Stockholm School of Economics
Department of Accounting
Master Thesis in Accounting and Financial Management
Spring 2017

Shareholder altruism or corporate piracy?

Operational performance of companies targeted by activist hedge funds

Wilhelm Börjesson[1] Jakob Kyllenbeck[2]

Abstract

In this study, the operational performance of companies subject to hedge fund activism is investigated. We study 689 companies in the Unites States and Europe between 2000-2015 and find that companies targeted by activist hedge funds outperform their control firms with regard to appreciation in valuation and capital efficiency, e.g. return on assets. In more detail, we observe an appreciation in valuation during the holding period whereas a lagging outperformance in return on assets is observed following the exit of the activist hedge fund. The outperformance in return on assets, in turn, is driven by an outperformance in asset turnover. As a result, capital optimization is concluded to be an important channel that activist hedge funds generate value through. A second contribution is that we study the jurisdictional differences in operating performance in companies subject to hedge fund activism. In short, we find no substantial differences between the United States and Europe. Lastly, we provide a potential explanation for the observed outperformance in asset turnover. That is, the structure of activist hedge funds allows for shareholder activism, but it also limits them to focus on more generic company problems, such as improving asset turnover, rather than performing holistic corporate restructuring. All in all, the study suggests that activist hedge funds catalyze change in the target companies, implying that monitoring performed by shareholders under certain circumstances serve a purpose on public markets, even through non-controlling block holdings.

Keywords: *Hedge fund activism, shareholder activism, operational performance*
Tutor: Tomas Hjelström
Date: 22 May 2017

[1] 40864@student.hhs.se
[2] 40863@student.hhs.se

Acknowledgements

We would like to thank our tutor, Tomas Hjelström, for his valuable guidance throughout the work process. We would also like to thank friends and family who have helped us improving the thesis with thoughtful comments.

Wilhelm Börjesson Jakob Kyllenbeck

Stockholm, 15 May 2017

Table of contents

1. Introduction

During the last two decades a new breed of active shareholders has emerged in the public markets, namely activist hedge funds. Through block holdings in publicly quoted companies these active owners employ a versatile toolbox to enforce corporate change. Change in a corporation is controversial by nature, partially explaining why this type of shareholder has rendered a lot of media attention. Even more, the actions taken by activist hedge funds have been accused to be shortsighted and not to the benefit of all shareholders (George and Lorsch, 2014). The long-term operational effects in companies subject to hedge fund activism are currently disputed, but the abnormal returns of the shares are not. Previous research shows that activist hedge funds experience abnormal returns in the stocks of the companies they target (Brav, Jiang, Partnoy and Randall, 2008a; Boyson and Mooradian, 2011; Klein and Zur, 2009). However, the origination of these abnormal returns is of interest. Some researchers argue that activist hedge funds are simply profound in identifying undervalued stocks and realizing quick change (Greenwood and Schor, 2009), others argue that the abnormal stocks returns are explained by the activist hedge funds' ability to enhance the companies operationally, employing a similar toolbox as other active owners (Bebchuk, Brav and Jiang, 2015; Brav et al., 2008a). The argument that activist hedge funds are able to conduct operational change is interesting, as the public setting with a dispersed ownership has proven troublesome in terms of achieving change in operational performance through shareholder activism when performed by other typical blockholders, such as pension institutions and mutual funds (Black, 1998; Karpoff, Malatesta and Walking, 1996). However, activist hedge funds have advantageous structural characteristics, as they have larger flexibility in terms of investment mandate, different remuneration structure, and experience less legal requirements than other blockholders performing shareholder activism in the public markets. Hence, activist hedge funds differentiate themselves in the public markets as their structure is suitable for performing activism (Brav et al., 2008a). Yet, the structure itself is not new, but quite proven in the private market. For instance private equity firms, another shareholder activist with a similar structure, engage in active ownership through majority block holdings in the private market. Research on private equity firms also show that they have been successful in enhancing operational performance in the companies they target. Hence, given the similarities with private equity firms and the differences towards other blockholders in the public market, studying the operational effects of the interventions by activist hedge funds is of interest, especially as activist hedge funds have experienced abnormal stock returns in the companies they target. Therefore,

The main purpose of this study is to evaluate the operational performance of companies targeted by activist hedge funds.

Consequently, the study may provide insights regarding the long-term operational effects that activist hedge funds have in the companies that are targeted. In turn, this information could increase the understanding for a new type of ownership form that is currently poorly understood,

and in a larger context, the study may contribute with knowledge regarding performing changes in a public market setting as a minority blockholder. Moreover, activist hedge funds, initially a concept in the United States ("U.S."), has increased its presence in the global capital markets the last decade. For instance Becht, Franks, Grant and Wagner (2015) conclude that European based activist hedge funds outperform their U.S. based peers in the U.S. capital markets. As Europe generally tends to have more concentrated shareholder structures and lower investor protection (Thomsen, Pedersen and Kvist, 2006), studying potential differences between these two jurisdictions is an interesting topic, as different contingencies adds to the understanding of the ownership form. Thus, we also examine the potential differences between operational performance in both U.S. and European companies subject to hedge fund activism. Furthermore, in terms of technical aspects, we focus on a larger set of operational metrics than in previous studies within the area in order to provide a more holistic understanding of the impact of the interventions made by activist hedge funds. In addition, previous similar studies analyze operational change with a predetermined set of years, thus not taking the holding period in to account. We add a holding period approach, where the operational performance change is analyzed from an entry versus exit perspective, to isolate operational performance changes occurring during the holding period as well as following the exit of the activist hedge fund. Lastly, additional time frames than in previous studies within the area will be examined. Hence, new business cycles will be incorporated.

In short, we find that activist hedge funds target companies with relatively poor operational performance compared to their control firms. However, the assets of the target company appreciate in valuation relative to the control firms over the holding period. This appreciation is followed by a lagging effect of a positive abnormal change in capital efficiency, e.g. return on assets. These results are in line with prior research within the area (Brav, Jiang and Kim, 2015; Clifford, 2008) Breaking down the return on asset, we find a abnormal positive change in asset turnover, whereas no abnormal change in operating margins is observed. Consequently, we argue that the abnormal appreciation in valuation appears to stem from capital optimization, which subsequently is argued to be an important channel that hedge funds generate value through in the target companies. A second contribution of this study is that we present new empirics regarding the consistency of these results between companies targeted by activist hedge funds in the U.S. and Europe, as we find no substantial differences between the two jurisdictions. Moreover, by anchoring in previous research on hedge fund activism, as well as shareholder activism in general, we provide a potential explanation for the observed outperformance in asset turnover. In more detail, the focus on asset turnover may stem from limitations in the structure of activist hedge funds combined with the characteristics of the public market. These factors make it more favourable for activist hedge funds to focus on improvements that are generic between companies, and such improvements arguably more often could relate to asset turnover rather than operating margins. All in all, the results suggest that activist hedge funds catalyze change in the target companies and that shareholder monitoring serves a purpose on public markets, even through non-controlling block holdings.

2. Literature review

Jensen and Meckling (1976) describe how the publicly traded corporation may suffer from agency costs. These agency costs are commonly described as indirect costs as a result of the potential conflict of interest between managers and investors. The potential conflict of interest can be derived from the distance between ownership and control. Naturally, this distance is most commonly found in the public market, as the public market allows for a less concentrated ownership than in the private market. Yet, the public market is also associated with advantages. Jensen (1989) argues that capital markets are important for companies in need of capital, such as growing companies. However, Jensen (1989) also argues that profitable companies with more mature business models and high cash generation do not need the capital markets to the same extent. Consequently, these mature companies run the risk of suffering from agency costs, as cash flow abundance may trigger management behaviour that is suboptimal for the shareholders, but serves some purpose for the management of the company.

Reducing agency costs may improve the operational performance of companies, that is, managers could have their interests aligned with the interest of the shareholders, and as a consequence behave in an more optimal way from the shareholders' point of view. For instance, excess cash flows could be distributed to shareholders rather than being subject to negative net present value projects. The potential improvements from reducing these agency costs have partly contributed to the evolution of the private equity industry. That is, companies suffering from agency costs in the public market may be targeted and taken private by private equity firms that can address the agency costs (Jensen, 1989). However, reducing agency costs in a public setting, where the ownership in general is less concentrated, has proven troublesome (Black, 1998; Karpoff et al., 1996). Monitoring management is associated with cost, whereby benefits of reducing agency costs need to exceed the cost of monitoring management, which in turn requires a more concentrated ownership (Bethel, Porter Liebeskind and Opler, 1998). This concentrated ownership has historically been attributed to institutions such as pension funds and mutual funds (Gillian and Starks, 2007). Yet, the structure of such institutions makes them unsuitable as active investors, as regulations of these actors limits their ability to engage in the operations of a company. Even more, the investment professionals within these institutions generally lack the incentives and the operational competence to become active owners (Black, 1998).

However, the last two decades a new type of shareholder activist has emerged in the public market, namely activist hedge funds. This new breed of active owners partly use the same techniques and toolbox as private equity firms, but through minority block holdings on the public markets (Brav et al., 2008a). Hedge fund is a widely used term and even though the word *hedge* implies offset risk of price movements, the name *activist hedge fund* has become commonly accepted for funds engaging in active ownership. Thus, there is no general definition of a (activist) hedge fund, but Brav et al. (2008b) outline four general characteristics:

"(1) they are pooled, privately organized investment vehicles; (2) they are administered by professional investment managers with performance based compensation and significant investments in the fund; (3) they are not widely available to the public; and (4) they operate outside of securities regulation and regulation requirements."

The typical structure implies that the fund is advised by a team of investment professionals referred to as general partners meanwhile the investors in the fund, the limited partners, have little say in the management of the fund (Brav et al., 2008a). In general, a 2% fixed management fee and a 20% performance based fee is applied. The management fee is generally applied on the total assets under management. The performance based fee is charged monthly or annually if the fund returns above an index or a predetermined rate of return. Brav et al. (2008a) argue that hedge funds in general are advantageous compared to regular mutual funds because of several factors. Most prominently are the more rigorous incentives towards the investment professionals employed by a hedge fund. Secondly, hedge funds may hold less diversified portfolios and use leverage and derivatives to a larger extent than other institutions. Thirdly, hedge funds generally have a more restrictive redemption policy than other funds, which may lock up capital for longer periods of time, in turn allowing the hedge fund to be flexible in terms of investment spectrum and time period. Consequently, the above factors permit and incite hedge funds to engage in shareholder activism to a larger extent than other blockholders.

Previous research shows that activist hedge funds experience abnormal returns in the stock of the companies that are targeted (Becht et al., 2015; Boyson and Mooradian, 2011; Brav et al., 2008a; Greenwood and Schor, 2009; Klein and Zur, 2009). However, the reason why these abnormal returns occur is currently disputed. For instance, the abnormal stock returns could stem from success in enhancing operations in companies, in stock picking, or in financial engineering. Also, the long-term operational effects in the companies subject to hedge fund activism are currently disputed. For example, George and Lorsch (2014) argue that activist hedge funds are inadequate owners and that their actions undermine the long-run competitiveness of the companies that are targeted.

Although activist hedge funds' presence in the public market today is indisputable, the ownership form is disputed and somewhat unknown. However, shareholder activism as performed by private equity firms is a more recognized concept. Both activist hedge funds and private equity firms are considered shareholder activists, as they engage in the operations of the companies they own. Activist hedge funds and private equity firms have numerous common denominators. As research focusing on activist hedge funds and operational performance is limited, research within shareholder activism and more specifically private equity could help increase the understanding of the process of reducing agency costs with active ownership, given their similarities (Brav et al., 2008a). Moreover, Kaplan and Strömberg (2009) argue that the private equity model could potentially be successful in a public setting as well. Thus, our literature review is anchored on both previous research on activist hedge funds and other shareholder activism, with a specific focus on private equity, as both

areas may explain why activist hedge funds should have a long-term operational impact on the target companies. In section 2.1 the framework for operational improvement will be discussed. In section 2.2 other potential sources of abnormal stock returns will be discussed. Lastly, in section 2.3, two illustrative examples is provided in order to exemplify how value creation may be actuated by activist hedge funds.

2.1. Framework for operational improvement

The purpose of the study is to evaluate the operational performance of companies targeted by activist hedge funds. To comprehend why change in operational performance in the target companies is to be expected following the intervention of an activist hedge fund, a framework is provided. The framework for operational improvement consists of theories from both prior research on activist hedge funds and private equity. These theories are presented and discussed below in five main sections, followed by its contingencies in a sixth section and some alternative explanations in a seventh section. For an overview of core previous research, please refer to Appendix A.

2.1.1. Capital structure modifications

Jensen and Meckling (1976) conceptualize the principal-agent problem in the public corporation. Jensen (1989) argues that agency costs are likely to be inherent in companies with high cash generation and low concentration of ownership. Addressing these agency costs has been an important part of the value creation generated by private equity firms performing public to private leveraged buyout transactions (Kaplan, 1989a). Generally, a leverage buyout implies a substantial increase in debt, which addresses some of the agency costs associated with cash flow abundance, as managers need to become more frugal because of the large increase in debt related payments each year (Jensen, 1986). For instance, the increased debt related payments may mitigate the risk of management undertaking projects that are not profitable from a present value perspecitve. Moreover, Kaplan and Strömberg (2009) ascertain that public market companies tend to have relatively low levels of debt, which can be derived from factors such as managerial disliking and public market investors worrying about debt. Also, previous research examine how the activist hedge fund modifies the capital structure of the target companies. Boyson and Mooradian (2011) find that the fund often succeeds in reducing cash positions in target companies. Klein and Zur (2009) also find evidence of reduced cash positions as well as increased take on of debt in target companies. Lastly, Brav et al. (2008a) find evidence of increased payout ratio in target companies following intervention of activist hedge funds. These actions are ways of addressing the agency costs inherent within a firm. Changing capital structure may affect operational performance, however, prior research on activist hedge funds have not presented such evidence. On the other hand, this has been researched within private equity, where studies such as Kaplan (1989a) and Guo, Hotchkiss and Song (2011)

find evidence of improved operational performance when agency costs have been addressed through increased debt. Yet, Acharya, Gottschalg, Hahn and Kehoe (2012), also researching private equity firms, find no relation between operational performance and debt levels. In addition, Myers (1977) argues that increased debt may have a negative net effect, as it reduces investments. Yet, this decrease in investments, in a private equity setting, is often combined with a more focused investment schedule that is directed to the core technology of the company (Lerner, Sorensen and Strömberg, 2011). Lastly, the size of the company may be related to its debt levels. Barclay and Smith (1995) provide evidence that companies with limited growth opportunities or large companies may be subject to more extensive debt levels. To summarize, activist hedge funds may target companies in order to modify the capital structure and thus address potential agency costs. In extension this may impact operational performance of the target companies.

