Q[8], and through excess values[9], respectively. In the latter case, the diversification discount amounted to an average of 13-15 percent during the period of 1986-1991, i.e. diversified firms traded at 13-15 percent discount relative to single-segment peers. This value loss is however smaller when the segments of the diversified firms are in the same two-digit SIC-codes[10]. The main reasons for this value loss identified by Berger and Ofek, are over-investments by corporate managers, and cross-subsidization between the segments.

Before going further on in the discussion about the diversification discount, the reader must beware. Even though that the majority of the diversification literature recognize that this discount is a reality, during the last years, some researchers have begun to question its existence (e.g. Hund, Monk and Tice, 2012; Maksimovic and Phillips, 2008). The main arguments are biases in the valuation methodology and the sample selection.

2.2.1.1. DIVERSIFICATION AND STOCK RETURNS: LESS UPSIDE POTENTIAL

One of the reasons for this diversification discount (the other one being relatively lower expected cash flows due to the above-mentioned reasons) is the lower so-called positive skewness in their stock returns.

[8] Defined as the market value of the firm (equity and debt) scaled by the replacement value of the firms assets (Erdorf et al, 2013).

[9] Defined as the natural logarithm of the ratio of actual firm value (equity and debt) to the imputed firm value. This imputed firm value is the value when multiplying a reported accounting value (assets, sales or earnings) by the median ratio for single-segment firms in the same industry. Hence, it shows the firms value as if it would been a single-segment firm, and a discount or premium due to diversification is derived (ibid.).

[10] SIC codes stand for Standard Industrial Classification codes and were created in 1937 by U.S. government to build a system for categorization and classification of firm activities and their industry group. SIC codes include a 4-digit code, where the first classify a firms overall characteristics and thus its industrial group. The third and fourth digits of the code clarify a firms specialized areas and conduct a more detailed area levels (U.S Government, 2011).

The skewness coefficient for 12 months of stock returns is as follows:

$$S = \frac{\frac{1}{12}\sum_{t=1}^{12}(r_i - \mu)^3}{\hat{\sigma}^3}$$

EQUATION 1: SKEWNESS COEFFICIENT

ri = monthly return of the stock

μ = mean monthly return of the stock

σ^3= The cube of the estimated return standard deviation

Mitton and Vorkink (2010), show that diversification discount firms have higher expected stock returns than their focused peers in order to compensate investors for offering less upside potential. Their research is an extension on Lamont and Polk (2001), and they find that this upside potential, referred to as positive skewness, is eroded with the grade of diversification, which means that stock returns of diversified firms have less variance and are less positively skewed than stock returns in focused firms. This can be thought of as a "bell-shaped" normal distribution curve where the right tail is longer, while most of the distribution is on the left side towards the left tail of the curve. Consequently, the impact is that investors require higher returns from diversified firms, in order to be compensated by the less likelihood of any extreme gains. In contrast, they propose that investors pay a premium for single-segment firms, due to higher upside potential (i.e. higher skewness coefficient). Their sample includes extreme winners; stocks with annual returns above 280 percent and the great majority of these are focused firms. Investors might otherwise choose to stay under-diversified in order to catch these extreme winners, however, in diversified firms this option is not provided since the whole firm is diversified.

What are then the reasons for firms to diversify? Below are some of the most important motives from prior research.

2.2.2. AGENCY THEORY AND POWER STRUGGLES

Jensen (1986, 1993) argue that firms with large cash holdings will suffer from overinvestment problems, due to incentives for managerial discretion and misbehaviour in a way that gives rise to reduced shareholder maximization and value-destructive behaviour. Thus, managers have a tendency to grow their firms beyond the optimal size, for their own perquisites and private objectives. These private objectives include monetary compensation of different types, a

reduction in their employment risk through reduction in firm risk, and their entrenchment through manager-specific investments that make it costly to replace them (Jensen 1986; Amihud and Lev, 1981; Vishny and Shleifer, 1989). Scharfstein and Stein (2000) continue on Jensen's hypothesis and argue that same behaviour can be seen in diversified firms where managers misallocate resources within a firms internal capital market. The implication is that managers acts in a destructive manner and invites to pareto inefficiency throughout the allocation chain. Scharfstein and Stein term the problem as cross-subsidization, or corporate socialism. They argue that divisional managers in diversified firms could increase their bargaining power on the basis of value maximization and where less profitable and weaker divisions might get subsidized with the help of more profitable and stronger divisions. This will also allow for negative expectations by the market and thus result in reduced value relative focused peers.

Rajan, Servaes and Zingales (2000) continue on this track and argue that the best way for firms to maintain their internal capital allocation advantage compared to focused firm, is to dispose less profitable divisions and only keep those divisions that create value. However Rajan et al. show that this is unlikely and firms will instead introduce weaker behaviour and thus other agency problems connected to corporate socialism. Less profitable divisions get capital to fund investments since managers for these divisions are bribed so that they behave more cooperatively. This will essentially drag the remaining part of the firm down and hence encourage suboptimal capital allocations through the entire firm.

Finally, using a sample of Italian[11] firms from the period 1980-2006, Staglianó et al (2013) investigated why firms decide to diversify, more specifically, they compared the agency costs of free cash flow motive for diversification, with the internal markets motive. Based on their results they conclude that the strongest reason for firms to diversify is to gain benefits from internal markets.

2.2.3. INTERNAL CAPITAL MARKETS AND "WINNER-PICKING"

Gertner, Scharfstein and Stein (1994) find that the owner-provided internal capital has two important advantages over bank lending; increased monitoring, i.e. better flow of information

[11] The authors choice of Italian firms is motivated with the large number of elements of inefficiency in the allocation of funds among Italian firms. Such inefficiency can be seen in for example external capital markets, large controlling shareholders that exploit minority shareholders, problems with information asymmetries and in the corporate governance.

between users and providers of capital, and better asset redeployability, i.e. if one segment performs poorly its assets can be redeployed[12] and combined with the other assets controlled by the corporate headquarters. However, a disadvantage is that the increased monitoring (and thus control) from the providers of internal capital, i.e. corporate headquarters, can diminish the segment managements incentives. The manager may feel that (s)he doesn't get all of the rents from their efforts, due to transfer of control to the providers of capital, i.e. to the corporate headquarters (or "parent company"). The first two (benefits) must outweigh the third (cost), in order for the internal capital markets to be beneficial for the diversified firm (op cit).

Other studies with the subject of internal capital allocation and winner picking have also suggested that diversified firms during downturns develop a higher efficiency to survive. They show that firms can become more efficient in their internal capital market since they can be forced to focus even more on investment opportunities that actually generate the highest NPV (Rajan, Servaes and Zingales, 2000). This would thus result in less unprofitable projects and hence mitigate more severe agency problem. Koller et. al. (2010) on the other hand argue for the opposite; senior executives in diversified firms tend to respond to investment opportunities more slowly than executives in focused firms.

For this specific thesis however, it is important to compare the value of internal capital markets during different market conditions. Yan, Yang and Jiao (2010) find that diversified firms have an advantage compared to focused single-segment firms in crisis periods when external capital markets become more costly, resulting in a decline of investments by focused firms. These results with increased value in diversified firms are consistent with Yan (2006) and Matsusaka and Nanda (2002), who further state that this increase is even greater for financially constrained conglomerates. Thus, a great advantage of diversification is the ability to substitute external capital markets with internal capital markets, which can be viewed as a real option. However, this advantage for diversified firms is not only due to the internal capital markets, but also due to the ease of access to external capital markets in economic downturns and financial crisis. This ease of access comes as a result from the so-called coinsurance effect, i.e. the reduced risk of default due to imperfectly correlated earnings in the different segments (Hann Ogneva and Ozbas, 2009). There is a decrease in systematic risk and hence the total cost of capital (op cit).

[12]Also, one segments assets can be used as collateral for another segment (Erdorf et al, 2013).

2.2.4. DURING THE 2007-2009 FINANCIAL CRISIS

Kuppuswamy et. al. claim that the value of diversification significantly increased during the 2007-2009 Financial Crisis, due to financing and investment advantages over focused firms. They use the traditional excess value measure for discounts, i.e. the natural logarithm of a firm's ratio between market value and its imputed market value (see footnote on p. 15). The discounted value relative their focused peers decreased with 7-9 percent during the crisis period. The main reason was the increasing costs for external capital, which made their internal capital markets more valuable, and also more efficient in regards to capital allocation; allocating funds to value-increasing divisions. Also, diversified firms became significantly more leveraged than their focused peers during this period. More on leverage in diversified firms in the next section.

Rudolph et. al. confirm that diversification discount of conglomerates fell significantly during the crisis years of 2008 and 2009. They study how the value of diversification was affected in different parts of the world, with regards to the institutional context, i.e. investor protection and development of capital markets. Hence, this value increase was higher in countries with strong investor protection and well-developed capital markets, e.g. the U.S. and the U.K.

2.2.5. DEBT CO-INSURANCE

Lewellen (1971) introduce the coinsurance effects theory[13] and claimed that one can expect to see imperfect correlations in earnings streams, in more diversified firms, and thus greater debt capacity. This results in higher leverage and thus higher tax shield relative its focused peers. Higher leverage can also mitigate some of the potential agency problems through its disciplinary role of debt. Jaffe and Stiglitz (1990) proceeded with the coinsurance effects theory and argued that one could also expect higher credit ratings[14] in diversified firms, which result in less costly external financing.

Better access to external capital market for diversified firms even in a credit downturn, e.g. during the Financial Crisis, gives diversified firms better opportunities to substitute internal capital for external capital due to higher credit ratings and greater ability to carry more debt (Lewellen, 1971; Gertler and Gilchrist, 1994; Stein, 1997; Matsusaka and Nanda, 2002; Yan,

[13] Coinsurance effects refer to risk reduction of default for merged firms through imperfect correlation in earning stream and thus increase debt capacity of the new combining firm (Lewellen, 1971).

[14] Credit agencies like S&P and Moody´s use segmental and geographical diversifications as parameters when assessing a firm's credit rating (see for example www.moodys.com)

Yang and Jiao 2009). The same conclusion is made in Gertler and Gilchrist (1994), Kashyap, Lamont, Stein (1994), and Almeida and Campello (2007), which indicate that with reduced access to capital market, they also exhibit larger investments sensibility in credit market conditions. This suggests that firms with more limited opportunities to capitalize internal investments and simultaneously also have a limited ability to borrow on external markets, also may postpone investments or dropping them entirely during the credit downturns.

Finally, an important study for this particular thesis is Duchin (2010), which finds that diversified firms hold significantly lower amounts of precautionary cash. This is due to reasons that cross-divisional diversification in investment opportunity is related to capital transfers across divisions, which drive firms to hold less cash when these transfers are abundant. The results are in line with the co-insurance effect and strongest in well-governed and financially constrained firms (ibid.). Since there are opportunity costs associated with large cash holdings, these results imply a positive gain in value for diversified firms (op. cit.).

2.2.6. MARKET FRICTIONS

Diversification because of market frictions, has been a widely used argument, i.e. transaction costs of internal financing is lower than external financing (e.g. bank loans). In 1961, Gordon Donaldson introduced the theory of pecking order which Myers and Majluf (1984) later modified. They find that firms use the principle of minimal effort and minimal resistance to find the optimal source of funding, and this will result in a last resort for funding since firms will see an increase in equity as an expensive way to finance future projects. Instead, internal cash flows are the optimal funding source to maximize value-creation, since they will minimize adverse selection problems most firms suffer from. The arguments are in the information asymmetry within firms, where managers are assumed to have a more extensive and transparent information advantage regarding the firm's future prospects, risks and value, in contrast to outside investors on the market.

Donaldson (1961) and Myers and Majluf (1984) further find that information asymmetry will result in a price premium for external financing, which may give managers incentives to act in existing stockholders' interest and thus pass up future valuable investment opportunities since they believe the firm is more undervalued than the NPV generated by the investment. Managers will thus issue the safest security, which also is seen to be the least sensitive to information

asymmetry problems. Beside equity and internal funds a firm can also choose to issue debt. Debt is seen to be in the middle between equity and internal funds in pecking order model (op cit). The reason for this lies in the difficulties to value the different securities, which furthermore implies investors information disadvantage as non-beneficial in terms of valuation possibilities. Debt on the other hand, is less difficult to value due to certain payoff streams compared to stocks and thus only have to rely on valuation of the collateral connected to the debt instead of the whole firm.

2.3. THE HYPOTHESES

Based on the literature review, it is possible to define the hypotheses for this study. These will form the forthcoming parts of this thesis, and help answer the research question.

1. *H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and focused single-segment firms with excess cash, during the pre-crisis period.*

2. *H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and focused single-segment firms with excess cash, during the crisis period.*

3. *H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and focused single-segment firms with excess cash, during the post-crisis period.*

4. *H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and the 20 percent largest excess cash holding focused single-segment firms during the pre-crisis period.*

5. *H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash and the 20 percent largest excess cash holding focused single-segment firms during the crisis period.*

6. *H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and the 20 percent largest excess cash holding focused single-segment firms during the post-crisis period.*

The hypotheses include a distinction between firms with different grade of diversification, i.e. firms with two, three or more business segments. This is done in order to reveal if the grade of diversification has an impact on the stock returns. This way, large international conglomerates will be part of the same sample. Also, there is a distinction between firms with simply excess cash holdings and firms with relatively large excess cash holdings, i.e. the top 20 percent of the firms with the most excess cash.

2.4. EFFICIENT CAPITAL MARKETS – UNDERLYING ASSUMPTION

As the research aims to fill the gap from prior research and provide evidence of differences in abnormal returns between diversified and focused firm with regards to excess cash holdings, evaluation of stock performances must be done by some measurement. But to be able to understand the fundamental theory behind these models, a guideline of the underlying arguments must first be discussed.

2.4.1. EFFICIENT MARKET HYPOTHESIS

According to financial theory, capital markets should be seen as efficient where arbitrage opportunities are not possible. The theory of efficient capital market is introduced by Fama (1970) and is today the leading theory and the fundamental assumption behind all market pricing and evaluation models. In efficient markets, all known information reflect market prices and thus, abnormal returns in excess of investors risk premium are thus not possible. Fama quoted:

> *"The principal hypotheses following from quick and accurate reaction of price to new information is that stale information is of no value in money making"*

A conclusion which would prevent investors from using new information to generate excess returns, as merely unmediated information could be value creating and thus influence future price fluctuations. Fama termed the phenomenon as a random walk. Schleifer (2000) provide further discussions on Fama's argument, and find that new information is priced in directly, which also mitigates arbitrage and mispricing of financial assets. To term market efficiency, Fama (1970) and Schleifer (2000) set for three grades of efficiency:

- *The weakest form of efficiency:* Trends from historical prices cannot be used to forecast future prices.
- *Semi-strong form of efficiency:* All known information should be priced, and arbitrage by information interpretation and analysis is not possible.
- *Strongest form of efficiency:* Latent information is assumed to be priced in, whereas insider trading is not possible.

The implication would thus be that our model assumes efficient capital markets. But since this research doesn't aim for ex-ante valuation but rather ex-post evaluation for differences between real return, the underlying efficiency assumption is not necessary for our purpose, but still important in order to understand evaluation of stocks and the pricing models used.

2.4.2. TOTAL RETURNS TO STOCKHOLDERS (TSR)

The total amount shareholders gain from their stocks is the percentage increase in stock price plus the dividend yield, commonly known as the Total Returns to Shareholder[15], which often is used by investors as a measure of firm performance. However, Koller et. al. (2010) argue for a decomposition of TRS into four parts:

- The value gained from revenue growth, net of the capital invested for the growth, which equals the improvements in operating performance (e.g. higher margins).
- The earnings yield, i.e. the TRS in the beginning of the measurement period without any of the above mentioned growth.
- Change in shareholders expectation for the firm's performance, which can be measured with the help of P/E or P/B ratios for example.
- The impact of financial leverage, i.e. debt financing of investments.

Realized TRS thus depend on investor expectations on future performance. These expectations make TRS difficult to use as a performance measurement tool. Essentially, over short times periods such as three months, TRS measurements are also largely meaningless for intrinsic value, due to the domination of expectations over important factors for intrinsic value, such as revenue growth or return on invested capital (op.cit.). On short-term, TRS can simply be driven by movements in the industry or the broader market. For example, falling interest rates are

[15] Average annual TRS on U.S. equities for the last 200 years have been 6,5 percent adjusted for inflation (op. cit.).

known factors that have an effect on the stock markets. Also, irrational behaviour by investors can have its effect on the stock markets; ”*whole markets can lose touch with fundamental laws grounded in economic growth and returns on investment*” as Koller et. al. (2010) quoted it, referring to the Dot.com boom in the late nineties.

Most recently, the economy was hit by the Global Financial Crisis, which wiped more than 50 percent of the value of stock markets across the world, from their peak levels in 2007. For example, S&P 500 went from 1,565 in mid-2007, before dropping to 667 in March 2009 (op. cit). The large fluctuations on the market makes it therefore also interesting to compare focused firms with large excess cash holdings and diversified firms with less cash holdings, in order to discover any potential differences between the expectations on these firms. As a proxy for these expectations, the risk-adjusted excess returns of the stock prices are measured.

