The influence of leverage on firm performance: A corporate governance perspective

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1. Introduction

One of the more fundamental questions with respect to corporate finance is concerned with capital structure: to what degree should firms be financed with debt compared to equity? In their famous theorem, Modigliani and Miller (1958) propose that managers should be indifferent with respect to capital structure under certain conditions. Due to the fact that (some of) their assumptions, including the absence of taxes, don't hold in real life, a more nuanced view with respect to the influence of capital structure emerged. When the assumption of the absence of taxes is relaxed, the fact that companies can benefit from the so called tax shield can be taken into account (Hillier, Clacher, Ross, Westerfield & Jordan, 2011). Due to the tax deductibility of the interest paid on the debt, one could easily argue that increasing debt will increase firm value due to the benefits obtained from the tax shield. When taken too far, however, firms might become threatened with bankruptcy due to increased financial distress costs. Taken both the tax shield and the financial distress costs into account, an inverted U-shape relationship can be expected between the amount of leverage and firm performance.

Besides the aforementioned perspective(s), the issue with respect to the optimal amount of leverage can also be approached from a corporate governance perspective. Corporate governance refers to the system of controls, regulations, and incentives designed to prevent fraud (Berk & DeMarzo, 2007). Two examples of such mechanisms are a firm's capital structure and the amount of free cash flow. The corporate governance approach provides two hypotheses which are relevant with respect to capital structure: the free cash flow hypothesis and the monitoring hypothesis. The free cash flow hypothesis states that debt can help reduce the amount of free cash flow available to managers (Jensen, 1986). By reducing the amount of free cash flow, debt can prevent managers from investing in negative NPV projects, thereby increasing firm performance. Several studies have indicated that the free cash flow hypothesis is a valid theory of capital structure, at least to some degree (De Jong, 2002; Gul & Tsui, 1997; Harford, Mansi & Maxwell, 2008; Jensen, 1986). However, these studies lack to provide a clear link between leverage and firm performance.

The monitoring hypothesis states that debt can reduce the agency conflict by credit monitoring, especially by banks (Thomson & Coyen, 2012). By monitoring and controlling managerial behavior, creditors can reduce self-interested behavior of managers and, thus, increase firm performance. Several studies have indicated that bank loans can have a positive effect on firm performance (Degryse and Ongena, 2001; James, 1987; Lummer & McConnell,

1989; Slovin, Johnson and Glascock, 1992). However, these studies also lack to address the relationship between leverage and firm performance.

The current study will contribute to the existing literature by addressing the effect of leverage on firm performance. this effect will be tested on a regular firms, firms vulnerable to overinvestment and relatively small firms. The current study will therefor also be able to compare the effect of leverage on firm performance across different types of firms. The following research question will be answered:

"What is the influence of leverage on firm performance?"

This question will be answered using a sample of all firms listed in the "100 best companies to work for in America" list published in Fortune in a four year time span (2010 till 2013), excluding firms operating in the financial industry or utilities. In general, the results of the current study reveal that debt doesn't have a positive effect on firm performance. in fact, it appears to have no significant effect at all. This indicates that capital structure decisions might be irrelevant, at least in terms of firm performance.

The remaining part of this thesis will consists of a literature review (chapter 2) which will elaborate further on related studies, followed by an explanation of the methodology used in the current study in chapter three. Further the results will be described in chapter four, followed by the main conclusions (chapter 4) and the implications of the results and limitations of the current study will be discussed in chapter five and six respectively.

2. Literature Review

This chapter will investigate existing evidence regarding the influence of leverage on firm performance. In the first part, measuring firm performance will be addressed followed by an overview regarding the influence of leverage on firm performance.

2.1 Firm Performance

Profitability ratios evaluate a company's performance in generating earning, profits and cash flows relative to the amount of money invested (Palepu, Healy & Peek, 2010). They emphasize how effectively the profitability of a company is managed and how the company performs at generating revenue or profit relative to the investment. Return of equity (ROE) is

an example of a profitability ratio which provides an indication regarding how well managers are investing the funds provided by investors. ROE is calculated by dividing the net profits by the book value of equity. Another profitability measure is return on assets (ROA) which measures how well a company is at generating profit from their assets. Total assets of ROA are measured by using the book value of its assets. Both these ratios, however, use book values of equity and assets. A limitation of this approach is that only current or historical firm profitability can be measured. In order to be able to include predicted future profitability, market values should be included in the analysis. An example is the market-to-book ratio (M/B ratio) which is calculated by dividing the market value of equity by the book value of equity or Tobin's q which is calculated by adding the market value of equity to the book value of debt and dividing this by the book value of total assets . When Tobin's q is below 1, the firm is undervalued indicating that the book value of the firm's assets are higher than their expected market value and when Tobin's q is above one, the value of its assets are expected to be higher than book value. Thus, by using firm performance measures including the market value, a more complete picture can be provided compared to a focus on profitability ratios alone since the expected future value of the firm are also incorporated.

2.2 The influence of leverage on firm performance

According to the theorem of Modigliani and Miller, a firm's value is unaffected by the way that it is financed, e.g. whether the firm is financed by debt or equity. However, one of the assumptions under which they state this theorem holds, the absence of bankruptcy cost, is known to be untrue in real life. When the assumption of the absence of taxes is relaxed, the fact that companies can benefit from the so called tax shield can be taken into account (Hillier, Clacher, Ross, Westerfield & Jordan, 2011). Due to the tax deductibility of the interest paid on the debt, one could easily argue that increasing debt will increase firm value due to the benefits obtained from the tax shield. When taken to far, however, firms might become threatened with bankruptcy due to increased financial distress costs. Apparently, capital structure decisions can affect firm performance and should, thus, be addressed. Taken both the tax shield and the financial distress costs into account, an inverted U-shape relationship can be expected between the amount of leverage and firm performance. Besides these arguments with respect to capital structure decisions, one could also engage in a corporate governance perspective to examine the influence of leverage on firm performance.

The following section will explain the influence of leverage on firm performance from a corporate governance perspective. The first part will explain the free cash flow hypothesis and the second part will elaborate on the monitoring hypothesis.