2.1.2. Capital allocation

Redeploying capital can serve the purpose of addressing historical capital allocation decisions within the company that has not been proven to add value. For instance, Clifford (2008) examines the operational performance and finds evidence of an increased return on asset ("ROA") for companies targeted by activist hedge funds compared to companies targeted by passive owners. This increased ROA is driven by a decreased asset base rather than increased earnings before interest taxes depreciation and amortizations ("EBITDA"), implying divestitures of relatively underperforming assets. Brav et al. (2015) study plant level information and find an increased operational efficiency following capital redeployment. That is, plants sold after the intervention experience higher efficiency in the hands of the new owner. Furthermore, the relative productivity of the divesting company subsequently increases since relatively underperforming assets were divested. In extension, these divestitures reduced the work hours for employees at stagnated salaries. Therefore, capital rationalizing appears to serve as an important channel in which the activist hedge fund may generate value through. Another source for generating value resides in the exploitation of the conglomerate discount. That is, a company with business areas in different sectors could be split up in several entities and receive an appreciation in total valuation as separate entities. According to Berg and Gottschalg (2005) the utilization of the conglomerate discount were a common practice in the private equity industry in its early development stages. Moreover, this practice has also been performed by activist hedge funds on the public market. Such examples include the split of Cadbury Schweppes, an action that Trian Partners advocated through its block holding in the company. The distinction between capital redeployment and exploitation of the conglomerate discount is not clear cut, as both practices reside on a continuous scale.

2.1.3. Governance engineering through incentives and pressure

Incentives that align the interest of owners and managers is an important part in the process of reducing agency costs (Phan and Hill, 1995). Activist hedge funds employ a double-edged strategy that both puts pressure and increases incentives for management of the target companies. That is, an integral part of the strategy for activist hedge funds is to claim a board seat or engage in formal discussions with the board or management to influence management. Brav et al. (2008a) and Brav, Jiang and Kim (2009) report a decrease in fixed salaries and a increase in performance based pay for management in companies targeted by activist hedge funds. With regards to performance based pay, option constitutes a large part of the remuneration of towards management, as elaborated upon in Brav et al. (2009). While this is a proven tool to incentivize management in capital markets, it is not as effective as large equity positions according to Kaplan and Strömberg (2009). This is explained by the options payoff structure that limits downside for management compared to large equity investments. The other part of the strategy is to simply put pressure on management. For instance, Clifford (2008) outlines that the ability of hedge funds to lock up capital appears to strengthen the negotiating position towards management. Moreover, prior research has documented a higher CEO turnover following the intervention of activist hedge funds (Brav et al. 2008a; 2009). In extension, Brav et al. (2008a) conclude that the simple fact that these funds exist may disciple management in public companies, as not addressing shareholder value may attain the attention from activist hedge funds. Lastly, as the activist hedge fund may encounter resistance from other shareholders in pursuing its agenda, media channels also remain an important tool to influence management. Thus, prior research shows that activist hedge funds use the balancing act of incentivizing and pressuring management at the same time to apply their agenda.

2.1.4. Benefits of concentrated ownership and mitigating the free-rider problem

A problem in a public corporation is the costs associated with monitoring management. In general, a less concentrated shareholder structure implies that non substantial shareholders do not have the capacity or resources to monitor the management of a company. In extension, this may imply a free-riding problem with regard to monitoring of management (Shleifer and Vishny, 1986). That is, the ownership for a specific shareholder must exceed a certain point in a company before the costs of monitoring management are offset by the potential benefits of doing so. Bethel et al. (1998) conclude that the market for block holdings and thus partial corporate control plays an important role in reducing agency costs inherent in public companies. The free-riding problem is a partial explanatory factor for why other institutions such as pension funds to some extent have failed to monitor management (Black, 1998; Karpoff et al., 1996). The structure of such institutions generally does not incentivize the behaviour associated with activism, and consequently the activism is limited (Black, 1998). Brav et al. (2008a) and Clifford (2008) argues that activist hedge funds are sophisticated monitors of management in a company and that these funds have incentives to

do so because of their performance based remuneration. Moreover, Acharya et al. (2012) finds that the concentrated ownership in private equity owned companies results in more frequent and focused board meetings. The legal restrictions and structure of activist hedge funds also allow for block holdings in a lower number of companies relative to, for example, mutual funds. Hence, even though the relative costs of monitoring management increase in a public setting, activist hedge funds still have incentives to do so. Also, hedge funds have been documented to ally with other institutions in order to act as the devil's advocate with regard to demanding change within the target company. All in all, regular institutions do not have the incentives to monitor management and impose corporate change. Equivalently to private equity firms, activist hedge funds have incentives to take action for corporate change in the target companies. In extension, this could address factors such as potential principal-agent problems inherent in boards in companies.

2.1.5. Providing expertise to the target company

A way of enhancing the operational performance of the target company is by bringing expertise and counsel to the target company. Such expertise may include knowledge regarding current strategies, merger and acquisitions, and capital allocation decisions. In practice, the activist tends to bring advice and expertise and impose corporate change through formal discussion with management or the board, a trait that Brav et al. (2008a) identify as a key factor compared to other institutions. Boyson and Mooradian (2011) also conclude that activists that obtain board seats improve the operational performance more extensively. Usually, activist hedge funds advocate that boards seats in the target company are to be given to representatives of the hedge fund or to some independent directors. Independent directors could comprise of for instance industry specialists. With regard to private equity, Cressy, Munari and Malipiero (2007) document that boards containing industry specialists are more likely to enhance operational performance. However, criticism has also been directed towards the investment professionals of activist hedge funds, e.g. that they lack industry expertise and that a firm comprising financial analysts does not comprehend industry dynamics the same way as an experienced management team does (George and Lorsch, 2014).

2.1.6. Contingencies of the framework for operational improvement

In order to properly understand how the framework for operational improvement may explain the interventions by activist hedge funds it is important to acknowledge the contingencies with regards to activist hedge funds, shareholder activism in general and private equity in specific. Even though activist hedge funds and private equity firms share characteristics that may explain similarities in the outcome of the interventions, they also have some distinctive differences that may explain deviations. Prior research within activist hedge funds highlight the similarities between activist hedge funds and private equity with regards to the structure of the funds (Bebchuk et al., 2015; Brav et

al., 2008a). That is, both ownership forms have a fund structure where investment professionals have a flexible mandate of investing the money of outside investors. Moreover, the investment professionals have a remuneration structure that is highly dependent on the performance, reducing the principal-agent problem between general and limited partners. With regards to value creation within the target companies, previous research within private equity highlights governance, operational and financial engineering as tools for creating value. Previous research indicate that activist hedge funds apply roughly the same approach, adapted after contingencies such as the public market setting.

One advantage of activist hedge funds compared to other blockholders is the relatively longer lock up period of investor money, allowing activist hedge funds to take illiquid positions and engage as active owners (Clifford, 2008). However, private equity firms tend to have a even longer lock up period. The difference in lock up period of capital may induce implications with regard to the value creation focus. That is, Bratton and McCahery (2015) argue that activist hedge funds may have a more specified focus of the intervention, compared to private equity firms that have more time to thoroughly influence a company. The shorter time frame in combination with general- rather than industry-specific investment competence in a activist hedge fund may thus partly drive them to focus on more generic corporate issues, rather than specific corporate issues. In addition, Singh and Davidsson (2003) argue that the limitations with regards to due-diligence on publicly traded companies make it more favourable to address more general corporate issues relating to cash flow and asset turnover than issues relating to for instance operating margins. This is due to asymmetric information, as understanding operating margins often demand more detailed information than available through annual and quarterly reports (Singh and Davidsson, 2003). Private equity firms mainly perform private to private transactions, allowing them to engage in more detailed due-diligence, and consequently identify issues and opportunities that would not be identifiable with just public information. Hence, prior research indicates that activist hedge funds share several characteristics with other forms of active shareholders, and in particular private equity. The structure of the funds and the value creation approach are two common denominators. Yet, prior research also shows that activist hedge funds may apply a value creation approach in a more selective manner, whereas private equity uses a more extensive approach to enhance operational performance in the target company. Lastly, contingencies with regard to jurisdictions might have some implications for operating performance change in difference jurisdictions as Europe tends to have more concentrated ownership structure and lower investor protection (Thomsen et al., 2006).

2.2. Other explanations for the observed abnormal stock returns

A possible explanation for the abnormal stock returns that activist hedge funds experience in target companies is the funds' ability to enhance the operational performance within the target companies. However, other possible explanations for the abnormal stock returns can also be identified. Even though this is not within the frame of this study, other explanations also ought to be evaluated for

deeper understanding. The most prominent alternative explanations is that activist hedge funds are superior in identifying undervalued stocks. Greenwood and Schor (2009) argue that activist hedge funds invest in undervalued small capitalization stocks with the objective of seeing the target company being sold. Another factor could be that activist hedge funds are money managers with ability to time the market, which imply that activist hedge funds can buy a company on a relatively low valuation and sell on a relatively high valuation. Although, Swensen (2009) argues that timing the market is difficult as it requires one to forecast factors that are arduous to forecast. Another way of timing the market could be to hold insider (illegal) information of some kind. Several high profile litigations by the Securities and Exchange Commission ("SEC") have also been directed to hedge funds such as SAC Capital and Galleon Group with regard to insider information.

Modifying the capital structure might address agency costs, as elaborated on earlier. However, the practice of taking on additional debt is also referred to as financial engineering. That is, tax deductability of additional interest costs may generate value because of tax shields. Within the private equity industry these tax shields have been documented to generate value (Kaplan, 1989b). Another potential value generative effect elaborated on by Kaplan and Strömberg (2009) is the relative pricing of debt and equity. That is, with regard to the risk derived to debt, debt is priced relatively low compared to equity. Consequently, if a company increase its debt substantially this might imply arbitraging the debt and equity markets (Kaplan and Strömberg, 2009).

2.3. Illustrative examples

In this section two illustrative examples is provided in order to exemplify how activist hedge funds may intervene in the target companies. Two interventions are provided within different economic cycles. As activist hedge funds are a relatively new phenomena, the illustrative examples intends to facilitate the process of assimilating the theoretical framework in this study.

2.3.1. Pershing Square Capital and Canadian Pacific 2011-2016

Pershing Square Capital, a U.S. based activist hedge fund, filed a 13D in October 28th 2011 for its block holding of 12% in Canadian Pacific declaring intentions of being an active owner. Canadian Pacific owns and operates a national-wide railway in Canada (Allaire and Dauphin, 2016). Pershing Square Capital argued that Canadian Pacific could have substantially higher margins as the operational performance over the last years was dismal compared to peers. That is, both the operating margins and stock price were substantially depressed, compared to the industry in general. The management of Canadian Pacific on the other hand argued that the mountainous areas in which the railways resided, drove costs up because of steeper slopes and greater curvature (Allaire and Dauphin, 2016). Pershing Square Capital sided with other institutional investors and

replaced five board of directors as well as the CEO at the annual general meeting in May 2012. The governance restructuring was followed by an operational restructuring. The new CEO launched an operational restructuring program that comprised of reducing personnel and improving asset utilization. For instance, the workforce was substantially larger compared to peers prior to the intervention and a 27% layoff was made between 2011-2015 (Allaire and Dauphin, 2016). Other modifications of operations included new sidings to remove bottlenecks in areas such as cargo handling and closure of several unnecessary hump-switching yards (Allaire and Dauphin, 2016). These measures also implied substantially reduced costs. Lastly, an organizational reform with regard to culture was employed to enforce new visions and a new strategic orientation. During the holding period of Pershing Square Capital, Canadian Pacific had its operating ratio, i.e. expenses to sales, decline, to becoming one of the lowest in the peer group (Allaire and Dauphin, 2016).

2.3.2. Cevian Capital and Lindex 2003-2006

Cevian Capital, an activist hedge fund based in Stockholm, acquired 10% of the shares in the publicly traded company Lindex in 2003. Lindex, a Swedish based lingerie retailer had experienced fluctuating earnings in recent years and was valued at depressed levels (Becht, Franks and Grant, 2010). Cevian Capital subsequently identified a restructuring possibility because of above factors in combination with a failed expansion in Germany. The co-founder of Cevian Capital, Christer Gardell, as well as an industry specialist entered the board. A new CEO and management team was brought in from Hennes & Mauritz, widely regarded as a best-practice retailer in Sweden at the time, and these new recruits were subsequently subject to a new incentive program (Becht et al., 2010). The governance restructuring was followed by operational improvements as well as a modified capital structure. With regard to operations, stores was reviewed on profitability basis and a number of stores in Germany were closed in combination with the launch of the Lindex concept in the Baltics and the Czech Republic. Lindex had previously concluded that closing stores in Germany was expensive due to the lease contracts, however, Cevian Capital contrasted this view through analyzing the payback period. Moreover, profitability was improved in the core Nordic market because of transformed practices within inventory management, purchase management and reporting (Becht et al. 2010). Another important part of the operational engineering was to modify logistics in order to decrease the time to market for the products. Lastly, a loss-making division in Sweden was divested. During the holding period of Cevian Capital the margins of Lindex was improved from 5% to 14%, moreover Lindex experienced above industry growth rates. Becht et al. (2010) conclude that Cevian Capital gained an 85% abnormal return during the holding period.

3. Development of hypotheses

Previous studies on activist hedge funds have mainly focused on abnormal returns for the stocks in the target companies. Studies which have focused on operational performance have done so mainly as a subarea within abnormal returns for the stocks in the target company. Moreover, studies concerning the impact on operational performance have taken a stance to investigate the myopic claim and capital allocation modifications, rather than creating a holistic understanding of the potential changes in operating performance. In order to create a more holistic understanding we will focus on a larger set of operational metrics. Furthermore, by studying different time frames and operational performance across different jurisdictions than previously done we add to the current literature within the activist hedge fund field. Moreover, while previous studies have looked at change in the operational performance from a static time perspective, this study applies a holding period approach where the change in operational metrics is with respect to the actual ownership of the activist hedge fund. This is done in order to isolate operational performance changes occurring during the holding period as well as following the exit of the activist hedge fund. Firstly, with basis in the value creation framework it is possible to conclude that intervention of an activist hedge fund tends to be coupled with a general appreciation in valuation. That is,

Hypothesis 1: *Companies subject to hedge fund activism experience an appreciation in valuation relative to their control firms during the holding period.*

Secondly, previous research has shown that activist hedge funds improve capital efficiency measures such as return on assets in the target companies. Therefore,

Hypothesis 2: *The capital efficiency of companies targeted by activist hedge funds is improved relative to their control firms during the holding period.*

In order to understand any improvements in capital efficiency measures, the DuPont model is used to decompose the capital efficiency measures into profitability, in terms of operating margins, and asset turnover. Consequently,

Hypothesis 3: *The profitability of companies targeted by activist hedge funds is improved relative to their control firms during the holding period.*

Hypothesis 4: *The asset turnover of companies targeted by activist hedge funds is improved relative to their control firms during the holding period.*

Furthermore, we intend to examine the growth of companies targeted by activist hedge funds. Prior research is ambiguous with regard to growth. On one hand the activist engage in governance and operational engineering for increased growth prospects, however, divestment of assets may

also decrease sales in order to increase capital efficiency. Thus, the hypothesis regarding growth is two-sided. That is,

Hypothesis 5: *The growth of companies targeted by activist hedge funds is different relative to their control firms during the holding period.*

Also, we intend to examine the development of cash flows. Prior research within activist hedge funds and shareholder activism emphasizes that reducing agency costs should result in higher cash flow generation. That is,

Hypothesis 6: *The cash generation of companies targeted by activist hedge funds is improved relative to their control firms during the holding period.*

