

The Importance of the Investing Corporation's Financial Condition in the Presence of Schedule 13(D) Filings

Leopold Ingenohl

26th April 2018

1 Introduction

Macht das überhaupt Sinn was ich schreibe? Kann man das nachvollziehen?

Much attention has been recently given to the current Securities and Exchange Commission (SEC) reporting requirements for Schedule 13(D), governing the disclosure of beneficial ownership interests in excess of five percent of outstanding common stock of a U.S. public company (Giglia, 2016). Amongst other causes, it is due to significant gains for the subject's stock when the partial acquisition through a Schedule 13(D) filing is announced (Akhigbe et al., 2007). wer filed alles?

However, it is still largely unanswered where this upward drift comes from (Greenwood and Schor, 2009). An approach to this issue is objective of this thesis. Namely, analyzing the relation between the financial condition of corporate investors and the abnormal returns on the subject's stock and determining whether the financial condition has explanatory power for the latter. The following findings motivate this approach.

In recent studies of what happens to the target's stock after such a filing, Collin-Dufresne and Fos (2015) observe a positive significant market reaction to the subject's stock upon a more general sample of Schedule 13D filings¹. Brav et al. (2008) have shown a favorable market reaction, 7% - 8% average abnormal returns in the (-20|20) event window, particularly to Schedule 13D's filed by hedge funds. Similar results have been shown by Klein and Zur (2009) who observe 10.2% average abnormal stock returns specifically for hedge fund targets. In addition, Brigida and Madura (2012) have shown an even higher runup if the acquirer is a private investor or a non-financial corporation. This is matching with Akhigbe et al. (2007) findings who observe greater gains for the target's stock if the partial position was initiated by a corporate bidder. Concluding, filings submitted by all investor types are followed by positive market reactions on the subject's stock but those submitted by corporations seem to have a stronger impact. This motivates the first hypothesis which assumes significant positive abnormal returns for Schedule 13(D)'s filed by corporations.

¹The sample is only restricted on the subjects stock characteristics rather than on characteristics of the filers e.g. they exclude all filings which are not common stock (CRSP share code 10 or 11), whose prices are below \$1 and above \$1000 and which involve derivatives (Collin-Dufresne and Fos, 2015).

Since the investing corporation is allowed to behave in an activist manner by filing a Schedule 13(D) ² (Brigida and Madura, 2012) they can use their stakes to actively monitor and influence the target which is similar to the definition of an entrepreneurial activist by. ³ Klein and Zur (2009) These stakes tend to be either made for the purpose of investment or far more importantly, as strategic investments (Damodaran, 2005), possibly resulting in business agreements, alliances or joint ventures (Allen and Phillips, 2000).

In a more direct approach however, these strategic investments can also help as a stepping stone towards full control (Huang et al., 2017). This approach is supported by Goldman and Qian (2005) who find that mergers and takeovers are often preceded by the acquisition of a minority stake in the target. Whereas hedge funds use their stakes to change characteristics of the target (e.g. the board of directors or the strategic orientation) (Klein and Zur, 2009) corporate filers are mainly focused on synergies in the form of strategic alliances or takeovers between them and the target. Akhigbe et al. (2007) observe that partial acquisitions, if carried out by corporate investors, are more likely to result in a full acquisition when compared to all other activist investors. This means that within the mass of Schedule 13D filings, institutional investors are unlikely to pursue a complete takeover whereas corporations are potential full acquirers (Brigida and Madura, 2012). The possibility of a takeover could be one explanation for the strong impact corporate filings have on the market, because the abnormal returns could be a reflection of investors' expectations of the target firms stock being acquired at a premium to the current price (Goldman and Qian, 2005) especially with strong corporate bidders being likely to overpay in the event of a full takeover (Akhigbe et al., 2007). These findings motivate the second hypotheses which assumes the highest abnormal returns occur in the event of a purpose of transaction statement involving a merger or a takeover of the subject.

However, in order to be able to bring change – might it be in the form of a strategic alliance or eventually in a takeover – the filing corporation should be in a condition of sufficient financial health. A recent example on this matter is the public perception of the HNA Group. The financial condition of the HNA group, China's largest private conglomerate which over the past few years invested around \$US40 billion in businesses around the world, has currently been

²In comparison the investor could file a Schedule 13(G) in which he would hold the shares passively hence with no intention to bring change.

³Klein and Zur (2009) define the entrepreneurial activist as an investor who buys a large stake in a publicly held corporation with the intention to bring change and thereby realize a profit on the investment.

of great interest to financial news. Not least because they built up a 9.9% stake of of around \$US4 billion in Deutsche Bank in 2017, which is just below the 10% threshold above which stake purchases must be approved by Germany's financial watchdog but also because of their complex and nontransparent financing methods . The financing of the group has come under strain as a result of an official crackdown on risky financing at acquisitive private enterprises in China. The highly leveraged group is now facing a potential cash-shortfall and liquidity issues resulting in a S&P global rating downgrade referring to a „deteriorating liquidity profile" of HNA. Although HNA group is a private conglomerate, the financial condition of corporations seems to be of great importance to other market participants with that said, even in the context of minority acquisitions. Therefore, linking investors' financial condition to underlying market reactions could be an explanation for the latter. This motivates the third and most important hypotheses, namely that abnormal returns, triggered by activist minority acquisitions, can be explained by the financial condition of the investor.

Based on the previous findings of corporate activism, namely their strong impact on the subjects stock in the form of abnormal returns and future possibilities involving the target, the economic significance of corporations as filers of Schedule 13(D)'s seems to be apparent.

Yet in order to make these possible developments and expectations look credible – amongst other things strategic alliances and takeovers – the investing corporation somehow has to emit signs of sufficient financial strength. Therefore, the link between the financial condition of the investor and the subsequent abnormal returns on the target's stock is an interesting issue to examine. This in particular, is objective of the paper. What precisely are the effects of Schedule 13(D) filings by corporations on the subject's stock and can the financial condition of the corporation explain the market's reaction? Or in other words – how important is the financial condition of the corporation behaving in an activist manner?

The paper proceeds as follows. Section 2 reviews relevant literature on Schedule 13(D) filings, their effect on the market and the motivation behind corporate equity ownership. Section 3 describes the composition of the sample and identifies the corporate investor. Section 4 presents the market's response to Schedule 13(D) filings and Section 5 analyses the relation between target's abnormal returns and investor's financial condition.

2 Literature Review

2.1 Schedule 13(D) and Market Reactions – Institutional Investors and Corporations

Section 13(d) of the Exchange Act of 1934 was passed in order to increase regulation of tender offers and accumulations of stock. It acts as an early warning, signaling "every large, rapid aggregation or accumulation of securities, regardless of technique employed, which might represent a potential shift in corporate control" (**Morrison2015**). This means that under Section 13(d), anyone who becomes the beneficial owner of 5% of an issuer's equity securities registered under Section 12 of the Exchange Act must file with the SEC a Schedule 13(D) within 10 days after the acquisition. The filing informs shareholder about investors who could influence or change control of the issuing company (**Giglia2016**). The investors filing such a Schedule 13(D) can be broadly classified into institutional investors (e.g. hedge funds or mutual funds), other entrepreneurial activists (e.g. individual investors) (Klein and Zur, 2009, p.188) and relevant for this thesis, corporate investors.

Whereas filing a Schedule 13(D) allows the investor to behave in an active manner, a passive investor can equivalently file a Schedule 13(G). It is a short-form filing that can be utilized if an investor holds a beneficial ownership interest passively, with no intent to change control of the company (**Giglia2016**). So according to Klein and Zur (2009, p.187), an entrepreneurial activist is as an investor "who buys a large stake in a publicly held corporation with the intention to bring about change and thereby realize a profit on the investment". Based on this approach, corporations filing a Schedule 13(D) confess to manage their investments actively, likewise confess to approach and interact with the target company.

So far, there exist many studies that examine the effect the disclosure of such an activist investment has on the target's stock. With regards to short-horizon event studies, all these studies find positive and significant abnormal returns around the Schedule 13(D) filing date.