2.2.1 The free cash flow hypothesis

Jensen (1986) developed the free cash flow hypothesis which can be used to explain the effects of capital structure and free cash flow. Free cash flow is defined by the cash flow in excess of the cash that is needed to invest in all positive NPV projects. The free cash flow hypothesis assumes that managers with access to free cash will invest it in negative NPV projects instead of paying it out to shareholders in dividends. In his article, Jensen (1986) also discusses the benefits of debt in motivating managers to be efficient, called the control hypothesis. He argues that, by taken on debt, managers commit themselves to future payments and provide the issuer(s) of debt the right to declare the firm bankrupt in court. This puts pressure on the manager to engage in profitable investments and maintain the ability to pay the interest and principal payment. Jensen (1986), thus, proposes a positive influence of leverage on firm performance.

The free cash flow hypothesis as proposed by Jensen (1986) has been tested in several research designs. Jensen (1993) investigated the investment behavior of managers of firms in industries with excess capacity, meaning industries in which the actual production of firms is less than the achievable or optimal production level. Jensen observed that the reaction of many managers, in response to the excess capacity, was to invest in unprofitable projects with the free cash flow available to them. These observations confirm the free cash flow hypothesis as stated by Jensen (1986), namely that free cash available to managers will be invested in negative NPV projects. Jensen (1993) also conducted a study regarding the efficiency of R&D spending and capital expenditures. He found that corporate internal control mechanisms, like the board of directors, weren't sufficient to prevent inefficient investments and that, although the average performance results were positive, a substantial number of firms reported inefficient R&D spending and capital expenditures. These results are also in line with the free cash flow hypothesis, since these results suggest that managers will spend free cash in negative NPV projects when they aren't constraint sufficiently by internal control mechanisms. Another study, by Harford, Mansi, and Maxwell (2008) examined the relationship between corporate governance, cash holdings and firm value within a US sample. Governance structure was defined by antitakeover decisions, ownership concentration,

executive pay and board structure and firm value was estimated by investment decisions (changes in capital expenditure, R&D expenditure and acquisitions), pay out policy (changes in dividends and/or share repurchases), profitability and book-to-market ratio. Cash holdings were measured by the cash to sales ratio. They found that weaker governance structures correlated negatively with firm value and that larger cash holdings made this correlation more pronounced, meaning that the negative relationship between governance structures and firm value was stronger when managers had access to relatively more cash. These results suggest that managers indeed invest excess cash in negative NPV projects, in line with the free cash flow hypothesis, when they aren't controlled properly. These findings are, thus, also in line with the results of the study by Jensen (1993). The free cash flow hypothesis has also been tested by Gul and Tsui (1997) in a different research design. They investigated whether the amount of free cash flow had a positive correlation with audit fees and whether this relationship was influenced by the amount of debt within a Hong Kong sample. They hypothesized that the audit fees were higher for firms with high levels of free cash, since this cash is supposed to be invested in negative NPV projects which should lead to management trying to mask these unprofitable expenditures which, in turn, leads to more effort from auditors in an attempt to find irregularities in the administration. Free cash flow was calculated in two different ways. In both estimations, the total taxes, interest payments and dividends paid in both preferred and ordinary shares were subtracted from operating income before depreciation and divided by last year's book value of equity in measurement one and divided by last year's total assets in measurement two. They found that, indeed, audit fees were higher for firms with a higher level of free cash flow which provides evidence in favor of the free cash flow hypothesis as stated by Jensen (1986).

In conclusion, all the aforementioned studies provide evidence with respect to the free cash flow hypothesis. However, none of these studies investigate the influence of leverage on firm performance. So, although these studies indeed suggest that managers will invest free cash flow in negative NPV projects, none of these studies is able to provide evidence for the positive influence of leverage on free cash flow.

A study by De Jong (2002), regarding the role of leverage in the overinvestment problem, did investigate the influence of leverage on firm performance. More specifically, De Jong (2002) investigated the role of leverage in a normal sample and an overinvestment sample. This hypothesis was tested by relating leverage, free cash flow and Tobin's Q to each other in a

Dutch sample, whereby a high amount of free cash flow and a low Tobin's Q indicated that a firm was vulnerable to overinvestment. Free cash flow was calculated by the operating income minus taxes, interest payments and dividends divided by total assets, Tobin's Q was calculated by dividing the firms' market value by the replacement costs of its assets. De Jong (2002) found that leverage did have a positive effect on firm performance (Tobin's q) in the sample of firms vulnerable to overinvestment. However, he also found that firms in the overinvestment subsample are avoiding the disciplining role of debt. These findings, thus, indicate that the free cash flow hypothesis is only valid in firms vulnerable to overinvestment. Further, managers appear to be motivated to keep the degree of leverage low under overinvestment conditions in order to maintain an amount of free cash flow available at their own discretion. The study by De Jong (2002), thus, nuances the free cash flow hypothesis: apparently, it is only valid in some type of firms.

In conclusion, all the aforementioned studies provide evidence with respect to the free cash flow hypothesis. However, the study by De Jong (2002) indicates that the validity of the free cash flow hypothesis might differ across firms: firms vulnerable to overinvestment are susceptible to the positive influence of leverage on firm performance compared to "normal" firms who are not affected by leverage. A problem with his research is that it was conducted on a Dutch sample of firms which may limit the generalizability of the results. The current study will try to resolve the generalizability issue by investigating the influence of leverage on firm performance on both a regular US sample and an overinvestment subsample.

2.2.2 The monitoring hypothesis

Another theory with respect to the influence of leverage on firm performance from a corporate governance perspective is the monitoring hypothesis. The monitoring hypothesis states that debt can also reduce the agency conflict by creditor monitoring, especially when companies engage in bank loans (Thomson & Conyen, 2012). Banks can protect themselves from borrowers defaulting on their obligations by monitoring managerial behavior and control it using covenants. Covenants are formal debt agreements stating what activities can or can't be carried out (often related to future borrowing behavior). Therefore, bank monitoring can reduce risky behavior by managers, asset substitution (replacement of low-risk assets with more risky ones) and overinvestment (managerial decision to invest in negative NPV projects). Fama (1985) further argues that banks have inside information, compared to public

debt holders, which, not only, enables them to monitor borrowers more efficiently but engagement in bank loans can also serve as a signal to outside investors and debt holder.