Lastly, prior research has indicated that activist hedge funds tend to favour more debt to optimize the capital structure and utilize the disciplinary effect on management that higher debt levels potentially induces. Although, the public market tends to disfavour a take-on of debt and divestiture of assets also imply uncertainty on the net effect of debt levels. That is, ambiguous prior research results in a two-sided hypothesis. Therefore,

Hypothesis 7: *The solidity of companies targeted by activist hedge funds changes relative to their control firms over the holding period.*

In order to examine the long-term effects we not only intend to examine the operational performance during the holding period, but also the potential persistence or any lagging effects following the exit of the activist hedge fund. The persistence ought to be an important component when examining the currently disputed long-term corporate effects of hedge fund activism. Moreover, a company's value is the present value of its future cash flows. That is, expected changes in future cash flows will likely be reflected in the stock price prior to actually receiving that cash flow. In other words, corporate change is to be reflected more rapidly in the valuation of a company than in its reported operating performance. As a consequence, examining lagging effects is important in order to fully understand the impact of interventions by activist hedge funds. In order to examine the persistence of returns or any lagging effects, a three year period following the exit of the activist hedge fund will be studied. That is,

Hypothesis 8: *There is persistence or a lagging effect in hypothesis 1-7 following the exit of the activist hedge fund.*

As mentioned, we also intend to examine if there are any differences with regard to change in operational performance and different jurisdictions. Different legislations regarding shareholder rights and concentration of ownership imply different circumstances for corporate change in the U.S. and

Europe (Thomsen et al., 2006). Thus, the potential difference in operational performance is of interest, as it can reflect activist hedge funds ability to adapt to contingencies. Becht et al. (2015) conclude that hedge fund activism has become a global phenomena and that European funds in general yield higher abnormal returns in the stock of the target companies than U.S. based hedge funds. However, no prior study has to our knowledge examined the accounting performance across jurisdictions. That is,

Hypothesis 9: *The potential change in operating performance of companies targeted by activist hedge funds varies across jurisdictions of the target company.*

Lastly, according to Brav et al. (2008a) the number of activist hedge fund interventions has increased over time, which have contributed to a decline in abnormal stock returns following intervention. As the amount of interventions increases, the potential addressable change ought to decrease over time. This implies that the potential change in operational performance ought to decrease over time. Consequently,

Hypothesis 10: *The time of entry affects the change in operating performance.*

4. Methodology

To empirically evaluate the hypotheses, the operational performance of the target companys' is compared to a model of expected performance. In more detail, the change in an accounting metric for the target company is compared to the change in the accounting metric for the model of expected performance, which in our case is approximated through the median change for the 20 largest companies in the same industry as the target company, a approach presented by Bergström, Grubb and Jonsson (2007). Thus, the median change in the specific accounting metric for these 20 companies is subtracted from the change in the specific accounting for metric for the target company, in accordance with the method advocated by Barber and Lyon (1996). In order to both examine the effect of the intervention during the ownership as well as any persistence or lagging effects, we look at four different time windows. That is, we apply a holding period approach and examine the change during the holding period as well as the change one year, two year, and three year after the exit of the activist hedge fund, always with respect to the entry values. The holding period approach is adapted from previous studies within private equity, more specifically Fredriksson and Westerberg (2016). This is in contrast to previous studies that have examined the operating performance from a fixed time frame following the entry date of the activist hedge fund. Consequently, we are able to isolate operational performance changes occurring during the hedge fund ownership as well as following its exit. This may contribute to a more holistic understanding of the operational impact of interventions by activist hedge funds. In section 4.1 the details and methodology regarding the accounting data and the accounting metrics is presented and in section 4.2 the details and methodology for the model of expected return is presented. In section 4.3 the statistical methodology is presented.

4.1. Accounting data and metrics

The initial step is to establish what accounting metrics to look at in order to evaluate operational performance. With background in the hypotheses, accounting metrics reflecting valuation, capital efficiency, profitability, asset turnover, growth, cash generation, and capital structure are evaluated. In accordance with Barber and Lyon (1996), looking at change instead of the actual metric is preferable. Moreover, the change in the accounting metrics is evaluated on a absolute basis rather than a relative basis, implying that an increase from 4% to 5% is a 1% increase rather than a 25% increase. This approach is applied in order to mitigate skewness when companies start from low or negative levels. To examine the valuation of the target companies over time, Tobin's Q is applied. Bebchuk et al. (2015) argue that Tobin's Q is a metric frequently used for investigating the efficiency of operations in companies. Moreover, the metric may be used to evaluate how a company serves its shareholders. Several studies have applied the metric to investigate factors such as governance arrangements (Bebchuk et al., 2015). Furthermore, in order to get an overall

estimate of the change in performance we use the capital efficiency measures ROA[3] and return on capital employed ("ROCE"). Moreover, we study the drivers of capital efficiency measures. That is, we use the DuPont model and look at changes in profitability, through the measures EBITDA- and EBIT-margin, and changes in asset turnover, through the measures sales to assets and sales to capital employed. To examine whether companies targeted by activist hedge funds grow more than their control firms, sales growth during the holding period is used. To evaluate the development in cash flow generation we look at cash flow to sales, where EBITDA has been used to approximate the unleveraged operational cash flow before changes in working capital and capital expenditures. Lastly, to evaluate changes in capital structure we look at equity to assets ratio. Please refer to table I below for each metric, its corresponding calculation, and which hypothesis it addresses.

Table I: Accounting metrics

	Metric	**Hypothesis**	**Comment**
(1)	Tobin's Q	1	Market value of equity and debt, divided by book value of equity and debt.
(2)	ROA	2	EBITDA divided by the average value of total assets.
(3)	ROCE	2	EBIT divided by average value of capital employed.
(4)	EBITDA-margin	3	EBITDA divided by sales.
(5)	EBIT-margin	3	EBIT divided by sales.
(6)	Sales to assets	4	Sales divided by the average value of total assets.
(7)	Sales to capital employed	4	Sales divided by the average value of capital employed.
(8)	Sales growth	5	Compounded annual growth rate.
(9)	Cash flow to sales	6	EBITDA less change in working capital and capital expenditures, divided by sales
(10)	Equity to assets	7	Book value of equity divided by total assets.

Average value refers to average of opening and closing balance sheet value. (1) As advocated by Bebchuck et al. (2015). (2) As advocated by Bebchuk et al. (2015). (3) As advocated by Penman (2012). (10) As advocated by Damodaran (2012).

All accounting data is collected from Compustat. Currency effects are not a direct problem as all metrics are relative. However, it needs to be acknowledged that currency fluctuations may affect the results in relation to the European data indirectly. In 1999, several countries changed their main currency to the Euro. Although, the reporting currency for all affected European observations was not changed until the early 21th century. Thus, manual adjustments are made for this currency change as the metrics otherwise will be misleading. We convert to Euro using average yearly foreign exchange rate for income statement and foreign exchange rate at year end for balance sheet items. It also needs to be acknowledged that IFRS was not an EU legislation prior to 2005. Consequently some companies are subject to the change between local GAAPs and IFRS between 2004 and 2005. This may skew the findings regarding European data, however the control firms also ought to experience the same transition, mitigating this problem somewhat. In a wider sense, studying accounting data is subject to this problem with continuously updated accounting practices, hence, it is difficult to fully mitigate this problem. Also, differences between US GAAP and IFRS may affect the comparability of the findings between different jurisdictions. The four-digit Global Industry

[3]ROA is defined as EBITDA divided by average of opening and closing value of total assets. This definition is not in accordance with the conventional accounting definition of return on assets. However, in order to ensure comparability the same definition as in other similar studies is used.

Classification Standard codes (GICS codes) are collected for each company through Compustat.

As argued by Fredriksson and Westerberg (2016), the annual financial reports following the entry of a new active owner is, in this study, a combination of the operating performance with activist hedge funds as owner as well as owners that are not activist hedge funds. To mitigate this problem, the year prior to the entry is used, to ensure that the operating performance is not yet influenced by the activist hedge fund. Likewise, this problem also occurs with regards to exit as well. Thus, we use the financial report for the exit year of the activist hedge fund. Consequently, the financial metrics for the year prior to the intervention is compared with the financial metrics for the year of the exit of the activist hedge fund. Moreover, the data sample contains non-exited holdings. For these observations the last reported financials is used as a hypothetical exit year, in accordance with Fredriksson and Westerberg (2016). Including non-exited holdings may create a bias, as the reason for a non-exit may be that the planned agenda is not fully realized. However, to mitigate this effect we create a sub sample ("Full data sample") that exclude observations that are not exited. Using the last report prior to the entry ensures that the accounting metrics for the entry year are not affected by the activism performed by the activist hedge fund. Also, relying on quarterly reports would in most cases imply relying on figures that have not been revised by a certified auditor. That is, using non-revised figures creates uncertainty, which we avoid with the chosen approach. In some cases several activists have operated in cooperation targeting the same target company, commonly referred to as a wolf-pack. As we intend to examine the operating performance of companies targeted by activist hedge funds, including these observations as several activist cases could skew the results towards frequently targeted companies. Consequently, a wolf-pack intervention is considered one intervention in this study.

4.2. Model of expected return

To distinguish between operational performance driven by hedge fund activism and general industry and economic development, a model of expected performance needs to be defined. Expected performance is determined based on industry control firms in accordance with Barber and Lyon (1996). Publicly traded companies in the U.S. have SIC codes meanwhile traded companies in Europe have NACE codes. Using a different set of codes might bias the control firms with regard to consistency in different jurisdictions and thus GICS codes are used to mitigate this problem. All companies that have been targeted by activist hedge funds are removed from the control firm sample to eliminate any biases. Expected performance is approximated using the 20 largest companies in each four-digit GICS group. Each target company is subsequently matched to the respective peer group using the four digit GICS code for each company. Size is approximated through the total revenue for each year. Eventual differences in profitability and shifting macroeconomic trends ought to be captured to a large extent by the industry matching. For U.S. target companies we use the 20 largest publicly quoted companies in the U.S. within each industry group and for Europe we use the 20 largest publicly quoted companies in the EU within each industry group. Barber and Lyon

(1996) also presents an alternative methodology, where adjustments are made for the operational performance prior to the specific event. This is motivated by the fact that abnormal, both positive and negative, operating performance may mean revert over time. Thus, adjusting for the performance prior to the intervention can be of importance as it is a potential explanatory factor for any observed abnormal results. We choose to not do this in accordance with the argument provided in Bergström et al. (2007). That is, as we in most cases have a group of 20 control firms, the potential effect of this bias should decrease. Also, this approach requires substantially more data which may imply that a large amount of observations needs to be excluded. However, in order to analyze the findings we provide pre-entry descriptive characteristics of the target companies and control firms. The group of control firms for each target company is not rebalanced as this would imply excluding companies that experience poor performance in relation to their industry. Another effect of this method is that companies that for some reason discontinue their operations, get acquired or get taken private will be excluded from the sample of control firms. As the group of control firms comprise the twenty largest companies within each industry this potential bias ought to be small. Another implication of the method is that it may contribute to a size difference between target companies and control firms. In extension, this may effect the results. For instance, some industry specific changes may affect smaller companies to a greater extent than larger companies, because of factors such as less diversified operations. Also, less diversified operations may increase volatility in the operational performance, which needs to be acknowledged when considering the results.

4.3. Statistical methodology

With basis in the hypotheses, we examine whether there are any differences between the change in operational performance of companies targeted by activist hedge funds and the change in operational performance of companies not targeted by activist hedge funds. Consequently, to test the hypotheses we perform statistical analysis. In more detail, we use the parametric Student's t-test and the non-parametric Wilcoxon test. The abnormal return for each target company and metric is calculated by subtracting the median obtained from the group of control firms. To test whether the average abnormal change in operational performance is different from zero, the one-sample t-test is applied. To test whether the median abnormal change in operational performance is different from zero, the Wilcoxon test is applied. The t-test hinges on three main assumptions, namely, that the sample is normally distributed, independent and continuous. The data is continuous as accounting metrics can take on any value within an unspecified or specified interval. However, the data may not be independent or normally distributed. We remove all target companies from the model of expected performance in order mitigate dependency, however, the assumption may still be violated due to other factors. To test for normality we use the Shapiro-Wilk test. The test results indicate that our sample is not normally distributed on a 1% significance level. However, this might be due to factors such as the characteristics of the companies targeted by activist hedge funds.

As the data is not normally distributed, statistical inferences using non-parametric analysis is more plausible. On the other hand, the t-test is more statistically robust. Moreover, as the t-test is used in other similar studies it is still included, however, main analysis will be performed with basis in the non-parametric Wilcoxon test. Barber and Lyon (1996) argue that the Wilcoxon test is suitable for analysis of accounting data as accounting data generally contains extreme values. That is, contrary to the t-test the Wilcoxon test does not build upon the underlying sample being normally distributed, although it has inferior statistical power. At last, to test for differences between sub samples, for example differences between jurisdictions, the independent two sample t-test is applied. The two-sample t-test tests for difference in the averages. To test for differences in the median between two samples, we apply the non-parametric Mann-Whitney test.

A commonly used approach when studying accounting data is to winsorize data. This procedure would adjust for extreme values, while keeping them in the sample. This commonly advocated approach we argue is misleading as it is self-fulfilling. In other words, extreme values will be replaced to support the rest of the data sample. Thus we apply another approach. For instance, certain accounting metrics are not defined during a certain set of circumstances. Consider a company with no revenue and negative operating margin. The operating margin for this company will arguably be undefined. In our study, where the accounting metric is an outlier, defined as three standard deviations from the mean, we investigate this observation. In cases where the metric is simply not defined due to the underlying accounting data, it is removed. This approach is done for all variables separately, resulting in a total of 34 observations being removed. The approach will allow us to keep the initial sample and modify fewer observations than if methods such as winsorizing or trimming were to be used.

5. Data

The lack of a central database comprising activist hedge funds has hindered research on hedge fund activism. Thus, in line with previous articles within the area, a unique database of activist hedge fund interventions between 2000 and 2015 needs to be constructed. The beginning of the time frame is determined based on the fact that hedge fund activism was a relatively premature phenomena prior to year 2000. The end of the time frame is based on the latest available revised annual accounts. We use the data methodology as advocated by Brav et al. (2008a) for companies listed in the U.S. and the data methodology advocated by Becht et al. (2010) for companies listed in Europe. However, the first step is to construct a gross list of hedge funds that have the characteristics of a activist hedge fund. Data is obtained from Bloomberg L.P. through its professional services. Roughly 6700 hedge funds with investments in the U.S. and Europe between 2000 and 2015 is obtained. These funds are subsequently sorted on a predetermined set of keywords with regard to fund style. These predetermined set of keywords for example includes: "Activist", "special situations", "event-driven" and "value investing". This yields a gross list of 258 activist hedge funds within our time frame.