With regards to investor activism, especially filings disclosed by hedge funds, Brav et al. (2008, p.1730) find positive average abnormal returns in the range of 7% to 8% in the (-20,+20) event

window. Klein and Zur (2009, p.188) have similar findings and observe 10.2% average abnormal stock returns on the target's stock. In a more recent study on investor activism by Denes et al. (2017, p.410), the average valuation effect is evaluated to be around 5%. A somehow different approach is found in a study of Greenwood and Schor (2009, p.363) who observe abnormal announcement returns of 2.36% for a sample of activist portfolio investors and document that the ability to force the target into a takeover is the driving force behind the abnormal market reaction. Nevertheless, all studies observe positive abnormal returns around the filing date but results differ in magnitude.⁴

While all of these studies identify hedge fund activism, its motivation and the effect it has on the market, most of them leave filings submitted by corporations aside. Brigida and Madura (2012, p.29) however, note that if the acquirer is a non financial corporation abnormal returns in the (-10,-1) window are around 14%. The reaction implies the market perceives such corporate investments as value generating for target. Allen and Phillips (2000, p.2803) find abnormal returns of around 7% in the (-10,10) period on corporate purchase announcements which are significantly larger if the announcement is accompanied by strategic investments. Their sample however is based on purchase announcements and therefore differs from studies on the effect of Schedule 13(D) filings.⁵ In addition Collin-Dufresne and Fos (2015) find a positive significant market reaction upon a more general sample of Schedule 13(D) filings, including corporate investors but not explicitly addressing them.

So what is the motivation of corporations to engage in active equity ownership, thereby disclosing a Schedule 13(D), and why are these investments perceived as value generating?

⁴Comparing the the abnormal returns across studies can be misleading as the authors used different models and event windows for estimating the abnormal returns. Greenwood and Schor (2009) use the market return model with matching portfolios and the CAR for aggregated abnormal returns; Brav et al. (2008) calculates the aggregated abnormal returns by subtracting the value-weighted market index from the buy-and-hold return; Klein and Zur (2009) use a similar approach with buy-and-hold returns but make more adjustments.

⁵In Allen and Phillips (2000, p.2801) sample, the mean fraction of equity acquired in the sample is 14%, and includes acquisitions of at least 5% of voting shares only.

2.2 Motives of Corporate Equity Ownership and Target's Value Increase

Corporate investments in other firms' equities can be split into three broad categories. They can either be classified as ordinary, far more importantly as strategic and thirdly as stepping stones in a takeover process. In the sense of possibilities that might be reached, corporate ownership, in comparison to ownership by institutional investors, is unique (Allen and Phillips, 2000, p.2791).

Huang et al. (2017, p.1) suggest that corporations make strategic minority acquisitions in other companies when they confront informational or integration barriers. Therefore, one reason for corporations to acquire a partial stake is that in the presence of alliances or joint ventures, minority acquisitions help to align the incentives of both firms involved and thereby decrease contracting and monitoring costs (Allen and Phillips, 2000, p.2792). This especially is of importance, if the strategic cooperation involves relationship specific assets and the investing corporation might be concerned with a holdup problem.⁶ Allen and Phillips (2000, p. 2793) show that in the years following a strategic investment, targets increase investment expenditures, exhibit substantive gains in operating cash flow and the partial stake leads to significant benefits for both firms.

The second motive behind corporate minority investments is that if asymmetric information has an adverse effect on cost and availability of external capital for the target, the investment can provide capital directly to the issuing firm or validate its investment opportunities (Allen and Phillips, 2000, p. 2792). This is supported by Ouimet (2013, P.1038) who finds that the investment helps to overcome asymmetric information and thereby helps to certify the target for other outside investors.

Thirdly, by acquiring partial stakes corporations can effectively monitor or influence the target's management. When compared to institutional investors, a corporate investor has superior knowledge and operating expertise (Allen and Phillips, 2000, p.2792) and can thereby further increase the target's operational performance.

⁶Ouimet (2013, p.1023) Defines the holdup problem as a decrease in the investors bargaining power in a renegotiation of the contract because the value of the initial investment is dependent on future cooperation with the target.

But acquiring a minority position also helps to better assess real options, notably that of expanding. The acquisition of a minority stake helps to better assess the target for a potential majority acquisition (Ouimet, 2013) and according to Huang et al. (2017, p.30) gather more information before launching a bid for takeover. In this sense, by decreasing informational barriers the investments can help as a stepping stone towards full control (Huang et al., 2017, p.3).

Because there exist two options to acquire full control of a publicly traded firm in the United States, either through a merger or through a tender offer (Offenberg and Pirinsky, 2015, p.2), Betton et al. (n.d., p.1) use the term takeover "for any acquisition of corporate control through the purchase of the voting stock of the target firm, regardless of whether the bid is in the form of a merger agreement or a tender offer".

For merger agreements, a beneficial ownership of a partial stake helps to speed up the shareholder approval process, induce the acquirer to fully commit to the merger and therefore increases the probability of a successful takeover (Betton et al., n.d., p.19). Prior to the takeover bid, the corporations can also acquire a toehold where neither management nor target's shareholders know of the investor's takeover intention until the announcement of a Schedule 13(D) is due. Following Eckbo (2009, p.158) acquiring a toehold, before initiating the takeover bid, is compelling. It reduces the number of shares that must be bought at the full takeover premium and it can be sold at a profit if a rival bidder wins the target. Concluding, corporations filing a Schedule 13(D) and thereby confessing to actively manage the investment have several reasons to do so. However, overcoming informational and integration barriers seems to pervade in almost all cases.

But beyond the motives of corporations to actively engage in another firm and the benefits such an investment brings to both, to what extent does the corporations financial condition matter when the market values such activist investments? One could assume that a financially strong investor proxies for the investment's future value creation and therefore should have an impact on the market's assessment of the present and future value of the target. Determining questions would be whether the investing corporation is able to establish a profitable collaboration, whether it is able to bring value to the target, whether it can ensure assertiveness in a takeover or whether it is likely to pay a large premium in the event of a

takeover. At large, on what scale is the market's perceived benefit for the target dependent on the financial condition of the investor?

Under the assumption of perfect capital markets however, the financial structure of the investor should be irrelevant to investment and the markets valuation of it, because "external funds provide a perfect substitute for internal capital" (Fazzari2016). This however, is not the case for financially constrained firms because they face an inelastic supply of external capital (Farre-mensa and Ljungqvist, 2013, p.1). Consequently, firms who are able to raise substantial amounts of external capital without much of an increase in the cost of capital are considered as unconstrained (Farre-mensa and Ljungqvist, 2013, p.1). Therefore if a firm is constrained, likewise faces a cost disadvantage of external finance, the investment would be driven by fluctuations in the cash flow (Fazzari et al., 1988, p. 142) . This in turn would imply a different investment behavior of constrained firms when compared to healthy firms.

Bhagat et al. (2005, p.450) investigate whether the same can be assumed about the investment policy of distressed firms and find it does. They also show that firms in distress invest less and "behave differently from financially constrained firms" (Bhagat et al., 2005, p.461). In addition, the size of the investing corporation could also play an important role in the market's investment valuation of the investment in the target. Large firms may enjoy easier access to capital markets, receive higher credit ratings for their debt issues and pay lower interest rates on borrowed funds (Saquido2003)

The hypothesis would therefore be, the better the answer to those questions, the higher are the abnormal returns because the market values the investment higher. And therefore the relation between the investors financial condition and abnormal returns determines how important the financial condition in the presence of Schedule 13(D) filings is. are the response, we analyze the relation between the abnormal returns and the financial condition

2.3 Investment Behavior and Financial Condition – Financial Health, Constraints and Distress

For example, in a study of 2010 *BCG* notes many of that year's acquisitions would involve a financially strong acquirer. But because the attribute of being financially strong can

be difficult to isolate, Piotroski's F-score is used as proxy in this sense. This is done for the two reason that it generally addresses the issue as a "... composite measure of firm strength" (Fama and French, 2006, p. 496) and considers in what directions the fundamentals of a company are trending and whether general health conditions are met (Mohr, 2012, p.5). Although Piotroski (2000) established it to separate strong from weak value firms ⁷ Mohr (2012) shows that its application on growth stocks yields similar results ⁸. And even though the score was developed to distinguish among firms based on their stock performance, its application on the sample of investors will yield results that support a general understanding of financially weak and strong firms. The score consists of nine binary signals that form a final score between zero and nine, with a score of zero signaling a firm is in bad condition and a score of nine the firm is in a state of financial strength. Although a firm might be in the lower region of the score, it does not imply that it can be automatically called weak. For simplicity and consistency however, investors within the range of (0-3) points are labeled as weak investors and firms with a score between (7-9) are labeled as strong investors. These limits are different to Piotroski's original application but they yield larger sub-samples which are more independent from rare outliers (Mohr, 2012, p.12).