2.4.3. MEASURING ABNORMAL RETURNS – JENSEN´S ALPHA

The measure used in this research for the risk-adjusted stock returns, i.e. the abnormal returns over the so-called theoretical expected stock returns given the risk, is the commonly used Jensen´s Alpha. Jensen´s Alpha was first introduced back in 1968 as a performance measure for mutual funds, but can be applied to any asset (Jensen, 1986). The formula for Jensen´s Alpha is given by the intercept in the following equation:

$$E[R_i] - R_f = \alpha_i + \beta_i\,(E[R_m] - R_f)$$

When setting alpha as the dependent variable, a more common equation is introduced, which sets the way for the measurement of abnormal returns. The model can be seen below:

$$\alpha_i = R_i - [R_f + \beta_i\,(R_m - R_f)]$$

EQUATION 2: JENSEN`S ALPHA

Ri = Expected total return of the stock

Rf = Risk-free interest rate (r_f)

Bi = Beta and systematic risk of the stock (β_i)

Rm = Expected market return (r_m)

As one can see from the formula above, the abnormal return is the return in excess of that given by a stocks theoretical return according to the Capital Asset Pricing Model (CAPM). If a stock has a higher return than the risk-adjusted return, the stock is said to have a positive alpha, or an

abnormal return (op. cit.). Thus, the aim of this study is to compare the risk-adjusted stock returns in terms of alphas, for the sample of focused cash-rich and diversified firms. The risk-free interest rate used in the model is usually a government bond, e.g. U.S. treasury bond for U.S. stocks or a German Eurobond for European stocks (Koller et. al., 2010). But since this research doesn't aim to distinguish the differences between market return and stock return, but rather between two different strategies, both risk-free interest rate and market return/premium is of less importance. However, due to the transparency motives, both variables will be discussed and implemented in their entirety.

The beta of a stock represents the systematic risk, in terms of the correlation between the stock's volatility and the "markets" volatility. The market in this case is a hypothetical portfolio of all the weighted assets and securities across the entire world (Byström, 2007). For example, a stock with a beta of 1 will have the exact same theoretical volatility as the market; if the market increases one percent, the stock increases one percent as well (Byström, 2007). A beta of 2 means that a stock is twice as volatile as the market (ibid.) which also means that a stock with beta 2 will increase or decrease twice as much as the market portfolio. In reality however, the market portfolio is a well-diversified portfolio of stocks, e.g. Standard & Poors 500 (S&P500) or Morgan Stanley Capital International (MSCI) World Index (Koller et. al. 2010).

Other models can be used for the same purpose, but in order to motivate the choice of Jensens Alpha, this next section provides two alternative methods together with some theoretical issues connected to them.

2.4.4. ALTERNATIVE MODELS

2.4.4.1. SHARPE RATIO

For the last 50 years, the Sharpe ratio has been a widely used and well-known evaluation tool to evaluate stock returns and mutual funds. Sharpe (1966) introduced the ratio, which first was named "reward-to-variability" for its characteristics of evaluation risk returns but was later renamed after its author. The model is similar to the so-called Information ratio[16], and it can be interpreted as the risk-adjusted return ratio of a zero investment strategy. The measurement characteristics are assigned to measure expected return per unit of risk in volatility. The model is

[16]The equation for information ratio can be seen as $R_{it} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + e_{it,}$, where the ratio then is defined as $IR_i = a_i/\text{Std } e_i$

further based on ex ante values but is more commonly used and implemented as ex post evaluation. Sharp (1966, 1994) define the model as:

$$Sr_i = \frac{E\left[R_i - R_f\right]}{\sigma_i}$$

EQUATION 3: SHARPE RATIO

Ri = Expected total return of the stock

Rf = Risk-free interest rate (r_f)

σi = Volatility for the stock

The model is especially beneficial due to its ability to test for differences between risk-adjusted portfolios as:

$$H_0: Sr_{ij} \equiv Sr_i - Sr_j = 0.$$

The model assumes returns to be independent and identically distributed (IID) and thus serially uncorrelated, which essentially means that transformed differences of the statistics as normal distributed with mean Sr_{ij} and variance θ (Jobson and Korkie, 1981). The reason why the Sharpe ratio became a global measurement tool is due to the interest of risk-adjusted returns assigned to rational investors, who have a desire to achieve the highest return per unit of risk as possible. Obviously the model provides incentives to investors and justifies evaluating regarding risk-adjusted returns across portfolios or assets. Nevertheless, the model contains volatility (σ), which measures the whole risk and thus not only systematic or idiosyncratic risk. At first sight, the model would therefore also be beneficial for this research purpose.

However, Sharpe has some major destructive drawbacks, especially during uncertain and problematic states of the economy where the model generates misleading conclusions. Israelsen (2003) named the problem as *"The negative excess return dilemma"*. To demonstrate the behaviour, consider two portfolios. Portfolio A generates returns of -3 percent and a stock volatility of 3 percent, while portfolio B generates returns of -30 percent and a volatility of 40 percent. Obviously portfolio B is worse off than portfolio A, both in risk and returns. However, Sharpe ratio will prefer portfolio B over A since the ratio indicate -1 for portfolio A and -0,75 for portfolio B, which means that inferior portfolios are preferred over more attractive ones. Since our research also focuses on downturns in the economy, Sharpe ratio is to consider as inappropriate due to its major drawbacks during unstable market conditions, a conclusion which

also is consistent with Sholtz & Wilkens (2005). Due to these drawbacks, the use of Sharpe Ratio is not of interest or relevance for this study and this gives a better understanding for the choice of Jensen´s Alpha.

2.4.4.2. TREYNORS RATIO

Just as Sharpe ratio, the Treynor ratio measures excess return per unit of risk, but unlike the Sharpe ratio, Treynor only focuses on the systematic risk and therefore not the overall risk, which also introduce the assumptions of non-diversifiable risk associated with the asset. This assumption is obviously fundamental for the use of the model and makes it directly unsuitable as a risk measure in less diversified portfolios. Treynor (1973) defines the model as;

$$Tr_i = \frac{R_i - R_f}{\beta_i}$$

EQUATION 4: TREYNORS RATIO

Ri = Expected total return of the stock

Rf = Risk-free interest rate (r_f)

βi = Beta and systematic risk for the stock

To look at potential drawback beside previously mentioned assumptions, one should turn the attention to the dimensionality of the model, where it only ranks the outcome rather than quantify the added value. Ranking will subsequently only be considered as appropriate if the sample portfolios are considered as fully diversified, which more or less makes the model useless for regular investors. If this assumption isn´t satisfied, portfolios with different idiosyncratic risks are ranked equally, ceteris paribus, which will give rise to either distortion in mispricing of the assets if evaluations are being used ex ante. Alternatively, incorrect inference regarding a portfolio's risk-adjusted return in ex post evaluations. Treynor ratio can thereafter be rearranged and traceable to the more common CAPM, which should give rise to the question if the model also should be seen as equivalent to Jensen's Alpha? The answer is no, since the differences between the models introduce potential errors in the comparative rankings (Jobson and Korkie, 1981). The conclusion is that neither Sharpe nor Treynor can be considered as appropriate for the purpose of this research. And even if Jensen's Alpha can be criticized with CAPM arguments of inefficient markets and pricing errors, it nevertheless gives quantification potential for excess returns and does not invite to misleading conclusion regarding defective rankings.

3. METHOD

In this chapter, a thorough presentation of the method is given, which includes details of the data used, the models for deriving excess cash and abnormal stock returns, and the definition of diversified firms. Both practical and theoretical aspects are explained and motivated, with the goal of having a full transparency and a total replicability.

3.1. OVERVIEW OF METHOD STRATEGY

The choice of method has to a large extent been inspired by prior research, e.g. Opler et. al (1999) for determining excess cash.[17] The study is based on a quantitative deductive approach, i.e. with the development of hypotheses from prior research and theory, which are tested with statistical analyses (Saunders, Lewis and Thornhill, 2009).

In order to give the reader a clear view of the practical process of the method, the following intermediate section will provide a short overview of the different steps involved in the method. This is then followed up by a more detailed presentation of the work behind.

1. The first step involves the collection of relevant cross-section data for measuring firms excess cash and grade of diversification (e.g. Cash and Short Term Investments, Total Assets, SIC-codes, et cetera). This is done for all listed U.S. firms available in Thomson Reuters DataStream® and results in a spreadsheet with approximately 14,000 U.S. firms / year of different size and in different industries. However, the firm sample decreases substantially after the first elimination round. In line with prior research, the sampling criteria exclude firms in the financial and utility sector, firms without all necessary data available, and finally, all firms with below 20 million dollars in annual sales.
2. In step two, firms are sorted out by their SIC-codes and sale per segment, which leads to a distinction between diversified and focused firms. At first sight it seems as a wearisome task, but proves to be a fairly smooth process due to the IF(AND) functions in Excel.
3. The third step involves processing of the downloaded data since some of the variables for the determination of excess cash are not available as "ready to use" variables in the database, and thus need to be derived with the help of available variables. For example,

[17] Excess cash are all the liquid funds in the firm regarded as unneeded for the daily operations.

average industry cash flow volatility is estimated with regards to EBIT, Interest Payments, Tax Payments, Depreciation and Total Assets.

4. In step four, regressions for excess cash are run in Eviews®, which through the residuals reveal which firms hold excess cash. Hence, they can now be sorted out in different dimensional portfolios by the relative amount of cash. This is done for both diversified and focused firms. Also, diversified firms, which are considered as highly diversified according to their SIC-codes and sales per segment, are distinguished and put in separate portfolios, hence; a grade of diversification is created.
5. In the fifth step, firms´ stock returns, and market index returns (for beta estimation) are downloaded from the same database as earlier. Also, the risk free interest rate with a relevant maturity is downloaded, whereas a market risk premium is determined with help of the literature.
6. The final step involves measuring abnormal stock returns in the different portfolios with the help of the equation for Jensen´s Alpha. These returns are then tested in Eviews® for significant differences between the portfolios.

3.2. DATA AND SAMPLE

In order to receive the cross-section data for the firms´ excess cash holdings, segmental diversification and their stock returns, data from Thomson Reuters DataStream®[18] is used. The total number of U.S. firms that end up in the final sample after the sorting process, are on average 826 focused and 358 diversified firms per year. The proportion of diversified firms to focused firms is quite similar to prior studies, 25-40 % (e.g. Yan et. al. 2010). The data covers a total of 10 years, 2004 – 2013. The study is limited to non-financial and non-utility firms [19] with a minimum of $20 millions in annual sales. The exclusion of firms in the financial- and utility industry is a common practice in prior research on cash holding, due to these firms´ regulatory requirements on capital and "cash" in the form of current marketable securities (Opler et. al.,

[18] Prior empirical studies in diversification have mainly used Compustat as a source. However, some papers criticize the use of Compustat due to claims of misclassifications in segmental data, for example that the true extent of diversification is higher than reported in Compustat (e.g. Lichtenberg, 1991; Villalonga, 2004). Thus, besides for practical reasons, this is another argument for the use of a different database.

[19] Financials have SIC-codes between 6000-6999, whereas utilities have SIC-codes between 4900-4999. Note however, that industrial firms with a financial segment are not excluded, since these firms are often large conglomerates that have initially had their prime industrial segment, but later expanded to the financial industry. A good example is General Electrics, which started of as an electrical distribution company, but nowadays are present in the business and consumer finance industry as well (GE Money and GE Commercial Finance, respectively).

1999). The exclusion of firms with less than $20 millions in sales is made for reasons of not getting too small single-segment firms in the sample, which may give rise to bias and distorting results since conglomerates usually are relatively large (e.g. Berger and Ofek 1995; Rudolph et. al., 2013).

3.2.1. TIME INTERVAL OF STUDY

Boldin and Cici (2010) argue that the majority of prior research within areas based on financial statistics has based their frequency data on time interval of 5-10 years in order to get a decent consistency and relevance in their time selection. This time length is also assumed to be appropriate for this research purpose, in order to maintain a relevance and reliability throughout the research. One should also understand the interests behind the research, where a benchmark period against credit downturns is highly necessary to distinguish any disparities between diversification and focused firms with regards of cash holdings during different states of the economy. One might therefore also assume that there can be different results between different time periods and this makes it even more relevant for a wider time frame of 10 years. With regards to these assumptions the choice of time interval is set at 10 years.

To specify the exact time period we turn the attention to the Financial Crisis, which had its origins in the household sector, more specifically, in the wave of subprime mortgage defaults in early 2007 (Gorton, 2008). Later that year, mortgage defaults also began to slowly spill over to the supply of bank credits, which affected the corporate sector (Ivashina and Scharfstein, 2010). The bankruptcy of Lehman Brothers on 15th of September 2008 was the starting point for the huge drop in stock performances across equity markets throughout the world. Also, bank lending in the form of new loans for large borrowers in the U.S. fell by 47 percent during this period in 2008 (ibid.). Kuppuswamy et. al. (2010) define the crisis period with the following three periods:

- *Early crisis:* Q3 2007 - Q3 2008
- *Late crisis:* Q4 2008 - Q1 2009
- *Post crisis:* Q2 2009 - Q4 2009

As this study aims to look at differences between focused firms and diversified firms during different states in the economy, a time frame including 2007 - 2008 is of greatest interest, specifically between January 2004 - December 2013, which gives the opportunity to catch the

differences before, during and after the crisis, where the crisis as a whole will be defined as Q3 2007 - Q1 2009. The rest is defined as pre-crisis and post-crisis period. The crisis can be seen graphically by plotting out the intensity of it measured by two of the same variables as in Kuppuswamy et. al. (2010)[20] :

- The so-called TED-spread, which is the difference between a 3-month LIBOR and the yield on a 3-month treasury bills, is an indication of the liquidity in the financial system.
- The Chicago Board Options Exchange Volatility Index (VIX), shows the implied volatility of the S&P 500 options index, and is often referred to as the "fear index", since it indicates the market's future expectations of the stock market volatility for the coming 30-day period (Bloomberg, 2014).

Figures 1 and 2 illustrate the TED-spread and VIX respectively. The TED-spread is shown in basis points (1 percent = 100 bps) and the VIX is shown in annualized percentage change. Hence, the values in the figure for the VIX are divided by √12 to get the VIX on a monthly basis.

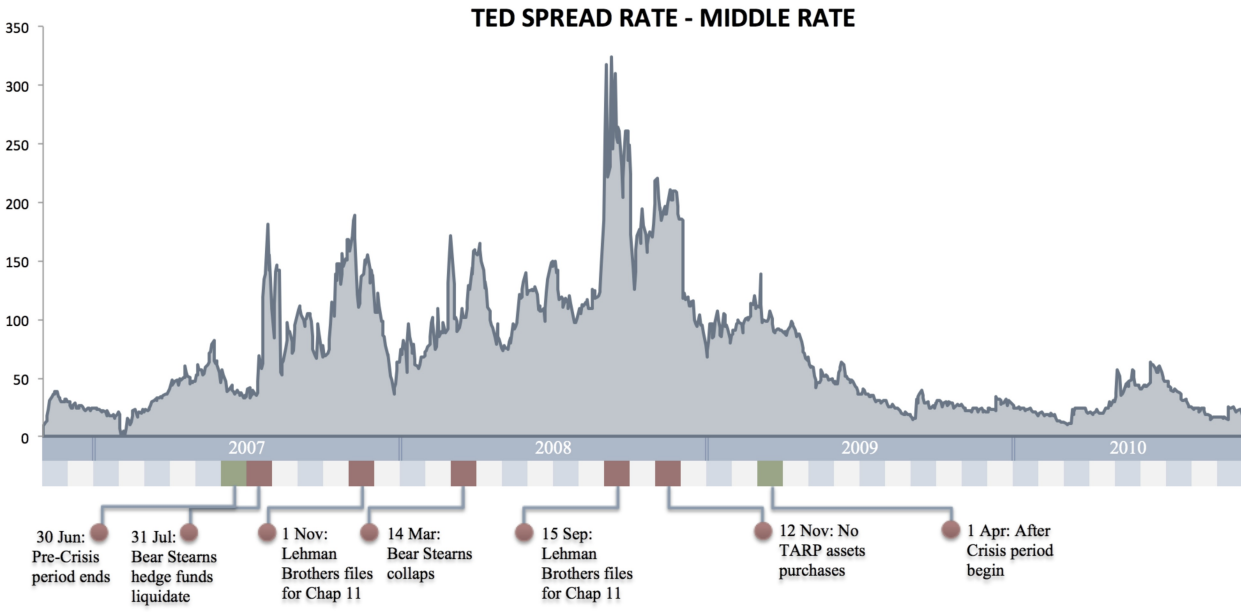

FIGURE 1: *THE SPREAD BETWEEN A 3-MONTH LIBOR, I.E. THE INTERBANK INTEREST RATE, AND THE YIELD ON A 3-MONTH TREASURY BILL.*

[20] Kuppuswamy et. al. (2010) also use the difference between 3-month commercial papers over treasury bills of the same maturity, for the pre-crisis period. However, they point out that, according to Almeida et. al. (2009), this measure is highly correlated with the TED-spread, especially from Q4 2008 and beyond.