5.1. U.S. data

The second step is to go through regulatory filings made by activist hedge funds, in order to identify activist interventions. That is, we utilize two securities law requirements that imply mandatory filings from the hedge fund regarding its holdings. In more detail, if a hedge fund acquires 5% of any class of securities in a publicly quoted companies, it must file a 13D filing to the SEC within ten days and elaborate on the intentions of the investment. This is a mandatory regulatory filing in section 13(d) of the Securities Exchange Act of 1934. Moreover, Section 13(f) in the same act stipulates that an institutional investor, with more than USD 100 million in assets under management, must file a 13F filing every calendar quarter and elaborate on the amount of shares the investor holds in each publicly quoted company. Thus, activist hedge funds with USD 100 million assets under management must make quarterly Form 13F filings to report their holdings. The entry point of the active ownership period is thus defined as when the 13D was filed. We read the *Purpose of Transaction* section in each 13D filing to identify whether or not the activist hedge fund is pursuing an activist strategy. Activist strategy is defined as board representation or formal discussions with management. Exit point is defined as when the holding no longer appears in the 13F or when the activist hedge fund files an additional 13D, explaining that it will no longer be an active owner. Given the prerequisite on capital to amass a 5% block holding in large capitalization companies, the Schedule 13D methodology applied may skew the sample against smaller target companies, in terms of market value.

A number of hedge funds have performed activism with an ownership below 5% in the target company. In order to identify such cases we perform new searches on the sample of hedge funds on Factiva. Any ownership that appears to be active according to the Factiva search is verified as holding through the 13F, which is in line with the approach advocated by Brav et al. (2008a). In accordance with Brav et al. (2009), we exclude 13D filings that involve risk arbitrage and distressed financing, for instance, inherent control through a convertible bond. The filings are obtained through the SEC EDGAR database. Between 2000-2015 711 activist hedge fund interventions in the U.S. are identified, please refer to table II for more information.

5.2. European data

In Europe the approach presented by Becht et al. (2010) is applied. Thus, we use country specific regulatory filings if applicable. If there is no government authority releasing such regulatory filings, we utilize Factiva for press information and other filings. That is, we use the gross list of hedge funds provided by Bloomberg L.P. and search Factiva to identify interventions made by activist hedge funds. These interventions are identified searching for news articles including fund names. Interventions made by activist hedge funds tend to render a lot of media attention. This can be used in Factiva in order to find other interventions made by the same hedge fund. Activism in this case is defined as board representation or formal discussions with the board and management. We believe this definition corresponds to the U.S., that is, if the hedge funds have an interest in influencing the management of the target company. Entry (exit) point is defined as date of initial (last) regulatory filing and/or press release. If no information of the exit period can be found using this method the annual reports -if applicable- are used to detect when the activist hedge is not an owner any more. This yields an additional 131 interventions by activist hedge funds in Europe.

5.3. Data sample

Table II illustrates the data collection on a fund and target company level. Step (1)-(6) is explained in previous sections within this chapter. Loss of data, step (7), refers mainly to undefined accounting metrics as elaborated upon in section 4.3. The remaining data loss in step (7) is with regard to recent entry dates. That is, entry after end of 2015 implies that no revised accounting data will be available for obtaining data on variables at exit. Moreover, adjustments for wolf-packs have been made, step (8), as elaborated upon in section 4.1. This results in 689 target companies that are included in our main results.

Table II: Data collection

		No.	Comment
	Fund level		
(1)	Bloomberg L.P.	6715	Searching Bloomberg Professional for hedge funds.
(2)	Adjustment	-6457	Adjusting initial search for keywords on hedge fund style.
(3)	Not activists	-87	Removing hedge funds with no documented activist interventions.
(4)	Jurisdictions	-56	Hedge funds with interventions in jurisdictions outside the scope of this study.
	Final sample	**115**	
	Target company level		
(5)	SEC Edgar	693	Going through 13D filings in SEC Edgar.
(6)	Factiva	149	Searching Factiva using a predetermined set of keywords.
	Gross sample	**842**	
(7)	Data quality	-38	Observations with no qualitative accounting data in Compustat.
(8)	Wolf-pack adjustment	-44	Adjustment for duplicates of same target company.
	Main results	**689**	
	Whereof U.S.	*589*	
	Whereof Europe	*100*	
(9)	Missing data	-581	Missing data on input for one metric or missing data for one year.
	Full data sample	**108**	Sample where no data is missing on any metric or year.
	Whereof U.S.	*92*	
	Whereof Europe	*16*	

The table illustrates the data collection process, both on fund level and target company level. On each step the data implications are elaborated upon, followed by a description. The main results is based on the data available for the return on asset metric.

The main results suffer from loss of observations with regard to the persistence analysis. Moreover, lack of data in Compustat prevents us from obtaining the same amount of data for all the metrics. This is acknowledged to be problematic in our study, as 581 target companies suffers from this, but also a natural consequence given the prerequisites and contingencies in a study of this kind. In order to address this issue, we exclude these incomplete observations, step (9), and construct a sub sample, the Full data sample, that includes the 108 target companies where data are complete for all metrics and years. This sample is tested separately, see Appendix B. However, as it is argued that a large amount of hedge funds engage in either divestiture of assets or divestiture of the whole target company, a certain amount of data loss is to be expected. Even more, observations with exit date from 2013 and forward will naturally miss data as the persistency analysis require data points for three years following the exit year. Yet, it is also important to acknowledge that similar studies have experienced this problem.

Roughly 85% of the target companies included in the main results are companies listed in the U.S. while roughly 15% are companies listed in Europe. Becht et al. (2015) conduct a global study with regard to announcement returns on hedge fund activism. The sample in the study comprise of 66% U.S. companies, 22% European companies and 12% Asian companies. In general, studies of this kind is skewed towards the U.S. since the industry originates from U.S. capital markets and since

U.S. regulatory filings are more easily accessible. Out of a total of 115 activist hedge funds the 15 activist hedge funds with most intervention comprise roughly 50% of the sample, however no individual activist hedge funds comprises more than 8%. Hence, the sample appears not dependable on a single hedge fund skewing the results.

5.4. Descriptive statistics

This section provides descriptive statistics for the sample of hedge fund interventions included in this study. As the number of observations vary across the different accounting metrics, the descriptive data is based on the available data for ROA. This is motivated by the fact that ROA is the metric with the most observations. To reduce any risks of biases due to observation loss, we provide complementary descriptive statistics based on the Full data sample, see Appendix C. However, as a consequence of the design of this study, the Full data sample will have a somewhat different distribution with regards to entry and exit as the persistency analysis needs three years of revised accounting data at the end.

Table III: Entry and Exit year

Year	**Entry**	**Exit**
2000	16	2
2001	18	4
2002	19	12
2003	20	19
2004	27	12
2005	48	18
2006	69	29
2007	70	55
2008	49	60
2009	31	43
2010	46	38
2011	59	35
2012	39	38
2013	70	48
2014	60	49
2015	48	70
Present Holding	N/A	157
Sum	689	689

The table illustrates the entry year and exit year for the target companies included in the sample of ROA during the holding period. The target companies that have not been exited by 2015-12-31 is defined as "Present Holding".

The observations are quite evenly distributed in terms of entry year, with no year containing more than 15% of the observations. The number of interventions increase substantially between 2004 and forward but starts to decline in 2008, in conjunction with the financial crisis. However, the number of interventions start to increase again in 2010 and reaches pre-financial crisis levels in 2013. The pattern of interventions in this study is in line with previous studies up until 2010 (Becht et al.,

2015). The period between 2010 and 2015 has been documented in very few studies. There are 157 observations that had not been exited as of 2015-12-31. In the results, these observations are treated as if they where exited as of 2015-12-31. However, to avoid any skewness due to this way of handling present holdings, we also perform tests on the Full data sample, see Appendix B.

Table IV: Holding period

Year	**Count (exited)**	**Accumulated**	**Count (present holding)**
1	72	72	45
2	182	254	35
3	103	357	31
4	89	446	6
5	32	478	16
6	21	499	6
7	12	511	5
8	7	518	4
9	4	522	0
10	3	525	3
11	4	529	4
12	3	532	1
13	0	532	0
14	0	532	1
Present Holding	157	689	0
Total	689		157
Average holding period	3,1		3,3
Median holding period	3,0		2,0

The table illustrates the holding period for the target companies included in the sample of ROA during the holding period. Year refers to number of years that the activist hedge fund owned the target company. As the data sample contains holdings that have not been exited, the right column illustrates the current holding period for those companies.

The average holding period for exited interventions in the study is 3,1. Moreover the median for exited interventions is 3,0. The average holding period for current holdings is 3,3 while the median is 2,0. Brav et al. (2008a) have an average holding period of 20 months meanwhile Becht et al. (2015) have an average holding period of 20,5 months. Slightly different definition of entry point as well as exit point, along with a different time frame likely explain the deviations in the holding periods compared to previous studies. That is, studying accounting metrics instead of abnormal stock returns requires another approach because of revised accounting figures only being available in the annual report. The average holding period is however substantially shorter than that of private equity firms. Kaplan and Strömberg (2009) find that the median holding period for private equity firms on a global basis is 5,9 years. Intuitively, the holding period with regard to hedge fund activism ought to be shorter than private equity because of liquidity in the investment, among other things.

Table V: Sector

GICS Code	Sector	Count	Share	2000-2004	2005-2009	2010-2015
10	Energy	37	0,06	5	12	20
15	Materials	44	0,06	6	13	25
20	Industrials	117	0,17	19	45	53
25	Consumer discretionary	167	0,24	28	78	61
30	Consumer staples	30	0,04	2	9	19
35	Healthcare	60	0,09	14	25	21
40	Financials	52	0,08	2	16	34
45	IT	148	0,21	19	54	75
50	Telecommunication services	14	0,02	3	8	3
55	Utilities	10	0,01	2	5	3
60	Real Estates	10	0,01	0	2	8
Sum		689	1	100	267	322

The table illustrates the sector distribution for the target companies included in the sample of ROA during the holding period. The table also illustrates sector distribution over time, divided into three cohorts based on entry year of the hedge fund.

The most targeted sectors, on a high-level (2 digit GICS code), in the data sample is consumer discretionary followed by IT and industrials. These three sectors have been among the largest constituents of the S&P 500 over the time period, which in turn may reflect the general sector decomposition in U.S. and Europe. The illustrated sector distribution over time indicates no major fluctuations. To contrast with private equity, Kaplan and Strömberg (2009) find that industrial and consumer discretionary were most common in the development of the private equity industry, whereas financials and healthcare have increased recently. Private equity firms, however, tend to be more active than activist hedge funds. Arguably, this may also be reflected in the target characteristics, as the target companies may differ with regard to sector characteristics and thus profitability. This potential deviation is also to be acknowledged when using theory from the private equity field. That is, target characteristic may comprise an contingency when analyzing the results.

Table VI: Target characteristics

	Entry -1	Entry -1	Entry adj.-1	Entry adj.-1	Entry adj.-2	Entry adj.-2
	average	*median*	*average*	*median*	*average*	*median*
Tobin's Q	1,9801	1,5433	-0,3670	-0,5879	-0,4222	-0,5742
ROA	0,1061	0,1054	-0,0349	-0,0316	-0,0376	-0,0344
ROCE	0,1026	0,0911	-0,0500	-0,0665	-0,0496	-0,0708
EBITDA-margin	0,1485	0,1171	-0,0593	-0,0555	-0,0621	-0,0614
EBIT-margin	0,0898	0,0762	-0,0630	-0,0524	-0,0666	-0,0595
Sales to assets	0,9220	0,8113	0,1078	0,0305	0,1209	0,0395
Sales to capital employed	1,2479	1,0378	0,1815	0,0294	0,1830	0,0435
Sales growth	0,0816	0,0579	N/A	N/A	-0,0146	-0,0337
Cash flow to sales	0,0706	0,0576	-0,0425	-0,0414	-0,0362	-0,0377
Equity to assets	0,4470	0,4376	0,0385	0,0357	0,0262	0,0306

The table illustrates the target characteristics of the 689 target companies in the main results. The first two columns show the average and median raw value for each metric one year prior to entry. The following four columns show the average and median for each metric in relation to the control firms one respectively two years prior to entry.

Companies targeted by activist hedge funds on average underperform with regards to Tobin's Q, ROA and ROCE in relation to the peer group prior to hedge fund intervention. This appears to be driven by underperformance with regards to operating margins, as target companies perform slightly better with regards to asset turnover. The target companies also underperform prior to the intervention with regards to sales growth. However, equity to assets is on average higher for the target companies than for their peer group. All in all, the target companies appear to be underperforming prior to the intervention of the activist hedge fund. Bebchuk et al. (2015) find that the target companies underperform with respect to Tobin's Q and ROA prior to the intervention when adjusting for the industry performance. Clifford (2008) finds that activist hedge funds target underperforming companies. Brav et al. (2015) argue that activist hedge funds target companies with relatively low growth, ROA and Tobin's Q. Moreover, Brav et al. (2015) argue that the consistency in the operational underperformance of target firms imply that activist hedge fund likely target firms with problems that are generalizable to all firms rather than firms with problems that are unique for the specific company.

The control firms for each target company consists of the 20 largest companies in the same industry, which may have implications with regard to differences in operational performance. The 20 largest companies are expected to have a more consistent operational performance whereas the target companies' operational performance is expected to vary more. Even more, the choice of using the 20 largest companies as control firms may partly explain some of the deviation in operating margins, as larger companies are expected to have somewhat higher margins, *ceteris paribus* (Selling and Stickney, 1989). Furthermore, the absolute numbers of performance for both the target companies and the peer groups are a consequence of the mixture of the sector distributions as well as the entry distribution. Hence, data will to a larger extent contain companies within the industrial, consumer discretionary, and IT sector that was entered during 2005-2007 and 2012-2014. With regards to equity to assets, Barclay and Smith (1995) points out that the size of the firm may be positively correlated to the amount of debt relative to equity, which may explain deviations in debt levels between target companies and control firms.

6. Results

In this section the results of the study is presented and discussed. The main result are presented in section 6.1. and 6.2. This is followed by an analysis and a discussion of the different variables in section 6.1.1-6.1.2 and 6.2.1-6.2.5. The seven sections are arranged to address the first seven hypotheses. Hypotheses eight, nine, and ten are addressed continuously throughout each subsection, however, tables referring to different time periods and thus hypothesis ten is to be found in Appendix D. Given our method, all results and subsequent discussion are discussed in relation to the control firms and not in absolute numbers[4], if not stated otherwise.

6.1. Main results - part 1

Table VII: Main results 1 - Whole dataset

		Tobin's Q	ROA	ROCE
t: holding period				
t-test	*Average*	0,1133*	-0,0072*	-0,0138**
Wilcoxon	*Median*	0,1151***	0,0001	0,0008
Count		585	689	655
t + 1				
t-test	*Average*	0,1829*	0,0187***	0,0166*
Wilcoxon	*Median*	0,1849***	0,0073***	0,0118***
Count		261	311	304
t + 2				
t-test	*Average*	0,2747***	0,0175***	0,0222*
Wilcoxon	*Median*	0,2784***	0,0135***	0,0229***
Count		218	262	253
t + 3				
t-test	*Average*	0,3753***	0,0253***	0,0313**
Wilcoxon	*Median*	0,2991***	0,0173***	0,0354***
Count		181	215	209

*Holding period t, t-tests shows the average absolute change in relation to control firms and Wilcoxon test show the median absolute change in relation to the control firms over the holding period. t+1, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level.*

[4]When referring to an increase in for example asset turnover, this increase is relative to the control firms and not in absolute numbers.