With the Whited-Wu- and the KZ-Index two measures of financial constraints complement the overall picture of the investor's financial condition. Based on their indicator's value, each separates the sample in financially constrained and unconstrained firms. This is done on the following grounds. Under the assumption of perfect capital markets, the financial structure of the investor should be irrelevant to investment because "external funds provide a perfect substitute for internal capital" (Fazzari2016). This however, is not the case for financially constrained firms because they face an inelastic supply of external capital (Farre-mensa and Ljungqvist, 2013, p.1). Consequently, firms who are able to raise substantial amounts of external capital without much of an increase in the cost of capital are considered as unconstrained (Farre-mensa and Ljungqvist, 2013, p.1). If a firm is constrained, likewise faces a significant cost disadvantage of external finance, then the investment is driven by fluctuations

⁷In order to legitimize the explanatory power of the F-score in separating strong from weak firms Piotroski formed portfolios consisting of value firms. In doing so, he showed that an investment strategy of shorting expected losers (weak firms) and buying expected winners (strong firms) would "generate a 23% average annual return" (Piotroski, 2000, p. 4). This is matching with Hyde (2014) results, who observe significant return premiums for stocks with a high F-score over stocks with a low F-score.

⁸This is in line with Piotroski (2000) and confirms earlier research conducted by him.

in the cash flow (Fazzari et al., 1988, p. 142). This means that in the presence of asymmetric information, the internally generated cash flow is the most likely source of funds for corporate investments (Bhagat et al., 2005, p.450). Consequently, the firm invests less when it faces a decrease in internal funds (Bhagat et al., 2005, p.451), also known as investment-cash flow sensitivity. Amongst others, this is why both indices include the dividend payouts in their formulas, as firms paying out dividends are more independent on cash-flow fluctuations hence can be classified as financially unconstrained.

There exist several methods for determining the KZ-Index is based on a logit model relating the degree of financial constraints to five accounting variables: cash flow, market value, debt, dividends and cash holdings, each scaled by assets (Farre-mensa and Ljungqvist, 2013, p.5). Although Khatami et al. (2014) notes that more recent literature has questioned the reliability of constraint measures, the Whited-Wu- and KZ-Index as defined in Farre-mensa and Ljungqvist (2013) are used as indicators for the latter. For both indices firms are sorted into terciles based on their index values. Firms in the top tercile are coded as constrained those in the bottom tercile are coded as unconstrained. This results in 166 constrained and 166 unconstrained firms. origin of the KZ-Index

To further enrich the measures, Altman's Z-score is included. The Z-score is a fundamental indicator that according to Mohr (2012, p.5) shows statistically significant results in predicting the bankruptcy of a company and has become a popular and widely accepted measure of financial distress (Campbell et al., 2008, p.2903). A measurement of financial distress is included because . In particular, they observe that the investment policy of distressed firms differs from that of healthy firms based on operating performance. In comparison to the investment-cash flow sensitivity presented above, Bhagat et al. (2005) show that distressed firms have a negative cash flow sensitivity when operational losses. Because financial distress possibly resulting in bankruptcy represents a state in which the firm cannot meet or has difficulty paying off its financial obligations to its creditors the reference to HNA Group made above is exemplary here as the group has problems in refinancing the enormously high debt burden. With regards to the above the Z-score is a prediction of corporate bankruptcy (**Altman**) and is computed with a predefined model that considers five variables ratios of financial analysis. With respect to a threshold of 2.675 (Edward I. Altman, 1968, p.607) the final score is put

into perspective, according to which firms below can be classified as firms in bankruptcy and those above as in non-bankruptcy. With regards to the upcoming analysis, firms are classified as being in a good (bad) financial condition when they either belong to sample of strong (weak) firms, to the samples of undistressed (distressed) firms or to the sample of unconstrained (constrained) firms.

3 Data

Within the Schedule 13(D) filings is information important to the following analysis. They specify (1) the security and the issuer, subject to the filing, (2) the identity and background of the filer, (3) the source and amount of funds or other considerations and most importantly, (4) the purpose of the transaction.

3.1 Constructing the Sample

The data used to conduct the following analysis is primarily composed of information gathered from Schedule 13(D) filings within SEC's Edgar database and further from data provided by Wharton Research Data Services (WRDS).⁹ The sample of Schedule 13(D) filings is constructed as follows. First, using an automatic search script, 48'626 filings from the 20 year period starting in January 1996 and ending in December 2016 were identified. The script identifies all Schedule 13(D) filings that appear on EDGAR and extracts the following information: name of filer and subject, the CUSIP of the underlying security and the filing date. Next, to only have filings submitted by corporations hence to separate corporate investors from institutional investors (i.e. hedge-funds or pension-funds), 10-K reports were cross-referenced with the initial sample of all filings.¹⁰ In order to be part of the sample, the filer had to

⁹Schedule 13(D) filings are "the mandatory federal securities law filings under Section 13(d) of the 1934 Exchange Act that investors must file with the SEC within 10 days of acquiring more than 5% of any class of securities of a publicly traded company if they have an interest in influencing the management of the company" (Brav et al., 2008, p. 1736)

¹⁰10-K reports were used to identify corporations because "managers of publicly traded firms are required to produce public documents that provide a comprehensive review of the firm's business operations and financial condition and an important financial disclosure document created by managers to communicate with investors

have a 10-K report submitted 12 months prior to the filing which reduced the sample to 3'325 filings. Because the daily stock returns and prices for the underlying securities come from the Center for Research in Security Prices (CRSP) the subject not only had to have SEC's CUSIP identifier but also an active link between its CUSIP and CRSP's unique PERMNO identifier. For the remaining 1'467 filings, there had to be sufficient data on CRSP in order to calculate the abnormal returns for the subjects which reduced the sample to 1'151 filings. The accounting fundamentals for identifying the filing corporation's financial condition were extracted from the COMPUSTAT database. To be included, the filer had to have a valid link between its 10K-CIK and COMPUSTAT's unique GVKEY identifier. This further reduced the sample to 1'014 filings. In the next step and according to Fama & French's industry classification code, all filers belonging to the trading industry (Code 47) were dropped because their investment behavior differs substantially from that of other industries. This left a sample 898 filings. These filings were then checked by hand and the purpose of the transaction was manually extracted. In the process Schedule 13(D/A) filings (amendments to previous filings) that were mistakenly classified as original Schedule 13(D) filings and filings not submitted by corporations were excluded which reduced the sample to 748 filings.¹¹ In order to compute different measures of financial condition, there had to be sufficient information on explicit fundamental variables which was missing for several investors. The final sample consists of 495 filings.

3.2 Descriptive Data

Table 1 describes the general composition of the sample's Schedule 13(D) filings. In column (1) the complete sample of firms is being described, whereas column (2) and (3) present information on sub-samples of filings submitted by either strong or weak investors, respectively¹². Panel A gives general characteristics of the sample's Schedule 13(D) filings. The total sample consists of 498 filings submitted by firms with 110 submitted by strong and 85 by weak.

and analysts is the annual report filed pursuant to the Securities Exchange Act of 1934 the Form 10-K." (Loughran and McDonald, 2014, p. 1643)

¹¹The only exception were filings submitted by the Commerce Group Inc., which provides both insurance and, real estate, brokerage services. These filings were excluded because (1) the largest part of them were amendments, (2) the amount of filings submitted was disproportionately and (3) all purposes of the transaction were general investments in a fund.

¹²The separation of firms into strong and weak ones is based on Piotroski's F-Score. Strong firms are within a score of (7-9) whereas weak firms have scores between (0-3) which is in accordance with Mohr (2012, p.12)

That is a difference of around 5% with regards to the total sample but can be considered as unsubstantial with regards to the analysis. Following, the filings were submitted by 394 different investors but reported only 394 different subjects. This means that occasionally either one firm was investing in multiple targets (e.g. 6 filings submitted by AT&T) or a target was subject to more than one filing (e.g. four filings in which Clearwire Inc. is target). However, in comparison to the total sample size, these pattern do not occur frequently.