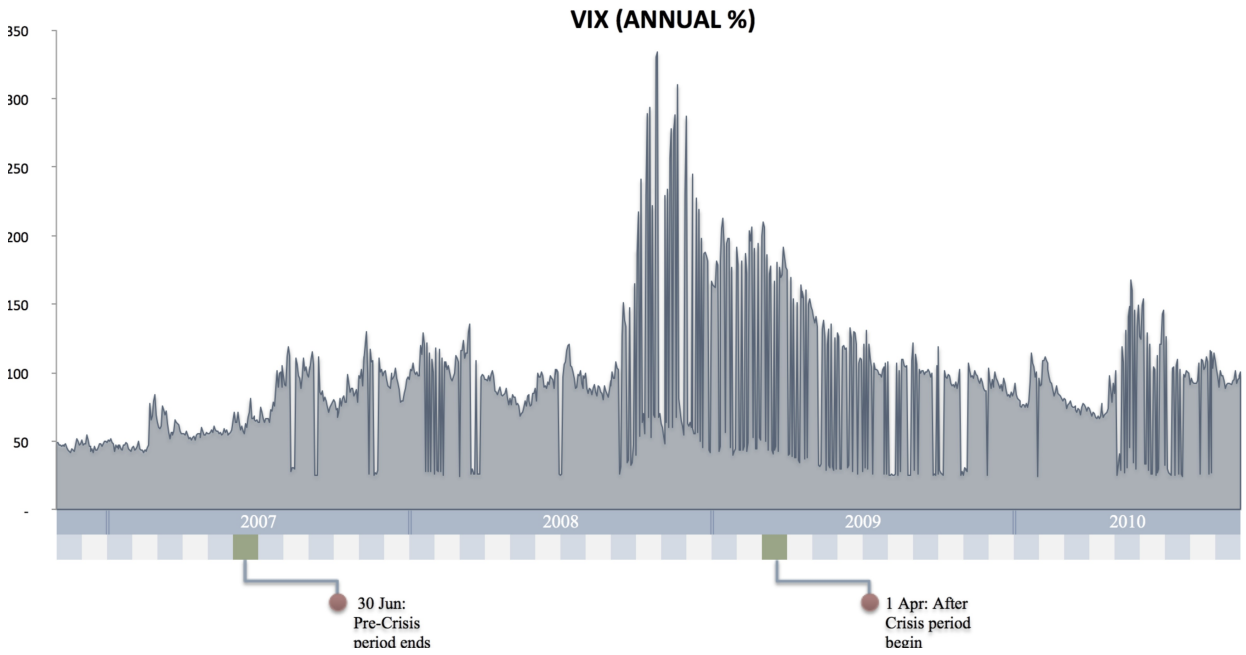

FIGURE 2: *MARKETS IMPLIED VOLATILITY (%) ON THE S&P500 OPTIONS INDEX. THE VALUES IN THE FIGURE ARE DIVIDED BY √12 IN ORDER TO GET THE VIX ON A MONTHLY BASIS.*

Since this study aims at highlighting the difference between diversified firms and cash-rich focused firms during credit downturns, there is a chance to capture both market behaviour in terms of return and risk-adjusted returns before the downturn, and its behaviour during and after the downturn. One can therefore assume that the breakpoints will provide a good base to illustrate the differences that may arise between the two firm characteristics.

3.3. DEFINITION OF CASH-RICH FOCUSED FIRMS

Cash-rich focused firms are defined as focused firms with significant amounts of excess cash on their balance sheets, at the end of every year. For firms to be classified as focused, it is required of them to have reported only one segment and thus have one SIC-code in DataStream. In the case where a firm has more than one segment, requirements are set to show the same three-digit SIC-codes, i.e. the first three figures in their SIC must be the same. This requirement has also been used in prior research (Subramaniam et. al., 2010).

To determine and define excess cash, prior research has used a set of variables by the same way as Opler, Pinkowitz, Stulz and Williamson (1999). However since prior research also provide arguments for larger excess holdings in focused firms compared to diversified (e.g. Duchin, 2010), the model is modified with a dummy variable and therefore improved to better determine

excess cash variation between firms. Diversification as determinant of excess cash is actually tested in Opler et. al. (1999) as well, but the variable turns out to be insignificant for the sample as whole[21]. The model with this slight modifications:

$$C_{it} = \beta_{1t}MB_{it} + \beta_{2t}Size_{it} + \beta_{3t}CAPEX_{it} + \beta_{4t}NWC_{it} + \beta_{5t}L_{it} + \beta_{6t}FDC_{it} + \beta_{7t}CF_{it} + \beta_{8t}\sigma_{it}^{industry} + \beta_{9t}DIV_{it} + \beta_{10t}Strategy_{it} + \varepsilon_{it}$$

EQUATION 5: MODEL FOR DEFINING EXCESS CASH

The original model is one of the most widely used in the literature of corporate excess cash holdings (e.g. Bates et. al., 2009; Subramaniam et. al., 2010). The model shows how different variables determine a firm's excess cash holdings. In the model, epsilon represents the residuals in the regression. Whenever positive, these residuals indicate that a firm has excess cash holdings. The betas are the coefficients for the different variables that Opler et. al. (1999) identify as determinants of corporate cash holdings. The model has been extended with a dummy variable – called strategy, which takes the value of one if the firm is focused, and zero otherwise. The dependant variable (C_{it}) is thus a firms all liquid asset holdings at time t.

3.3.1. DEPENDANT VARIABLE

Liquid Asset Holdings (C_{it}): To derive liquid asset holding, Opler et. at. (1999) use the natural logarithm of Cash and Short Term Investments divided with Total Book Value of Assets less Cash and Short Term Investments. The denominator is referred to as "net assets".

$$C_{it} = LN\left(\frac{Cash\ and\ short\ term\ investments}{Total\ Book\ Value\ of\ Assets - Cash\ and\ short\ term\ investments}\right)$$

3.3.2. INDEPENDENT VARIABLES

Market-to-book (MB): Opler et. al. (1999) defines the market-to-book ratio as book value of assets minus book value of equity, plus market value of equity. This term is then divided with total book value of assets less cash and short-term investments, i.e. net assets. Market-to-book measures the market's expectations about the firms future NPV investment opportunities and the likelihood of these opportunities being positive. Since book values of assets doesn´t include future growth options, the market's expectations are thus taken into consideration with the

[21] The variable "number of segments" is significant at the 10 % level for only a subsample of firms using derivatives as hedging instruments.

market value of equity. Firms that have high market values relative their book values are believed to have high future growth opportunities (ibid.).

$$MB_{it} = \frac{Total\ Book\ Value\ of\ Assets - Total\ Book\ Value\ of\ Equity + Market\ Value\ of\ Equity}{Total\ Book\ Value\ of\ Assets - Cash\ and\ short\ term\ investments}$$

Firm size (SIZE): The size of a firm is according to Opler et. al. (1999) an important determinant of its cash holdings. The variable is defined as the natural logarithm of total book value of assets at the end of each year.

$$Size_{it} = LN(Total\ Book\ Value\ of\ Assets_{year\ end})$$

Capital Expenditure (CAPEX): Capital expenditures are all the investments in various fixed assets made by a firm (e.g. property, plant and equipment), investments in assets that are believed to bring future benefits for the firm. These are then divided by net assets to get CAPEX in proportion to firm size.

$$CAPEX_{it} = \frac{Capital\ Expenditures}{Total\ Book\ Value\ of\ Assets - Cash\ and\ short\ term\ investments}$$

Net Working Capital (NWC): To measure liquid asset substitutes, Opler et. al. (1999) uses working capital less cash and short-term investments, divided by net assets. The ratio shows the liquid assets excluding cash that a firm can sell off as non-core assets during periods of economic distress (Lang et al, 1994).

$$NWC_{it} = \frac{Working\ Capital - Cash\ and\ short\ term\ investments}{Total\ Book\ Value\ of\ Assets - Cash\ and\ short\ term\ investments}$$

Leverage (L): Leverage is also a determinant of excess cash holdings, and it is measured with the plain debt-to-asset ratio.

$$L_{it} = \frac{Short\ Term\ Debt + Long\ Term\ Debt}{Total\ Book\ Value\ of\ Assets}$$

Financial Distress Cost (FDC): As a proxy for potential financial distress costs, the R&D expense-to-sale ratio is used. A large number of firms do not report any R&D expenses however, these are then considered to be firms with no such expenses, all in line with Opler et. al. (1999).

$$FCD_{it} = \frac{Research\ \&\ Development}{Revenue}$$

Cash Flows (CF): Measured as EBIT less interest, taxes and dividends paid out, but before depreciation. This is then divided by net assets, again as defined above. When dividing with net assets, one gets the cash flows relative to the size of a firm.

$$CF_{it} = \frac{EBIT + Depreciation - Interest - Taxes - Common\ Dividends}{Total\ Book\ Value\ of\ Assets}$$

Industry Cash Flow Volatility ($\sigma^{industry}$): The cash flows are also used for calculation of the industry cash flow volatilities. The volatility, which equals the average standard deviation of the industry´s cash flows, is the measure for cash flow riskiness in a specific industry (industry defined by two-digit SIC). The cash flows for each firm in the 10-year period[22] preceding this study´s time interval (i.e. 1993-2003) are downloaded, whereby the standard deviation for each is calculated. The firms are then grouped in their respective industry, and average volatility across all firms in an industry are thereby obtained.

Firm strategy (Strategy): A dummy is included to explain the difference between diversified and focused firms. If the firm is focused, the dummy takes on the value of one, otherwise zero.

Dividend Payment (DIV): Finally, the regression also contains a second dummy variable that takes into account for dividend payouts, i.e. if a firm pays out any dividends the variable takes on the value of one, otherwise zero.

3.4. DEFINITION OF DIVERSIFIED FIRMS

The definition of diversified firms is on the other hand somewhat unclear and can sometimes seem arbitrary. Since 1997, FASB has implemented a standard, referred to as SFAS No. 131, for

[22] Opler et al (1999) actually makes the calculation for a 20-year time period, but due to time limitations for data processing (downloading and sorting out), we settled with 10 years. Also, there was a lot of relevant data missing for firms in DataStream, for years prior 1992. 10 years is also used by Simutin (2010).

the way public firms in the U.S. are required to report greater segment disclosure about the segments in which they operate (Yan, 2006). This standard basically requires a firm to report financial and descriptive information about its operating segments, if the firm has separate internal financial information available for the segment in order for the management to keep track on and evaluate the performance. The standard requires information for segment profits and losses, specific revenue and expense items, and specific segment assets (FASB, 2014).

There is however differences in the literature on the definition of diversified firms. Mitton and Vorkink, (2010) in their study of the diversification-discount, define diversified firms as those that have more than one four-digit SIC-code reported in Compustat. Yan (2006) define diversified and even conglomerates in a similar way, while Tong (2011) also follows this reasoning but states that she gets similar results by defining diversified firms as firms that have at least two segments with different two-digit SIC-codes. Han-Shin et. al. (1998), Subramaniam et. al. (2011), and Hann et. al. (2009) define a firm as diversified in this way, i.e. if it reports more than one business segment at the different two-digit level. The literature refers to these segments as *unrelated*, since the first two digits indicate the major industry group of the segment (Erdorf et. al. 2013).

This thesis goes with this way of defining diversification as well, mainly for two reasons. First, remember that prior research argues that both the value of internal capital markets and excess cash holding increases during periods of crisis. Since the aim of the study is to find out whether diversified firms provide higher abnormal returns than focused cash-rich firms, it feels intuitive to set a clear distinction between the two firm characteristics. A lot of firms in the sample have indeed reported more than one different SIC-code, but when looking at the three-digit level, these firms´ segments can be quite related with each other. For example, Wasau Paper Corporation is a firm in the sample, with the SIC-codes 2621 and 2676[23]. This firm produces towel and tissue products, such as; roll towel, folded towels, facial tissue, and household roll towels (Wasau Paper Corporation, 2014). They also have roll towel dispensers, bath tissue dispensers, dairy towels, hand care products (soap) and hand care dispensers (ibid.). However, it is hard to justify this firm as (enough) diversified, and that it has an internal capital market which enables it to sell of non-core assets in the case of a lower demand, or moving capital from one

[23] Paper Mills and Sanitary Paper Products respectively

segment to another. On the other hand, if one defines diversification at the two-digit level, there is an inclusion of firms with unrelated segments such as Newtek Business Services. This firm provides its customers with small business loans, merchant processing (i.e. different payment solutions), and even web services (Newtek.com, 2014).

The second reason for this choice of definition is due to the prior literature, which finds stronger effects for unrelated diversification and capital markets. For example, Staglianó et. al. (2013) state that related and unrelated diversification have different drivers; unrelated diversification outside a firms core-business is mostly associated with benefits from internal capital markets which are extracted when external financial capital markets fail, while related diversification is more driven by factors regarding product expansion and technology. Thus, there is a specific benefit for unrelated diversification and internal capital markets, which outweighs the costs from opportunistic problems and agency costs. Also, the above-mentioned findings from Kuppuswamy et. al. (2010), on the reduction in diversification discounts during the Financial Crisis, is entirely attributable to unrelated form of diversification.

To mitigate potential bias in classification, and in accordance with prior research, firms that report more than 90 percent of their revenues in only one segment are regarded as focused (Rudolph, 2013). The research also aims to reclassify firms every year, which will result in changes in data structure since firms goes from focused to diversified and vice versa during this time period ("refocusing" or "diversifying").

3.5. PORTFOLIOS

For every year, focused firms with positive residuals and therefore excess cash are put together in portfolios and compared with diversified firms without any excess cash, i.e. diversified firms with negative residuals. Thus, we avoid firms that are both cash-rich and diversified. Also, subsequent tests are made where the top 20th percent of all focused firms that hold the most excess cash are put in one separate portfolio and again compared with diversified firms that don´t hold any excess cash. Simutin (2010) in his study on stock returns in firms that hold excess cash divides the portfolios in deciles. However, in this case, it will result in quite a few firms in every portfolio.

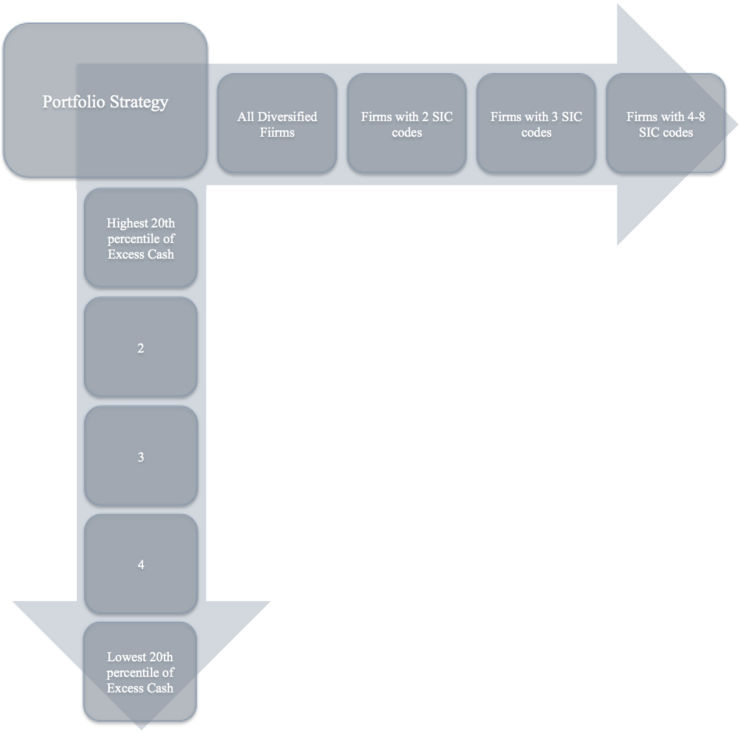

FIGURE 3: *THE PORTFOLIO STRUCTURE AND HENCE THE GRADE OF DIVERSIFICATION AND EXCESS CASH POSITION FOR DIVERSIFIED AND FOCUSED FIRMS RESPECTIVELY.*

Also, it is tested whether grade of diversification can play an important part. The diversified portfolio is split in three grades of diversification:

- Low grade of diversification, which consists of firms that operate in two different segments.
- Medium grade of diversification, which consists of firms that operate in three different segments.
- High grade of diversification, which are firms that operate in many different segments, and are often referred to as holdings.

3.6. INPUTS USED FOR JENSEN´S ALPHA

As mentioned in the prior chapter, abnormal returns are measured with the help of Jensen´s Alpha. In this section, different inputs will be presented and motivated. Again, the equation is:

$$\alpha_i = R_i - [R_{f+} \beta_i (R_m - R_f)]$$

EQUATION 6: JENSEN´S ALPHA

Ri = Expected total return of the stock

Rf = Risk-free interest rate (r_f)

Bi = Beta and systematic risk of the stock (β_i)

Rm = Expected market return (r_m)

The risk-free interest rate used in the formula for abnormal returns is a simple U.S. treasury bond with a relevant maturity, in this case 1 year. The interest rate is downloaded from DataStream.