Although the idea that debt financing can enhance firm performance due to debt holder monitoring has been tested and demonstrated in several studies before, the majority of these studies focused on the stock responses associated with debt financing. These effects, however, are more related to the signaling effect of a bank loan compared to the effect of bank loans on firm performance. An example of such a study is the study by James (1987). He compared the difference in stock responses of firms announcing a new bank loan agreement compared to firms engaging in new private placements. The stock response was estimated using abnormal returns. He found that the abnormal returns were significantly higher than zero when firms announced a new bank loan agreement. In the case of the announcement of private placements, negative abnormal returns were observed. Further, he found that straight debt issues used to replace bank loans also resulted in negative abnormal returns. These stock responses can be explained by the monitoring hypothesis of debt. These results, namely, indicate that stockholders value firms engaging in bank loans higher compared to firms that do not. These expectations regarding better firm performance can be caused by the expectations of shareholders that banks will monitor managerial behavior. A similar study was conducted by Slovin, Johnson and Glascock (1992). They investigated whether the announcements of initiations or renewals of bank loans influenced stock prices. The results reveal that only the share prices of small size firms were positively affected by these loan announcement compared to large size firms. This indicates that especially small size firms gain value from the monitoring of banks which can be caused by their greater vulnerability to moral hazard and adverse selection (a situation whereby sellers possess information buyers don't have). Finally, a study by Lummer and McConnell (1989) investigated the influence of new bank loan debt agreements compared to revisions on stock responses and they found that only revisions had an impact on the excess returns. More precisely, favorable revisions resulted in positive returns and unfavorable revisions resulted in negative excess returns. All the aforementioned studies provide evidence that outside investors regard bank loan agreements to be valid signals regarding the (financial) position of a company. These studies, however, do not provide solid evidence regarding the influence of bank loans on firm performance. A study by Degryse and Ongena (2001) did investigate the influence of banking relationships on profitability in a Norwegian sample, though in a slightly different paradigm. The banking relationship was measured by the number of banks a company borrowed from

and profitability was measured by ROA. They found that companies engaging in only one bank relationship (bilateral) compared to companies borrowing from multiple banks (multilateral) had higher profitability. This can be explained by the fact that multilateral bank relationships can cause inefficient (re)negotiation of relevant lending conditions, thereby limiting the influence the individual banks can exert on managerial behavior. Although this study is able to confirm that bank monitoring can increase firm profitability, it doesn't focus on relating actual leverage to firm performance.

The current study will try to add to the current understanding of both the free cash flow hypothesis and the monitoring hypothesis by investigating the influence of leverage on firm performance. More specifically, it will investigate the influence of leverage on a regular US sample, an overinvestment subsample to investigate the generalizability of the results obtained by De Jong (2002) and a small firms subsample to investigate whether the influence of leverage is also larger with respect to firm performance compared to stock responses in relatively smaller firms. The results of this study are therefore able to contribute to the current knowledge with respect to the both the free cash flow hypothesis and the monitoring hypothesis and will be able to demonstrate whether leverage actually influences firm performance or whether leverage merely influences shareholder expectations. Further, it will provide evidence with respect to the validity of both hypotheses in different samples. This results in the following research question:

"What is the influence of leverage on firm performance?"

Based on the results obtained by studies investigating the free cash flow hypothesis (De Jong, 2002; Gul & Tsui, 1997; Harford, Mansi & Maxwell, 2008; Jensen, 1986) and the monitoring hypothesis (Degryse and Ongena, 2001; James, 1987; Lummer & McConnell, 1989; Slovin, Johnson and Glascock, 1992) it is expected that leverage has a positive influence on firm performance. Further, it is proposed that the positive influence of leverage on firm performance will be more pronounced in both the overinvestment (De Jong, 2002) and small firm subsample (Slovin, Johnson & Glascock, 1992). These hypotheses will be tested on the companies listed in Fortune's "100 best companies to work for in America" in the period of 2010-2013.

3. Methodology

3.1 Sample

The sample that is investigated by the current study consists of all firms listed in the "100 best companies to work for in America" list which is published in Fortune in a four year time span (2010 till 2013), excluding firms operating in the financial industry or utilities. The relevant data is collected from the Orbis database, which covers the financial data of over 100 million private and public companies worldwide. Orbis contains information of both listed and non-listed firms. Missing data regarding dividend payouts is supplemented by data available on "www.nasdaq.com".

The total number of observations is 173. Two of these observations are removed from the sample due to the fact that they report negative amounts of shareholder funds. The linear regression model is conducted on the entire sample included 97 observations (57% of the total amount of observations). This means that 74 observations are removed from the sample due to missing values. The overinvestment subsample consists of 18 observations (19% of the entire sample). The small firms subsample consists of 24 observations which is equal to 25% of the entire sample.

3.2 Research question and hypotheses

Like mentioned before, the research question that the current study will answer is:

"What is the influence of leverage on firm performance?"

The three hypotheses that are being tested are:

H1: When the amount of leverage increases, firm performance will also increase.
H2: The positive relationship between leverage and firm performance described in H1 will be more pronounced in the overinvestment subsample.
H3: The positive relationship between leverage and firm performance described in H1 will be more pronounced in the small firms subsample.

3.3 Variables

Firm performance is measured by using an approximation of Tobin's q (TOBIN). This approximation is calculated in line with the approximation proposed by Chung and Pruitt

(1994) namely by adding the market value of equity to the book value of debt and dividing this by the book value of total assets. Robustness checks are conducted by replacing Tobin's q with both return on assets and return on equity. Return on assets (ROA) is calculated by dividing the net income by total assets. Return on equity (ROE) is calculated by dividing net operating income by the book value of equity with the exclusion of preferred stock.

The first hypothesis that is tested is whether leverage has an influence on firm performance. Leverage (LEV1) is calculated by dividing the book value of debt by the book value of equity. The book value of debt equals the total non-current liabilities. The current liabilities, which are liabilities due in one year, aren't included in determining the debt ratio since this category of debt is comprised mostly of bills due to suppliers for example, which is not the kind of debt the current study is concerned with. The results obtained are checked using a different measurement of leverage (LEV2), which is calculated by dividing the total non-current liabilities by total assets. Further, the inverted U-shape is controlled for by calculating the square of leverage (LEV3). By replacing leverage with leverage squared, it can be investigated whether the relationship between leverage and firm performance is U-shaped.