In the ten-year span from 2002–2011, over 60% of the total number of filings were submitted. The peak of filings was in the 5-year span before the financial crisis. It is noticeable that the number of filings in the period around the financial crisis is higher than the number of filings in the following five years. An explanation could be the merger wave of 2007 (Huang et al., 2017, p.19) increasing the need to file Schedule 13(D)'s. Strikingly, a total of 30% of these filings were submitted by strong firms and only 12% by weak firms, indicating that potentially a large part of the mergers were carried out by strong firms.

	Complete Sample of Filings (1)	Subsample of Filings disclosed by strong Investors (2)	Subsample of Filings disclosed by weak Investors (3)
Panel A: Characteristics Schedule 13(D) Filings			
Filings	494	109	83
Number of individual Investors	392	100	76
Number of individual Investors	455	107	77
Filings per Period			
1997-2001	71	13	12
2002-2006	158	34	29
2007-2011	152	38	17
2012-2016	113	24	25
Panel B: Purpose of the Transaction			
Engaging into a Takeover	248	65	27
Investment Opportunity while Actively Monitoring the Target	88	16	22
Strategic Investment	63	15	8
Investor is compensated through Issuer Stock	37	7	8
Investor is Subject to Merger	35	2	13
Engaging into a Proxy Fight	7	1	0
Issuer Financing	5	1	1
Other	11	2	4
Panel C: 48 Fama and French Industry Classifications of the Investor			
Business Services	88	19	9
Pharmaceutical Products	49	5	14
Patroleum and Natural Gas	47	12	7
Electronic Equipment	43	11	9
Communication	40	5	6
Computers	36	7	7
Medical Equipment	19	4	5
Machinery	15	1	3

Panel B lists the "Purpose of Transaction" which represents item 4 of a Schedule 13(D) filing. For simplicity and larger sub-samples, these purposes have been grouped into the following six categories. The reporting person (1) is engaging in a takeover process and, vice versa (2) became the target of a takeover, (3) actively and (4) strategically invests into the target firm, (5) is being compensated and lastly (6) reports other purposes. Detailed information on how the filings were categorized can be found in Appendix A.

The category of engaging into a takeover process, controls for all filings stating either a merger agreement, a tender offer or a hostile bid with merger agreements being the most frequently reported purposes and hostile bids the least. Remarkable is the fact that around half of the stock acquisitions were made in the course of engaging into a takeover process. This information is important in two ways: It implies firstly that the timing component plays an important role in analyzing the market reaction around the filing date and secondly that for around half of the sample the financial condition already plays an important role. Correspondingly, more than double the amount of "takeover filings" were submitted by strong firms when compared to weak firms.

On the other hand, the ratio is switched for filings in which the firm acquires the stock in the course of becoming the target. This can be understood in the way that the target's shares were acquired in order to compensate own shareholders at the event of acquisition. Now, 37% of the filings were submitted by weak firms compared to only 6% by strong firms.

The second most reported purpose for firms to acquire the stock was to actively monitor the investment. Table II reports 86 of those filings. This kind of investment is based on several assumptions, which include the belief that the target's stock is undervalued (a simple investment opportunity) or the possibility to get a first glimpse at the firm. However, the bottom line is that these investments do not directly imply a value creating interaction between the two parties for the future.

Following actively held investments, strategic investments were made in 55 of the filings. Different to the former, they are based on the premise of future collaboration between investor and target. A strategic investment represents amongst others the realization of an alliance agreement, a license agreement or that of a joint venture. Although potentially very interesting for the coming analysis, they represent only 10% of the filings.

Eventually the filings are also submitted because the "acquiring" firm is being compensated for pending payments in the form of the target's stock. This supports Ouimet (2013) concept that minority acquisitions can be carried out in order to help financing the target.

Panel C is a representation of the investing firms industries according to the (48) Fama & French industry classification code with the three-digit SIC code in brackets. In the total sample, 42 out of the maximum 48 industries are represented in the sample. Panel C only shows industries that represent at least 15 investing firms. As mentioned in Section X, the sample is restricted by excluding the trading industry due the irregular investment behavior of the corresponding firms. The two highest industry representations with more than 50 firms are computer software and pharmaceutical products. Interestingly, they have switched representations of strong and weak firms with 16 (7) and 5 (15) firms. The top two industries for strong firms were computer software and petroleum and natural gas and for weak firms pharmaceutical products and electronic equipment.

4 Identifying the Investors prior to the Schedule 13(D) Filing and Measures of Financial Condition

After being familiar with general characteristics of the sample's filings, this section focuses on identifying the investors with regards to their financial condition. The section proceeds as follows. It starts by introducing the two indicators and scores used to separate the investors into sub-samples given their indicator and score value. The section proceeds by identifying the financial characteristics for both, the total and the four sub-samples. This is done to contextualize the tools for testing the main hypothesis, namely that the investing firm's financial condition is important to the market reaction to Schedule 13(D) filings. In order to do that, the financial condition has to be broken down into quantifiable components that represent the general characteristics of profitability, liquidity, solvency and operational performance. Piotroski's F-Score is used as a measurement of general firm strength, Altman's Z-Score represents a measurement of bankruptcy and both the Whited-Wu- and KZ-Index identify financially constrained firms. A detailed explanation on the composition and calculation

of the measurements can be found in Topics: Which measures and Why (WW vs. KZ) and Composition

4.1 Summary Statistics

For all four measures, there exist two sub-samples leading to a total of eight. For that reason, Table II displays comprehensive statistics for all of them, including the initial sample. It presents the means [medians] and the significance levels for difference in means [medians] for each measure. A detailed description on the measures and following ratios can be found in Appendix C. For all following tests, the t -statistics are for difference in means, assuming unequal variances between the samples. The Z -statistic is a Mann-Whitney rank-sum test for equality of medians on unmatched data and all measurements are winsorized at the 1% and 99% levels so that extreme values are replaced by the respective percentiles. This enables a presentation of more meaningful mean statistics (Klein and Zur, 2009, p.203). In panel A return on assets, defined as the ratio of earnings before interest and taxes (EBITDA) to total assets, and the ratio of cash flow from operations to total assets represent financials on profitability. Panel A shows that the return on asset is positive for all investor samples except for the sample of weak firms where the mean return on assets is negative. Compared to their counter samples, for each score firms in a good financial condition have higher returns on assets. The ratio of profitability, operational cash flow to assets, is positive for the complete sample but has negative values for the sample of distressed and Whited-Wu constrained firms which validates the assumptions made above.