When it comes to the betas of the stocks, they are calculated with the same methodology as in Koller et. al. (2010). The steps involved for gaining as accurate betas as possible, are the following. First, regressing the raw betas against a well-diversified market index, i.e. using the SLOPE function in Excel on the logarithmic returns[24] of the stocks against the logarithmic returns of S&P500. The frequency is monthly, and for a 5-year period preceding the studied period, i.e. the betas for 2004 are calculated with monthly stock returns for 1999-2003. This results in 60 observations for each stock, all in line with Koller et. al. (2010). These betas are the so-called raw levered betas. They argue that daily or weekly returns leads to systematic biases, due to the fact that some stocks are rather illiquid and will show zero returns for daily or weekly frequencies. The consequence from this is that betas of illiquid stocks will be biased downward. One also have to see the other side of beta estimation, where market betas are unknown and therefore estimated with historical stock return. Beta estimation will thus be backward looking rather than forward and cause potential two pass methodology problem in afterward regressions. A commonly used method to reduce this bias is to increase the length of the time period for beta estimation. However, when this is done, the assumption of stationarity in beta also exists, which is not the case. A total of 60 observations therefore seem reasonable.

Other problems might also be referred to a distortion from the so-called bid-ask bounce that depends on the last trade in a specific day or week and thus creates spurious volatility and non-positive autocorrelation which has nothing to do with the intrinsic value of the stock (Roll, 1984). Thus, the closing price depends on whether the last trade was a purchase or a sale. The

[24] Closing prices

bid-ask bounce is however reduced by using long-period returns, such as weekly returns (Koller et al, 2010).

The levered beta is then stripped out of its leverage, to get ”operating” beta (ibid.). This is done with the equation $\beta_U = \beta_L / (1 + D/E)$ where the D/E ratio is Long-Term Debt + Short Term Debt divided by Market Value of Equity. This unlevered beta is the taken across an entire industry, with the help of primary SIC 1 codes. An entire industry´s median is then calculated. The usage of SIC 1 ensures that highly diversified conglomerates are sorted into their primary industry for the median calculation. Finally, the beta of each firm is re-levered with the firms D/E ratio, $\beta_L = \beta_{U,\,\text{IND MEDIAN}} \times (1 + D/E)$ to get the firm-specific levered beta.

The results from this procedure are rather similar to the ready to use betas that are provided by DataStream. However, admittedly, there are some discrepancies. Possible reasons for this are the fact that DataStream uses Bayesian Adjustments[25] on the raw betas (according to a phone conversation with their customer service). Also, it is unclear how narrow they classify the industries when deriving the industry median betas.

Finally, we have the Market Risk Premium (MRP), which is the difference between the market's expected return and the risk-free interest rate. According to Koller et. al. (2010), the MRP can be estimated through different methods, e.g. through regression analysis or through measuring and extrapolating historical returns. However, the purpose of this thesis is not to delve into the estimation of the MRP, instead, a constant MRP of 5.4 percent is assumed. Koller et al (2010) states that this figure is a fair estimation for the time period of May 2009. They believe that the MRP has continually varied between 4.5 percent and 5.5 percent throughout the last century, and that the MRP has only experienced a marginal increase due to the Financial Crisis (op. cit.).

3.7. SECONDARY DATA AND ITS CRITICS

Secondary data is collected by a second party or more obvious, sources whose data are obtained through primary data. Secondary data can thus be secondary in several steps and therefore much more uncertain regarding reliability and correctness. One should therefore also be aware of the underlying danger secondary data can bring, since it not only is built on primary sources but also

[25] Bayesian adjustment is a statistical method used for improving uncertain variables. The process includes pushing outliers towards the mean, in order to mitigate over- and underestimations (Lindley, 1972)

tertiary[26]. One may therefore assume some probability of incorrect information when information passed different levels of information retrieval and thus incorrect somewhere along the way (Saunders, Lewis & Thornhill, 2009). Thus, the researcher should always validate this kind of data in order to check its accuracy. Saunders, Lewis & Thornhill (2009) suggest that a possible explanation to researchers use of secondary sources instead of primary is due to its ease of access, which results in a lower quality and thus a lower reliability in their dataset compared to researchers who only use primary sources. To counteract negative influences in this research, generated by inaccurate information regarding tertiary sources, only reputable sources have been used in the most possible extent and they have been validated against other sources as much as possible.

3.8. VALIDITY AND RELIABILITY

This research aims to find potential discrepancies in abnormal returns between firms with different industry compositions. The progress of classification regarding both excess cash and industry segmentations width must therefore be of highly importance to ensure the validity of the selection process and thus, a fair measure of divergence in abnormal returns between the two strategies. However, some non-existence might be present in the sense of SIC code misallocation, due to the risk that SIC codes rarely give a complete description of a firm's product or industry range, but rather an illustration of the manufacturing chain throughout the whole corporation. Incorrect segment classification might therefore occur in the sample and thus generate bias in alpha estimation for the strategies if no control mechanisms exist.

However, to reduce matching problematization regarding product and industry segmentation compositions and thus potential biases in the alpha regression, 5 percent of each category sample has randomly been selected to validate segmentation composition between firms. To utilize these benchmark assessments, SIC-codes have been compared to segmentation charts from Yahoo Finance, where the outcome indicates a high correlation between SIC codes and segmentation chart classification. This makes the categorization trustworthy. The comparison indicates a high matching degree for firms where segmentation charts was available**.** The classification methods regarding product and industry segmentation are therefore assumed to be fairly pleased. To

[26] Tertiary sources can be seen as secondary sources in which data is build on other secondary data.

further on reduce bias in strategy change between years, reclassification of all firms has also been utilized during all years in the studied period.

The study thus demonstrates a correct and current product segmentation compositions and excess cash holdings during all years and therefore guarantees a high validity throughout the estimation chain for the research. One should also consider the validity check of the accounting data underlying the excess cash estimations, where even this verification have been done by random selection and validated against annual reports during all years of the research. Even here the study can demonstrate a high degree of reliability regarding the choice of data collection from DataStream. To address the potential measurement error and bias in frequency data related to stock prices from DataStream, random selection from Yahoo Finance has been done to validate correctness throughout the estimation window.

As the research follows prior research methodology and include historical frequency-based data to demonstrate discrepancies between product and industry compositions, comparable result can be replicable for future researchers. Thus, it is provided a high degree of reliability to the extent of firm and variables selection based on identical choice of working methodology, time period and similar adequate selections. All variables, downloaded from DataStream are given in appendix A, together with their codes.

4. EMPIRICAL ANALYSIS

In this fourth chapter, the results from the study are presented and described. Starting off with the results from the excess cash regression, complemented with some diagnostic tests, and then moving on to the results from the abnormal return measurements, this chapter tests the hypotheses formed in chapter two.

4.1. EXCESS CASH REGRESSION

4.1.2. DESCRIPTIVES

With a total average sample size of 826 focused firms, and 358 diversified firms between 2004-2013, the regression for excess cash has been done each year. Also, since excess cash determination is crucial for firm categorization and thus the conclusion for the research, the result and summary from the regression is shown in table 1. Annual data is further assigned to appendix F for a more extensive visualization.

TABLE 1: *SUMMARY OF ALL VARIABLES IN EXCESS CASH REGRESSION BETWEEN 2004-2013.*

Summary 2004-2013										
	Focused					Diversified				
Variables	Median	Mean	Standard Deviation	Minimum	Maximum	Median	Mean	Standard Deviation	Minimum	Maximum
Cash Ratio	-1,87052	-2,03588	1,82354	-12,56164	5,23680	-2,25408	-2,39811	1,51500	-10,61720	4,53277
Market-To-Book	1,91514	4,96611	103,81592	0,06254	11456,3	1,71751	2,92996	24,55759	0,06525	1948,5
Size	12,79350	12,86296	1,87226	5,81114	19,51590	13,90832	13,89199	1,96849	7,84542	20,49733
Capital Expenditure	0,04491	2,67092	191,55940	0	20447,9	0,03815	0,06157	0,08888	0	3,22831
Working Capital	0,06331	0,04592	0,65834	-39,58218	32,07441	0,08493	0,12173	1,72737	-5,47399	135,09908
Leverage	0,14330	0,22243	0,60580	0	63,65885	0,19810	0,24581	0,35978	0	9,14165
Research & Development	0	0,06980	0,22729	0	7,05636	0,00004	0,03517	0,15471	0	8,30255
Cash Flow	0,08179	0,06420	0,37164	-9,73206	24,97683	0,08203	0,07370	0,17782	-2,32502	6,20736
Cash flow σIndustry specific	0,19536	0,22601	0,14420	0,02648	0,65683	0,18176	0,21455	0,14053	0,02648	0,65683
Common Dividends (Dummy)	0	42033,7	316073,5	0	10856000	0	150919,2	807214,8	0	36112000

Throughout the entire test period of 2004-2013, adjusted R-square obtains explanatory power of between 27 percent and 35 percent, which means that independent variables explain about a third of the variation in the dependent variable. The coefficients are not further analysed in their fullness but rather given by a short summary of interest for further conclusion for this research.

Common dividends: The regression indicate a significant inverse relationship 8 of 10 years between excess cash and dividend payments, where firms that pay dividends also carry less cash.

CAPEX: 3 of 10 years show a positive significance between capital expenditure and excess cash, which means that firms with high CAPEX also hold more cash.

Leverage: 7 of 10 years show a significant result that firms with high leverage hold less cash.

Size: In 3 of 10 years, there is a significantly negative relation between firm size and excess cash, which is consistent with prior research that larger firms hold less cash than smaller firms.

NWC: In 6 out of 10 years, there is significance in the Net-Working-Capital ratio as well, meaning that firms hold less excess cash if they can substitute it with other liquid assets.

Market-to-book: 7 of 10 yearly regressions indicate a positive relationship between excess cash and Market-to-book value of the firm which indicates that firms with future growth opportunities also tend to hold more cash, also consistent with Opler et al (1999).

Research & Development: 9 out of 10 regressions indicate a positive significance between excess cash holding and R&D. A conclusion which also is consistent with Opler et al (1999) prior research that firms with larger R&D expenditure also suffer from financing problems due to asymmetry information between managers and stakeholders and thus have to retain more cash.

Firm Strategy: 6 out of 10 regressions indicate a positive relation between focused firm and excess cash holding, which is consistent with prior research that focused firms hold more cash due to lack of internal capitalization options. This evidently illustrates the importance of the new variable in the regression. These results also support Tong (2011) and Duchin (2010) previous paper, where the value of excess cash holding was a decreasing function of the grade of diversification.

Cash Flow: 5 out of 10 regression indicate significant inverse relationship between excess cash holding and cash flow-to-assets, an implication that firms with higher cash flows also hold less cash compared to firms with lower cash flows, a conclusion which actually is the opposite as in prior research.

Cash flow volatility$_{industry\ specific}$: In 10 out of 10 years the regressions show that excess cash holding has a positive relation with industry-specific volatility. Firms operating in volatile industries, thus tend to hold more cash. This conclusion is also consistent with Bates, Kahle and Stulz (2009) previous research.

The F-stats in the regressions are higher than the critical value, thus the null:

$$H_0: \beta_1=0, \beta_2=0, \beta_3=0, \beta_4=0, \beta_5=0, \beta_6=0, \beta_7=0, \beta_8=0\ \beta_9=0\ \beta_{10}=0$$ is rejected.

This means that the model as a whole is significant. Furthermore, obtaining the residuals from the regression above provides us with information regarding excess cash holdings. Positive residuals are equivalent to positive excess cash holding.

4.1.3. MODIFIED MODEL

As noted, the initial idea for the use of the model was to obtain the residuals in order to distinguish firms with excess cash from firms with less or non-excess cash holdings. With this logic, the coefficients per se are irrelevant for this study, as are OLS diagnostic tests for normality, multicollinearity, heteroscedasticity. However, since the model is modified with a dummy variable for whether a firm is focused or diversified, and this dummy actually improves the original model from Opler et al (1999) in terms of adjusted R-squares, some simple diagnostic tests are made. These tests should however be seen as intermediate steps before going forward with the main purpose of this study – presenting the results from the abnormal stock returns.

4.1.3.1. MULTICOLLINEARITY

When running regressions with the OLS estimation, one has to check to which extent the independent variables are correlated with each other. If some of the variables are highly correlated with each other, the regression suffers from multicollinearity (Brooks, 2008). Multicollinearity can cause inflated R-square, meaning that the regression as a whole "looks good" while the affected coefficients actually have too large standard errors. This can in turn cause distortions in the inference (op. cit.). With a simple correlation matrix one can spot near multicollinearity, which is when the correlation is 0.8 or more (ibid.). Looking at the correlation matrix in appendix E one can see that the highest correlation is 0.436 – the one between firm size and the common dividend dummy. Hence, near multicollinearity is in this case not an issue.

4.1.3.2. NORMALITY

To be able to draw any inferences from the regression with assumptions based on the normal distribution, the regression has also been tested for normality (ibid.). Appendix D shows the normality according to the so-called Bera-Jarque (BJ) test each year's regression, but similar results apply for all years. Skewness measures the extent to which a distribution is skewed about its mean value, i.e. the extent of asymmetry about its mean (ibid.). Kurtosis on the other hand, measures how fat the tails of the distribution are and how pointy it is at the top. A normal distribution has a kurtosis coefficient of 3, which means that the tails of the distribution are too fat. This is called a leptokurtic distribution (op. cit).

All of the regressions exhibit a slight skewness to the left, with a range of between -0.68 and -1.16 throughout the years. The p-value of the JB test reveals that the null hypothesis of normality can be rejected. This non-normality is caused by some extreme residuals in the test, from observations that appear in the tails of the distribution, so-called outliers (ibid.). For example, most firms in the 2012-year sample had a market-to-book ratio of between 1 and 4 and a mean of 2.8, while one firm has a market-to-book ratio of 175. This non-normality can be fixed by removing the outlier(s) from the sample. However, the total sample in this specific year consists of 2 589 firms, and according to Brooks (2008), violations of normality when doing an OLS regression, has no consequences for large samples as these. This is due to the central limit theorem, which states that the sample mean converges to a normal distribution.

4.1.3.3. HETEROSCEDASTICITY

To test for homoscedasticity and ensure that the squared residuals from the OLS regression are not related to the independent variables, the Breusch-Pagan-Godfrey (BPG) test for heteroscedasticity is used. The F-statistic and P-values in this test indicate that the null hypothesis of homoscedasticity can be rejected. Hence, there is a presence of heteroscedasticity (Brook, 2008). However, since the purpose in this case is not to draw any inferences from the regression, there cannot be any consequences from this heteroscedasticity. A regression with robust standard errors is nevertheless given in appendix F.

4.2. COMPARISON OF ABNORMAL RETURNS

4.2.1 FOCUSED WITH EXCESS CASH VS. DIVERSIFIED WITHOUT EXCESS CASH

As the market premium is being estimated by theoretical and historical assumptions and therefore not by real return on the market, further interpretation will only be focusing on the degree of differences between portfolio alphas rather than the absolute level of abnormal returns for each portfolios. Also, the returns are not compared to the market portfolio S&P500.

4.2.1.1. PRE-CRISIS PERIOD 2004 - Q2 2007

Results will subsequently be presented in chronological order, starting with the pre-defined period between 2004 and mid 2007, whereas a brief summary of the results for the pre-defined crisis period is presented and visualized in Table 2 below. Results for a specific year are further presented in appendix B.

The results for the defined pre-crises period reveal significant differences in the sample containing all focused firms with positive residuals received from the excess cash regression and all diversified firms with non-positive residuals. Table 2 further describes a significant positive added value for investors of diversified firms regarding the abnormal returns, at a 5 percent confidence level (two-sided).

TABLE 2: *MEAN ALPHAS FOR ALL FOCUSED FIRMS THAT HOLD EXCESS CASH, COMPARED TO ALL DIVERSIFIED FIRMS WITHOUT ANY EXCESS CASH (PRE-CRISIS PERIOD).*

Analysis of Variance (Two-side) Pre-Crises

Groups	*Sample size*	*Mean*	*Variance*	*p-level*
Focused firm. cash holders	3182	-0,0022	0,498	
Diversified firm 4-8 SIC codes	508	0,0408	0,276	0,004**
Diversified firm 3 SIC codes	445	0,039	0,376	0,039*
Diversified firm 2 SIC codes	514	-0,0081	0,393	0,762
All Diversified firms	1467	0,0231	0,352	0,047*

Diversified firms as a group obtain an abnormal return of 2.31 percent on average, which can be compared to focused firms negative abnormal return of -0.22 percent on average. A suggestion that diversified firms in general performed better during the defined time period until the beginning of the Financial Crisis. A result, which further implies a certain advantage for internal

capitalization above more, focused firms, with larger cash holdings during normal market conditions.

A second question should therefore also be if this superior advantage regarding abnormal returns differs between different degrees of diversification towards focused. The answer is to some extent yes. Table 2 illustrates a monotonic relation between the grade of diversification, where diversified firm with broad product segments i.e. firms with 4-8 SIC codes reveal a positive significant abnormal return on the stock market compared to focused. To further visualize the relationship, diversified firms with 4-8 SIC codes generates on average an abnormal return of 4.08 percent which also is approximately 75 percent higher than all diversified firms as a group and over 1800 percent better than focused. This fraction might however seem extremely high, but should also be considered in light of the low return throughout all average abnormal returns during the time period.