To be able to test the second hypothesis with respect to the influence of leverage on firm performance in a special subsample it is necessary to determine the overinvestment sample within the entire sample. These are selected in line with the method used by De Jong (2002), thus by selecting the firms with a low Tobin's q (Tobin's q lower than the median of 2.08) and a high amount of free cash flow (higher than the median of 0.20). The third hypothesis is tested by determining the subsample of small firms within the entire sample. All firms with a smaller than median natural logarithm of firm size (15.08) were included in the small firms subsample.

The control variables incorporated in the current study are employee satisfaction determined by fortune ranking, growth opportunity, the natural logarithm of firm size and industry since they are expected to influence firm performance (Edmans, 2011; Elyasiani & Jia, 2010). The first control variable, employee satisfaction, will be estimated by their ranking on the "100 best companies to work for in America" list published in fortune (FORTUNE). It can be assumed that companies which are present on this list are not only concerned with shareholders but also with a different stakeholder, their employees. This list, and respectively

whether a company is on it or not, will serve as a measure of employee satisfaction. The current study tries to overcome the lack of absolute scores by dividing the companies on the list in categories based on their ranking. The current study chooses to divide the rankings in three categories, this way the problem with linearity can be overcome best while still enabling some comparison between groups. Category one (FORTUNE1) will contain ranking the highest rankings (1-33), category two (FORTUNE2) the medium rankings (34-66) and category three (FORTUNE3) will contain the lowest rankings (67-100). Two dummy variables are created for the different categories of this variable with the third category as a reference. Growth opportunity (GROWTH) is estimated by the sales growth rate (percentage of change in sales at time t, compared to time t-1) and firm size by the natural logarithm of total assets (SIZE) and a categorical variable is created to discriminate between the different industries. The different industries included are: 1=publishing & printing (IN_1), 2=machinery, equipment, furniture & recycling (IN_2), 3=hotels & restaurants (IN_3), 4=transport (IN_4), 5=food, beverages & tobacco (IN_5), 6=chemicals, rubber, plastics & non-metallic products (IN_6), 7=other services (IN_7), 8=wholesale & retail trade (IN_8), 9=primary sector, 10=education & health (IN_10), 11=construction, 12=post & telecommunications and 13=metals & metal products. Industry 9, 11, 12 and 13 are combined due to the fact that these categories were represented by only a very small number of companies (IN_9). The total amount of industry categories, thus, becomes ten. In order to be able to include these categories in the linear regression model, nine dummy variables are created (the first industry category, publishing and printing, was used as a reference).
All necessary data can be extracted directly from Orbis, which contains information based on the financial report of a company.

These variables result in the regression model described below:

$$(TOBIN)_t = \alpha + \beta1(LEV1)_{t-1} + \gamma1(FORTUNE1)_{t-1} + \gamma2(FORTUNE2)_{t-1} + \beta2(GROWTH)_{t-1} + \beta3(SIZE)_{t-1} + \gamma3(IN\_2)_{t-1} + \gamma4(IN\_3)_{t-1} + \gamma5(IN\_4)_{t-1} + \gamma6(IN\_5)_{t-1} + \gamma7(IN\_6)_{t-1} + \gamma8(IN\_7)_{t-1} + \gamma9(IN\_8)_{t-1} + \gamma10(IN\_9)_{t-1} + \gamma11(IN\_10)_{t-1} + \varepsilon1$$

Firm performance $(TOBIN)_t$ = (market value of equity + book value of debt)/book value of total assets
Leverage $(LEV1)_{t-1}$ = non-current liabilities/book value of equity

3.4 Data analysis

The proposed hypotheses are tested using a linear regression model. The dependent variable of this model is Tobin's q and the independent variable included is leverage. The control variables included in the model are employee satisfaction, growth opportunity, firm size and industry category. Both the independent and control variables are lagged by one year in order to be able to control for reverse causation. The linear regression model is performed on both the entire sample and to both the subsample of overinvestment firms and the subsample of small firms.

Robustness checks are conducted using two different kinds of firm performance measurements (ROA and ROE) and two variations on the measurement of leverage: non-current liabilities/total assets and leverage squared whereby the latter is used to test whether an inverted U-shape relationship between leverage and firm performance is present.

4. Results

4.1 Descriptive statistics

This section consists of an univariate analysis of the variables used on this study. The first part contains the summary statistics of the variables of the entire sample (table 1), the overinvestment subsample (table 2) and the small firms subsample (table 3). The summary statistics are followed by a correlational analyses with respect to the variables which are presented afterwards. The correlational analysis is performed on the entire sample (table 4), the overinvestment subsample (table 5) and the small firms subsample (table 6).

Table 1 The summary statistics of the variables used in the current study of the entire US sample.

Variables	Mean	Median	Standard deviation	Minimum	Maximum	N
Tobin's q	2.59	2.08	1.61	0.79	9.00	101
ROA	0.08	0.07	0.10	-0.26	0.87	133
ROE	0.13	0.14	0.15	-0.59	0.41	132
Leverage (1)	0.80	0.35	1.56	0.00	10.34	120
Leverage (2)	0.30	0.21	0.40	0.00	2.40	120
Sales growth	1.07	1.07	0.12	0.67	1.35	104
Total assets	11.61	15.08	6.91	0.00	18.69	162

The summary statistics entail an overview of the mean, median, minimum and maximum value per variable. further, the number of observations and the standard deviation per variable are present in the table. The dummy variables were excluded from the table. The variables displayed in this table were defined as followed: Tobin's q (firm performance) was calculated by adding the market value of equity to the book value of debt. The sum of both concepts is divided by the/book value of total assets, leverage (1) is calculated by dividing the non-current liabilities by the book value of equity, leverage (2) is determined by dividing the non-current liabilities by total assets, growth opportunity is the sales value at t divided by the sales value at t-1 and firm size equals the natural logarithm of total assets.