Total Sample					F-Score		Z-Score		Whited-Wu Index		S&P Domestic Long Term Issuer Credit Rating		
					Weak Investors		Firms in Distress		Constrained Firms		Investors without Rating		
Mean	Median	Std. Dev.	Min.	Max.	N=83	N=109	N=103	N=351	N=164	N=165	N=238	N=256	
Panel A: Profitability													
Return on Assets	0.101	0.123	0.151	-0.573	0.398	-0.565 [-0.05]	0.172 [0.160]	-0.018 [0.042]	0.134 [0.138]	0.016 [0.055]	0.162 [0.152]	0.048 [0.087]	0.151 [0.142]
Cash-Flow / Assets	0.053	0.088	0.173	-0.918	0.320	-0.148 [-0.46]	0.134 [0.119]	-0.098 [0.154]	0.094 [0.102]	-0.038 [0.503]	0.109 [0.113]	0.005 [0.073]	0.098 [0.097]
Panel B: Cash Balances and Debt													
Cash and Short-Term Investments / Assets	0.215	0.152	0.205	0.001	0.830	0.253 0.188	0.181 [0.128]	0.192 [0.076]	0.238 [0.178]	0.337 [0.327]	0.129 [0.086]	0.313 [0.286]	0.124 [0.862]
Cash / Assets	0.144	0.100	0.146	0.001	0.746	0.166 [0.237]	0.136 [0.105]	0.148 [0.063]	0.154 [0.121]	0.224 [0.170]	0.084 [0.069]	0.208 [0.164]	0.084 [0.067]
Leverage	0.221	0.198	0.206	0.000	0.834	0.237 [0.179]	0.218 [0.197]	0.369 [0.345]	0.164 [0.141]	0.149 [0.032]	0.242 [0.228]	0.143 [0.055]	0.294 [0.259]
Short-Term Debt/Assets	0.028	0.007	0.054	0.000	0.353	0.023 [0.003]	0.019 [0.007]	0.052 [0.008]	0.024 [0.005]	0.023 [0.002]	0.037 [0.018]	0.021 [0.001]	0.033 [0.014]
Long-Term Debt/Assets	0.191	0.150	0.194	0.000	0.785	0.214 [0.145]	0.199 [0.157]	0.312 [0.279]	0.14 [0.109]	0.121 [0.013]	0.201 [0.187]	0.12 [0.019]	0.256 [0.210]
Panel C: Firm Size and Investment													
Market Value of Equity i 19936	1778	45564	4	422640	4'165 [567]	22'973 [3'269]	4'855 [523]	22'646 [2'499]	627 [307]	55'056 [25'127]	3'404 [543]	35'305 [7'367]	
Size of the Firm	7.531	7.566	2.165	3.006	12.398	6.221 [6.074]	7.964 [7.929]	6.759 [7.6838]	7.622 [7.567]	5.274 [5.423]	9.847 [9.944]	5.999 [6.038]	8.956 [8.759]
Tobin's Q	2.100	1.675	1.318	0.599	7.315	1.966 [1.489]	2.267 [1.807]	1.494 [1.235]	2.362 [1.982]	2.207 [1.689]	2.169 [1.854]	2.208 [1.741]	2.000 [1.632]

Panel B shows fundamentals on cash balances and debt in the form of cash and short-term investments, cash, short-term debt and long term debt, each divided by total assets and the variable leverage. According to (MacKay and Phillips, 2005) leverage is defined as the ratio of total debt to total assets. In Panel B, the ratio of cash and short-term investments and cash to assets have an uneven distribution across the samples. Weak and Whited-Wu constrained firms have higher ratios for both when compared to their counter samples. For the variable leverage however, samples of firms in a weaker financial condition have higher leverage compared to their counter sample. This is in line with the general understanding. Panel C presents information on firm size and investment. The associated variables are market value of equity, the size of the firm defined as the natural logarithm of total assets and Tobin's Q. Tobin's Q and size are of importance as Tobin's Q is a proxy for investment opportunity (Duchin, 2010, p.957) and the size of firms in comparison can be seen as a sign of strength. Interestingly, the sub-samples of investors in a good condition have a market value of equity at least US\$ 10 billion higher when compared to their counter samples. Interestingly, the size of the firm does seem to be rather consistent across all the samples which implies that size is independent of the strength measures. When compared to the distribution for the variable leverage, Tobin's Q is higher for all investors in a good condition. Taken together, the findings suggest that, when compared to each other, the four different measures of a firm's financial condition separate the sample in a common way. Weak firms have a bad profitability, distressed and Whited-Wu constrained firms have a negative operational cash flow and all firms in the weak condition sample have significant lower Tobin's Q when compared to firms in a good state.

5 Market Returns to Initial 13(D) Filings – Abnormal Stock Returns

Abnormal share price reactions around the filing date identify the effect the 13(D) filing has on the target's stock, after accounting for general market movements. The set up of the event study performed for this purpose is as follows: The time line consists successively of the estimation window, in which parameter estimates are obtained, the event window for which the abnormal returns are computed and the post event window. The filing date, as

reported by the SEC and reported on EDGAR is set as the event day. For simplicity, the event window $[x,y]$ is determined relative to the event day 0 with x days before and y days after the filing date. Abnormal returns are computed for various event windows. For that reason, the estimation window is set 120 days prior to the largest event window. With the largest event window starting 30 days before the event day, the estimation window begins 150 days prior to the actual event day.

The abnormal return $AR_{i,t}$ for the target's security i at day t is defined as the difference between the actual (observed) return $R_{i,t}$ and the expected return $E(R_{i,t}|X_t)$ given the absence of the event (MacKinlay, 1997, p.15):

$$AR_{i,t} = R_{i,t} - E(R_{i,t}|X_t) \quad (1)$$

The expected return $E(R_{i,t}|X_t)$ is the result of an estimation based the market model, in which the value-weighted NYSE/Amex/Nasdaq index from CRSP proxies for the market return $R_{M,t}$ and likewise is the independent variable (MacKinlay, 1997, p.18).¹³ This yields the abnormal return $AR_{i,t}$

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{M,t}) \quad (2)$$

To accommodate for a multiple period event window and to draw overall inferences of the Schedule 13(D) filings (MacKinlay, 1997, p.21), the abnormal returns $AR_{i,t}$ for target i are aggregated over the event window (τ_1, τ_2) .

For robustness, two different methods in aggregating over time are used. The cumulative abnormal return $CAR_{i,(\tau_1, \tau_2)}$ and the abnormal buy-and-hold return $BHAR_{i,(\tau_1, \tau_2)}$.

The cumulative abnormal return $CAR_{i,(\tau_1, \tau_2)}$ for security i in event window (τ_1, τ_2) , is the sum of the abnormal returns $AR_{i,t}$ from equation (2).

$$CAR_{i,(\tau_1, \tau_2)} = \sum_{t=1}^T AR_{i,t} \quad (3)$$

¹³For the expected return the market model assumes a constant and linear relation between the observed returns $R_{i,t}$ and the return of a market index $R_{m,t}$ (MacKinlay, 1997, p.18). The parameters are estimated by ordinary least squares regressions based on estimation-window observations of stock returns.

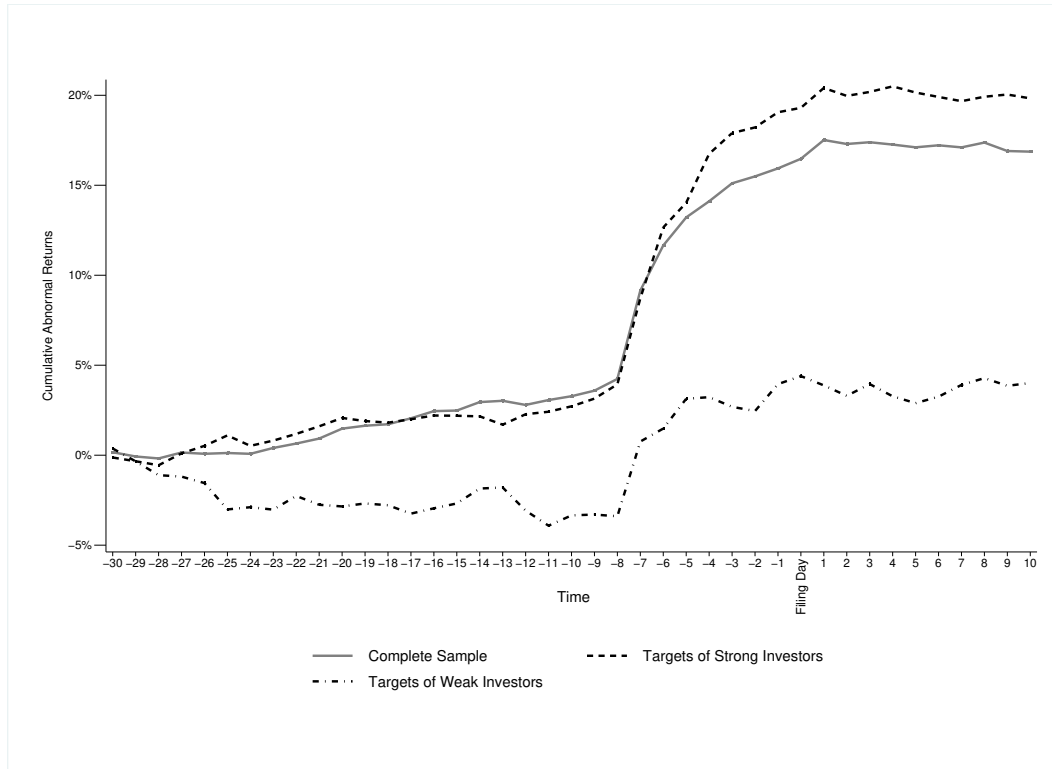
The second method of aggregation over time is the abnormal buy-and-hold return $BHAR_{i,(\tau_1, \tau_2)}$. It is independent from the results of equation (2) and no estimation window is required. The abnormal buy-and-hold returns $BHAR_{i,(\tau_1, \tau_2)}$ are the difference between the realized (observed) buy-and-hold returns and the normal buy-and-hold returns $R(R_{i,t}|X_t)$. But in contrast to the cumulative abnormal return, the buy-and-hold return mimics the investment strategy of investors that buy the stock and hold it for a longer period of time. In this sense, the actual (normal) buy-and-hold return on day t is the return on day t times its lagged return on day t_{-1} . This means that for the target's security i in the event window (τ_1, τ_2) the abnormal buy-and-hold return $BHAR_{i,(\tau_1, \tau_2)}$ is

$$BHAR_{i,(\tau_1, \tau_2)} = \prod_{t=1}^T (1 + R_{i,t}) - \prod_{t=1}^T (E(R_{i,t}|X_t)) \quad (4)$$

