DOES THE RISE OF PASSIVE INVESTORS FACILITATE HEDGE FUND ACTIVISM?

AN EMPIRICAL ANALYSIS OF TARGET FIRM VALUE AND OPERATING PERFORMANCE

JAN GUNELL

PHILIP LINDERUM

Does the Rise of Passive Investors Facilitate Hedge Fund Activism? An Empirical Analysis of Target Firm Value and Operating Performance

Abstract:

Recent years have witnessed a concurrent development in U.S. stock ownership with a growing presence of passive investors and an increasing activity of hedge fund activism. This thesis addresses the question whether this development is related, and more specifically, whether the growth of passive investors facilitates hedge fund activism. Using a comprehensive sample of 1,641 activist hedge fund campaigns in the U.S. from 2000 to 2015, we study the long-term effect of passive ownership on the value and operating performance of firms targeted by activist hedge funds. Based on univariate and multivariate analyses, our findings indicate that target firms with a low level of passive ownership tend to outperform target firms with a high level of passive ownership, both in terms of changes in firm value and operating performance. However, we find no statistical support that this tendency for outperformance is attributable to the level of passive ownership. In particular, we find no support for the claim that activist hedge funds would be more successful in creating value and improving the operations in target firms where the level of passive ownership is high.

Authors:

Jan Gunell (41381)
Philip Linderum (41380)

Tutor:

Stina Skogsvik, Assistant Professor, Department of Accounting

Table of Contents

1.   Introduction

Since the rise of activist hedge funds during the 1990's, policymakers, academics and the business community have been ambiguous as to whether activist hedge funds are able to add value to the companies they target or if they are simply myopic corporate raiders (Bebchuk, Brav & Jiang, 2015). Typically, activist hedge funds will acquire a minority stake in a public company ("target firm") and then at any cost strive to improve corporate governance and create shareholder value by e.g. replacing management, increasing operational efficiency or divesting non-core assets (Brav, Jiang, Partnoy & Thomas, 2008). However, since activist hedge funds tend to acquire an ownership stake of 6-10% they rely on the support from other shareholders to enforce their proposed changes (Brav et al., 2008; Greenwood & Schor, 2009; Boyson & Mooradian, 2010). Over time, activist hedge funds have demonstrated that they are a force to be reckoned with as estimates show that about 50% of all S&P 500 firms had an activist hedge fund on their shareholder register at some point between 2009 and 2015 (*The Economist*, 2015). Not even blue-chip companies such as Apple, Microsoft nor Procter & Gamble have been able to bypass this trend as all of them have been subject to an activist hedge fund campaign during recent years. While often being labeled as shortsighted, activist hedge funds tend to improve the operating performance in the firms they target (Bebchuk et al., 2015; Clifford, 2008) and the stock market seem to anticipate these value appreciations as reflected in abnormal returns of 3-9% in target firms upon the announcement of an activist hedge fund intervention (Brav et al. 2008; Clifford, 2008; Greenwood & Schor, 2009; Boyson & Mooradian, 2011; Becht, Franks, Grant & Wagner, 2017).

Amidst this rapid development, there has also been a growing presence of passive institutional investors ("passive investors") with assets under management ("AUM") invested in passively managed funds now exceeding those invested in actively managed funds (Gittelsohn, 2019). The three largest players in passive asset management; BlackRock, Vanguard and State Street, collectively known as "The Big Three", today own c. 7-8% of all the listed shares in the world and 20-25% of all the shares in the S&P 500 (Bebchuk & Hirst, 2019b; McLaughlin, 2020). While the success of passively managed funds has arguably been a favorable development for individual investors due to lower management fees, the impact on firm-level corporate governance has become an area of concern. The large portfolios of passive investors often make them hold the same portfolio companies as their competitors which is why they, in order to improve their relative performance, have incentives to minimize expenses rather than to maximize returns (Bebchuk & Hirst, 2019a). As such, passive investors do not have the same incentives as activist hedge funds to allocate resources to corporate governance. For instance, Bebchuk and Hirst (2019a) find that out of the 3,792 board members nominated to the board of directors of companies listed on Dow Jones between 2007-2018, not a single one was nominated by BlackRock, Vanguard nor State Street. In addition, "The

Big Three" have been documented to vote in line with management in 90% of the proposals put forward at general meetings (Fichtner, Heemskerk & Garcia-Bernardo, 2017) implying a tendency for a status-quo, "pro-management", standpoint.