Further on, less diversified firms with 3 SIC codes also uplift significant results below the 5 percent level and an abnormal return of 3.9 percent on average, firms are practically similar to firms with 4-8 SIC codes, but differences in variation make the abnormal return more dispersed and sensitive which also explain the lower significance in the sample when compared to focused firms. For the least grade of diversification including firms with 2 SIC codes which are those firms, that are assumed to be most emulate focused firms, there is no significant differences during the time period. In forthcoming samples, insignificant result will not be discussed any further since differences between the strategies not are sufficient to make meaningful interpretation. Results will nevertheless be publicized in summary tables for transparency purpose.

Due to significant differences in the results between all diversified firms without excess cash as a group, and all focused firms with excess cash, the first hypothesis is rejected;

H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and focused single-segment firms with excess cash, during the pre-crisis period.

4.2.1.2. CRISIS PERIOD Q3 2007 – Q1 2009

In contrast to previous section, Table 3 reveals that an inverse relationship is seen where focused firms provide significant better abnormal returns on average compared to diversified firms as a group. The result should however not be seen as value creating for their investors, but rather less value destroying since both strategies show negative abnormal returns on average throughout the crisis.

TABLE 3: *MEAN ALPHAS FOR ALL FOCUSED FIRMS THAT HOLD EXCESS CASH, COMPARED TO ALL DIVERSIFIED FIRMS WITHOUT ANY EXCESS CASH (CRISIS PERIOD).*

Analysis of Variance (Two-side) Crises

Groups	*Sample size*	*Mean*	*Variance*	*p-level*
Foc. cash holders	2546	-0,3582	0,651	
Div 4-8 SIC codes	375	-0,3630	0,550	0,878
Div 3 SIC codes	325	-0,4013	0,644	0,260
Div 2 SIC codes	426	-0,4684	0,666	0,001***
Div all	1126	-0,4139	0,624	0,014*

Furthermore, focused firms obtain a mean abnormal return of -35.8 percent on average, which may be compared to diversified firms negative abnormal return of -41.4 percent on average, when taken as a group. An inverse relation suggests that firms with internal allocation do worse than firms with large excess cash holdings and thus in general perform worse during severe market conditions when firms are assumed to be more constrained compared to normal states of the economy. Results that imply a certain advantage for excess cash holding and also assumes to explain why some firms choose to hold large amounts of cash.

The next question should be similar as previous section if this superior advantage regarding abnormal return also differs between different degrees of diversification level towards focused. The answer is in this context a yes as well but with the inverse significances. In previous section both 4-8 and 3 SIC coded firms provided evidence of differences between the strategies while 2 SIC coded firms did not. In this context the results show the opposite which means that firms who are assumed to be most emulate to focused were the ones that actually did significantly worse, which might be explained by deficiency of capacity for internal capital allocation due to its two product segments, at the same time as these firms revealed major lacks in excess cash.

For firms with 3 or 4-8 different SIC codes, average abnormal returns were less than for focused but due to high variation in the sample, no significant differences can be concluded to exist.

To illustrate the relationship, diversified firms with 2, 3 and 4-8 SIC codes generates on average an abnormal return of -46.8 percent, -40.1 percent and -36.3 percent respectively.

Due to significant differences between all diversified firms without excess cash as a group, and focused firms with excess cash, the second hypothesis is rejected;

H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and focused single-segment firms with excess cash, during the crisis period

4.2.1.3. POST-CRISIS PERIOD Q2 2009 – 2013

Compared to pre-crisis and crisis period, similar results confirm once again significant differences between diversified firms as a group and focused. And just like in the pre-crisis period, its yet again diversified firms as a group who achieve a significant higher abnormal return on average compared to focused firms. As illustrated in table 4 below, diversified firms on average gain an abnormal return of 12.84 percent compared to focused 9.42 percent, which again implies a certain advantage for internal capitalization above more focused firms with larger cash holdings during normal market conditions, i.e. post-crisis.

However, during the post-crisis period, significant differences can't be seen for firms with 3 or 4-8 SIC codes, which is in contrast to the pre-crisis period. Instead the differences turn to firms with 2 SIC codes, which are most related to focused firms due to their lack of large segment range. Table 4 furthermore illustrate the observed abnormal returns where diversified firms with 3 or 4-8 SIC codes achieve abnormal returns of 11.26 percent and 11.48 percent respectively compared to 2 SIC coded firms abnormal returns of nearly 15.26 percent on average. In contrast to focused 9.42 percent, diversified firms with 2 SIC codes nearly outperform focused firm with approximately 60 percent during the after crisis period. This result might further on imply a problem of carrying large amount of excess cash during stable market conditions and thus invite to price discounts on the market due to low market expectations.

TABLE 4: *MEAN ALPHAS FOR ALL FOCUSED FIRMS THAT HOLD EXCESS CASH, COMPARED TO ALL DIVERSIFIED FIRMS WITHOUT ANY EXCESS CASH (POST-CRISIS PERIOD).*

Analysis of Variance (Two-side) After Crises

Groups	*Sample size*	*Mean*	*Variance*	*p-level*
Foc. cash holders	4183	0,0942	0,584	
Div 4-8 SIC codes	565	0,1148	0,431	0,310
Div 3 SIC codes	501	0,1126	0,483	0,432
Div 2 SIC codes	644	0,1526	0,516	0,009**
Div all	1710	0,1284	0,479	0,020*

What is interesting is that differences in abnormal returns between the two strategies differ dependently on market conditions. A result which might imply the inverse relationship with previous paper by Rajan, Servaes and Zingales (2000) and Yan, Yang and Jiao (2010), where diversified firms during market downturns proved greater efficiency in their capital allocation and thus exhibit superior expectations from the market compared to focused firms who are assumed to show significant difficulties in external financing during market downturns. This problem is on the other hand, according to the literature, smaller in diversified firms due to internal capitalization options. A reduction in investments by focused firms will thus result in lower market expectations, and hence, reflect itself in the share price.

Due to significant differences in the result, the third hypothesis is rejected;

H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and focused single-segment firms with excess cash, during the post-crisis period.

However, the results show the inverse relation. And the question should be raised if it is due to large excess cash. The answer cannot be either yes or no since the conclusion fails under the assumption of: "*focused firms with large excess cash holdings*", where firms in previous samples haven´t been sorted out by the level of excess cash. Instead, they have been divided to this portfolio although their excess cash may have proved to be small in comparison to others. This surely creates a distortion in the sample since firms with marginal excess cash cannot be seen as representatives for the strategy´s purpose, and therefore answer the question if differences can be seen between diversified firms and focused firms with large amount of excess cash.

In order to provide a more relevant and interesting comparison between firms with large excess cash holdings and diversified firms with internal capital allocation, focused firms below the top 20 percent with excess cash are excluded from the sample. That is, the new way to define large excess cash holders is by only including the top 20 % of firms with the most excess cash on their balance sheets. These are then compared to firms with different grades of diversification as previously. A comparison, that also gives rise to more information regarding the true relationship between cash holding and value creation on the market during different states of the economy.

4.2.2. TOP 20 PERCENT FOCUSED FIRMS WITH MOST EXCESS CASH VS. DIVERSIFIED WITHOUT EXCESS CASH

The top 20 percent of focused single-segment firms that hold the most excess cash includes firms such as Choice Hotels International Inc. In 2013, this international hotel chain held cash and short-term investments equal to more than 30 percent of total assets. Next, these cash-rich firms are compared with diversified firms without any excess cash, to measure investors' expectations on these different firm characteristics. Grade of diversification will again also be taken into consideration.

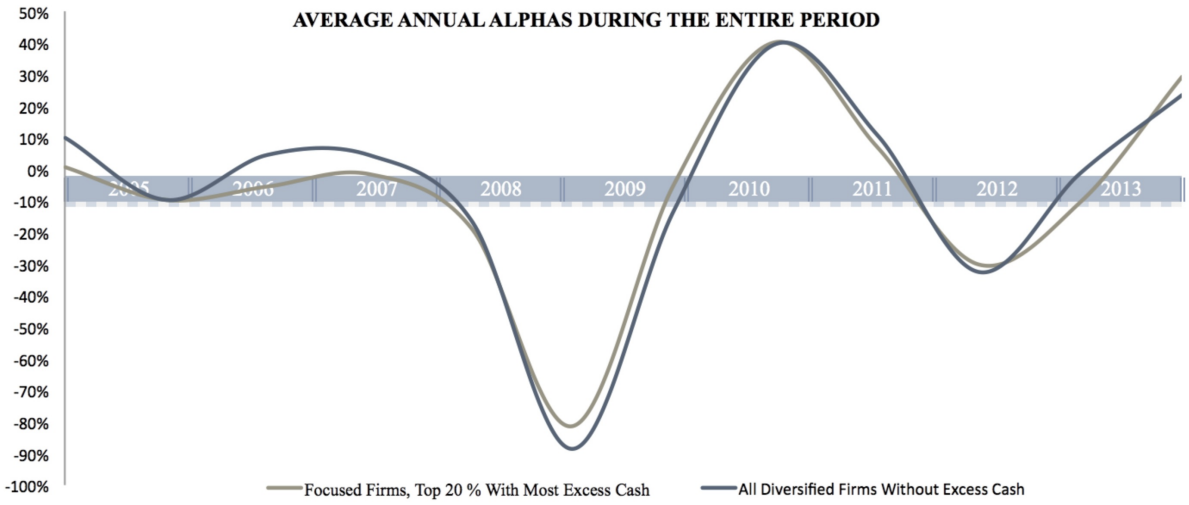

FIGURE 4: *AVERAGE YEARLY ALPHAS DURING THE ENTIRE PERIOD 2004-2013 FOR THE TOP 20 % FOCUSED FIRMS WITH THE MOST EXCESS CASH HOLDING, RELATIVE ALL DIVERSIFIED FIRMS WITH NO EXCESS CASH.*

4.2.2.1. PRE-CRISIS PERIOD 2004 - Q2 2007

TABLE 5: *MEAN ALPHAS FOR THE TOP 20 % OF FOCUSED FIRMS THAT HOLDS THE MOST EXCESS CASH COMPARED TO DIVERSIFIED FIRMS (PRE-CRISIS PERIOD).*

Analysis of Variance (Two-Side) Pre-Crisis

Groups	*Sample size*	*Mean*	*Variance*	*p-level*
Top 20 % Focused Cash Holders	637	-0,036	0,208	
Diversified Firms 4-8 SIC codes	508	0,041	0,276	0,000***
Diversified Firms 3 SIC codes	445	0,039	0,376	0,002**
Diversified Firms 2 SIC codes	514	-0,008	0,393	0,237
All Diversified Firms	1467	0,023	0,352	0,000***

The tests for the entire pre-crisis period of 2004 - mid 2007, show very significant higher mean abnormal returns in the portfolio containing diversified firms. As can be seen from the table, these results seem monotonic, implying that grade of diversification matters. However, no conclusions can be made from the comparison with diversified firms with 2 SIC codes due to insignificant difference.

The significantly higher returns for diversified firms as a whole group are in the years of 2004, 2006, and the pre-crisis period in Q1-Q2 2007. Hence, these years, diversified firms performed better with regards in mean alphas, relative focused firms holding large excess cash. In 2004 these mean returns were twice as high while in 2006 and in the first half of 2007, focused firms experienced negative alphas, in contrast to diversified firms. This indicates a higher value creation for investors in diversified firms. The difference between the firms in 2005 is however to small to show any significance.

When splitting up the sample of diversified firms after their grade of diversification, one can see significantly better results by the highly diversified firms, i.e. those firms having their segments in 4-8 different SIC-codes. These highly diversified firms, conglomerates or “holdings”, seem to outperform focused cash-rich firms, with regards to risk-adjusted stock returns, and are thus valued higher by investors, during this period.

Due to significant differences in the result, the fourth hypothesis is rejected;

H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and the 20 percent largest excess cash holding focused single-segment firms, during the pre-crisis period.

4.2.2.2. CRISIS PERIOD Q3 2007 – Q1 2009

During the crisis period as defined in chapter three, there are significant results showing that both portfolios had large negative abnormal returns, while diversified firms actually experienced a worse performance than focused firms with large excess cash holdings. See table 6. These results are consistent with the results in the preceding section. Again, grade of diversification seems monotonic, however, no conclusions can be made on the difference relative focused firms since the test is insignificant. Only the least diversified firms show significantly more negative returns.

TABLE 6: *MEAN ALPHAS FOR THE TOP 20 % OF FOCUSED FIRMS THAT HOLD THE MOST EXCESS CASH COMPARED TO DIVERSIFIED FIRMS (CRISIS PERIOD).*

Analysis of Variance (Two-Side) Crisis

Groups	*Sample size*	*Mean*	*Variance*	*p-level*
Top 20 % Focused Cash Holders	509	-0,34	0,394	
Diversified Firms 4-8 SIC codes	375	-0,362	0,55	0,055
Diversified Firms 3 SIC codes	325	-0,401	0,644	0,138
Diversified Firms 2 SIC codes	426	-0,468	0,666	0,000***
All Diversified Firms	1126	-0,413	0,624	0,008**

During the third quarter of 2007 when the mortgage defaults slowly started to spill over to the supply of bank credits, U.S. stock markets started to respond with large declines. This was the awakening of the crisis. However, the yearly results indicate that diversified firms actually experienced positive mean alphas under this early crisis period while focused firms had negative alphas. Thus, one can conclude that diversified firms stock returns were affected later by the crisis, in comparison to the focused cash-rich firms. Then, in 2008, financial markets plummeted after the bankruptcy of Lehman Brothers, which resulted in negative abnormal returns for pretty much all of the firms in the sample. Any differences between the firm types are however insignificant for this specific year as well, thus it cannot be concluded that there are any differences for 2008. Yearly observations are not illustrated, as they are deemed as redundant.

In Q1 2009, a period Kuppuswamy et. al. (2010) define as late crisis, diversified firms on the other hand experienced significantly worse negative returns.

Adding these sub-periods up and thus summarizing the whole crisis period as in the table above, indicates that diversified firms as a group experienced worse negative abnormal returns than the portfolio consisting of focused firms with large excess cash holdings. We can thus conclude that investors' future expectations during this period fell worse for diversified firms, with regards to risk-adjusted abnormal returns measured in alphas. Liquidity in focused firms, in the form of cash and short-term investments thus seem to have weighted more than internal capital markets for investors, during this credit crisis that shook the financial markets.

Due to significant differences in the result, the fifth hypothesis is rejected;

H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash and the 20 percent largest excess cash holding focused single-segment firms, during the crisis period.

4.2.2.3. POST-CRISIS PERIOD Q2 2009 – 2013

TABLE 7: *MEAN ALPHAS FOR THE TOP 20 % OF FOCUSED FIRMS THAT HOLDS THE MOST EXCESS CASH COMPARED TO DIVERSIFIED FIRMS (POST-CRISIS PERIOD).*

Analysis of Variance (Two-Side) After Crisis				
Groups	*Sample size*	*Mean*	*Variance*	*p-level*
Top 20 % Focused Cash Holders	837	0,089	0,361	
Diversified Firms 4-8 SIC codes	566	0,115	0,311	0,353
Diversified Firms 3 SIC codes	501	0,113	0,432	0,417
Diversified Firms 2 SIC codes	644	0,153	0,009	0,026*
All Diversified Firms	1711	0,128	0,479	0,045*

Throughout the post-crisis period, there are again significantly higher abnormal returns for all diversified firms, in comparison to focused firms with large excess cash holdings. Both firm types indicate relatively substantial abnormal returns in Q2 2009 - Q4 2009 after months of great turbulence in the stock markets, which can be linked to a general rebound in depressed stock prices (CNN Money, 2010).

Due to significant differences in the result, the sixth hypothesis is rejected:

H_0: There is no significant difference in abnormal stock returns between grade of diversified firms with no excess cash, and the 20 percent largest excess cash holding focused single-segment firms, during the post-crisis period.

5. ANALYSIS AND DISCUSSION

As the previous chapter revealed, there is a significant difference in abnormal returns over all time periods, and the variation of strategy advantage tends to move with current market conditions. This following chapter will focus on the relevant previous literature and theoretical framework related to the subject and context. Thus, the aim is to provide a comprehensive analysis and discussion of the differences in abnormal returns between the firms.

5.1. SUMMARY OF RESULTS

Summarizing the results from the previous chapter:

- During normal periods, diversified firms as a group seem to outperform focused firms with excess cash holdings, measured in abnormal stock returns i.e. alphas.
- However, during the Financial Crisis in Q3 2007 – Q1 2009 the roles are reversed, and cash-rich focused firms manage better mean alphas, although these returns are negative.

These results are remarkable in a way, since few prior studies have focused on the comparison between these corporate strategies and risk-adjusted value creation from the investor perspective. Also, an important part of the study is of course the comparison of these absolute risk-adjusted returns and how they are changing, contingent on the state of the economy. However, to fully understand these results, one has to decompose them and look more closely on what actually is being measured and how the level of each category affects the result. The results above reveal that firms´ real stock returns have either been higher or lower in regards to their theoretical return, based on the systematic risk implied by their betas. The firms that have managed the higher mean abnormal returns thus have either higher expectation from the investors, with regards to future cash flows. Alternatively, these firms experience relatively lower risk in relation to their stock returns. Both these possible reasons are reviewed in the following section.