Within the entire sample, Tobin's q has a mean value of 2.59 and a standard deviation of 1.61, return on assets is 0.08 on average with a standard deviation of 0.10 and return on equity has a mean value of 0.13 with a standard deviation of 0.15. Overall, firms performance appears to be positive, although relatively high standard deviations were found. Leverage (first measurement) has a mean value of 0.80 with a standard deviation of 1.56. the second measurement of leverage has a mean value of 0.30 with a standard deviation of 0.40. Sales growth is on average 1.07 with a standard deviation of 0.12, indicating firm growth. Finally, the natural logarithm of total assets reveals a mean value of 11.61 with a standard deviation of 6.91.

Table 2 The summary statistics of the variables used in the current study of the overinvestment subsample (Panel A) and the underinvestment subsample (Panel B).

Variables	Mean	Median	Standard Deviation	Minimum	Maximum	N
Panel A						
Tobin's q	1.92	1.87	0.40	0.92	2.57	27
ROA	0.08	0.08	0.05	0.01	0.21	27
ROE	0.20	0.22	0.11	0.02	0.41	27
Leverage (1)	1.42	0.57	2.41	0.00	10.34	27
Leverage (2)	0.43	0.33	0.54	0.00	2.34	27
Sales growth	1.06	1.07	0.12	0.67	1.27	27
Total assets	16.47	16.21	1.31	13.52	18.61	27
Panel B						
Tobin's q	2.98	2.69	1.84	0.79	9.00	67
ROA	0.08	0.09	0.08	-0.26	0.29	67
ROE	0.15	0.15	0.15	-0.59	0.41	67
Leverage (1)	0.61	0.31	0.61	0.00	2.25	67
Leverage (2)	0.25	0.17	0.25	0.00	1.23	67
Sales growth	1.07	1.07	0.13	0.80	1.35	67
Total assets	15.47	15.51	1.39	12.17	18.36	67

For a detailed description of the variables, see the description included in table 1. The overinvestment subsample consists of the firms with a Tobin's q below the median of 2.59 and a free cash flow above the median of 0.20. The underinvestment subsample consists of the firms that are not included in the overinvestment subsample.

The summary statistics of the overinvestment subsample reveal a Tobin's q of 1.92 on average with a standard deviation of 0.40, return on assets has a mean value of 0.08 with a standard deviation of 0.05 and return on equity reveals a mean value of 0.20 with a standard deviation of 0.11. These statistics reveal that firm performance is positive as well in the overinvestment subsample. Firm performance doesn't appear to differ greatly in the overinvestment sample compared to both the entire sample and the underinvestment sample and an independent samples t-test reveals that, indeed, firm performance doesn't differ significantly between the overinvestment subsample compared to the underinvestment subsample. An exception is Tobin's q, which was significantly higher in the underinvestment subsample compared to the overinvestment subsample ($F(1, 99)=16.80$, $p=0.00$). This

difference can be explained by the fact that the overinvestment subsample is characterized by a lower than median Tobin's q. Leverage is 1.42 on average with a standard deviation of 2.41 using the first measurement and 0.43 with a standard deviation of 0.54 using the second measurement of leverage. Leverage appears to be higher in the overinvestment subsample compared to both the entire sample and the underinvestment subsample. An independent samples t-test, however, demonstrates that this difference isn't significant. Further, sales growth has a mean value of 1.06 and a standard deviation of 0.12 and the natural logarithm of total assets 16.47 and a standard deviation 1.31.

Table 3 The summary statistics of the variables used in the current study of the small firms subsample (Panel A) and the large firms subsample (Panel B).

Variables	Mean	Median	Standard Deviation	Minimum	Maximum	N
Panel A						
Tobin's q	3.12	2.60	2.13	0.79	8.20	26
ROA	0.06	0.06	0.15	-0.26	0.87	46
ROE	0.06	0.10	0.19	-0.59	0.37	45
Leverage (1)	0.44	0.20	0.58	0.00	1.92	39
Leverage (2)	0.22	0.12	0.25	0.00	0.94	40
Sales growth	1.06	1.05	0.12	0.82	1.29	31
Total assets	6.85	0.00	7.01	0.00	15.06	81
Panel B						
Tobin's q	2.41	2.03	1.36	1.04	9.00	75
ROA	0.08	0.08	0.06	-0.05	0.24	81
ROE	0.17	0.17	0.11	-0.25	0.41	81
Leverage (1)	1.01	0.41	1.87	0.03	10.34	77
Leverage (2)	0.36	0.23	0.46	0.02	2.40	76
Sales growth	1.07	1.07	0.12	0.67	1.35	73
Total assets	16.37	16.01	1.04	15.09	18.69	81

For a detailed description, see the description of table 1. The small firms subsample (Panel A) consists of firms with a log size below the median of 15.08 and the large firms subsample (Panel B) consists of firms with a log size above the median of 15.08.

The results of the summary statistics on the small firms subsample has a mean value of 3.12 and a standard deviation of 2.13, return on assets is 0.06 with a standard deviation of 0.15 and return on equity has a mean value of 0.06 with a standard deviation 0.19. Apparently, firm performance appears to be positive in the small firms subsample as well. No big differences in firm performance appear to be present in the small firms subsample compared to both the entire sample and the large firms subsample and this lack of significant differences in firm performance between both the small firms subsample and the large firms subsample is confirmed by an independent samples t-test. Leverage is 0.44 on average with a standard deviation of 0.54 with respect to the first measurement of firm performance. The second measurement of leverage reveals a mean value of 0.22 with a standard deviation of 0.25. Leverage, especially the first measurement of leverage, appears to be lower in the small firms subsample compared to the large firms subsample. Leverage also appears to be lower in the small firms subsample compared to the entire sample. However, no significant difference in leverage is found between the small firms subsample and the large firms subsample for both measurements of leverage used in the current study. Further, sales growth has a mean value of 1.06 and a standard deviation of 0.12 and the natural logarithm of total assets is 6.85 on average with a standard deviation of 7.01.