Table VIII: Result 1 - U.S. vs Europe

		Tobin's Q	ROA	ROCE
t: holding period				
t-test	*Diff average*	-0,3168	-0,0048	-0,0356**
MW test	*Diff median*	-0,0263	-0,0181	-0,0250
t+1				
t-test	*Diff average*	-0,2592	-0,0127	-0,0399**
MW test	*Diff median*	0,0392	-0,0048	-0,0399
t+2				
t-test	*Diff average*	-0,2356	-0,0028	-0,0252
MW test	*Diff median*	0,0406	-0,0089	-0,0126
t+3				
t-test	*Diff average*	0,1276	0,0064	-0,0172
MW test	*Diff median*	0,2188	0,0193	-0,0143

*Holding period t, t-tests show the average absolute change for U.S. target companies in relation to control firms less European target companies in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for U.S. target companies in relation to control firms less European target companies in relation to control firms. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

6.1.1. Valuation

Tobin's Q is a comprehensive measure in the way that it captures the ability, or the expectation of the ability, of a company to generate value to its investors through its assets. We observe a significant increase in Tobin's Q for the target companies relative to the peer group during the holding period and following exit. Consequently, we find evidence for hypothesis 1 and hypothesis 8 with regards to hypothesis 1. This is consistent with previous findings by Bebchuck et al. (2015) and Boyson and Mooradian (2011), that also find an industry adjusted increase in Tobin's Q following intervention by the activist hedge fund. Moreover, the increase in Tobin's Q is progressive following exit. An progressively increased Tobin's Q over time is in line with the findings of Bebchuk et al. (2015). Furthermore, the main results is consistent with the Full data sample, please refer to Appendix B. However, the target characteristics indicate that activist hedge funds target companies with low Tobin's Q in relation to industry peers. Consequently, the results imply that the spread between the target company and control firms decreases following intervention of activist hedge funds. The positive change in Tobin's Q is uniform when testing U.S. and European observations separately, see Appendix B. When testing for differences in the samples between U.S. and Europe no significant difference is observed, therefore no support for hypothesis 9 with regards to valuation is found. Testing for differences between time cohorts we find a significantly higher Tobin's Q in the first period compared to the last period, please refer to Appendix D. This is however not significant using non-parametric analysis, why no ultimate conclusions of this can be drawn and no clear support for hypothesis 10 with regards to valuation is found.

6.1.2. Capital efficiency

A negative average change in ROA of -0,7% and ROCE of -1,4% relative to the control firms is observed during the holding period. However, minimal change is observed when looking at the median. Thus, ROA and ROCE appears to remain somewhat stable relative to the control firms during the holding period and no clear no support for hypothesis 2 is found. The year following the exit of the activist hedge fund, both metrics increase in relation to the industry control firms. In line with the observed results in Tobin's Q, ROA and ROCE increase progressively over time, showing a median increase of 1,7% and 3,5% respectively three, years after the exit. Consequently, we find support for hypothesis 8 with respect to hypothesis 2. The lagging change that is observed could be explained by public market characteristics. That is, activist hedge funds have a large flexibility with regards to exit of a holding, and an appreciation in valuation is deemed to happen before a potential operational improvement is observable in the annual report. The premature appreciation in Tobin's Q may be a reflection of expectations of improvements in the operational performance. The main results are in line with the observed results for the Full data sample, see Appendix B. Previous studies that have analyzed ROA with regard to companies targeted by activist hedge funds points toward similar results but with some potential differences. Brav et al. (2008a) show that companies targeted by activist hedge funds increase the ROA with 3,0% two years following the intervention. Clifford (2008) shows that companies targeted by activist hedge funds increase their ROA with 3,0% after one year and 2,0% after two years, compared to companies targeted by passive investors. Lastly, Bebchuk et al. (2015) conclude that companies targeted by activist hedge funds increase the ROA compared to their peers with 1,5% three years after intervention. As our study uses a holding period approach, analyzing the effect on the metric based on differences in entry compared to exit, the results are not fully comparable. Although, the results seems to be in line with prior research with regards to improvements in overall capital efficiency. With regards to our geographical sub sample, the findings in ROA are consistent across U.S. and Europe. However, the results on ROCE are positively abnormal in the European data sample. Thus, we find support for hypothesis 9 with regards to ROCE. When testing for differences between time cohorts, no abnormal changes are observed. Hence, no support is found for hypothesis 10 with regards to capital efficiency.

6.2. Main results - part 2

Table IX: Main results 2 - Whole dataset

		EBITDA-margin	EBIT-margin	Sales to assets	Sales to capital employed	Sales growth	Cash flow to sales	Equity to assets
t: holding period								
t-test	*Average*	-0,0395*	-0,0327	0,0260***	0,0638***	-0,0396***	-0,0140	-0,0142**
Wilcoxon	*Median*	-0,0041**	-0,0043**	0,0165***	0,0271***	-0,0540***	-0,0058	-0,0083*
Count		666	666	573	592	550	583	647
t + 1								
t-test	*Average*	-0,0067	-0,0026	0,0536***	0,0909***	-0,0238**	0,0039	0,0102
Wilcoxon	*Median*	-0,0023	-0,0012	0,0270***	0,0452***	-0,0420***	-0,0125	0,0011
Count		304	306	264	263	305	264	300
t + 2								
t-test	*Average*	-0,0083	-0,0034	0,0854***	0,0752**	-0,0117*	0,0074	0,0317***
Wilcoxon	*Median*	0,0017	0,0015	0,0663***	0,0773***	-0,0178***	-0,0007	0,0225**
Count		254	255	222	223	254	223	252
t + 3								
t-test	*Average*	0,0018	0,0065	0,0935***	0,0983**	-0,0176*	0,0110	0,0314**
Wilcoxon	*Median*	0,0061	0,0088**	0,0953***	0,0940***	-0,0245***	0,0060	0,0274**
Count		212	212	179	177	206	189	203

*Holding period t, t-tests shows the average absolute change in relation to peers and Wilcoxon test show the median absolute change in relation to the defined peer group over the holding period. t+1, t-tests show the average abnormal return in relation to peers and Wilcoxon tests show the median abnormal return in relation to peers over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to peers and Wilcoxon tests show the median abnormal return in relation to peers over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to peers and Wilcoxon tests show the median abnormal return in relation to peers over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level.*

Table X: Result 2 - U.S. vs Europe

		EBITDA-Margin	EBIT-Margin	Sales to assets	Sales to capital employed	Sales Growth	Cash flow to sales	Equity to assets
t: holding period								
t-test	*Diff average*	-0,0524*	-0,0444	-0,0422	-0,0163	-0,0126	-0,0031	-0,0314*
MW test	*Diff median*	-0,0137	-0,0107	-0,0504	-0,1082	-0,0375	-0,0114	-0,0070
t+1								
t-test	*Diff average*	-0,0345**	-0,0287*	-0,0422	-0,0385	-0,0308*	0,0007	0,0014
MW test	*Diff median*	-0,0143	-0,0062	-0,0937	-0,1559	-0,0482	-0,0148	-0,0070
t+2								
t-test	*Diff average*	-0,0448*	-0,0372*	0,0285	-0,0065	-0,0193	0,0115	0,0014
MW test	*Diff median*	-0,0128	-0,0115	-0,0390	-0,1153	-0,0247	0,0118	0,0078
t+3								
t-test	*Diff average*	-0,0136	-0,0069	0,0257	-0,0489	0,0237	-0,0085	0,0267
MW test	*Diff median*	-0,0030	0,0076	-0,0534	-0,1746	-0,0123	0,0101	0,0502

*Holding period t, t-tests show the average absolute change for U.S. target companies in relation to control firms less European target companies in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for U.S. target companies in relation to control firms less European target companies in relation to control firms. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

6.2.1. Capital efficiency components - Operating margins

No evidence of improved EBITDA-margins as well as EBIT-margins relative to the control firms is observed during the holding period or following the exit of the hedge fund. Consequently, we find no support for hypothesis 3 and hypothesis 8 with regards to hypothesis 3. This is also consistent with the Full data sample. Prior studies regarding operating margins have indicated ambiguous results. For instance, Brav et al. (2008a) finds a substantial increase in EBITDA-margins two year after intervention of 8,0%. Meanwhile, Clifford (2008) finds negative change in absolute EBITDA following the intervention. Concerning jurisdictions, European target companies have performed significantly better than U.S. target companies. That is, the change in performance for US target companies shows no significance while the change in performance for companies targeted by activist hedge funds in Europe is significantly positive in t+1 and t+2. The difference in itself is also significant, but only when using parametric analysis, and therefore we find no clear support for hypothesis 9 with regards to operating margins. Yet, as our data mainly consists of companies listed in the U.S., the insignificant results in the main results may be driven by the geographical distribution in the sample. No differences are observed when testing for abnormal changes between time periods, meaning that we find no support for hypothesis 10 with regards to operating margins.

6.2.2. Capital efficiency components - Asset turnover

A median increase in asset turnover relative to the control firms during the holding period in terms of sales to assets as well as sales to capital employed is observed of 0,02x and 0,03x respectively. This change holds when testing for the observed average change as well. Consistent with the efficiency measures ROA and ROCE, both sales to assets and sales to capital employed significantly increase after the holding period relative to the control firms, and the median change is 0,10x and 0,09x respectively three years after the exit of the activist hedge fund. Thus, we find evidence for hypothesis 4 and hypothesis 8 with regards to hypothesis 4. No previous studies have, to our knowledge, examined the development in sales to assets and sales to capital employed. However, as mentioned, studies examining ROA have concluded that the positive change in ROA is to be derived from a decrease in the asset base and better capital allocation, which is in line with our results, i.e. the increase in sales to assets and sales to capital employed that we observe. As EBITDA-margins remain constant in relation to control firms and growth in relation to control firms decreases, the increased ROA and ROCE thus appears to stem from a higher asset turnover. This, in turn, may be derived from either a lower asset base in absolute numbers or a higher growth in sales than in assets. Clifford (2008) concludes that activist hedge funds intervention on average results in a lower asset base and no change in operating margin. Consequently, Clifford (2008) argues that divestment of assets is explaining the observed improvement in ROA. We can not conclude that this explains our results, however, it is a possible explanation. No difference between jurisdictions or time cohorts is observed, thus providing limited evidence for hypothesis 9 and 10 with regards to asset turnover.

6.2.3. Sales growth

The compounded annual revenue growth rate in the companies targeted by activist hedge funds is significantly lower than for the control firms. Moreover, this spread remains intact three years after the exit of the fund, even though the discrepancy between the target companies and the peer companies decreases three years after exit, showing an average underperformance of 1,8% and median underperformance of 2,5%. Therefore, we find evidence for hypothesis 5 and hypothesis 8 with regards to hypothesis 5. No previous research has to our knowledge examined sales growth and prior studies within private equity have documented that companies targeted by private equity firms have experienced a higher growth rate in relation to their peers over the holding period. For instance, Acharya et al. (2012) present abnormal returns in sales growth for companies targeted by private equity of 3,2% at exit in relation to entry on U.K. data and Bergström et al. (2007) present abnormal sales segrowth corresponding to 3,5% for companies targeted by private equity in Sweden. No difference is observed with regards to jurisdiction. Hence, no support for hypothesis 9 with regards to growth is found. Testing for differences between time cohorts and exploring hypothesis 10 we find a significantly higher sales growth in the first period compared to the second

and last period and thus some support for hypothesis 10, please refer to Appendix D. This is however not significant using non-parametric analysis, why no ultimate conclusions of this can be drawn. As the sample is concentrated towards the later periods, the results regarding sales may thus be driven by the distribution of observations in the different time periods. That is, low relative sales growth might be driven by the concentration of observations in the two later time periods.

6.2.4. Cash generation

In line with theory of how to address agency costs within a corporation, one ought to expect higher cash flow as a result of activist hedge fund intervention. As the management in theory should have their interest aligned with the shareholders, frugality with cash flows could be a consequence. However, we find no support for the hypothesis that cash flow ought to increase as a result of hedge funds activism. Thus, no evidence for hypothesis 6 and hypothesis 8 with regards to hypothesis 6 is provided. Yet, it is argued that reduced agency cost through decreased solidity in theory may result in higher cash generation. A potential explanation of this could be the derived to the development of solidity in this study. That is, we only find a modest decrease in the solidity of target companies during the holding period, and the opposite following the exit of the activist hedge fund, implying low disciplinary effect of debt. No differences with regard to jurisdiction or time period is observed and no support for hypothesis 9 and 10 is consequently provided.

6.2.5. Solidity

Testing for the change in equity to assets, we observe a small decline in equity to assets during the holding period. However, after the exit of the hedge fund this reverses, as we observe an increase in equity to assets relative to the control firms. Three years after the exit of the activist hedge fund a median change in equity to assets of 2,7% is observed. Consequently, we find some support for hypothesis 7 but also for hypothesis 8 with regards to hypothesis 7, as a lagging effect is observed. Clifford (2008) finds limited results of any increased leverage whereas Brav et al. (2008a) as well as Klein and Zur (2006; 2009) both document an increase in leverage following activist hedge fund intervention. The results we observe is thus in the borderline between these results, as we observe a small decrease in solidity during the holding period but a increase in solidity following the exit of the activist hedge fund. The observed results might be explained by the choice of the method, as target companies consist of smaller companies in terms of revenue and market value than the peer group. That is, Barclay and Clifford (1995) point out how size may positively correlate with take on of debt. No differences between jurisdictions or time periods is observed. Consequently, we find no evidence for hypothesis 9 and 10 with regards to solidity.

6.2.6. Summary main results

The results show that the target company experiences an appreciation of valuation, measured through Tobin's Q during the holding period, and that this appreciation progresses after the exit of the hedge fund. Following the exit of the activist hedge fund, ROA and ROCE increases relative to the control firms. As the valuation metric Tobin's Q is affected by expectations of future shareholder returns, the premature appreciation in valuation and lag in increased capital efficiency appears logical. As we do not observe an increase in operating margins, but do observe an increase in sales to assets as well as sales to capital employed, the increase in capital efficiency appears to be driven by an increase in asset turnover relative to the control firms. Consequently, the increase in valuation thus appears to be driven by the target companies' ability to increase its asset turnover. An increase in asset turnover could stem from several factors. For instance, the target company could divest assets or simply increase the efficiency of the existing asset base at entry. As the changes are relative to the their control firms, it is difficult to perform definite conclusions about the absolute change in asset base. Moreover, the target companies experience underperformance in sales growth over the full period and findings with regard to cash generation indicate no change relative to the control firms. A small decrease in equity to assets is observed during the holding period, however, this reverses following the exit of the activist hedge fund.

The observed results in the main sample are in line with the observed results when testing the Full data sample. However, when testing for differences between jurisdictions, differences in changes in EBITDA-margins and ROCE are observed as target companies in Europe experience larger positive changes than target companies in the U.S. Besides these observed differences, the observed results are consistent across the jurisdictions. With regard to different time periods, we observe that Tobin's Q and sales growth appear to differ somewhat over time as we observe that Tobin's Q is higher in the first period compared to the last period and sales growth is significantly higher in the first period compared to the following two periods. These results are in line with Brav et al. (2008a) that argue that this could be driven by a larger amount of activist intervention over time, meaning addressable change and thus returns also decreases over time. However, the results on differences in time periods is not significant using non-parametric analysis. That is, no ultimate insights regarding the potential difference in operational performance in different cohorts of time periods is provided in this study.