5.2. ANALYSIS OF THE DIFFERENT PERIODS

5.2.1. PRE-CRISIS AND POST-CRISIS PERIODS

The opinions have been widely discussed in various papers regarding the value-creation from these different firm types, making it interesting to compare them. The results in this study proved to be significant regardless of the grade of excess cash among the focused firms, i.e. both for all focused firms and for the top 20 percent with the most excess cash. Also, the fact that most diversified firms exhibit the greatest divergence compared to focused firms in the pre-crisis periods proves that the grade of diversification is most relevant for the abnormal returns during this period.

The reason why focused firms with excess cash holdings underperformed relative diversified firms during normal periods can potentially be due to the agency problems identified in Jensen (1986, 1993). The Free Cash Flow Hypothesis states that firms with large amount of cash may be subject to overinvesting and managerial entrenchment, which investors also recognize. Thus, according to these results, one can further assume that the investors punish the focused firms with large excess cash holdings during these normal market conditions (as can be seen by the total negative alphas during the pre-crisis period). During the pre-crisis period, the financial and credit markets experienced strong growth, making external financing relatively cheap (Rudolph et. al., 2010). It is in these normal periods with low cash flow volatility that managers have the greatest incentives to postpone investments (Kisser, 2013). Thus, investors might prefer a payout of cash as one-time dividends, alternatively stock repurchases, instead of seeing firms stacking cash. As the descriptive statistics in the previous chapter revealed, firms with more excess cash also tend to pay out smaller dividends on average (even when size is accounted for), which indicates that these assumptions could hold. And since focused firms also seem to hold both more cash and pay out fewer dividends compared to diversified firms, this might indicate a favour for internal capital allocation. Thus large excess cash reserves during normal times, can be harmful to the firm, as Harford et. al. (2003) states, which then is reflected in firms´ stock returns. Excess cash can of course also signal low growth options and lack of valuable investment opportunities. And the quality and volatility of these investment opportunities can have a great impact on the value shareholders place on firms' excess cash (Pinkowitz et. al.

2006). After all, the stock markets valuation of excess cash reflects their expectations on how the cash will be used (Frésard and Salva, 2009)

Alternatively, excess cash can signal managers belief that harder times awaits the firm, and money must be stacked in accordance to the precautionary motive. This would further imply opportunity costs of investing cash in more valuable projects instead of having them as cash and short-term investments on the balance sheet. These firms can also be a subject to greater uncertainty, in accordance to Bates et. al. (2009), i.e. their idiosyncratic risk is higher due to lack of diversification, which gives them no choice but to build these reserves. A great part of the negative impact on stock returns may of course be linked to corporate governance, which also affects investors view on excess cash, since they put a lower value on cash holdings in firms with bad corporate governance (Dittmar and Mahrt-Smith, 2005) However, these are merely assumptions since corporate governance hasn´t been studied in this research. In summary, the investors have many reasons to doubt these firms, and this is reflected in firms´ stock returns. One can assume that this applies even more for the 20 % with the most excess cash, since they are the ones with really large cash holdings.

Nevertheless, investors earned significantly higher abnormal returns from stocks in diversified firms under normal periods. This implies that when entire diversified firms are taken as units, and not compared by their segments as in the diversification discount literature, they are successful firms that can create abnormal returns for their shareholders. One has to remember that a large number of the firms in the sample, especially the ones that operate in many segments (4-8), are large corporate holdings. These are characterized by their great success in managing subsidiaries and divisions, which makes management and administration their key strengths (Koller et. al. 2010). Among large firms, they are actually considered as more valuable; on average they represent 75 % of the market value on S&P 500 (Hund, et. al., 2012). However, there is another potential explanation for their outperformance, which is linked to their diversification discount and the eroded skewness in stock returns.

5.2.1.1. REDUCED SKEWNESS

The diversification discount literature argues that the segments of the diversified firms are traded at a discount relative focused single-segment peers. With the help of the reduced skewness argument in Lamont and Polk (2001) and Mitton and Vorkink (2010), this can be assumed as a

possible explanation for the diversified firms´ higher abnormal returns. Accordingly, one of the reasons for the diversification discount is due to investors' requirement for higher stock returns from these firms as a compensation for their lower up side potential. The skewness coefficient explained in chapter two is thus lower in diversified firms implying that there is a less up side potential for extreme stock gains in these firms. The implication would be, that this skewness coefficient decreases the more diversified the firm gets, which is consistent with the results in this study, i.e. highly diversified firms (4-8 SIC codes) are the ones that on average outperform the most, at least in the pre-crisis and crisis period. However, the results seem to be inconsistent with the post-crisis period where lesser diversification means higher abnormal returns.

5.2.2. FINANCIAL CRISIS Q2 2007 – Q1 2009

This next question discusses how these variations are analysed during more unpredictable and apprehensive market conditions, when both firm types theoretically have their benefits. During the beginnings of the Financial Crisis in 2007, one can assume that stock prices included all the different motives for diversification and excess cash holdings presented in chapter two; transactions motive, precautionary motive, internal capital markets motive, debt co-insurance motive, et cetera. Based on the results, it seems that the motives for excess cash have prevailed the motives for diversification during the crisis. This is in accordance to Opler et. al. (1999) and others, who expect that the motives for excess cash holdings are the greatest during uncertain times.

However, any significant differences between diversified firms without excess cash, and focused firms with excess cash holdings, are to be regarded as inconsistent with Modigliani (1961). Modigliani argues that excess cash holding is irrelevant due to expectations of frictionless financial market. One can state that any assumptions of frictionless financial markets fail to exist in the fundamental phase of this research. As figure 5 reveals, market conditions under the crisis period proved to be the inverse of what Modigliani implied.

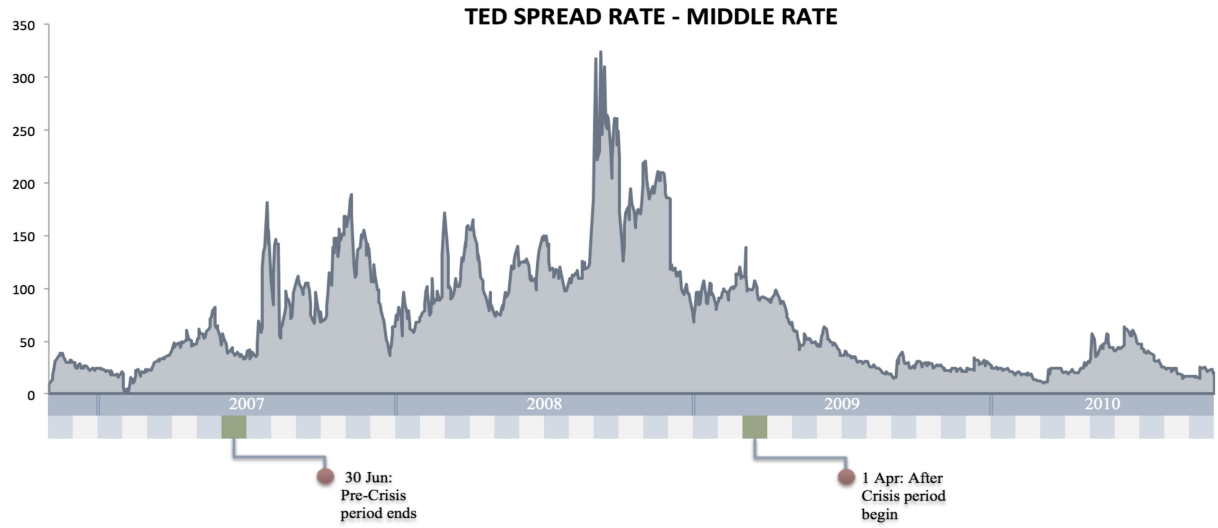

FIGURE 5: *THE SPREAD BETWEEN A 3-MONTH LIBOR (I.E. THE INTERBANK INTEREST RATE) AND THE YIELD ON A 3-MONTH TREASURY BILL.*

With a noticeable decline in the supply of external capital, firms with insufficient excess cash and firms without internal capital allocation opportunities are assumed to suffer the most damage seen from the investor's perspective during the crisis. Managers are aware of this, which can help explain the upward slope in the cash-to-asset ratio in recent years as illustrated in appendix A.

Likewise are the propositions from Cossin and Hricko (2000), which are assumed to be relevant even for this research, namely that information asymmetry and uncertainty is assumed to be the greatest during market periods of crisis, as in Q3 2007 - Q1 2009. This would further on create misevaluations and mispricings, which can make external financing even more expensive due to a misprice premium.

Going back to the results, one can assume that the crisis was expected to have a lesser impact on the future cash flows of focused firms with excess cash. Reasons for this might include real options that give these firms a more favourable situation for investing their way out of the crisis. Simutin (2010) argues that this is intuitively expected from firms with large excess cash holdings. However, he concludes that the firms with the most cash actually perform the worst during the crisis and explains this with a reduction of the value in excess cash firms´ future growth options in periods of crisis. Although, it is not entirely correct to compare these results with the ones in his study, since he measures the difference in stock returns for the firms with the most excess cash relative those with the least excess cash. Thus, he does not make the distinction

of diversified and focused firms. However, actually a subsequent test was made where a comparison between focused firms with the most excess cash and focused firms with the least excess cash. The reason for this was to see if excess cash had its implications on the within-group abnormal stock returns for the focused firms, and if similar results as in Simutin (2010) could be provided. The results revealed that the ones with the most excess cash outperformed firms with the least. Thus, this is an indication of the impact on abnormal stock returns from having large excess cash during normal periods. This subsequent test proved the arguments in Simutin (2010), that excess cash is valuable for stock returns during normal periods. However, this subsequent test isn´t linked to the research purpose, thus it will not be further discussed.

Alternatively, the abnormal returns reflect the findings from Harford et. al. (2003), which state that large cash reserves can be beneficial in downturns, due to firms´ higher investing during and immediately following the downturn. Thus, this opens the question how capital spending actually changed between 2006-2009 for this sample of firms. See Figure 6.

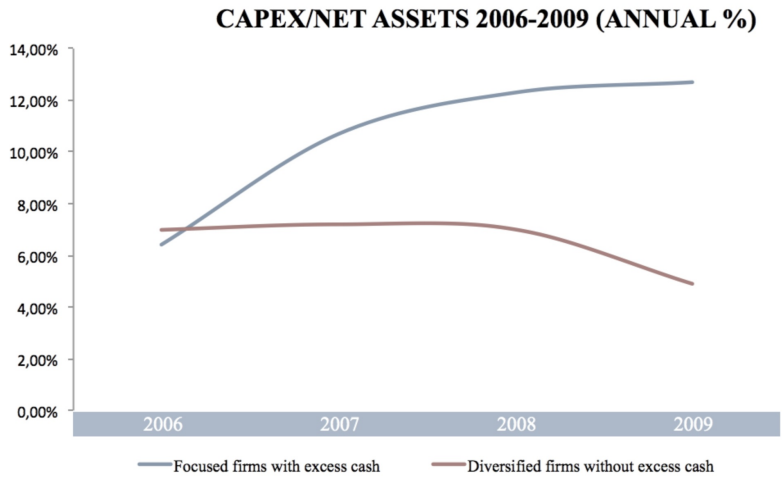

FIGURE 6: *MEAN CAPITAL EXPENDITURE IN RELATION TO NET ASSETS FOR BOTH FIRM TYPES.*

The figure shows that diversified firms without any excess cash experienced a decline in capital expenditures, while all focused firms with excess cash could increase their expenditures, compared to the pre-crisis year of 2006. It can be assumed that investors expected this increase in late 2007 when the crisis increased in magnitude, causing a smaller decrease in stock returns for the sample of focused firms. This lies on the assumption of efficient capital markets and investors' ability to evaluate stocks, as discussed in chapter three. Diversified firms enjoy the

advantage of asset redeployability between segments, which can of course have an impact on their capital expenditure. However, as mentioned in the method chapter, unrelated diversification has been the main purpose of study, implying that asset redeployability is harder in these firms. Also, any conclusions from these capital expenditures on the abnormal stock returns only hold for diversified firms operating in 2 SIC codes and diversified firms as a group, since other categories provide insignificant results compared to focused firms.

A possible implication might furthermore be connected to better internal capital allocation for more diversified firms. The results in this case are fairly ambiguous; if focused firms are equated with highly diversified firms i.e. firms with four to eight SIC codes and diversified firms with three SIC codes, the results are insignificant. This result holds regardless of focused firms magnitude of excess cash holdings, i.e. when firms with the top 20 % excess cash holders. At the same time can a positive function of the grade of diversification relatively focused firms be seen, where the differences between the strategies decreases notably with increasing level of SIC codes, resulting in significant differences between diversified firms as a group and company with only two SIC codes relative focused. Furthermore, should the correlation between the levels of diversification and focused firms also be highlighted, where the correlation also is believed to have a significant influence on the abnormal returns generated by the firms. As the results imply a significantly better abnormal returns on average for firms with higher grade of diversification, i.e. more SIC codes relatively less diversified. Compared to focused firms, no differences can be seen between fully diversified firms and focused firm as mentioned, but as the grade of diversification also decrease, insignificant differences between focused firms and diversified firms also decrease significantly and finally disappear completely. This certainly shows that internal capital allocation is far more widespread and effective the more diversified the firm is relatively different SIC-codes.

5.2.2.1. DIVERSIFICATION DISCOUNT DURING CRISIS

Finally, as previously discussed, segments in diversified firms trade at a discount compared to their focused peers, due to managers overinvestment in unprofitable projects and cross-subsidization to weaker segments within the group. During the Financial Crisis, this discount was reduced with 7-9 percent implying that diversified firms gained value thanks to their internal capital market and larger debt capacity, as according to Kuppuswamy et. al., (2010). However, it

is hard to draw any conclusion about the diversification discount based on the results in this study, since diversified firms are compared in their risk-adjusted stock returns, and not on what their segments would have been worth as stand-alone focused firms. This value-enhancement can have been a reality during the crisis, as stated in Kuppuswamy et. al. (2010). However, it has not been enough for diversified firms to have total higher abnormal stock returns than focused firms with excess cash. Nevertheless, this makes it interesting to see how leverage, one of the contributing factors for this value-enhancement, has changed in the two firms groups between the years[27]. See figure 7.

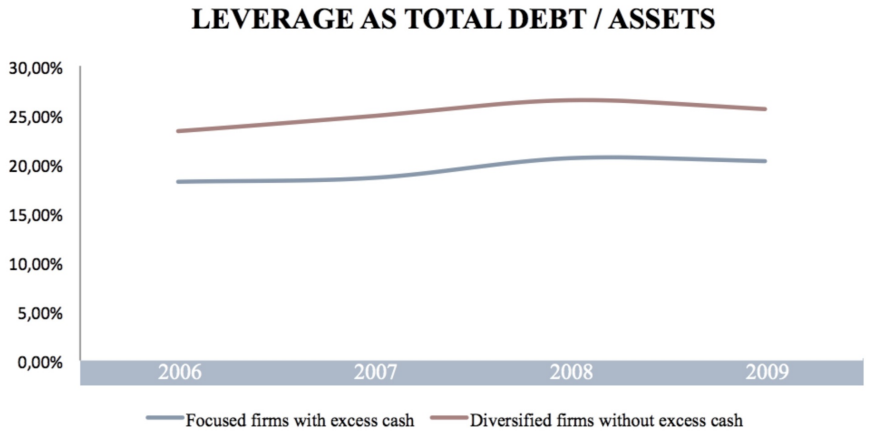

FIGURE 7: *MEAN LEVERAGE AS SHORT TERM DEBT + LONG TERM DEBT RELATIVE TOTAL ASSETS FOR BOTH FIRM TYPES.*

The figure illustrates that both focused firms and diversified firms increased their leverage during 2007-2008 but decreased it in 2009. It seems hard to draw any general conclusions from this, but since diversified firms seem to have a higher leverage, one can conclude that debt capacity through co-insurance effect is a great advantage for diversified firms[28] as previous research states (e.g. Lewellen, 1971; Hann Ogneva and Ozbas, 2009). Also, debt has a disciplinary role, which can contribute to greater capital efficiency. Also, enjoying higher credit ratings, diversified firms are less likely to miss out on investment opportunities, when there is a contraction in credit markets. Higher leverage eventually also means higher shareholder value,

[27] The other factor according to Kuppuswamy et al. (2010) is as mentioned earlier the activity in internal capital markets However, deriving and illustrating the activity in internal capital markets is above the scope of this thesis.

[28] These mean leverage levels for diversified firms are almost identical when measuring it for all diversified firms, including diversified firms with excess cash.

due to the tax shield component. However, higher leverage must also have an impact on the riskiness of the firm, see figure 8.