Analogous to the estimation of normal returns for equation (2), the value-weighted NYSE/Amex/Nasdaq index from CRSP is used to calculate the normal buy-and-hold returns in the respective event windows (τ_1, τ_2) (Brav, 2009, p.25).

5.1 Abnormal Returns, Event Windows and Strong investors

Graph 1 plots the times series of cumulative abnormal returns for securities subject to all filings and subject to filings of strong and weak investors. A first glance reveals that the abnormal returns on securities of the complete sample and those with a strong investor evolve almost equally although at around day -5, firms of filings by strong investors start to gain more. For both, the abnormal returns are consistently positive and aggregate almost to 20% during the 41-day period. For firms subject to a filing disclosed by a weak investor, the aggregated time series of abnormal returns appears to be much different. In the beginning these firms experience negative abnormal returns and become positive at around day -7. Additionally, their abnormal returns differ drastically in magnitude with a difference of around 10% in the post announcement period. In a first attempt to distinguish among abnormal returns based on the investors financial condition, firms subject to the filing of a weak investor, experience abnormal returns lower when compared to both, abnormal returns of the total sample and those of firms with a strong investor.



Striking is the fact that in all three cases, abnormal returns strongly aggregate in the $[-11,-8]$ period, meaning that valuable information – in any form – is available to Schedule 13(D) filers before the filing. This makes sense, as it is their own actions that potentially increase the value of the target firm and can be classified so. This is matching with Collin-Dufresne and Fos (2015, p.1561) who analyze the trading strategy of informed Schedule 13(D) filers. Three of their findings are important to the analysis of an early increase in abnormal return. Consistent with the sudden increase in abnormal returns in the $[-11,-8]$ period in Graph 1, they find that trading activity increases in the $[-12,-9]$ period which is consistent with the reported event dates (day on which the 5% threshold is passed) being clustered during that period. Secondly, they show that close to 1% of outstanding shares are purchased on the event date, compared to only 0.10% and 0.15% on the days before and after the event date (Collin-Dufresne and Fos, 2015, p.1561). Thirdly they note that the prices move up when Schedule 13(D) filers trade.

analyse for weak investors - it goes down!!!! This means that the increase in abnormal returns in Graph 1 lies within the $[-12,-9]$ period in which event dates are clustered and therefore trading increases. So as trading increases, prices move up as reported in Graph 1. Detatched from these findings, Brigida and Madura (2012, p.31) find evidence of a substantial

information leakage prior to the actual filing date and therefore suggest an event window no later than ten days before the filing. So another approach could be that the increase in abnormal returns is due to a leakage of information prior to the filing. To allow for the possibility that stock market participants knew about the pending stake before it was announced Allen and Phillips (2000, p.2802) choose their event window to be $[-10,10]$ for their analysis of equity ownership stakes where corporations hold at least 5% of stock. Klein and Zur (2009, p.207) also start their event window at day -30 to allow for the 10-day 13(D) filing window and possible prior leakage of information.

For the above mentioned reason, table III present the mean [median] cumulative and buy-and-hold abnormal returns for the following four event windows: Event window 1 is $[-10,3]$ to allow for the 10-day filing window, information leakage and accommodate subsequent press coverage. The second event window is $[-10,-6]$ to detach the possible effect of information leakages and event-date trading. Analogous the third event window $[-5,3]$ aims to control for these two. This seems to be reasonable, as the aggregation of abnormal returns in Graph 1 decreases at around day -5, implying that information has been processed. The fourth event window is $[-1,3]$ to accommodate for just the filing date and press coverage.

Column (1) presents the abnormal returns for the complete sample of filings. Column (2) and (3) show the abnormal returns for firms depending on the investor's condition. These sub-samples are based on Piotroski's F-score and are equal to those presented in Table II with 109 filings disclosed by strong and 85 disclosed by weak investors. Column (4) tests the difference in means [medians] of column (2) and (3). All returns presented in Table III are winsorized at the 1% and 99% level. This extensive presentation is done for two reasons. Firstly, it is an attempt to accommodate for the time-effect and secondly to test how much the investors financial condition matters across all event-windows.

Panel A presents the abnormal returns for the largest event window $[-10+3]$. Both, CAR and BHAR are positive and strongly significant at the 1% level with mean abnormal returns being 15.81% and 16.54% respectively. Targets that belong to the sub-sample of filings from strong investors have a mean CAR and BHAR around 3% higher when compared to the abnormal returns following weak investors. Although the difference is not statistically significant, it shows that the investor's financial condition does matter economically when

analyzing abnormal returns. This is supported by the difference in the CAR and BHAR medians which is around 7% and statistically significant at the 5% and 1% level respectively. The abnormal returns of around 16% are different to those presented by Klein and Zur (2009, p.208) who observe a 7% BHAR in the event window $[-30,5]$ on targets of hedge fund activism. Brigida and Madura (2012) however note, that the abnormal returns are higher for non-financial corporations. From the abnormal returns in Panel B, it is apparent that the largest runup happens in the $[-10,-6]$ event window with around 9% abnormal returns. This is matching with Brigida and Madura (2012, p.32) who find that the target runup is greatest during the event window $[-10,-6]$. The largest difference in abnormal returns when controlling for the financial condition of the investor is in the event window $[-5,3]$. The abnormal returns on targets with a strong investor aggregate to around 7.5% whereas those of weak investors only come to around 4.5%. This is a difference of around 60% in abnormal returns. Panel D presents the returns for the smallest event window closest to the filing. The filing date announcement abnormal returns on the complete sample are positive and significant at the 1% level.

Concluding, the subject's stocks experience significant gains around the Schedule 13(D) filing date. Apparent is the economic difference in abnormal returns for stocks belonging to filings submitted by strong investors. Across all event windows, the returns on their stocks outperform those with only a weak investor. This is matching with Graph 1, although the large difference has been equalled out.

5.2 Abnormal Returns and Financial Condition

As this thesis seeks to explore the relation between the filing of a Schedule 13(D), thereby the effect on the subject's stock, and the investor's financial condition, Table 3 plots the mean [median] abnormal returns by measures of financial condition and the transaction purpose. The measures among which the separation takes place are Piotroski's F-Score for general firm strength, Altman's Z-Score for determining investors in financial distress, Whited-Wu's index to identify financially constrained investors, S&P's long-term issuer credit rating and the investor's size. The displayed abnormal returns are aggregated over the event window $[-10,3]$. For each measure, Column (1) and (2) identify the investors based on their financial appearance with Column (2) representing the unfavorable state. Column (3) presents the t -statistics [Z-Statistics] for difference in means [medians] between Column (1) and (2).

For the complete sample, subjects that belong to an investor in the unfavorable state are outperformed by those in a better condition. In particular, abnormal returns for firms that belong to a weak or constrained investor are around 10% lower in the 14 day event window when compared to their counter samples. For both measures, the differences are statistically significant at the 1% level. On the other hand, firms belonging to investors that are ought to be in financial distress only gain around 3% less and are not lagging behind as much. Correspondingly, firms belonging to an investor without a credit rating have abnormal returns of around 12% and a difference of around 4.5%. Hence both measures, Z-score and S&P rating identify similar investors and show matching results. The difference in both measures, distress and credit rating is not statistically significant.