Table 4 The results of the correlational analysis conducted on the entire sample.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Tobin's q	1	0.42**	0.20*	-0.15	-0.18	-0.17	0.02	0.22*	-0.07
2. ROA		1	0.84**	-0.10	0.03	-0.04	-0.06	0.01	0.18*
3. ROE			1	0.15	0.11	-0.04	0.04	-0.04	0.25**
4. Leverage (1)				1	0.93**	-0.10	-0.02	0.00	0.06
5. Leverage (2)					1	-0.04	0.01	0.01	0.05
6. Fortune ranking (1)						1	-0.42**	0.10	0.00
7. Fortune ranking (2)							1	-0.06	-0.01
8. Sales growth								1	0.08
9. Total assets									1

The variables displayed in this table were defined as followed: Tobin's q (firm performance) was calculated by adding the market value of equity to the book value of debt. The sum of both concepts is divided by the/book value of total assets, leverage is calculated by dividing the non-current liabilities by the book value of equity, fortune ranking 1 is a dummy variable whereby all rankings ranging from 1-33 are marked with a "1", fortune ranking 2 is a dummy variable whereby all rankings ranging van 34-66 get a "1" and fortune ranking 3 contains all ranking ranging from 67-100. The third fortune ranking category was used as a reference and therefore not present in the table. Growth opportunity is the sales value at t divided by the sales value at t-1 and firm size equals the natural logarithm of total asset. A significant correlations at a level of 5% is indicated by a single star (*) and a significant correlation at a level of 1% was indicated by two stars (**).

The correlational analysis conducted on the entire sample reveals that the three measurements of firm performance (Tobin's q, return on assets and return on equity) correlate positively with each other. This correlation can be explained by the fact that all three variables measure firm performance, so when one of the three variables increases the other two variables should logically increase as well. Further, the first measurement of leverage correlates positively with the second measurement of leverage which can also be explained by the fact that both measure the same construct. However, no positive correlation can be observed between leverage and firm performance which provides evidence against the hypotheses proposed by the current study. The results also reveal that the first category of fortune ranking correlates negatively with the second category of fortune ranking which can be explained by the fact that the categories are mutually exclusive. Finally, Tobin's q correlates positively with sales growth and both return on assets and return on equity correlate positively with the natural logarithm of total assets.

Table 5 The results of the correlational analysis conducted on the overinvestment subsample.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Tobin's q	1	0.66**	0.67**	0.13	0.10	-0.25	-0.07	0.05	0.30
2. ROA		1	0.71**	-0.05	-0.06	-0.11	0.03	0.17	0.50**
3. ROE			1	0.51**	0.47*	-0.36	0.12	0.08	0.19
4. Leverage (1)				1	0.98**	-0.24	0.14	0.07	-0.16
5. Leverage (2)					1	-0.29	0.21	0.08	-0.16
6. Fortune ranking (1)						1	-0.31	0.44*	0.02
7. Fortune ranking (2)							1	-0.19	0.13
8. Sales growth								1	0.17
9. Total assets									1

For a description of the variables included in the analysis, see the description included in table 4.

The results of the correlational analysis conducted on the overinvestment subsample also reveal a positive correlation between the three performance measures (Tobin's q, return on assets and return on equity). The first measurement of leverage correlates positively with the second measurement of leverage. These results are similar to the results obtained by the correlational analysis conducted on the entire sample. Further, return on equity correlates positively with both the first and the second measurement of leverage which provide evidence with respect to the hypotheses proposed by the current study. The results also reveal a positive correlation between the first category of fortune ranking and sales growth. Finally, return on equity correlates positively with the natural logarithm of total assets.

Table 6 The results of the correlational analysis conducted on the small firms subsample.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Tobin's q	1	0.58**	0.44**	-0.13	-0.06	-0.37	0.26	0.53**	0.19
2. ROA		1	0.91**	-0.36*	0.26	-0.10	-0.06	0.04	0.13
3. ROE			1	-0.35*	-0.21	-0.01	0.04	0.03	0.05
4. Leverage (1)				1	0.80**	0.08	-0.05	0.13	0.09
5. Leverage (2)					1	0.00	0.03	0.12	0.06
6. Fortune ranking (1)						1	-0.38**	-0.22	-0.16
7. Fortune ranking (2)							1	0.17	0.03
8. Sales growth								1	0.03
9. Total assets									1

For a description of the variables included in the analysis, see the description included in table 4.

The correlational analysis conducted on the small firms subsample reveals the same positive correlation between the three measures of firm performance (Tobin's q, return on assets and return on equity). Further, the first measurement of leverage correlates positively with the second measurement of leverage. These results are similar to the results obtained by the correlational analysis conducted on both the entire sample and the overinvestment subsample. Both return on assets and return on equity reveal a negative correlation with the first measurement of leverage which contradicts the hypotheses of the current study. Further, these results are dissimilar compared to the results obtained in the entire sample and the overinvestment subsample. Further, the first category of fortune raking correlates negatively with the second category of fortune ranking. Finally, Tobin's q correlates positively with sales growth.

4.2 Linear regression model

A linear regression model was applied to both the entire sample, the overinvestment subsample and the small firms subsample. The results of these applications will be described separately.

4.2.1 Linear regression conducted on the entire sample

A linear regression model is applied with Tobin's q as the dependent variable, leverage (the first measurement) and fortune category, industry category, sales growth, and the natural logarithm of firm size are the control variables (table 7). The linear regression model reveals

an insignificant negative effect of leverage on firm performance which contradicts both the monitoring hypothesis and the free cash flow hypothesis since both indicate that firm performance should increase when leverage increases. This result is not in line with the findings of Gul and Tsui (1998), Harford, Mansi and Maxwell (2008), Jensen (1986), Degryse and Ongena, (2001), James (1987), Lummer & McConnell (1989), Slovin, Johnson and Glascock, (1992) since all these studies found evidence in favor of either the free cash flow hypothesis or the monitoring hypothesis but these indications of a positive influence of leverage on firm performance are, thus, not confirmed by the results of the current study.

Table 7 The result of the linear regression model using the entire sample in a time span of four years (2010-2013).

	Beta	Standard error	t-value	p
Leverage (1)	-0.17	0.10	-1.74	0.09
Fortune ranking (1)	-0.87	0.41	-2.15	0.04
Fortune ranking (2)	-0.24	0.40	-0.62	0.54
Sales growth	2.12	1.35	1.58	0.12
Total assets	0.02	0.13	0.16	0.87
Constant	3.77	1.71	2.20	0.03
R^2	0.27			
#	97			

A more detailed description of the variables can be found in table 4.