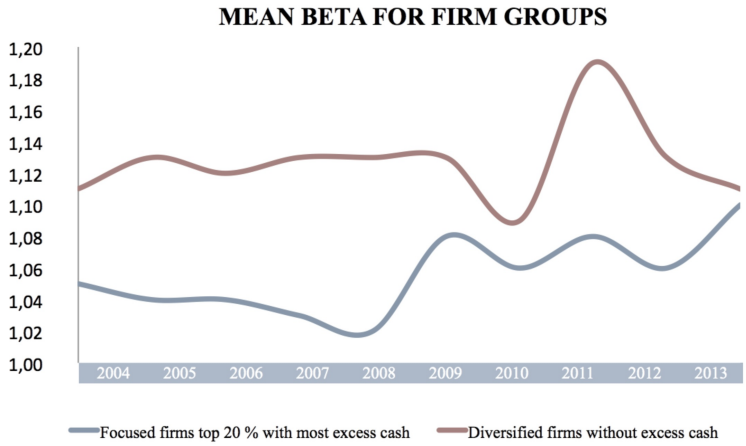

FIGURE 8: *MEAN BETA THROUGHOUT THE YEARS FOR TOP 20 % OF FOCUSED WITH THE MOST EXCESS CASH AND ALL DIVERSIFIED FIRMS WITHOUT EXCESS CASH.*

Higher leverage has a direct impact on stock returns, as mentioned in section 2.3.2. about TRS. The changes in beta for the firm stocks are not especially radical due to the crisis (note the lag between beta change and the crisis since beta is calculated from the monthly returns preceding the beta value). However, as one can see from the figure, they are consistently higher for diversified firms. The figure can at first sight seem inconsistent with the previous statements that diversified firms have a lower systematic risk and thus a lower cost of capital (Hann, et. al., 2009). However, this is because figure 8 above simply illustrates mean alphas for diversified firms as whole firms. The co-insurance literature on the other hand, compares diversified firms with portfolios of stand-alone focused firms much in the same way as the diversification discount literature; what the systematic risk and thus cost of capital would have been if the diversified firm was a portfolio of focused firms.

6. CONCLUSIONS

Based on previous research, a distinction is made between diversified firms that operate in different segments, and focused single-segment firms that stack excess cash. Both diversification and excess cash holding can have positive effects on firm value during a credit crisis. In this study, these firms are divided into different portfolios with regards to grade of diversification and excess cash, in order to measure and compare their performance on the stock markets, using risk-adjusted stock returns in the form of Jensen´s Alpha. These returns are measured cross-sectionally under both normal periods, and under the Financial Crisis in 2007-2009 in order to spot any differences between the firms. The Financial Crisis had a great impact on both corporate credits and corporate stock returns, thus, making it interesting to see which firms performed the best on the U.S. stock markets.

The main results indicate that diversified firms outperform focused firms with excess cash holdings as a whole under normal periods, while the opposite holds for the crisis period between Q3 2007 and Q1 2009. However, this only holds for less diversified firms with 2 SIC codes, where no significant differences can be seen between diversified firms with more than 3 SIC codes and focused firms with excess cash. It is concluded that lower positive skewness, which according to the literature helps explain the diversification discount, can be a contributing factor for these higher abnormal returns for diversified firms during normal periods. Also, higher leverage in accordance to the co-insurance motive can have its impact as well. On the other hand, under the Financial Crisis, the liquidity cushion in cash-rich focused firms and their higher capital expenditures, provides these firms with higher abnormal returns, implying that the value in excess cash can be increased in times of credit constraints.

6.1. THEORETICAL AND PRACTICAL IMPLICATIONS

The results presented in this study add to the rich existent literature in diversification and excess cash, but from an investor and capital market perspective. It is shown how abnormal stock returns in these firm categories are contingent to the state of the economy, or more specifically, the state of the financial and credit systems. Moreover, it shows that investor's aren´t better of by liquidity in the form of excess cash in times of crisis, compared to a widespread internal capital

markets. During the Financial Crisis, any significant differences in safest investment for investors cannot be seen since both diversified firms with 3 and 4-8 SIC codes provide insignificant differences compared to focused firms. What can be said is however, that investors were slightly safer in focused firms with large cash holdings, than in less diversified firms with 2 SIC codes and no excess cash. This possibly gives an added explanation for the increasing cash-to-asset ratio in past years by U.S. firms, and supports the precautionary motive for excess cash. However, it also exhibits a possible explanation why firms go widespread in different product segments and thus create value through internal capital allocation options.

For normal market conditions, this study reaffirms the diversification discount as a reason for higher stock returns in diversified firms, even when taking into account for the systematic risk, as has been the case here. Thus, diversified firms provide higher abnormal returns during normal periods, which makes them attractive for investors.

Finally, the modified excess cash model with the dummy variable presented in the previous two chapters, reaffirms what previous research has stated; focused firms do hold significantly more cash than diversified firms.

6.2. POTENTIAL WEAKNESSES IN STUDY

The division of firms in portfolios containing diversified firms and focused firm with excess cash, has been made with regards to their different characteristics. This comes from the fact that the excess cash regression defines firms that hold more cash than needed for their daily operations, based on their size, industry volatility, leverage, current assets, dividends, et cetera. Thus, it is not just a simple constant cash-to-asset ratio that applies to all firms in the sample, but the regression takes into consideration these different factors. Also, the smallest firms with annual sales of less than $20 million are excluded from the sample, which further reduces any biasedness from firm size. However, going back to table 1 in chapter four, one can notice that a few of the factors are considerably different between focused and diversified firms. For example, the average market-to-book ratio is twice as high among the focused firms, which implies that the market has higher future expectations on focused firms. This further implies that on average, these firms are valued relatively higher than diversified firms, and thus, they may have a hard time increasing their stock returns. They can for example, in a greater range, run on the so-called Expectations Treadmill. This expression is used in Koller et. al. (2010) and means that firms

who´s stock returns is valued high, have a hard time keeping up in regards to an increase in stock prices. The future expectations on these firms may very well already be priced in, thus managers run on an expectations treadmill, which goes faster and faster, due to higher and higher expectations. Hence, the sample of focused firms may have a harder time to realize abnormal stock returns due to relatively higher existing stock prices. Investing in a successful firm is not the same as investing in a successful stock[29] (ibid.).

Another potential weakness in this study is that it doesn´t take into consideration excess cash firms actual behaviour during the crisis period, i.e. the possibility that some firms perhaps chose to diversify in the crisis periods through acquisitions in non-core segments. These firms are then defined as focused in say, late 2008, when they perhaps have been diversified since early 2008. This then causes a risk of biasness in the conclusions made about the different firms.

Finally, stock betas for the post-crisis period, can be subject to an upwards bias, since they are calculated with the help of stock returns from the extreme crisis period. For example, a firm's beta in 2011 includes monthly stock returns from 2006-2010. However, this was the most severe financial crisis and the one with the most impact on stock markets since the Great Depression. At first sight, this ought to have the same implications for all of the firms in the sample since their beta is calculated with the same market index. Still, there is a potential risk that it has greater impact on some of the stocks, i.e. some of them could have experienced a much greater volatility during the crisis period. Also, one has to remember that these abnormal returns depend on the systematic risk only, whereas the whole risk including the idiosyncratic risk in the form of stock volatility is excluded. Thus, it is assumed that investors are rational and invest in fully diversified portfolios of stocks.

6.3. FURTHER RESEARCH

For further research, interesting viewpoints would be to see if these results are consistent with firms in Europe, where there are other characteristics in the credit system. The usage of corporate bonds has historically been relatively less developed in Europe. Especially firms in continental Europe are traditionally more bank-dependent than U.S. firms, which may have influenced them

[29] And of course, in the real world, stock returns are affected by many different factors, as investors sometimes simply act irrationally. Investors´ attention, mood and experience are said to have a large impact on their trading. For example, during perfectly sunny days the annualized market return in New York City is 24.8 % per year, compared to 8.7 % per year during perfectly cloudy days (Berk and DeMarzo, 2011).

differently throughout this credit crisis. What previous research also has found is that corporate governance structure can have a significant influence on a company's value-creation. However this factor has not been taken into consideration in this thesis, which consequently opens the question, as to whether differences in corporate governance also can help explain the differences in abnormal returns during crisis years when agency costs are assumed to change. Finally, previous research has also found that firms divesting non-core assets (i.e. refocusing) can generate greater value for its shareholders. A possible research question and interesting perspective would be to find out if firms who perform better during different market conditions in regards to abnormal returns, also divest more efficiently compared to less performing firms.

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APPENDIX A

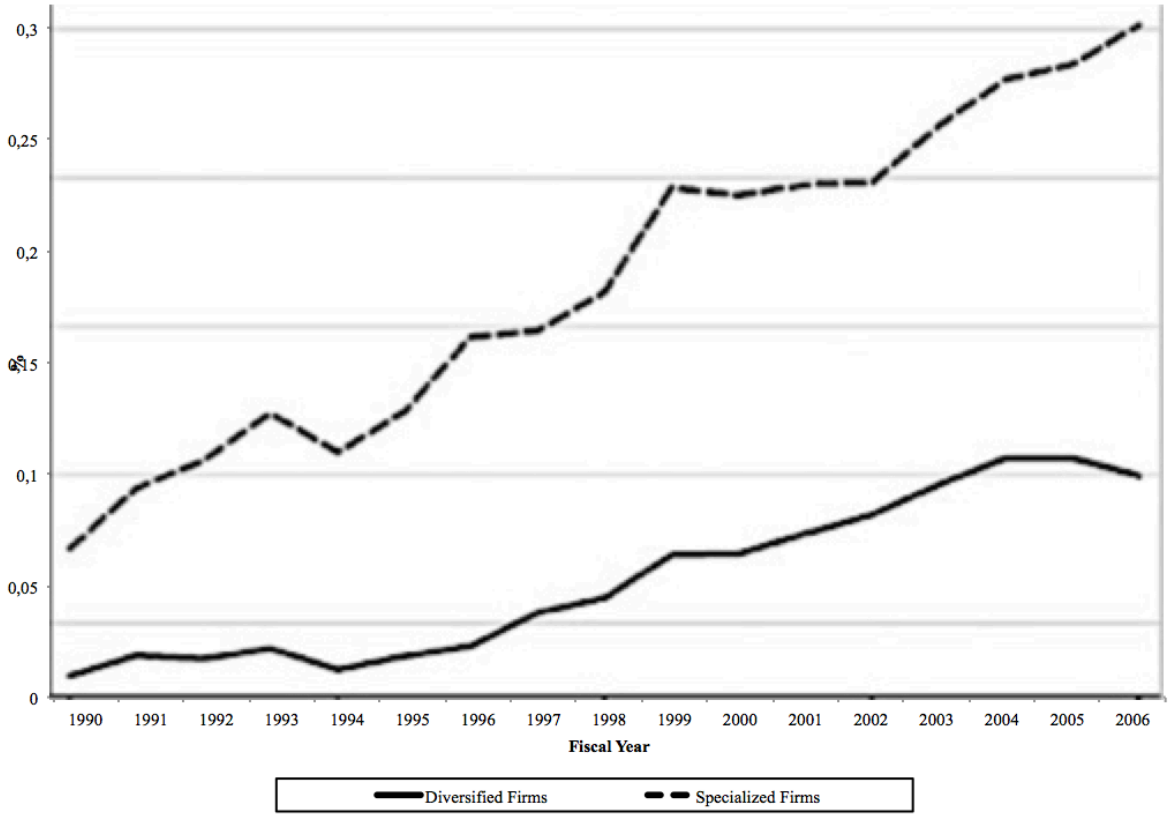

FIGURE 9: *AVERAGE ANNUAL CASH-TO-ASSET RATIOS FOR FOCUSED AND DIVERSIFIED NONFINANCIAL AND NONUTILITY FIRMS, WITH MARKET CAPITALIZATION OF $10 M OR MORE (DUCHIN, 2010).*

APPENDIX B

TABLE 8: *SUMMARY TABLES (2004-2013) FOR THE MEAN ALPHAS OF ALL FOCUSED FIRMS WITH EXCESS CASH COMPARED WITH ALL DIVERSIFIED FIRMS WITH NO EXCESS CASH*

Analysis of Variance (One-Way), 2004

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	631	0,0587	0,64392		
Div 4-8 SIC codes	118	0,1286	0,32853	0,0395	Yes
Div 3 SIC codes	104	0,1073	0,38512	0,1440	No
Div 2 SIC codes	116	0,0756	0,51675	0,3945	No
Div all	338	0,1039	0,41764	0,0935	No

Analysis of Variance (One-Way), 2005

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	682	-0,0767	0,53275		
Div 4-8 SIC codes	130	-0,0710	0,30639	0,4335	No
Div 3 SIC codes	111	-0,0716	0,41092	0,4620	No
Div 2 SIC codes	124	-0,1499	0,36533	0,0295	Yes
Div all	338	-0,0980	0,36164	0,2220	No

Analysis of Variance (One-Way), 2006

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	734	-0,016	0,46992		
Div 4-8 SIC codes	128	0,0515	0,20988	0,0040	Yes
Div 3 SIC codes	113	0,0833	0,41368	0,0170	Yes
Div 2 SIC codes	125	0,0021	0,33319	0,2990	No
Div all	366	0,0445	0,32658	0,0065	Yes

Analysis of Variance (One-Way), 2007 Pre-cries

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	803	0,0009	0,32858		
Div 4-8 SIC codes	131	0,0575	0,20235	0,0040	Yes
Div 3 SIC codes	116	0,0411	0,25843	0,1035	No
Div 2 SIC codes	149	0,0367	0,31744	0,1100	No
Div all	396	0,0448	0,26600	0,0065	Yes

Analysis of Variance (One-Way), 2007 Early cries

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	803	-0,1614	0,42905		
Div 4-8 SIC codes	131	-0,1009	0,30145	0,0240	Yes
Div 3 SIC codes	116	-0,1741	0,41798	0,3820	No
Div 2 SIC codes	149	-0,1816	0,36184	0,2940	No
Div all	396	-0,1527	0,36217	0,3655	No

Analysis of Variance (One-Way), 2008 Late cries

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	828	-0,8820	0,73947		
Div 4-8 SIC codes	133	-0,7764	0,59902	0,0350	Yes
Div 3 SIC codes	118	-0,8854	0,71892	0,4815	No
Div 2 SIC codes	151	-0,9946	0,70357	0,0415	Yes
Div all	402	-0,8993	0,68007	0,4245	No

Analysis of Variance (One-Way), 2009

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	917	0,3481	0,61119		
Div 4-8 SIC codes	111	0,1710	0,53441	0,0005	Yes
Div 3 SIC codes	91	0,3356	0,5413	0,4255	No
Div 2 SIC codes	126	0,2940	0,61761	0,1765	No
Div all	328	0,2639	0,57205	0,0150	Yes

Analysis of Variance (One-Way), 2010

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	983	0,1004	0,47721		
Div 4-8 SIC codes	119	0,1060	0,30934	0,4310	No
Div 3 SIC codes	94	0,0830	0,5155	0,3690	No
Div 2 SIC codes	114	0,1371	0,43344	0,2165	No
Div all	327	0,1102	0,41880	0,3615	No

Analysis of Variance (One-Way), 2011

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	635	-0,3361	0,61884		
Div 4-8 SIC codes	63	-0,1933	0,40358	0,0365	Yes
Div 3 SIC codes	68	-0,2852	0,54491	0,2570	No
Div 2 SIC codes	103	-0,1591	0,44795	0,0005	Yes
Div all	234	-0,2049	0,44795	0,0005	Yes

Analysis of Variance (One-Way), 2012

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	907	-0,0858	0,54862		
Div 4-8 SIC codes	138	0,0161	0,37712	0,0030	Yes
Div 3 SIC codes	114	-0,0302	0,36722	0,0775	No
Div 2 SIC codes	126	-0,0243	0,40931	0,0665	No
Div all	378	-0,0113	0,38482	0,0030	Yes

Analysis of Variance (One-Way), 2013

Groups	*Sample size*	*Mean*	*Variance*	*p-level*	*reject*
Foc. cash holders	741	0,2889	0,46555		
Div 4-8 SIC codes	133	0,1978	0,33803	0,0040	Yes
Div 3 SIC codes	134	0,2628	0,30433	0,2030	No
Div 2 SIC codes	172	0,2490	0,40456	0,1500	No
Div all	439	0,2377	0,35663	0,0170	Yes

APPENDIX C

TABLE 9: *ALL RELEVANT VARIABLES AND THEIR RESPECTIVE CODES IN THOMSON REUTERS DATASTREAM ®.*

Variable	CODE IN DATASTREAM
GENERAL INFORMATION	
Company Name	WC06001
INDUSTRY	
Industry Name	ICBIN
Industry Group	WC06011
ICB Code	WC07040
SIC - Code 1	WC07021
SIC - Code 2	WC07022
SIC - Code 3	WC07023
SIC - Code 4	WC07024
SIC - Code 5	WC07025
SIC - Code 6	WC07026
SIC - Code 7	WC07027
SIC - Code 8	WC07028
Product segment 1	WC19501
Product segment 2	WC19511
Product segment 3	WC19521
Product segment 4	WC19531
Product segment 5	WC19541