The inherently different approaches of activist hedge funds and passive investors to corporate governance have resulted in a debate among researchers as to whether the rise of passive investors facilitates or inhibits hedge fund activism. On the one hand, some researchers theorize that the two players complement each other as activist hedge funds can identify poorly managed companies that could benefit from corporate change while passive investors provide the voting power needed to support such proposals (Gilson & Gordon, 2013). Appel, Gormley and Keim (2019) find that shareholder activists[1] are more successful in obtaining board representation, removing takeover defenses as well as pursuing activities related to mergers and acquisitions ("M&A") in firms with high passive ownership with the conclusion that the growth of passive investors should facilitate activism. On the other hand, other researchers argue that the lack of incentives, in combination with inherent business ties to corporate managers, will discourage passive investors from interfering with managers, thus not providing activist hedge funds with the needed voting support (Bebchuk & Hirst, 2019a). This "pro-management" standpoint has been empirically supported by Brav, Jiang, Tao and Pinnington (2018) who find that passive investors are less likely than other institutional investors to support proposals put forth by activist hedge funds. Given the documented ability of activist hedge funds to enforce value-enhancing changes in the firms they target, any facilitation or inhibition should likely translate into greater or fewer opportunities for activist hedge funds to improve target firms' value and operating performance.

Considering these conflicting views, the purpose of this paper is to study the interaction between activist hedge funds and passive investors. While researchers have primarily focused on the interaction between the two players with regards to high-level corporate governance activities, there appears to be a gap in the research of what the outcomes are on an operational level. As such, this paper aims to analyze whether passive investors facilitate or inhibit hedge fund activism with regards to long-term target firm value and operating performance by answering the following research question:

What is the impact of passive ownership on the long-term value and operating performance of firms targeted by activist hedge funds?

By using a comprehensive data sample provided by Professor Alon Brav of Duke University we study 1,641 activist hedge fund campaigns in the U.S. from 2000 to 2015. We measure the abnormal changes in target firms' value and operating performance proxied by Tobin's Q ("Q") and return on assets ("ROA"), respectively, from the year

---

[1] I.e. not only activist hedge funds but also including activism performed by pension funds, individuals and non-profit organizations.

prior to an intervention up to three years following. To establish the impact of passive investors on these campaigns, we collect ownership data for each target firm and use Bushee's (2001) classifications of institutional investors to classify investors as either active or passive. Target firms are subsequently divided into two groups based on the level of passive ownership around the time of an activist hedge fund intervention. The effect of passive ownership on target firms' value and operating performance is analyzed through univariate and multivariate analyses. Our findings suggest that firms with a low level of passive ownership tend to outperform target firms with a high level of passive ownership, both in terms of firm value and operating performance. However, we find no statistical support that this tendency for outperformance is attributable to the level of passive ownership. More specifically, we find no support for the recent claim, and our hypotheses, that activist hedge funds would be more successful in creating value and improving the operating performance in target firms where the level of passive ownership is high.

The remainder of this paper is structured as follows. Section 2 provides a theoretical background to serve as a framework for why the presence of passive investors may influence the outcomes of activist hedge fund campaigns. This is followed by the development of our hypotheses in Section 3. Section 4 outlines our research design, data collection and model specifications. The empirical results are subsequently presented in Section 5 including descriptive statistics, univariate analyses and multivariate analyses. The interpretations, implications and limitations of these findings are discussed in Section 6. Finally, Section 7 presents our concluding remarks as well as our suggestions for future research.

2.   Theoretical Background and Literature Review

To acquire a deeper understanding of the difference between active and passive investors, we begin this section with an overview of different types of investors, how they are structured and what objectives they have. We then provide a theoretical background of the corporate governance dilemma followed by a review of current and past research comparing the differences in how activist hedge funds and passive investors cope with this dilemma as well as other characteristics that have been identified in the respective field. This theoretical background serves as a framework for why the presence of passive investors may influence the outcome of activist hedge fund campaigns.
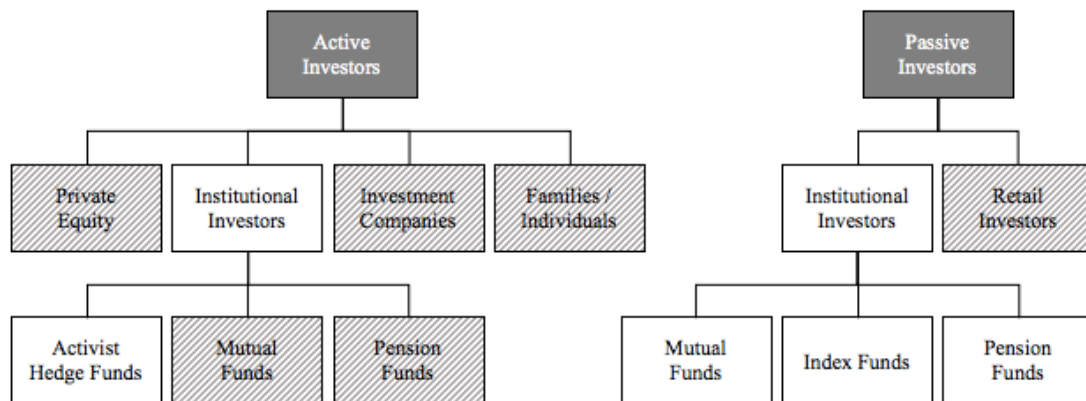
Figure 1. An Overview of Different Types of Investors[2]