4.2.2 Linear regression conducted on the overinvestment case

The linear regression model is also applied to the overinvestment subsample (table 8). Similar to the model applied to the entire sample, the dependent variable is Tobin's q, the independent variable is leverage and fortune ranking, industry category, sales growth and the natural logarithm of firm size are the control variables. The results of the model reveal an insignificant, positive effect of leverage on firm performance. This result is not in line with the findings of De Jong (2002), Gul and Tsui (1998), Harford, Mansi and Maxwell (2008), Jensen (1986), Degryse and Ongena, (2001), James (1987), Lummer & McConnell (1989), Slovin, Johnson and Glascock, (1992) and disconfirms both the free cash flow hypothesis and the monitoring hypothesis which both predict a positive effect of leverage on firm performance. Although the (insignificant) effect of leverage on firm performance differs in the overinvestment subsample (positive) compared to the entire sample (negative) both are

insignificant. Apparently, leverage doesn't have a significant effect in both the entire sample and in the sample more vulnerable to overinvestment. Since no significant difference was found between the mean value of leverage in the overinvestment subsample compared to the underinvestment subsample, this lack of an influence of leverage can't be explained by the overinvestment firms trying to avoid debt as De Jong (2002) concluded.

Table 8 The results of the regression model conducted on the overinvestment subsample. The time span of the observations is four years (2010-2013).

	Beta	Standard error	t-value	p
Leverage (1)	0.03	0.03	0.83	0.43
Fortune ranking = 1	0.05	0.17	0.32	0.76
Fortune ranking = 2	0.05	0.12	0.44	0.68
Sales growth	0.33	0.33	0.98	0.36
Total assets	-0.08	0.04	-1.87	0.10
Constant	2.67	0.70	3.84	0.01
R^2	0.90			
#	18			

A more detailed description of the variables can be found in table 4.

4.2.3 Linear regression conducted on the small firms subsample

The results of the linear regression model conducted on the small firms subsample are summarized in table 9. The table shows an insignificant, negative relationship between leverage and firm performance which is not in line with the findings of De Jong (2002), Gul and Tsui (1998), Harford, Mansi and Maxwell (2008), Jensen (1986), Degryse and Ongena, (2001), James (1987), Lummer & McConnell (1989), Slovin, Johnson and Glascock, (1992) since these studies did find evidence for either the monitoring hypothesis or the free cash flow hypothesis. The result of the current study, thus, contradicts both the free cash flow hypothesis and the monitoring hypothesis. Therefore, the hypotheses of the current study weren't confirmed.

Table 9 The results of the regression model conducted on the small firms subsample The time span of the observations is four years (2010-2013).

	Beta	Standard error	t-value	p
Leverage (1)	-0.43	1.02	-0.42	0.68
Fortune ranking = 1	-2.08	1.35	-1.54	0.15
Fortune ranking = 2	-0.40	1.02	-0.39	0.70
Sales growth	4.48	3.63	1.23	0.24
Total assets	-0.25	0.82	-0.30	0.77
Constant	3.32	11.30	0.29	0.77
R^2	0.52			
#	24			

A description of the variables can be found in table 4.

4.3 Robustness checks

Robustness checks are conducted using two different kinds of firm performance measurements (ROA and ROE). Further, a variation regarding the measurement of leverage (the use of total non-current liabilities divided by total assets instead of debt-to-equity) is used to test the robustness of the results obtained. Finally, leverage is replaced by leverage squared to investigate the possibility of an inverted U-shape relationship between leverage and firm performance. The results of the robustness checks are displayed in table 10.

When the model predicts ROA instead of Tobin's q, the effect of leverage remained insignificant and was also reduced to zero in both the entire sample and the overinvestment subsample. In the small firms subsample, the effect of leverage remained insignificant and negative. The model predicting ROE, however, does reveal a significant, positive effect of leverage on firm performance in both the entire sample and the overinvestment subsample. These results differ from the results obtained by the original model and provide evidence with respect to the positive influence of leverage on firm performance as predicted by both the free cash flow hypothesis and the monitoring hypothesis. In the small firms subsample, the effect of leverage remained both insignificant and negative.

The results obtained when leverage was estimated in a different manner also reveals insignificant effects of leverage on firm performance in line with the results obtained by both

the original model and the model predicting ROA. The insignificant effect remained negative in case of the entire sample and positive in case of the overinvestment subsample. The insignificant effect of leverage in the small firms subsample changed from negative to positive.

The robustness checks reveal that the insignificant effect of leverage is fairly robust across the different samples and models. The exception is the model predicting ROE which reveals a significant, positive effect of leverage on firm performance in both the entire sample and the overinvestment subsample. The fact that leverage has a positive effect on firm performance in the entire sample provides evidence for both the free cash flow and the monitoring hypothesis. The positive effect of leverage found in the overinvestment subsample is slightly bigger compared to the effect of leverage in the entire sample thereby confirming the conclusion by De Jong (2002) who found that firms vulnerable to overinvestment are more susceptible to the positive effect of leverage on firm performance. However, it also contradicts the results obtained by De Jong (2002) since he didn't find a positive effect of leverage on firm performance on his entire sample. Further, the insignificant, negative effect of leverage squared on firm performance indicates that no inverted U-shape relationship is to be expected between leverage and firm performance.

Table 10 The results of the robustness checks conducted on both the entire and both the overinvestment subsample and the small firms subsample with respect to the beta coefficient of leverage.

	M1	ROA	ROE	Leverage (2)	Leverage squared
Entire sample					
Leverage (Beta coefficient)	-0.17	0.00	0.02*	-0.65	-0.01
Overinvestment subsample					
Leverage (Beta coefficient)	0.03	0.00	0.03**	0.09	0.00
Small firms subsample					
Leverage (Beta coefficient)	-0.43	-0.03	-0.04	0.57	-0.62

A description of the variables of the original model (M1) can be found in table 4. The second model (ROA) predicts return on assets (net income/total assets t) instead of Tobin's q. The third model (ROE) predicts return on equity (operating income/book value of equity). The fourth model (leverage (2)) measures leverage differently (total non-current liabilities/total assets). For the fifth model (leverage squared), the first measurement of leverage is replaced by leverage squared. A significant beta coefficient at a level of 5% is indicated by a single star (*) and a significant beta coefficient at a level of 1% was indicated by two stars (**).