The observed results are in line with previous research, in those areas where previous research has been conducted. Bebchuk et al. (2015) and Boyson and Mooradian (2011) observe an improved Tobin's Q in target companies following the intervention of the activist hedge fund and Bebchuk et al. (2015) and Clifford (2008) document a positive change in ROA in target companies following the entry of the activist hedge fund. The results regarding the origination of the improved capital efficiency are confirming previous studies that have investigated asset divestment solely. However, by looking at a more comprehensive set of accounting metrics such as operating margins, asset

turnover, growth, cash flow generation, and solidity, a more comprehensive overview of the impact of activist hedge fund intervention is examined than in previous studies. Moreover, we also extend the time window significantly as previous research have looked on operational performance mainly on one to three years following the entry of the activist hedge fund, while we look at the intervention from the more precise holding period perspective. That is, the study is able to provide insight how operating performance changes during and after the holding period of the activist hedge fund. In short, the appreciation in valuation generally occurs during the holding period, while the operational performance improvement generally lags. Consequently, we argue that by providing an holistic view of the operational impact of activist hedge funds intervention we both confirm previous studies on specific metrics as well as deepen the understanding of the operational impact and the source of the value creation, as we provide a link between improved efficiency measures and the origination of that improvement. In addition, we present new evidence regarding the cross jurisdictional consistency of the operating performance following activist hedge fund intervention.

6.3. Discussion of results

The main results indicate that the capital efficiency of the companies targeted by activist hedge funds increase relative to their control firms following the exit of the hedge fund. We derive this increase from an increase in asset turnover, as sales underperform and no change relative to the control firms can be identified in operating margins. It should be noted that a decrease in sales and an increase in ROA and ROCE do not necessarily result in a positive net effect for the shareholder. However, given the increase in Tobin's Q we argue that the net effect appears to be positive. Given the underperformance in the operating margins prior to the intervention it is interesting that the improvement in efficiency measures such as ROA and ROCE appears to stem from an increase in asset turnover rather than improved margins. Moreover, research on private equity firms have shown that, in contrast to activist hedge funds, they are able to improve operating margins as well, and it has been argued in this study and in previous research within the activist hedge fund field that there are obvious similarities, but also some differences, between activist hedge funds and private equity firms. Consequently, looking at these factors may provide an explanation for the observed results.

The stated similarities between activist hedge funds and private equity firms mainly include the structures of the firms themselves and the approach they use to achieve change, whereas the differences mainly include the public setting compared to a private setting, as well as the minority block holdings compared to the majority block holdings. Moreover, the structure surrounding the committed capital differs between a private equity setting and a hedge fund setting. That is, hedge funds usually have a lock-in of capital between one to twelve months, implying potential lower outflows of money compared to mutual funds. However, hedge funds may still suffer from redemptions of capital, while invested capital in a private equity fund usually only is distributed to investors if a portfolio company is divested. As a result, activist hedge funds suffers from potentially larger

deviations in capital over time, which in turn may force activist hedge funds to focus on more selective problems, as a more comprehensive company restructuring requires more investor patience (Bratton and McCahery, 2015).

Another factor that may explain the focus on improved asset turnover resides in the information availability. A private setting offers the option of more rigorous due diligence than in a public setting, due to insider legislations, among other things. Hence, the information availability for activist hedge funds is more limited and Singh and Davidson (2003) argue that information asymmetry, or simply the lack of information, implicitly makes it more favourable to analyze and monitor a company from a cash flow and asset turnover perspective. That is, Singh and Davidson (2003) argue that focusing on operating margins requires more detailed information regarding the income statement and the company itself, which may be information that is not available to shareholders in a public setting. On a more general level, Singh and Davidsson (2003) argue that problems relating to asset turnover tend to be more generalizable problems whereas problem relating to operating margins tend to be more related to specific company or industry characteristics. Building on that, Clifford (2008) argues that activist hedge funds generally target company that have more generalizable problems, such as capital allocation, rather than specific company problems. This is motivated by their desire to achieve a scale in company monitoring and to leverage on the competence within the activist hedge funds, as the people working at activist hedge funds generally posses a background more closely related to financial and/or investment decisions than operational decisions (George and Lorsch, 2014). The same argument is put forward by Black (1990) that argues that shareholder activism has a stronger promise for structural issues rather than company specific ones. This is due to, among other things, the decreased costs of monitoring. Hence, by taking stance in previous research within both activist hedge funds and private equity, the observed focus on asset turnover as means of creating value seems to be in line with theory. That is, the observed contingencies and characteristics of activist hedge funds and the public market make it more favourable to focus on problems that are generalizable to several firms. More specifically, the arrangement surrounding the committed capital, the information availability, and the cost of monitoring management may motivate the focus on generic company problems. And such problems are more likely to include problems related to asset turnover, as argued by Clifford (2008) and Singh and Davidsson (2003).

It has been argued that the general source of value creation in shareholder activism stems from addressing the principal agent problem and the costs associated with that problem. If that was true, the improvement in operational metrics going forward would hence come from aligning management incentives and decreasing solidity, among other things. Management incentives and the development of those as a result of activist hedge fund interventions is out of the scope for this study, however, we find little evidence of any persistent decrease in solidity. Rather, our results indicate that the increase in ROA and ROCE comes from increased asset turnover, which in turn could come from asset divestment and/or increased efficiency of existing assets. Both Brav et al. (2015) and Clifford (2008) argue that the increased efficiency actually can be derived from asset divestments. Brav et

al. (2015) find that activist hedge funds tend to divest the relatively underperforming assets when performing asset divestment. Thus, the asset divestment strategy to achieve value may be a way of addressing the outcome of historical principal-agent problems rather than addressing current principal-agent problems. Yet, it is still possible that the improvement in efficiency measures could stem from more efficient use of an existing asset base, which would imply that sales have grown faster than the asset base.

A common argument against activist hedge funds' impact on target companies is that they are profound stock pickers. That is, they are good at identifying poorly performing companies that will outperform going forward. Even though we do not test whether this is the case, filing a 13D or equivalent with intentions of being active while simply engage in stock picking appears unlikely. This is due to the fact that activism is associated with costs, such as the cost of monitoring. If the costs of monitoring exceed the gains of being active, activism is not profitable. Hence, if the same stock return could stem simply from stock picking, the costs that burden activism could be avoided. As a result, filing a 13D with intentions of being active in some sense contradicts the stock picking argument.

Activist hedge funds, as mentioned, have historically mainly been a U.S. phenomena, but in recent years several activist hedge funds have increased its presence in the European market. We find somewhat stronger results in Europe, as target companies in Europe slightly outperform target companies in the U.S. with regards to operating margins and ROCE. Although, these results are only significant using parametric analysis. No other change is observed, and we can thus conclude that activists seem to perform roughly the same type of changes in the target companies regardless of jurisdiction. An interesting finding as Europe generally has more concentrated ownership structures and lower investor protection. One explanation for the potential outperformance in operating margins and ROCE is that more concentrated shareholder structures could imply that activist hedge funds seeking change must address corporate issues with a more holistic take. That is, other long term shareholders may require that activist hedge funds address both company specific and generic corporate problems in order to get acceptance of their agenda.

Some criticism needs to be acknowledged towards the study. Firstly, the use of Compustat implies that we are unable to obtain all data for the main results. This is problematic, however, we provide a Full data sample indicating the same results. This problem is however natural given the circumstances in the study and all similar studies experience the same type of problem. Another problem is that the method may skew the target companies towards smaller companies than the control firms. We have taken several measures against this problem, but it needs to be concluded that the results may suffer from influence from the discrepancy in characteristics between small and large companies. Regardless, we can conclude that this study provides results in line with previous studies, that is, monitoring of management may serve a purpose in public markets in order to generate operational performance changes. A third potential obstacle concerning the results is the fact that descriptive statistics indicate that the activist hedge funds target underperforming

companies. That is, potential mean reversion of certain variables may be a driver of the results. This argument may be mitigated by two factors. Firstly, as mentioned, the results are in line with previous studies using slightly modified methods, attempting to adjust for mean reversion. Secondly, mean reversion in theory ought to imply that ROA ought to increase compared to control firms as a result of increased operating profit margins and decreased asset turnover, and not the other way around.

7. Conclusion

In this study we evaluate the operational performance of 689 companies targeted by activist hedge funds between 2000 and 2015 in the U.S. and Europe. By breaking down the components of the value creation, a holistic view of the operational impact of activist hedge fund intervention is provided. Moreover, we present new evidence with regard to activist hedge fund interventions in European capital markets, as we observe a similar pattern of improvements in the operational performance following intervention, as in the U.S. In more detail, we find that companies targeted by activist hedge funds outperform their control firms with regard to appreciation in valuation, in terms of Tobin's Q, during the holding period as well as following the exit of the activist hedge fund. Additionally, a lagging increase in capital efficiency relative to the control firms, in terms of ROA and ROCE, is observed. In turn, this appears to driven by an increase in asset turnover rather than improvements in operating margins. An underperformance in sales growth is observed in relation to control firms and no abnormal change is found with regards to cash flow generation. However, solidity shows an abnormal increase following the exit of the activist hedge fund. Consequently, we find evidence for hypothesis 1, 4, 5, 7 and for hypothesis 8 regarding hypothesis 1, 2, 4, 5, and 7. We find no clear evidence for hypothesis 9, and no evidence for hypothesis is found 10. As a consequence of the observed results, we argue that it appears that activist hedge funds induce operational improvements in the target companies through capital rationalization. This capital rationalization could, for instance, be divestiture of assets or simply more efficient use of the existing assets. Moreover, these results appears to be consistent across the U.S. and Europe, implying that activist hedge funds have a somewhat similar approach independent on jurisdiction of the target company.

The fact that the improvements in ROA and ROCE appears to stem from improvements in asset turnover rather than improved operating margins can, by anchoring in previous research on activist hedge funds and on shareholder activism in general, potentially be derived from the contingencies of the activist hedge funds. That is, the structure and characteristics of hedge funds in combination with the public market environment make it more favourable to adopt a more selective approach and focus on problems that are generalizable to a larger number of firms. As problems relating to asset turnover have been argued to be more generic, and also more easy to detect, the focus on asset turnover appears to be logic. On a more general level, this implies that shareholder activists can serve a purpose company monitors, but also that the structure in which shareholder activists operates through appears to influence in the way that activism is applied.

The results indicate that value seems to be created from improved asset turnover relative to the control firms. Thus, a natural sequel is to investigate how this is actuated by the activist hedge fund. That is, investigating how the work of the activist hedge fund relates to potential improvements in asset turnover and what the improvements stem from would further add to the understanding of this ownership form. Moreover, it has been argued that the observed results partly can be

derived from the structure of the activist hedge fund. Given the differences in result compared to private equity, and the observed differences in the fund structure, it would be interesting to further explore the relationship between fund structure and how it relates to the ability of the activist hedge fund to induce operational change in target companies. Also, investigating the prerequisites for implementing a more private equity-like structure, from both an investor perspective as well as a business model perspective, would add to the development an the understanding of activist hedge funds.

REFERENCES

[1] Acharya, V.V., Gottschalg, O.F., Hahn, M. & Kehoe, C., 2012, Corporate governance and value creation: Evidence from private equity, *Review of Financial Studies*, Vol. 26 (2), pp.468-402.

[2] Allaire, Y. & Dauphin, F., 2016, Pershing Square, Ackman and CP Rail: A Case of Successful Activism?, *Institute for Governance of Private and Public Organizations*, 2016, available at: https://ssrn.com/abstract=2879033, downloaded 2017-02-23.

[3] Barber, B.M. & Lyon, J.D., 1996, Detecting abnormal operating performance: The empirical power and specification of test statistics, *Journal of Financial Economics*, Vol. 41 (3), pp. 359-399.

[4] Barclay, M.J. & Smith, C.W., 1995, The maturity structure of corporate debt, *The Journal of Finance*, Vol. 50 (2), pp. 609-631.

[5] Bebchuk, L.A., Brav, A. & Jiang, W., 2015, The long-term effects of hedge fund activism, *Columbia Law Review*, Vol. 115 (5), pp. 1085-1155.

[6] Becht, M., Franks, J. & Grant, J., 2010, *Hedge fund activism in Europe*, ECGI - Finance Working Paper No. 283/2010, available at: https://ssrn.com/abstract=1616340, downloaded 2017-02-19.

[7] Becht, M., Franks, J., Grant, J. & Wagner, H., 2015, *The returns to hedge fund activism: An international study*, European Corporate Governance Institute (ECGI) - Finance Working Paper No. 402/2014, available at: https://ssrn.com/abstract=2376271, downloaded 2017-02-15.

[8] Berg, A. & Gottschalg, O., 2005, Understanding value generation in buyouts, *Journal of Financial Restructuring*, Vol. 2 (1), pp. 9-37.

[9] Bergström, C., Grub,. M. & Jonsson, S., 2007, The operating impact of buyouts in Sweden: A study of value creation, *The Journal of Private Equity*, Vol. 11 (1), pp. 22-39.

[10] Bethel, J.E., Porter Liebeskind, J. & Opler, T., 1998, Share purchases and corporate performance, *Journal of Finance*, Vol. 103 (2), pp. 605-634.

[11] Black, B.S., 1990, Shareholder passivity reexamined, *Michigan Law Review*, Vol. 89 (3), pp. 520-608.

[12] Black, B.S., 1998, Shareholder activism and corporate governance in the United States, *The New Palgrave Dictionary of Economics and the Law*, Vol. 3, pp. 459-465.

[13] Boyson, N.M. & Mooradian, R.M., 2011, Corporate governance and hedge fund activism, *Review of Derivatives Research*, Vol. 14 (2), pp. 169-204.

[14] Bratton, W.W. & McCahery, J.A., 2015, *Institutional investor activism: Hedge funds and private equity, economics and regulation*, Oxford University Press, Oxford, U.K.

[15] Brav, A., Jiang, W., Partnoy, F. & Randall, T., 2008a, Hedge fund activism, corporate governance and firm performance, *Journal of Finance*, Vol. 63 (4), pp. 1729-1775.

[16] Brav, A., Jiang, W., Partnoy, F. & Randall, T., 2008b, *The returns of hedge fund activism*, ECGI Working Paper Series in Law, Vol. 098/2008, available at: https://ssrn.com/abstract=2376271, downloaded 2017-01-29.

[17] Brav, A., Jiang, W., & Kim, H., 2009, Hedge fund activism: A review, *Foundations and Trends in Finance*, Vol. 4 (3), pp. 185-246.

[18] Brav, A., Jiang, W. & Kim, H., 2015, The real effects of hedge fund activism: Productivity, asset allocation and labor outcomes, *Review of Financial Studies*, Vol. 28 (10), pp. 2723-2769.

[19] Clifford, C.P., 2008, Value creation or destruction? Hedge funds as shareholder activists, *Journal of Corporate Finance*, Vol. 14 (4), pp. 323-336.

[20] Cressy, R., Munari, F. & Malipiero, A., 2007, Playing to their strengths? Evidence that specialization in the private equity industry confers competitive advantage, *Journal of Corporate Finance*, Vol. 13 (4), pp. 647-669.