There are two main groups of investors: active investors and passive investors. Active investors tend to hold smaller, more concentrated portfolios with larger ownership stakes which leads to better incentives to influence the outcomes of their portfolio companies (Brav et al. 2008). In the public market, active investors include investment companies, families and activist hedge funds who all seek to influence corporate governance and discipline managers to create shareholder value. Actively managed mutual funds could also be seen as active investors as they will exit their positions when companies and their managers are underperforming (Appel, Gormley & Keim, 2016). Passive investors, on the other hand, tend to hold larger, more diversified portfolios which means that their exposure to any single company is often limited. The incentive as well as the possibility to actively get involved in any one of the companies decreases with every additional investment. This is partly due to attention constraints and partly due to the fact that any engagement would have limited impact on the overall portfolio (Bebchuk & Hirst, 2019a). Instead, the objective of most passive investors is to deliver returns close, or precisely, to a benchmark market index (e.g. the S&P 500 or Russell 3000) which is why they will not actively buy and sell shares but rather minimize expenses while increasing

---

[2] White boxes indicate area of interest for this paper.

6

their assets under management (Appel et al., 2016). In this paper the only type of active investor in focus is activist hedge funds and by passive investors we refer to index funds, passively managed mutual funds and passively managed pension funds.

Table 1. Overview of the Characteristics of Activist Hedge Funds and Passive Investors (Brav et al., 2008; Bebchuk & Hirst, 2019a)

	Activist Hedge Funds	Passive Investors
Objective:	Maximize shareholder value	Generate returns similar to a benchmark index at a low cost
Ownership concentration:	Small, concentrated portfolios	Highly diversified portfolios
Regulation:	Unregulated	Regulated
How they operate:	Closed-end fund with capital locked up for a given period	Open-end fund with daily or monthly in- and outflows of capital
Holding period:	Normally 1-2 years	Long
Beneficiary availability:	Not widely available to the public	Widely available to public
Fee structure:	Management fee of typically 1-2% of AUM as well as performance-based fee of 15-25% of profits subject to a hurdle rate	Management fee of typically <1% of AUM
Incentives for monitoring:	High	Low

2.1. The Corporate Governance Dilemma

Public corporations face a dilemma surrounding the separation of ownership and control (Berle & Means, 1936) which gives rise to agency costs when there are conflicting interests between the owners of a company and its managers (Jensen & Meckling, 1979). The role of owners is to monitor managers who have been delegated responsibility for the operations of a company. However, what is in the interest of managers is not always aligned with what is in the interest of owners. While managers have incentives to maximize their personal wealth, owners are concerned about creating, and restoring, shareholder value. For example, managers may be more inclined to retain excess cash than to distribute it to shareholders as it serves as a defense mechanism against possible takeovers (Jensen & Meckling, 1979). Additionally, it mitigates the effect of poor operational outcomes which provides comfort for managers. Attempts to align the interests of owners and managers include incentive schemes such as stock holdings, option programs and bonus systems (Jensen, 1989). If such alignments still do not proof to be effective, investors have two courses of action available to them; either they can "vote with their feet" by selling their shares (Admati & Pfleiderer, 2009) or they can interfere with management and advocate for change. The latter can be done by e.g. raising concerns at shareholder meetings, impacting nominations to the board of directors or engaging in informal discussions with management and other shareholders. Such actions are commonly referred to as shareholder activism defined as initiatives of "[...] monitoring and attempting to bring about changes in the organizational control structure

of firms (targets) not perceived to be pursuing shareholder-wealth-maximizing goals"
(Smith, 1996, p.227). However, investors who do not participate in such initiatives are
still able to benefit from any improvements they generate. This is commonly referred to
as the free-rider problem which significantly reduces investors' incentives to engage in
monitoring activities. The characteristics of different investors also plays a pivotal role
for the outcomes of shareholder activism. Institutional investors tend to hold diversified
portfolios which restricts them from committing full resources to all companies and limits
the impact of any single company's improvement (Bebchuk & Hirst, 2019a). This may
help explain why attempts by institutional investors to engage in shareholder activism
have had limited success (Black, 1998; Karpoff, 2001). On the other hand, the more
concentrated portfolios investors have, the more attention and importance is given to each
company which results in stronger incentives as well as capabilities for improved
governance (Jensen, 1989). This is why activist hedge funds have been successful in
dealing with troubled firms as they devote resources to few, but large, campaigns where
the potential for improvement is the greatest (Brav et al., 2008).