4. Conclusion

The aim of the current study is to investigate the influence of leverage on firm performance. More specifically, it will engage in a corporate governance perspective which predicts a positive relationship of leverage on firm performance based on both the free cash flow hypothesis and the monitoring hypothesis. This effect is tested on both a "normal" sample and on both an overinvestment and a small firms subsample. This distinction was made in order to be able to compare the effect of leverage of "normal" firms to firms that are more vulnerable to overinvestment and firms that are relatively smaller.

The results of the current study reveal an insignificant, negative effect of leverage on firm performance in the entire sample. Therefore the hypothesis, based on both the free cash flow hypothesis and the monitoring hypothesis, that leverage has a positive effect on firm performance has not been confirmed. Apparently, leverage can't be expected to be an effective internal corporate governance mechanism and can't help shareholders to reduce the agency conflict. This result is not in line with the results obtained by Gul and Tsui (1998), Harford, Mansi and Maxwell (2008), Jensen (1986) , Degryse and Ongena, (2001), James

(1987), Lummer & McConnell (1989), Slovin, Johnson and Glascock, (1992). Although these studies all demonstrated that either the free cash flow hypothesis or the monitoring hypothesis are valid to some degree, they are not concerned with linking both hypotheses to firm performance. The results are, however, in line with the results obtained by De Jong (2002) who found that leverage didn't have a positive effect on firm performance in a "normal" sample. Apparently, leverage doesn't have a significant effect on firm performance in a regular sample of firms. Further, this insignificant effect of leverage on firm performance has revealed to be fairly robust with the exception of the model that predicts ROE. In case of the model predicting ROE, a positive effect of leverage on firm performance can be observed. The fairly robust insignificant effect of leverage is confirmed by the fact that the robustness check didn't provide evidence with respect to an inverted U-shape relationship. Therefore, a tradeoff between the benefits of the tax shield and the disadvantages associated with the financial distress costs can't explained the lack of evidence with respect to both the free cash flow hypothesis and the monitoring hypothesis.

The results obtained from applying the linear regression model on the overinvestment subsample also reveal an insignificant, negative effect of leverage on firm performance. Therefore, the hypothesis that the positive effect of leverage on firm performance is more pronounced in firms that are vulnerable to overinvestment is not confirmed. These results are not in line with the studies by De Jong (2002), Gul and Tsui (1998), Harford, Mansi and Maxwell (2008), Jensen (1986), Degryse and Ongena, (2001), James (1987), Lummer & McConnell (1989), Slovin, Johnson and Glascock, (1992). Apparently, leverage also doesn't have an effect on firm performance in firms that are susceptible to overinvestment. These results have also proven to be fairly robust with, again, an exception in the model predicting ROE. In this model, the insignificant positive effect found by the original model becomes significant. Further, this positive effect found for the model predicting ROE is bigger in the overinvestment subsample compared to the entire sample which is in line with the result obtained by De Jong (2002). Thus, the current study did find some evidence with respect to a more pronounced positive effect of leverage on firm performance. In case of the overinvestment subsample, an inverted U-shape relationship between leverage and firm performance can't explain the insignificant effect of leverage found for most of the tested models.

Finally, the regression model was also applied to a small firms subsample. The results obtained by the regression indicate that in case of relatively small firms, leverage also doesn't have a significant effect on firm performance. Therefore, the hypothesis that the positive relationship between leverage and firm performance should be more pronounced in smaller firms isn't confirmed. This result contradicts findings by Gul and Tsui (1998), Harford, Mansi and Maxwell (2008), Jensen (1986), Degryse and Ongena, (2001), James (1987), Lummer & McConnell (1989), Slovin, Johnson and Glascock, (1992) who did find evidence with respect to either the free cash flow hypothesis or the monitoring hypothesis. This insignificant effect has proven to be very robust and appeared in all robustness checks. In the small firms subsample, the insignificant effect of leverage could also not be explained by an inverted U-shape relationship between leverage and firm performance.

Taken together, the results of the current study indicate that, in general, leverage doesn't have a positive effect on firm performance in normal firms, firms that are vulnerable to overinvestment and possible self-interested behavior and in firms that are relatively smaller in size. It can therefore be concluded that leverage can't be thought of as an effective governance mechanism and, thus, can't be expected to reduce the agency conflict for shareholders. However, when performance is measured by return on equity leverage does appear to have a positive effect on firm performance in both the entire sample and the overinvestment subsample. Further, this positive effect is more pronounced in the overinvestment subsample compared to the entire sample. So, some evidence with respect to the free cash flow hypothesis and the monitoring hypothesis was found. As well as some evidence with respect to the hypothesis that the positive effect of leverage on firm performance is more pronounced in firms vulnerable to overinvestment.

5. Discussion

Besides disconfirming the expected positive relationship between leverage and firm performance, the current study provides evidence with respect to the irrelevance of capital structure decisions since it reveals that leverage doesn't have an effect on firm performance at all. The irrelevance of capital structure decisions wasn't only found in the entire sample, but also in both subsamples that should be more susceptible to the positive influence of leverage on firm performance. These findings could be explained by the fact that the benefits obtained by leverage could be out weight by an increase of financial distress costs. In conclusion, the current study provides evidence that leverage doesn't affect firm performance and, thus, that

leverage can't be used as a governance mechanism by shareholders in order to help reduce the agency conflict.

Only when the model predicted return on equity, a significant and positive effect of leverage on firm performance was found in both the entire sample and the overinvestment subsample. This could be an indication that, in some cases, leverage can actually have a positive effect on firm performance (more specifically firm profitability). Future research should address this finding by the current study by replicating it on a larger sample. This could shed light on whether leverage is actually irrelevant in US firms and whether this effect differs compared to subsamples. Further, it could help to determine whether the model predicting ROE overstimates the effect of leverage on firm performance or whether the other models used in the current study have a tendency to underestimate the effect of leverage on firm performance due to the small sample used. Another limitation of the current study is the sample used. The fact that the sample consists merely of US firms listed in the "100 best companies to work for in America" limits the generalizability of the results to firms outside of this list and outside the US. Future research should find out whether the results obtained by the current study can be replicated in firms outside of the "100 best companies to work for in America" list and outside of the US.

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