[21] Damodaran, A., 2012, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset*, University ed., John Wiley & Sons, New Jersey, US.

[22] Fredriksson, V. and Westerberg A., 2016, Do Private equity owned companies outperform? - A study on the Swedish market, Stockholm School of Economics, Master Thesis in Finance.

[23] George, B. & Lorsch, J.W., 2014, How to outsmart activist investors, *Harvard Business Review*, No. 5, Available at: https://hbr.org/2014/05/how-to-outsmart-activist- investors, downloaded 2017-02-22.

[24] Gillan, S.L. & Starks, L.T., 2007, The evolution of shareholder activism in the United States, *Journal of Applied Corporate Finance*, Vol. 19 (1), pp. 55-73.

[25] Greenwood, R. & Schor, M., 2009, Investor activism and takeovers, *Journal of Financial Economics*, Vol. 92 (3), pp. 362-375.

[26] Guo, S., Hotchkiss, E. & Song, W., 2011, Do buyouts (still) create value?, *The Journal of Finance*, Vol. 66 (2), pp. 479-517.

[27] Jensen, M.C. & Meckling, W.H., 1976, Theory of the firm: Managerial behavior, agency cost and ownership structure, *Journal of Financial Economics*, Vol. 3 (4), pp. 305-360.

[28] Jensen, M.C., 1986, Agency cost of free cash flow, corporate finance, and takeovers, *American Economic Review*, Vol. 76 (2), pp. 323-329.

[29] Jensen, M.C., 1989, Eclipse of the public corporation, *Harvard Business Review*, No. 9 revised, Available at: https://hbr.org/1989/09/eclipse-of-the-public-corporation, downloaded 2017-02-25.

[30] Kaplan, S., 1989a, The effects of management buyouts on operating performance and value, *Journal of Financial Economics*, Vol. 24 (2), pp. 217-254.

[31] Kaplan, S., 1989b, Management buyouts: Evidence on taxes as a source of value, *The Journal of Finance*, Vol. 44 (3), pp. 611-632.

[32] Kaplan, S. & Strömberg, P., 2009, Leveraged buyouts and private equity, *Journal of Economic Perspectives*, Vol. 23 (1), pp. 121-146.

[33] Karpoff, J.M., Malatesta, P.H., Walking, R.A., 1996, Corporate governance and shareholder initiatives, *Journal of Financial Economics*, Vol. 42 (3), pp. 365-395.

[34] Klein, A. & Zur, E., 2006, *Hedge fund activism*, NYU Working Paper No. CLB-06-017, available at: https://ssrn.com/abstract=1291605, downloaded 2017-01-27.

[35] Klein, A. & Zur, E., 2009, Entrepreneurial shareholder activism: Hedge funds and other private investors, *The Journal of Finance*, Vol. 64 (1), pp. 187-229.

[36] Lerner, J., Sorensen, M. & Strömberg, P., 2011, Private equity and long-run investment: The case of innovation, *The Journal of Finance*, Vol. 66 (2), pp. 445-477.

[37] Myers, S.C., 1977, Determinants of corporate borrowing, *Journal of Financial Economics*, Vol. 5 (2), pp. 147-175.

[38] Penman, S.H., 2012, *Financial Statement Analysis and Security Valuation*, 5 int. ed., McGraw Hill Higher Education, New York, US.

[39] Phan, P.H. & Hill, C.W., 1995, Organizational restructuring and economic performance in leveraged buyouts: An ex post study, *Academy of Management Journal*, 38 (3), pp. 704-739.

[40] Selling, T.I., Stickney, C.P., (1989), The effects of business environment and strategy on a firm's rate of return on assets, *Financial Analysts Journal*, Vol. 45 (1), pp. 43-52+68.

[41] Shleifer, A. & Vishny, R.W., 1986, Large shareholders and corporate control, *The Journal of Political Economy*, Vol. 94 (3), pp. 461-488.

[42] Singh, M. & Davidson III, W.N., 2003, Agency costs, ownership structure and corporate governance mechanisms, *The Journal of Banking & Finance*, Vol. 27 (5), pp. 461-488.

[43] Swensen, D.F., 2009, *Pioneering portfolio management: An unconventional approach to institutional investment*, fully revised and updated, Simon and Schuster, New York, US.

[44] Thomsen, S., Pedersen, T. and Kvist, H.K., 2006, Blockholder ownership: Effects on firm value in market and control based governance systems, *Journal of Corporate Finance*, Vol. 22 (2), pp. 246-249.

A. Previous literature

Table XI: Summary of main articles used in this study

Article	Research Design	Key finding	Time period studied
Stock returns			
Becht et al. (2015)	20 and 40 day abnonrmal return, expected return estimated through Fama French four-factor model.	Significant abnormal returns, consistent across different jurisdictions.	2000-2010
Brav et al. (2008a)	20 day abnormal return, expected reutrn estimated through control firms in same industry.	Significant abnormal returns with no reversal subsequent year.	2001-2006
Greenwood and Schor (2009)	1 month, 3 months, 1 year, and 2 years abnornmal return. Expected return estimated through variety of models.	Significant abnormal returns, mainly driven by M&A exits.	1993-2006
Klein and Zur (2009)	30 day abnormal return. Expected return estimated through control firms within same industry and size.	Significant abnormal returns, activist hedge funds target profitable firms and adress agency costs.	1995-2005
Operational performance			
Bebchuk et al. (2015)	Track ROA and Tobins Q five year following intervention. Expected change estimated through control firms in same industry.	Long run improvements in operational performance.	1994-2007
Brav et al. (2015)	Study plant level data following activist hedge fund intervention.	The companies targeted by activist hedge funds divest underperforming assets.	1994-2007
Clifford (2008)	Track operational metrics in companies targeted by active and passive investors.	Activists increase ROA but not EBITDA.	1998-2005

The table summarises the core previous research within hedge fund activism referred to in this study. Three aspects of core prior research is compared. Firstly, how the stock respectively operating performance abnormal return on companies targeted by activist hedge funds is studied. Secondly, the main results and its drivers. At last, the time period of the corresponding study.

B. Additional tests

Table XII: Results 1 - U.S. data sample

		Tobin's Q	ROA	ROCE
Entry -1	*Average*	2,0205	0,1074	0,1038
Entry -1	*Median*	1,5749	0,1069	0,0908
Entry adj. -2	*Average*	-0,4507	-0,0408	-0,0536
Entry adj. -2	*Median*	-0,6386	-0,0385	-0,0732
Entry adj. -1	*Average*	-0,4686	-0,0418	-0,0510
Entry adj. -1	*Median*	-0,6435	-0,0406	-0,0771
t: holding period				
t-test	*Average*	0,0735*	-0,0079*	-0,0188***
Wilcoxon	*Median*	0,1061***	-0,0024*	-0,0019*
Count		504	589	562
t + 1				
t-test	*Average*	0,1401*	0,0160**	0,0086
Wilcoxon	*Median*	0,2113***	0,0032*	0,0047
Count		218	255	252
t + 2				
t-test	*Average*	0,2401***	0,0171***	0,0180
Wilcoxon	*Median*	0,2885***	0,0115**	0,0205***
Count		186	218	211
t + 3				
t-test	*Average*	0,3972***	0,0265***	0,0284*
Wilcoxon	*Median*	0,4002***	0,0318***	0,0314***
Count		150	177	173

*"Entry -1" shows the median and average of actual ratios for the target companies one year prior to the hedge fund intervention. "Entry Adj. -2" and "Entry Adj. -1" show the ratios in relation to the defined peer group for two respectively one year prior to the hedge fund intervention, i.e. the observed values for the target companies less the median value for the peer group for each specific target company. Holding period t, t-tests shows the average absolute change in relation to control firms and Wilcoxon test show the median absolute change in relation to the control firms over the holding period. t+1, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level. Please note that no statistical analysis have been performed on descriptive characteristics prior to intervention.*

Table XIII: Results 2 - U.S. data sample

		EBITDA-margin	EBIT-margin	Sales to assets	Sales to capital employed	Sales Growth	Cash flow to sales	Equity to assets
Entry -1	*Average*	0,1541	0,0933	0,8550	1,1685	0,0897	0,0733	0,4594
Entry -1	*Median*	0,1234	0,0801	0,7562	0,9681	0,0670	0,0587	0,4639
Entry adj. -2	*Average*	-0,0687	-0,0732	0,0947	0,1776	N/A	-0,0507	0,0374
Entry adj. -2	*Median*	-0,0655	-0,0629	0,0278	0,0472	N/A	-0,0474	0,0334
Entry adj. -1	*Average*	-0,0722	-0,0769	0,1095	0,2017	-0,0124	-0,0417	0,0202
Entry adj. -1	*Median*	-0,0732	-0,0698	0,0362	0,0540	-0,0337	-0,0474	0,0266
t: holding period								
t-test	*Average*	-0,0469*	-0,0390	0,0190*	0,0615***	-0,0413***	0,0081	-0,0186***
Wilcoxon	*Median*	-0,0047***	-0,0045***	0,0090**	0,0154***	-0,0597***	-0,0084	-0,0083**
Count		572	572	478	509	475	492	556
t + 1								
t-test	*Average*	-0,0128	-0,0077	0,0457**	0,0846**	-0,0265**	0,0041	0,0104
Wilcoxon	*Median*	-0,0053	-0,0038	0,0160**	0,02880**	-0,0464***	-0,0131	0,0041
Count		250	252	212	220	253	214	249
t + 2								
t-test	*Average*	-0,01580	-0,0096	0,0908***	0,0741**	-0,0150*	0,0095	0,0340***
Wilcoxon	*Median*	-0,0017	-0,0013	0,0519***	0,0668**	-0,0229***	0,0048	0,0271***
Count		212	212	180	187	211	182	210
t + 2								
t-test	*Average*	-0,0006	0,0053	0,0987***	0,0900*	-0,0133	0,0094	0,0362**
Wilcoxon	*Median*	0,0058	0,0119*	0,0808***	0,0580**	-0,0262**	0,0131	0,0376**
Count		175	174	143	147	169	153	166

*"Entry -1" shows the median and average of actual ratios for the target companies one year prior to the hedge fund intervention. "Entry Adj. -2" and "Entry Adj. -1" show the ratios in relation to the defined peer group for two respectively one year prior to the hedge fund intervention, i.e. the observed values for the target companies less the median value for the peer group for each specific target company. Holding period t, t-tests shows the average absolute change in relation to control firms and Wilcoxon test show the median absolute change in relation to the control firms over the holding period. t+1, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level. Please note that no statistical analysis have been performed on descriptive characteristics prior to intervention.*

Table XIV: Results 1 - European data sample

		Tobin's Q	ROA	ROCE
Entry -1	*Average*	1,7292	0,0989	0,0954
Entry -1	*Median*	1,3471	0,0984	0,0938
Entry adj. -2	*Average*	0,1540	0,0024	-0,0276
Entry adj. -2	*Median*	-0,2495	0,0018	-0,0227
Entry adj. -1	*Average*	-0,1175	-0,0124	-0,0412
Entry adj. -1	*Median*	-0,3365	-0,0045	-0,0328
t: holding period				
t-test	*Average*	0,3903*	-0,0031	0,0168
Wilcoxon	*Median*	0,1324**	0,0076	0,0156**
Count		81	100	93
t + 1				
t-test	*Average*	0,3994	0,0311***	0,0554***
Wilcoxon	*Median*	0,1722**	0,0159***	0,0447***
Count		43	56	52
t + 2				
t-test	*Average*	0,4757*	0,0198*	0,0432***
Wilcoxon	*Median*	0,2480***	0,0204***	0,0332***
Count		32	44	42
t + 3				
t-test	*Average*	0,2696	0,0201*	0,0456***
Wilcoxon	*Median*	0,1814	0,0125**	0,0457***
Count		31	38	36

*"Entry -1" shows the median and average of actual ratios for the target companies one year prior to the hedge fund intervention. "Entry Adj. -2" and "Entry Adj. -1" show the ratios in relation to the defined peer group for two respectively one year prior to the hedge fund intervention, i.e. the observed values for the target companies less the median value for the peer group for each specific target company. Holding period t, t-tests shows the average absolute change in relation to control firms and Wilcoxon test show the median absolute change in relation to the control firms over the holding period. t+1, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level. Please note that no statistical analysis have been performed on descriptive characteristics prior to intervention.*

Table XV: Results 2 - European data sample

		EBITDA-margin	EBIT-margin	Sales to assets	Sales to capital employed	Sales growth	Cash flow to sales	Equity to assets
Entry -1	*Average*	0,1154	0,0693	1,2629	1,7313	0,0304	0,0564	0,3719
Entry -1	*Median*	0,0949	0,0553	1,0550	1,4653	0,0218	0,0559	0,3625
Entry adj. -2	*Average*	-0,0020	-0,0015	0,1797	0,2050	N/A	0,0014	0,0449
Entry adj. -2	*Median*	-0,0039	-0,0013	0,0644	-0,0563	N/A	-0,0044	0,0545
Entry adj. -1	*Average*	-0,0009	-0,0036	0,1793	0,0695	-0,0284	-0,0071	0,0627
Entry adj. -1	*Median*	-0,0154	-0,0138	0,0506	0,0028	-0,0349	-0,0112	0,0572
t: holding period								
t-test	*Average*	0,0055	0,0055	0,0612**	0,0778*	-0,0288**	0,0112	0,0127
Wilcoxon	*Median*	0,0001	-0,0031	0,0593***	0,1204**	-0,0222***	0,0030	-0,0090
Count		94	94	95	83	75	91	91
t + 1								
t-test	*Average*	0,0217**	0,0210**	0,0858*	0,1232	-0,0107	0,0034	0,0090
Wilcoxon	*Median*	0,0090*	0,0024*	0,1097**	0,1848*	-0,0158	0,0017	-0,0037
Count		54	54	52	43	52	50	51
t + 2								
t-test	*Average*	0,0291***	0,0275***	0,0623	0,0806	0,0043	-0,0020	0,0203
Wilcoxon	*Median*	0,0111***	0,0101**	0,0909**	0,1821*	0,0017	-0,0070	-0,0063
Count		42	43	42	36	43	41	42
t + 3								
t-test	*Average*	0,0130	0,0121	0,0730	0,1389	-0,0370*	0,0179	0,0096
Wilcoxon	*Median*	0,0089	0,0043	0,1342**	0,2326**	-0,0139**	0,0030	-0,0126
Count		37	38	36	30	37	36	37

*"Entry -1" shows the median and average of actual ratios for the target companies one year prior to the hedge fund intervention. "Entry Adj. -2" and "Entry Adj. -1" show the ratios in relation to the defined peer group for two respectively one year prior to the hedge fund intervention, i.e. the observed values for the target companies less the median value for the peer group for each specific target company. Holding period t, t-tests shows the average absolute change in relation to control firms and Wilcoxon test show the median absolute change in relation to the control firms over the holding period. t+1, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level. Please note that no statistical analysis have been performed on descriptive characteristics prior to intervention.*