For filings with the transaction purpose takeover, that is merger agreements, tender offers and hostile bids, the abnormal returns are the highest. This is matching with ... In this category however, firms belonging to financially distressed investors have abnormal returns 4% higher when compared to undistressed firms. This however is not matching for targets of investors with no credit rating as they have abnormal returns 10% lower compared to targets of investors with a S&P rating. For all measures, except the Z-score, is the difference in abnormal returns among the corresponding samples statistically significant at the 1% level.

Targets of companies that file the Schedule 13(D) with the purpose of a strategic investment experience 10.27% abnormal returns during the [-10,3] period. Targets of strong investors earn 17% more, although the sample size is very small with only 15 and 8 filings. But nonetheless, across all measures do firms belonging to an investor in a favorable state outperform those belonging to an investor in the unfavorable state. The same applies to any remaining purpose.

Concluding, independent of measure and purpose, targets experience a positive market reaction around the Schedule 13(D) filing date. The difference between each measures sub sample however, is strongly positive and at least significant at the 10% level. This means, filings disclosed by investors with a strong financial condition are more valuable to the market and the univariate analysis predicts that the financial condition of the investor is of importance to the market.

6 Appendix

6.1 Appendix A – Categoization of Filings

6.2 Appendix B – Financial Condition Measures

6.2.1 F-Score

Used from Piotroski (2000) and calculated according to Fama and French (2006) and Choi and Sias (2012). Each component contributes one point if the condition holds, zero otherwise.

1. Positive net income before extraordinary IB

$$IB > 0$$

2. Positive cash flow from operations $OANCF$ — all investors had a reported cash flow format of 7. Therefore

$$OANCF > 0$$

3. Cash flow from operations is greater than net income

$$OANCF > IB$$

4. Growth in net income IB scaled by total assets AT from prior fiscal year end

$$\frac{IB}{AT}$$

5. Decrease in leverage from prior fiscal year end with leverage defined as the sum of long-term debt $DLTT$ and long-term debt due in one year $DD1$

$$\frac{DLTT + DD1}{AT}$$

6. Increase in liquidity from prior fiscal year end with liquidity defined as the ratio of current assets ACT to total liabilities LCT

$$\frac{ACT}{LCT}$$

7. No new common or preferred stock issued $SSTk$ over the previous year

$$SSTK = 0$$

8. Increase in gross margin from prior fiscal year end with gross margin defined as one minus the ratio of costs of goods sold $COGS$ to sales $SALE$

$$1 - \frac{COGS}{SALE}$$

9. Increase in asset turnover from prior fiscal year end with asset turnover defined as the ratio of sales $SALE$ to total assets at the beginning of the year AT_{t-1}

$$\frac{SALES}{AT_{t-1}}$$

6.2.2 Z-Score

The Z-score is computed according to Edward I. Altman (1968, p.549) and Edward I Altman (2002, p.14). For firms in manufacturing industries (SIC industries 2000-3999) the Z-score is

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

where firms with a score below the threshold of 1.81 are considered as distressed and those above 2.99 as not distressed (Edward I Altman, 2002, p.14).

For all remaining industries the Z-Score is

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

where firms with a score smaller than 1.1 are considered as distressed (Edward I Altman, 2002, p.18) and firms with a score higher than 2.6 as not distressed (Sulub, 2014, p.175).

With $X_1 - X_5$ being

$$X_1 = \text{Working capital to total assets } \frac{WCAP}{AT}$$

$$X_2 = \text{Retained earnings to total assets } \frac{RE}{AT}$$

$$X_3 = \text{Earnings before interest and taxes to total assets } \frac{EBIT}{AT}$$

$$X_4 = \text{Market value of equity to book value of total liabilities } \frac{PRCC_F * CSHO}{LT}$$

$$X_5 = \text{Sales to total assets } \frac{SALES}{AT}$$

6.2.3 Whited-Wu Index

The Whited-Wu index is calculated according to Whited and Wu (2006, p.543) and Farre-mensa and Ljungqvist (2013, p.6).

$$I_{WW} = -0.091X_1 - 0.062X_2 + 0.021X_3 - 0.044X_4 + 0.102X_5 - 0.0354X_6$$

With $X_1 - X_5$ being

$$X_1 = \text{Cash flow to assets } \frac{IB+DP}{AT}$$

$$X_2 = 1 \text{ if firm pays a dividend, zero otherwise } DVC + DVP > 0$$

$$X_3 = \text{Long-term debt to total assets } \frac{DLTT}{AT}$$

$$X_4 = \text{size of the firm } \log(at)$$

$$X_5 = \text{Average industry sales growth, estimated for each three digit SIC industry and each year separately } \frac{SALE_t}{SALE_{t-1}}$$

$$X_6 = \text{Sales growth } \frac{SALE}{SALE_{t-1}}$$

Following convention, firms are sorted into terciles based on their index value in the previous year. Firms in the top tercile are coded as constrained and those in the bottom tercile are coded as unconstrained (Farre-mensa and Ljungqvist, 2013, p.38).

6.2.4 Control Variables

1. Return on assets

$$\frac{EBITDA}{AT}$$

2. Cash flow from operations to total assets

$$\frac{OANCF}{AT}$$

3. Cash and short-term investments to total assets

$$\frac{CHE}{AT}$$

4. Cash to total assets

$$\frac{CH}{AT}$$

5. Short-term debt to total assets

$$\frac{DLC}{AT}$$

6. Long-term debt to total assets

$$\frac{DLTT}{AT}$$

7. Book leverage according to (MacKay and Phillips, 2005, p.1440)

$$\frac{DLTT + DLC}{AT}$$

8. Size of the firm

$$\log(at)$$

9. Tobin's Q according to (Khatami et al., 2014, p.120)

$$\frac{AT - CEQ - TXDB + CSHO * PRCC_C}{AT}$$

6.3 Appendix A

In order to compute the abnormal returns $AR_{i,t}$ for security i at time t in (1) the following models are used:

1. Market Model – For the expected return it assumes a constant and linear relation between the observed returns $R_{i\tau}$ and the return of a market index $R_{m\tau}$. The parameters are estimated by ordinary least squares regressions based on estimation-window observations. The value-weighted NYSE/Amex/Nasdaq index from CRSP is used as the market return $R_{M\tau}$.

$$R_{i,\tau} = \alpha_i + \beta_i R_{M,\tau} + \epsilon_{i,\tau} \tag{5}$$

with

$$E[\epsilon_{i,\tau}] = 0 \quad (6)$$

and

$$Var[\epsilon_{i,\tau}] = \sigma_{i,\tau}^2 \quad (7)$$

This yields the abnormal return $AR_{i,\tau}$

$$AR_{i,\tau} = R_{i,\tau} - (\hat{\alpha}_i + \hat{\beta}_i R_{M,\tau}) \quad (8)$$

2. Market Return Model – The model is classified as the restricted market model with $\alpha_i = 0$ and $\beta_i = 1$. This means that there is no estimation window required and the abnormal return $AR_{i,\tau}$ is simply the difference between the observed return $R_{i,\tau}$ and the value-weighted NYSE/Amex/Nasdaq index return $R_{M\tau}$.

$$AR_{i,\tau} = R_{i,\tau} - R_{M,\tau} \quad (9)$$

Table 1: F-Score
Regression F-Score

VARIABLES	(1)	(2)	(3)	(4)	(5)
F-Indicator	0.0885* (1.8171)	0.0583 (1.2234)	0.0600 (0.0634)	0.0636 (0.0607)	0.0056 (0.0898)
Return on Assets			-0.1732 (0.2084)		-0.3401 (0.3384)
Cash flow from Operations to Assets			-0.0311 (0.1149)		-0.0021 (0.2613)
Cash and short-term Investments to Assets			-0.1337 (0.1326)		-0.2147 (0.1911)
Leverage			-0.1187 (0.1170)		-0.2236 (0.1470)
Ln(At)			0.0395** (0.0161)		0.0402** (0.0184)
Tobin's Q			0.0397** (0.0155)		0.0326 (0.0251)
Takeover Purpose		0.1077** (2.3818)			0.0872 (0.0715)
Strategic Purpose		0.1764** (2.0002)			0.2157* (0.1200)
Return on Assets Targets				0.1493 (0.1923)	0.2380 (0.2053)
Cash flow from Operations to Assets Targets				-0.2191 (0.2066)	-0.2409 (0.2256)
Cash and short-term Investments to Assets Targets				-0.0374 (0.1727)	-0.1205 (0.2046)
Leverage Targets				-0.0642 (0.1429)	0.0291 (0.1463)
Ln(At) Targets				0.0004 (0.0237)	-0.0120 (0.0280)
Tobin's Q Targets				0.0021 (0.0154)	-0.0190 (0.0215)
Constant	0.0376 (0.2684)	-0.0888 (-0.6475)	-0.3225* (0.1908)	0.2873 (0.1855)	-0.1172 (0.2203)
Observations	192	192	192	137	137
R-squared	0.3593	0.3975	0.4375	0.4875	0.5870