Variable	CODE IN DATASTREAM
PERFORMANCE	
Market Capitalization	WC08001
Market Price - Current	WC05006
Cash Dividends Paid - Total	WC04551
Stock Price	P
Index Price	X
U.S. Treasury Bill - 1 Year	USTRCN1
Betas	BETA
BALANCE SHEET	
Market Value Of Equity	MV
Total Assets	WC02999
Short Term Debt	WC03051
Long Term Debt	WC03251
Working Capital	WC03151
Common Equity	WC03501
ANNUAL REPORT	
Research & Development Expense	WC01201
Interest Expense on Debt	WC01251
Non-Operating Interest Income	WC01266
Income Taxes	WC01451
Depreciation and Depletion	WC04049
Net Sales or Revenue (USD)	WC07240
Capital Expenditure % of Total Assets	WC08416
Earning Before Interest and Taxes	WC18191
Cash and Short Term Investments	WC02001

APPENDIX D

TABLE 10: *NORMALITY TEST AND DESCRIPTIVE DATA FOR RESIDUALS FOR EACH YEAR IN THE EXCESS CASH REGRESSION.*

$Residual_{2004}$				
Mean	2.84E-17	Skewness	-1.077293	
Median	0.234690	Kurtosis	5.466251	
Std. Dev.	1.453029			
Maximum	3.976305		Test Statistics	p-level
Minimum	-7.492500	Jarque-Bera	1089.891	0.000000
Observation	2439	Conclusion (5%)	Reject	

$Residual_{2005}$				
Mean	6.60E-16	Skewness	-0.936879	
Median	0.208748	Kurtosis	5.531732	
Std. Dev.	1.459612			
Maximum	5.172599		Test Statistics	p-level
Minimum	-8.992566	Jarque-Bera	810.1853	0.000000
Observation	1960	Conclusion (5%)	Reject	

$Residual_{2006}$				
Mean	-1.21E-16	Skewness	-1.014254	
Median	0.200257	Kurtosis	6.239273	
Std. Dev.	1.421259			
Maximum	4.746694		Test Statistics	p-level
Minimum	-11.07029	Jarque-Bera	1276.960	0.000000
Observation	2098	Conclusion (5%)	Reject	

$Residual_{2007}$				
Mean	1.84E-16	Skewness	-0.936722	
Median	0.209849	Kurtosis	5.983935	
Std. Dev.	1.476988			
Maximum	8.448237		Test Statistics	p-level
Minimum	-9.633868	Jarque-Bera	1159.126	0.000000
Observation	2241	Conclusion (5%)	Reject	

$Residual_{2008}$				
Mean	1.49E-15	Skewness	-0.681339	
Median	0.183235	Kurtosis	5.345141	
Std. Dev.	1.455007			
Maximum	9.064439		Test Statistics	p-level
Minimum	-7.839682	Jarque-Bera	733.5120	0.000000
Observation	2393	Conclusion (5%)	Reject	

$Residual_{2009}$				
Mean	4.96E-16	Skewness	-0.722472	
Median	0.189928	Kurtosis	4.961848	
Std. Dev.	1.408114			
Maximum	8.283601		Test Statistics	p-level
Minimum	-7.174266	Jarque-Bera	594.6606	0.000000
Observation	2404	Conclusion (5%)	Reject	

$Residual_{2010}$				
Mean	1.08E-15	Skewness	-1.167135	
Median	0.231846	Kurtosis	6.605533	
Std. Dev.	1.343479			
Maximum	4.408649		Test Statistics	p-level
Minimum	-9.625992	Jarque-Bera	1890.222	0.000000
Observation	2459	Conclusion (5%)	Reject	

$Residual_{2011}$				
Mean	7.91E-16	Skewness	-0.708454	
Median	0.176384	Kurtosis	4.263102	
Std. Dev.	1.846387			
Maximum	5.340301		Test Statistics	p-level
Minimum	-9.598335	Jarque-Bera	243.2061	0.000000
Observations	1620	Conclusion (5%)	Reject	

$Residual_{2012}$				
Mean	3.92E-16	Skewness	-1.107517	
Median	0.204826	Kurtosis	6.583080	
Std. Dev.	1.388666			
Maximum	6.406666		Test Statistics	p-level
Minimum	-9.738618	Jarque-Bera	1807.755	0.000000
Observations	2445	Conclusion (5%)	Reject	

$Residual_{2013}$				
Mean	1.35E-15	Skewness	-0.978060	
Median	0.198007	Kurtosis	5.912309	
Std. Dev.	1.412798			
Maximum	7.574562		Test Statistics	p-level
Minimum	-7.876858	Jarque-Bera	1210.282	0.000000
Observations	2360	Conclusion (5%)	Reject	

APPENDIX E

TABLE 11: *CORRELATION TABLE FOR ALL VARIABLES IN EXCESS CASH REGRESSION FOR EACH YEAR AS AN ILLUSTRATION OF NON-MULTICOLLINEARITY.*

Correlation matrix - Excess Cash regression$_{2013}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	-0,129	1,000									
Div	-0,133	0,045	1,000								
CAPEX	-0,002	0,073	-0,048	1,000							
S	0,110	-0,046	-0,188	0,107	1,000						
L	-0,328	0,054	-0,006	0,027	-0,030	1,000					
MB	0,224	-0,071	-0,051	0,032	0,070	-0,040	1,000				
R&D	0,304	-0,216	-0,151	0,009	0,111	-0,035	0,143	1,000			
Cash Flow $_{Volatility}$	0,330	-0,101	-0,140	-0,093	0,058	-0,109	0,122	0,254	1,000		
Size	-0,205	0,207	0,354	0,021	-0,227	0,219	-0,078	-0,109	-0,121	1,000	
WC	-0,221	0,110	0,089	-0,100	-0,086	-0,206	-0,406	-0,194	-0,178	0,013	1,000

Correlation matrix - Excess Cash regression$_{2012}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	-0,084	1,000									
Div	-0,148	0,098	1,000								
CAPEX	-0,065	0,054	-0,044	1,000							
S	0,099	-0,048	-0,202	0,078	1,000						
L	-0,313	-0,041	0,017	0,058	-0,020	1,000					
MB	0,360	-0,070	-0,067	0,031	0,101	-0,047	1,000				
R&D	0,292	-0,282	-0,142	-0,019	0,074	-0,058	0,340	1,000			
Cash Flow $_{Volatility}$	0,312	-0,073	-0,167	-0,096	0,061	-0,110	0,220	0,216	1,000		
Size	-0,147	0,247	0,369	0,051	-0,289	0,159	-0,086	-0,089	-0,126	1,000	
WC	-0,135	0,119	0,015	-0,025	-0,046	-0,105	-0,436	-0,118	-0,105	0,019	1,000

Correlation matrix - Excess Cash regression$_{2011}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	0,112	1,000									
Div	-0,129	-0,022	1,000								
CAPEX	0,103	0,101	-0,043	1,000							
S	0,184	-0,030	-0,155	0,133	1,000						
L	0,037	0,131	0,009	0,005	-0,021	1,000					
MB	0,057	0,645	0,049	0,018	0,008	0,043	1,000				
R&D	0,179	0,016	-0,140	-0,039	-0,016	-0,038	-0,002	1,000			
Cash Flow $_{Volatility}$	0,256	-0,006	-0,167	-0,041	0,066	-0,025	-0,004	0,201	1,000		
Size	-0,182	-0,198	0,221	0,073	-0,080	-0,072	-0,128	-0,015	-0,107	1,000	
WC	0,109	0,179	0,036	0,303	-0,063	-0,004	0,084	-0,025	0,025	-0,061	1,000

Correlation matrix - Excess Cash regression$_{2010}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	0,099	1,000									
Div	-0,150	-0,181	1,000								
CAPEX	0,019	0,165	-0,041	1,000							
S	0,106	0,114	-0,177	0,069	1,000						
L	-0,388	-0,018	0,025	-0,023	-0,034	1,000					
MB	0,385	0,164	-0,077	0,046	0,097	-0,108	1,000				
R&D	0,328	0,191	-0,143	-0,017	0,096	-0,078	0,503	1,000			
Cash Flow $_{Volatility}$	0,300	0,058	-0,145	-0,038	0,056	-0,143	0,219	0,287	1,000		
Size	-0,167	-0,179	0,355	-0,016	-0,262	0,229	-0,104	-0,093	-0,120	1,000	
WC	-0,316	-0,087	0,050	-0,050	-0,068	-0,020	-0,617	-0,371	-0,215	-0,052	1,000

Correlation matrix - Excess Cash regression$_{2009}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	-0,053	1,000									
Div	-0,153	0,095	1,000								
CAPEX	0,058	0,077	-0,021	1,000							
S	0,070	-0,040	-0,183	0,080	1,000						
L	-0,322	-0,059	0,013	-0,029	-0,019	1,000					
MB	0,173	0,074	0,006	0,011	0,045	-0,033	1,000				
R&D	0,304	-0,254	-0,134	-0,036	0,085	-0,040	0,099	1,000			
Cash Flow $_{Volatility}$	0,313	-0,066	-0,147	-0,064	0,035	-0,117	0,048	0,263	1,000		
Size	-0,142	0,172	0,385	0,027	-0,267	0,159	-0,060	-0,083	-0,125	1,000	
WC	-0,207	0,030	0,042	-0,048	-0,063	-0,160	-0,666	-0,185	-0,160	0,044	1,000

Correlation matrix - Excess Cash regression$_{2008}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	0,107	1,000									
Div	-0,139	0,118	1,000								
CAPEX	0,130	0,034	-0,026	1,000							
S	0,284	-0,256	0,023	0,034	1,000						
L	0,017	-0,030	-0,010	0,007	-0,033	1,000					
MB	0,157	-0,161	-0,153	-0,005	-0,063	0,175	1,000				
R&D	0,146	-0,085	-0,205	0,029	-0,043	0,067	0,118	1,000			
Cash Flow $_{Volatility}$	0,236	-0,109	-0,173	-0,037	-0,092	0,075	0,289	0,054	1,000		
Size	-0,175	0,235	0,372	-0,004	0,117	-0,088	-0,096	-0,290	-0,133	1,000	
WC	0,135	0,313	0,103	-0,028	-0,221	-0,226	-0,264	-0,069	-0,194	0,048	1,000

Correlation matrix - Excess Cash regression$_{2007}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	0,199	1,000									
Div	-0,175	-0,019	1,000								
CAPEX	0,016	0,000	-0,009	1,000							
S	0,110	-0,043	0,035	0,042	1,000						
L	-0,343	0,611	-0,089	0,049	-0,091	1,000					
MB	0,324	-0,065	-0,135	0,006	-0,079	0,256	1,000				
R&D	0,213	0,025	-0,215	0,083	-0,057	0,081	0,087	1,000			
Cash Flow $_{Volatility}$	0,242	-0,041	-0,165	-0,046	-0,110	0,144	0,238	0,037	1,000		
Size	-0,183	-0,030	0,395	0,021	0,148	-0,096	-0,073	-0,266	-0,117	1,000	
WC	-0,302	0,009	0,076	-0,106	-0,093	-0,472	-0,252	-0,023	-0,204	-0,031	1,000

Correlation matrix - Excess Cash regression$_{2006}$

	C	CF	Div	CAPEX	S	L	MB	R&D	CF $_{Volatility}$	Size	WC
C	1,000										
CF	0,096	1,000									
Div	-0,175	0,034	1,000								
CAPEX	0,011	-0,018	-0,004	1,000							
S	0,249	-0,095	-0,018	-0,003	1,000						
L	-0,343	0,614	-0,082	-0,004	-0,110	1,000					
MB	0,324	-0,089	-0,162	-0,008	-0,052	0,234	1,000				
R&D	0,292	-0,011	-0,215	0,023	-0,043	0,095	0,070	1,000			
Cash Flow $_{Volatility}$	0,242	-0,072	-0,163	0,034	-0,078	0,152	0,267	0,015	1,000		
Size	-0,183	0,034	0,399	-0,029	0,103	-0,116	-0,066	-0,255	-0,095	1,000	
WC	-0,359	0,029	0,065	-0,030	-0,170	-0,396	-0,179	-0,028	-0,157	-0,039	1,000

Correlation matrix - Excess Cash regression$_{2005}$

	C	CF	Div	CAPEX	S	L	MB	R&D	$CF_{Volatility}$	Size	WC
C	1,000										
CF	0,199	1,000									
Div	-0,198	-0,089	1,000								
CAPEX	0,011	-0,165	0,121	1,000							
S	0,104	-0,021	0,014	-0,024	1,000						
L	-0,344	-0,373	-0,079	-0,032	-0,007	1,000					
MB	0,486	0,282	0,007	-0,039	-0,005	-0,105	1,000				
R&D	0,292	0,321	-0,263	-0,165	-0,008	-0,022	0,174	1,000			
Cash Flow$_{Volatility}$	0,324	0,127	-0,047	-0,211	0,025	-0,056	0,090	0,080	1,000		
Size	-0,121	-0,149	0,205	0,398	-0,023	0,117	-0,092	-0,073	-0,257	1,000	
WC	-0,359	-0,171	0,097	0,052	-0,015	-0,131	-0,633	-0,152	-0,037	-0,026	1,000

Correlation matrix - Excess Cash regression$_{2004}$

	C	CF	Div	CAPEX	S	L	MB	R&D	$CF_{Volatility}$	Size	WC
C	1,000										
CF	-0,082	1,000									
Div	-0,155	0,110	1,000								
CAPEX	0,078	0,199	-0,035	1,000							
S	-0,359	-0,070	-0,041	-0,061	1,000						
L	0,296	0,022	-0,054	0,061	-0,131	1,000					
MB	0,308	-0,331	-0,168	0,002	0,015	0,127	1,000				
R&D	0,115	-0,039	-0,163	0,108	-0,079	0,081	0,062	1,000			
Cash Flow$_{Volatility}$	0,296	-0,150	-0,172	-0,089	-0,100	0,158	0,270	-0,013	1,000		
Size	-0,120	0,198	0,386	-0,024	0,121	-0,100	-0,059	-0,221	-0,109	1,000	
WC	-0,189	0,109	0,047	-0,145	-0,130	-0,289	-0,158	-0,022	-0,152	-0,034	1,000

APPENDIX F

TABLE 12: *ILLUSTRATION OF EXCESS CASH REGRESSION WITH HETEROSCEDASTICITY-ROBUST STANDARD ERRORS*

Excess Cash regression white heteroskedasticity-consistent standard errors & covariance												
	Variable	CF	Common Dividends	CAPEX	MB	L	R&D	Cash Flow Volatility	S	Size	WC	C
2004	Coefficient	-0,099	-0,118	0,097	0,007	-1,988	1,386	2,166	-0,612	-0,072	-0,766	-0,564
	Prob	0,235	0,066	0,706	0,153	0,000	0,000	0,000	0,000	0,000	0,000	0,007
2005	Coefficient	-0,089	-0,232	-0,491	-1,712	0,070	0,847	2,006	0,107	-0,007	-0,036	-2,276
	Prob	0,653	0,000	0,010	0,000	0,012	0,022	0,000	0,089	0,711	0,696	0,000
2006	Coefficient	0,331	-0,087	1,259	0,037	0,000	1,493	2,853	0,694	-0,143	0,040	-2,013
	Prob	0,034	0,416	0,001	0,010	0,524	0,000	0,000	0,000	0,000	0,001	0,000
2007	Coefficient	0,057	-0,254	-0,016	-2,529	0,041	1,002	1,598	0,119	-0,013	-0,564	-1,788
	Prob	0,796	0,000	0,884	0,000	0,045	0,000	0,000	0,043	0,410	0,000	0,000
2008	Coefficient	-1,021	-0,321	0,000	-2,173	0,105	1,370	1,378	0,108	-0,011	-0,218	-2,217
	Prob	0,000	0,000	0,102	0,000	0,000	0,000	0,000	0,113	0,527	0,439	0,000
2009	Coefficient	-0,318	-0,322	-0,019	-1,917	0,015	1,639	1,977	0,195	-0,025	-0,504	-2,049
	Prob	0,050	0,000	0,262	0,000	0,188	0,000	0,000	0,003	0,167	0,000	0,000
2010	Coefficient	-0,578	-0,352	-2,158	-0,195	0,052	0,864	1,929	0,124	-0,047	-0,381	-1,685
	Prob	0,009	0,000	0,000	0,172	0,013	0,103	0,000	0,063	0,008	0,005	0,000
2011	Coefficient	-1,021	-0,321	0,000	-2,173	0,105	1,370	1,378	0,108	-0,011	-0,218	-2,217
	Prob	0,000	0,000	0,102	0,000	0,000	0,000	0,000	0,113	0,527	0,439	0,000
2012	Coefficient	-0,138	-0,301	-2,608	0,000	0,025	2,269	2,073	0,186	-0,013	-0,256	-2,111
	Prob	0,639	0,000	0,000	0,138	0,063	0,000	0,000	0,009	0,513	0,156	0,000
2013	Coefficient	0,024	-0,319	0,668	-2,668	0,033	2,148	1,899	0,169	0,005	-0,591	-2,349
	Prob	0,916	0,000	0,136	0,000	0,002	0,000	0,000	0,009	0,786	0,004	0,000