Table XVI: Results 1 - Full data sample

		Tobin's Q	ROA	ROCE
Entry -1	*Average*	2,0205	0,1074	0,1038
Entry -1	*Median*	1,5749	0,1069	0,0908
Entry adj. -2	*Average*	-0,8362	-0,0278	-0,0663
Entry adj. -2	*Median*	-0,7897	-0,0327	-0,0642
Entry adj. -1	*Average*	-0,7446	-0,0339	-0,0746
Entry adj. -1	*Median*	-0,5742	-0,0305	-0,0749
t: holding period				
t-test	*Average*	0,1587***	-0,0003	0,0073
Wilcoxon	*Median*	0,1755***	-0,0018	-0,0019
Count		108	108	108
t + 1				
t-test	*Average*	0,2211***	0,0137*	0,0249***
Wilcoxon	*Median*	0,1775***	0,0058*	0,0112**
Count		108	108	108
t + 2				
t-test	*Average*	0,3418***	0,0224***	0,0371***
Wilcoxon	*Median*	0,2565***	0,0192***	0,0331***
Count		108	108	108
t + 3				
t-test	*Average*	0,3736***	0,0173**	0,0307***
Wilcoxon	*Median*	0,2840***	0,0145**	0,0353***
Count		108	108	108

*"Entry -1" shows the median and average of actual ratios for the target companies one year prior to the hedge fund intervention. "Entry Adj. -2" and "Entry Adj. -1" show the ratios in relation to the defined peer group for two respectively one year prior to the hedge fund intervention, i.e. the observed values for the target companies less the median value for the peer group for each specific target company. Holding period t, t-tests shows the average absolute change in relation to control firms and Wilcoxon test show the median absolute change in relation to the control firms over the holding period. t+1, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level. Please note that no statistical analysis have been performed on descriptive characteristics prior to intervention.*

Table XVII: Results 2 - Full data sample

		EBITDA-margin	EBIT-margin	Sales to assets	Sales to capital employed	Sales growth	Cash flow to sales	Equity to assets
Entry -1	*Average*	0,1541	0,0933	0,8550	1,1685	0,0897	0,0733	0,4594
Entry -1	*Median*	0,1234	0,0801	0,7562	0,9681	0,0670	0,0587	0,4639
Entry adj. -2	*Average*	-0,0515	-0,0505	0,1284	0,1905	N/A	-0,0195	0,0339
Entry adj. -2	*Median*	-0,0420	-0,0414	0,1098	0,1100	N/A	-0,0321	0,0342
Entry adj. -1	*Average*	-0,0583	-0,0560	0,1293	0,2020	-0,0049	-0,0330	0,0210
Entry adj. -1	*Median*	-0,0460	-0,0513	0,0506	0,1233	-0,0155	-0,0302	0,0387
t: holding period								
t-test	*Average*	-0,0076	-0,0057	0,0128	0,0382	-0,0353*	0,0315	0,0074
Wilcoxon	*Median*	-0,0021	-0,0047	0,0157	0,0193	-0,0593***	-0,0074	-0,0025
Count		108	108	108	108	108	108	108
t + 1								
t-test	*Average*	0,0044	0,0085	0,0553***	0,0601*	-0,0286*	0,0039	0,0273*
Wilcoxon	*Median*	0,0093	0,0074	0,0609**	0,0907**	-0,0526***	0,0148	0,0270*
Count		108	108	108	108	108	108	108
t + 2								
t-test	*Average*	0,0092	0,0140*	0,0876***	0,0940*	-0,0139	0,0075	0,0329**
Wilcoxon	*Median*	0,0088*	0,0095**	0,0728***	0,1248**	-0,0216**	0,0115	0,0324**
Count		108	108	108	108	108	108	108
t + 3								
t-test	*Average*	0,0052	0,0103	0,0770***	0,0880*	-0,0119	0,0150	0,0202
Wilcoxon	*Median*	0,0059	0,0067	0,0986***	0,0675**	-0,0220*	0,0147	0,0315
Count		108	108	108	108	108	108	108

*"Entry -1" shows the median and average of actual ratios for the target companies one year prior to the hedge fund intervention. "Entry Adj. -2" and "Entry Adj. -1" show the ratios in relation to the defined peer group for two respectively one year prior to the hedge fund intervention, i.e. the observed values for the target companies less the median value for the peer group for each specific target company. Holding period t, t-tests shows the average absolute change in relation to control firms and Wilcoxon test show the median absolute change in relation to the control firms over the holding period. t+1, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and one year following exit of the activist hedge fund. t+2, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and two year following exit of the activist hedge fund. t+3, t-tests show the average abnormal return in relation to control firms and Wilcoxon tests show the median abnormal return in relation to control firms over the holding period and three year following exit of the activist hedge fund. *, **, and *** refer to significance on the 10%, 5% and 1% level. Please note that no statistical analysis have been performed on descriptive characteristics prior to intervention.*

C. Descriptive statistics - Full data sample

Table XVIII: Entry and Exit year

Year	Entry	Exit
2000	0	0
2001	4	0
2002	4	2
2003	3	6
2004	7	1
2005	12	5
2006	18	10
2007	24	12
2008	14	17
2009	8	18
2010	2	8
2011	8	15
2012	4	14
2013	0	0
2014	0	0
2015	0	0
Present Holding	0	0
Sum	108	108

The table illustrates the entry year and exit year for the target companies in the sample with no missing data. The target companies that have not been exited by 2015-12-31 is defined as "Present Holding".

Table XIX: Holding period

Year	Count (exited)	Accumulated	Count (present holding)
1	23	23	0
2	36	59	0
3	25	84	0
4	12	96	0
5	6	102	0
6	5	107	0
7	0	107	0
8	0	107	0
9	0	107	0
10	0	107	0
11	1	108	0
12	0	108	0
13	0	108	0
14	0	108	0
Present Holding	0	108	0
Total	108		0
Average holding period	2,7		N/A
Median holding period	2,5		N/A

The table illustrates the holding period for the target companies in the sample with no missing data. Year refers to number of years that the hedge fund owned the target company. As the dataset contains holdings that have not been exited, the right column illustrates the current holding period for those companies.

Table XX: Sector

GICS Code	Sector	Count	Share	2000-2004	2005-2009	2010-2015
10	Energy	2	0,02	0	2	0
15	Materials	9	0,08	4	4	1
20	Industrials	19	0,18	6	10	3
25	Consumer discretionary	30	0,28	2	25	3
30	Consumer staples	6	0,06	0	4	2
35	Healthcare	10	0,09	4	6	0
40	Financials	0	0,00	0	0	0
45	IT	26	0,24	1	20	5
50	Telecommunication services	4	0,04	1	3	0
55	Utilities	2	0,02	0	2	0
60	Real Estates	0	0,00	0	0	0
		108	1	18	76	14

The table illustrates the sector distribution for the target companies in the sample with no missing data. The table also illustrates sector distribution over time, divided into three cohorts based on entry year of the hedge fund.

D. Operational performance over time

Table XXI: Results - first (2000-2004) vs. middle (2005-2009)

		Tobin's Q	ROA	ROCE
t: holding period				
t-test	*Diff average*	0,2348	0,0032	-0,0056
MW test	*Diff median*	0,1709	0,0129	0,0029
t+1				
t-test	*Diff average*	0,4838	0,0077	0,0253
MW test	*Diff median*	0,2714	0,0239	0,0393
t+2				
t-test	*Diff average*	0,2157	0,0026	-0,0394
MW test	*Diff median*	0,0877	0,0161	-0,0082
t+3				
t-test	*Diff average*	0,3223	-0,0009	-0,0394
MW test	*Diff median*	0,1921	0,0161	-0,0082

*Holding period t, t-tests show the average absolute change for target companies in the first period in relation to control firms less target companies in the second period in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for target companies in the first period in relation to control firms less target companies in the second period in relation to control firms. Target company is categorized based on time of entry. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

Table XXII: Results 2 - first (2000-2004) vs. middle (2005-2009)

		EBITDA-margin	EBIT-margin	Sales to assets	Sales to capital employed	Sales growth	Cash flow to sales	Equity to assets
t: holding period								
t-test	*Diff average*	-0,0146	-0,0053	0,0870	0,0297	0,0383	0,0004	-0,0171
MW test	*Diff median*	0,0034	0,0077	0,0669	0,0348	0,0166	0,0032	-0,0252
t+1								
t-test	*Diff average*	0,0145	0,0131	0,1186	0,0455	0,0517	-0,0362	-0,0138
MW test	*Diff median*	0,0196	0,0152	0,0964	0,0588	0,0410	-0,0174	-0,0305
t+2								
t-test	*Diff average*	0,0106	-0,0115	0,1120	0,0484	0,0592**	0,0120	-0,0242
MW test	*Diff median*	0,0114	0,0074	0,0372	0,0196	0,0532	0,0074	-0,0350
t+3								
t-test	*Diff average*	-0,0162	-0,0073	0,1151**	0,1391	0,0582**	0,0387	-0,0018
MW test	*Diff median*	-0,0082	-0,0015	0,0316	0,0733	0,0257	0,0000	-0,0240

*Holding period t, t-tests show the average absolute change for target companies in the first period in relation to control firms less target companies in the second period in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for target companies in the first period in relation to control firms less target companies in the second period in relation to control firms. Target company is categorized based on time of entry. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

Table XXIII: Results - first (2000-2004) vs. last (2010-2015)

		Tobin's Q	ROA	ROCE
t: holding period				
t-test	*Diff average*	0,2348	0,0101	0,0026
MW test	*Diff median*	0,2784	0,0159	-0,0006
t+1				
t-test	*Diff average*	0,6046**	-0,0088	0,0197
MW test	*Diff median*	0,4595	0,0288	0,0393
t+2				
t-test	*Diff average*	0,3421	0,0192	-0,0449
MW test	*Diff median*	0,5286	0,0193	0,0182
t+3				
t-test	*Diff average*	0,6453**	0,0101	-0,0449
MW test	*Diff median*	0,7138	0,0347	0,0182

*Holding period t, t-tests show the average absolute change for target companies in the first period in relation to control firms less target companies in the last period in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for target companies in the first period in relation to control firms less target companies in the last period in relation to control firms. Target company is categorized based on time of entry. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

Table XXIV: Results 2 - first (2000-2004) vs. last (2010-2015)

		EBITDA-margin	EBIT-margin	Sales to assets	Sales to capital employed	Sales growth	Cash flow to sales	Equity to assets
t: holding period								
t-test	*Diff average*	0,0466	0,0399	0,0939*	0,0670	-0,0048	0,0485	-0,0067
MW test	*Diff median*	0,0062	0,0075	0,0780	0,0659	-0,0144	0,0080	-0,0146
t+1								
t-test	*Diff average*	-0,0093	-0,0095	0,0909	0,0280	0,0341	-0,0429	0,0072
MW test	*Diff median*	0,0250	0,0166	0,1219	0,1221	0,0159	-0,0048	-0,0131
t+2								
t-test	*Diff average*	-0,0130	-0,0185	0,0949	0,0831	0,0570**	0,0473	-0,0084
MW test	*Diff median*	0,0133	0,0042	0,0968	0,1454	0,0341	0,0454	-0,0311
t+3								
t-test	*Diff average*	-0,0063	-0,0045	0,0858	0,2564	0,0599*	0,0540	-0,0148
MW test	*Diff median*	-0,0014	0,0019	0,0761	0,1855	0,0207	0,0066	-0,0353

*Holding period t, t-tests show the average absolute change for target companies in the first period in relation to control firms less target companies in the last period in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for target companies in the second period in relation to control firms less target companies in the last period in relation to control firms. Target company is categorized based on time of entry. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

Table XXV: Results - middle (2005-2009) vs. last (2010-2015)

		Tobin's Q	ROA	ROCE
t: holding period				
t-test	*Diff average*	0,0001	0,0069	0,0082
MW test	*Diff median*	0,1075	0,0030	-0,0035
t+1				
t-test	*Diff average*	0,1208	-0,0164	-0,0056
MW test	*Diff median*	0,1882	0,0049	0,0000
t+2				
t-test	*Diff average*	0,1263	0,0167	-0,0055
MW test	*Diff median*	0,4409	0,0032	0,0264
t+3				
t-test	*Diff average*	0,3230	0,0111	-0,0055
MW test	*Diff median*	0,5217	0,0186	0,0264

*Holding period t, t-tests show the average absolute change for target companies in the second period in relation to control firms less target companies in the last period in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for target companies in the second period in relation to control firms less target companies in the last period in relation to control firms. Target company is categorized based on time of entry. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

Table XXVI: Results 2 - middle (2005-2009) vs. last (2010-2015)

		EBITDA-margin	EBIT-margin	Sales to assets	Sales to capital employed	Sales growth	Cash flow to sales	Equity to assets
t: holding period								
t-test	*Diff average*	0,0612	0,0452	0,0070	0,0373	-0,0431	0,0481	0,0104
MW test	*Diff median*	0,0028	-0,0002	0,0112	0,0311	-0,0311	0,0048	0,0106
t+1								
t-test	*Diff average*	-0,0238	-0,0226	-0,0277	-0,0174	-0,0176	-0,0067	0,0214
MW test	*Diff median*	0,0055	0,0014	0,0255	0,0632	-0,0252	0,0126	0,0173
t+2								
t-test	*Diff average*	-0,0236	-0,0070	-0,0171	0,0347	-0,0022**	0,0353	0,0158
MW test	*Diff median*	0,0019	-0,0032	0,0596	0,1258	-0,0191	0,0380	0,0039
t+3								
t-test	*Diff average*	0,0099	0,0028	-0,0294**	0,1172	0,0017**	0,0153	-0,0130
MW test	*Diff median*	0,0067	0,0034	0,0445	0,1122	-0,0050	0,0066	-0,0113

*Holding period t, t-tests show the average absolute change for target companies in the second period in relation to control firms less target companies in the last period in relation to control firms. Mann-Whitney tests ("MW test") show the median absolute change for target companies in the second period in relation to control firms less target companies in the last period in relation to control firms. Target company is categorized based on time of entry. t+1, t+2 and t+3 shows the development of the same variables following one, two and three years after the exit of the hedge fund. *, **, and *** refers to significance on the 10%, 5% and 1% level, respectively.*

E. List of definitions

Table XXVII: List of definitions

Word	Comment
Activist hedge fund	Investment fund focusing on active ownership through minority block holdings in public markets.
Block holder	A shareholders that is considered significant in terms of the size of its holdings.
Committed capital	Contract between investors and general partners to commit money to a investment fund.
GAAP	Generally Accepted Accounting Principles.
GICS	Global Industry Classification Standard.
IFRS	International Financial Reporting Standards.
Institution	Umbrella term for a firm that manages money for others.
Leveraged buyout	Buying a whole company with substantial debt financing.
Mutual fund	Passive institution. Large mutual funds tends to become block holders.
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne. NACE is the industry standard classification used in Europe.
Pension fund	In general a passive institution. Pension funds tends to become block holders due to the size of their assets under management.
Private equity firm	Investment fund focusing on active ownership through majority block holdings in private markets.
Public market	Market that enables high level of liquidity to a large amount of investors.
SIC	Standard Industrial Classification. SIC is the industry standard classification used in the United States.
Target company	The company that is subject to intervention by a activist hedge fund.
Wolf-pack	A group of activist hedge funds targeting the same company and cooperating to enforce corporate change.

The table illustrates the definitions of some frequently used words and abbreviations. Several of the terms have no absolute definition. Hence, some terms can be defined in a other way, however, the definitions presented in the table corresponds to their content and implications in this study.