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Z-Score

Regression Z-Score asdjhaskjdhkajshdkjashdkjashdkjahsdkjaskjdhdhkasjhdhkas askjhdkasjhdhkasjhdh

VARIABLES	(1)	(2)	(3)	(4)	(5)
Z-Indicator	-0.0099 (-0.2604)	-0.0344 (-0.9528)	-0.0572 (0.0447)	0.0013 (0.0485)	-0.0930* (0.0558)
Return on Assets			-0.0933 (0.1364)		-0.2435 (0.1991)
Cash flow from Operations to Assets			0.1154 (0.1098)		0.2382 (0.1611)
Cash and short-term Investments to Assets			0.0849 (0.0841)		0.1079 (0.0893)
Leverage			-0.0366 (0.0840)		0.0021 (0.0913)
Ln(At)			0.0315*** (0.0092)		0.0488*** (0.0109)
Tobin's Q			-0.0062 (0.0122)		-0.0179 (0.0149)
Takeover Purpose		0.1595*** (5.6436)			0.1546*** (0.0327)
Strategic Purpose		0.1278** (2.4042)			0.0938 (0.0659)
Return on Assets Targets				-0.0856 (0.2183)	-0.1876 (0.2141)
Cash flow from Operations to Assets Targets				0.0144 (0.2089)	0.1025 (0.2008)
Cash and short-term Investments to Assets Targets				0.0256 (0.0953)	-0.0125 (0.0933)
Leverage Targets				0.0359 (0.0765)	-0.0212 (0.0701)
Ln(At) Targets				-0.0162 (0.0122)	-0.0372*** (0.0130)
Tobin's Q Targets				-0.0034 (0.0109)	-0.0090 (0.0108)
Constant	-0.2050** (-2.0256)	-0.3064*** (-3.1507)	-0.3668*** (0.1167)	-0.0719 (0.1851)	-0.2840 (0.1861)
Observations	454	454	454	345	345
R-squared	0.1655	0.2200	0.2040	0.2028	0.3317

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Whited-Wu Indicator

Regression WW-Index

VARIABLES	(1)	(2)	(3)	(4)	(5)
WW-Indicator	0.0975** (2.4224)	0.0860** (2.1823)	-0.0516 (0.0764)	0.1552*** (0.0545)	0.0077 (0.0858)
Return on Assets			-0.1487 (0.1877)		-0.2366 (0.2158)
Cash flow from Operations to Assets			0.0811 (0.1384)		0.1388 (0.1631)
Cash and short-term Investments to Assets			0.0932 (0.1148)		0.1191 (0.1097)
Leverage			0.0106 (0.1150)		0.0509 (0.1100)
Ln(At)			0.0393** (0.0183)		0.0391* (0.0206)
Tobin's Q			-0.0116 (0.0161)		-0.0268 (0.0187)
Takeover Purpose		0.1801*** (4.7829)			0.1551*** (0.0404)
Strategic Purpose		0.1191* (1.8678)			0.1150 (0.0735)
Return on Assets Targets				-0.2153 (0.3749)	-0.3091 (0.3747)
Cash flow from Operations to Assets Targets				0.1157 (0.3707)	0.2155 (0.3570)
Cash and short-term Investments to Assets Targets				0.0669 (0.1051)	0.0109 (0.1042)
Leverage Targets				0.1661 (0.1362)	0.1034 (0.1362)
Ln(At) Targets				-0.0299* (0.0157)	-0.0311* (0.0176)
Tobin's Q Targets				-0.0044 (0.0119)	-0.0073 (0.0115)
Constant	-0.1420 (-1.1435)	-0.2625* (-1.9005)	-0.2791* (0.1579)	-0.0110 (0.1569)	-0.2054 (0.2000)
Observations	329	329	329	257	257
R-squared	0.2182	0.2783	0.2374	0.2872	0.3563

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Rating Regression
Regression Ratings

VARIABLES	(1)	(2)	(3)	(4)	(5)
rating_indicator	0.0668** (2.2413)	0.0644** (2.2096)	-0.0071 (0.0377)	0.0981** (0.0392)	-0.0047 (0.0443)
Return on Assets			-0.1766 (0.1408)		-0.3255* (0.1934)
Cash flow from Operations to Assets			0.1044 (0.1110)		0.1859 (0.1612)
Cash and short-term Investments to Assets			0.0299 (0.0884)		0.0554 (0.0904)
Leverage			-0.0063 (0.0785)		0.0449 (0.0863)
Ln(At)			0.0318*** (0.0104)		0.0463*** (0.0124)
Tobin's Q			-0.0060 (0.0119)		-0.0148 (0.0142)
Takeover Purpose		0.1621*** (5.5861)			0.1523*** (0.0332)
Strategic Purpose		0.0948* (1.9100)			0.0771 (0.0624)
Return on Assets Targets				-0.0484 (0.2108)	-0.1267 (0.2054)
Cash flow from Operations to Assets Targets				0.0100 (0.2007)	0.0668 (0.1919)
Cash and short-term Investments to Assets Targets				0.0488 (0.0946)	-0.0029 (0.0918)
Leverage Targets				0.0752 (0.1006)	0.0636 (0.0961)
Ln(At) Targets				-0.0260** (0.0120)	-0.0393*** (0.0134)
Tobin's Q Targets				-0.0053 (0.0107)	-0.0094 (0.0106)
Constant	-0.1740 (-1.4256)	-0.2361 (-1.5782)	-0.3333*** (0.1213)	0.1071 (0.1230)	-0.0795 (0.1442)
Observations	494	494	494	376	376
R-squared	0.1621	0.2145	0.1857	0.2049	0.2955

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Size Regression
Regression Size

VARIABLES	(1)	(2)	(3)	(4)	(5)
size_indicator	0.0724** (2.4793)	0.0673** (2.3634)	-0.0561 (0.0466)	0.1208*** (0.0368)	-0.0383 (0.0548)
Return on Assets			-0.1939 (0.1438)		-0.3334* (0.1948)
Cash flow from Operations to Assets			0.1044 (0.1119)		0.1845 (0.1621)
Cash and short-term Investments to Assets			0.0263 (0.0871)		0.0562 (0.0893)
Leverage			-0.0105 (0.0755)		0.0421 (0.0867)
Ln(At)			0.0419*** (0.0139)		0.0533*** (0.0166)
Tobin's Q			-0.0048 (0.0121)		-0.0138 (0.0142)
Takeover Purpose		0.1607*** (5.5508)			0.1512*** (0.0331)
Strategic Purpose		0.0941* (1.8843)			0.0743 (0.0616)
Return on Assets Targets				-0.0201 (0.2099)	-0.1364 (0.2035)
Cash flow from Operations to Assets Targets				-0.0312 (0.1981)	0.0786 (0.1892)
Cash and short-term Investments to Assets Targets				0.0248 (0.0903)	-0.0037 (0.0920)
Leverage Targets				0.0950 (0.0999)	0.0651 (0.0949)
Ln(At) Targets				-0.0316** (0.0124)	-0.0395*** (0.0133)
Tobin's Q Targets				-0.0055 (0.0105)	-0.0096 (0.0106)
Constant	-0.1429 (-1.3996)	-0.2049 (-1.6170)	-0.4051*** (0.1409)	0.1133 (0.1237)	-0.1275 (0.1622)
Observations	494	494	494	376	376
R-squared	0.1641	0.2156	0.1882	0.2145	0.2965

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1