2.2. Activist Hedge Funds

2.2.1. Background

Although there is no exact definition, Brav et al. (2008) explain that activist hedge funds
usually share four set of 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
registration requirements". The typical ownership stake taken by activist hedge funds
ranges from 6-10% with a holding period of 1-2 years (Brav et al., 2008; Greenwood &
Schor, 2009; Boyson & Mooradian, 2010). In contrast to passive investors, activist hedge
funds have a much greater leeway in how they invest their capital as they are unregulated
and thus able to hold smaller, more concentrated portfolios which means that a specific
holding is naturally given a significant importance (Brav et al., 2008). Incentive structures
are another fundamental difference where activist hedge funds to a much larger extent
have performance-based compensation and more "skin in the game" which increases the
incentives to monitor and improve the governance of target firms (Brav et al., 2008;
Clifford, 2008). The fee structure typically comprises an annual management fee of 1-2%
on the assets under management and then a performance-based fee of 15-25% of profits
subject to a hurdle rate (Brav et al., 2008). In addition, most activist hedge funds are
structured as closed-end with limited partners providing capital to the fund and a general
partner managing the fund. This means that the capital is locked-up over a predetermined
period, enabling activist hedge funds to bypass the liquidity risk some mutual funds, both
active and passive, have with daily or monthly in- and outflows to the fund (Clifford,
2008).

2.2.2. Objectives and Tactics

When activist hedge funds in the U.S. acquire a position greater than 5% of the shares outstanding in a company, they are obliged to file a Schedule 13D to the Securities and Exchange Commission ("SEC") stating the intent of being an active owner. The reasons, although non-mutually exclusive, typically range from general undervaluation of the stock, an intention to improve the target firm's capital structure, business strategy or governance functions, or alternatively, plans to pursue M&A related activities (Brav et al., 2008). In approximately 50% of the cases, Brav et al. (2008) find that activist hedge funds disclose general undervaluation of the stock as an intention for engagement, to which critics claim that activist hedge funds are not superior owners but that their success is rather attributable to stock picking. However, in more than 80% of their engagements, activist hedge funds disclose that the reasons behind their engagements are focused on improvements in either: (1) governance functions such as the ousting of a CEO/Chairman; (2) business strategies such as restructuring or improving operational efficiency; or (3) changes to the capital structure such as demands of reducing excess cash. The findings of Brav et al. (2008) are also confirmed by Greenwood and Schor (2009).

Furthermore, the means of which activist hedge funds tend to use when raising their concerns are in most cases concentrated to regular communication with the board/management, as illustrated in Figure 2 below.
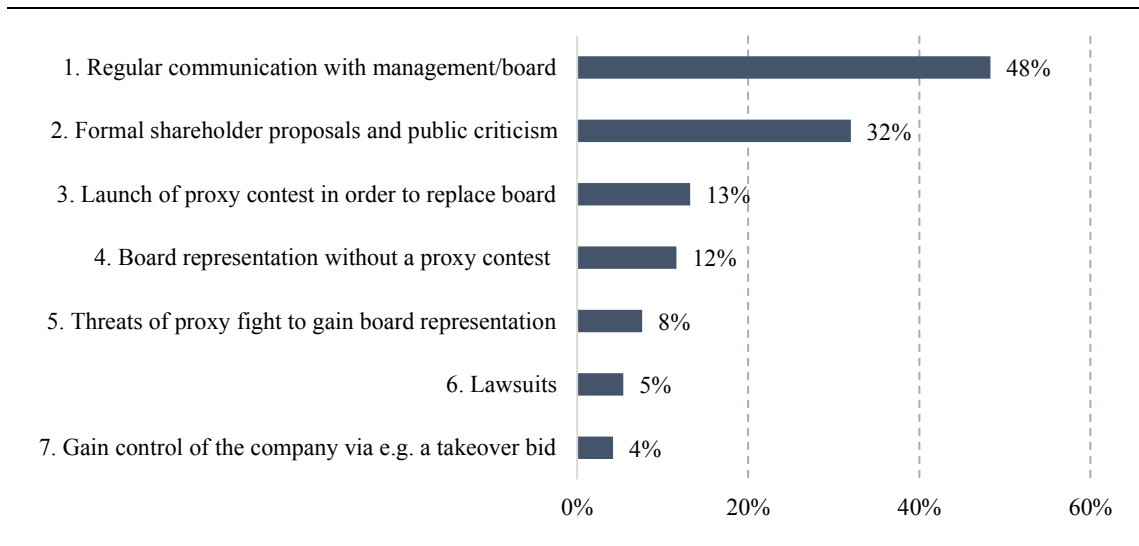

Figure 2. Summary of Tactics Used by Activist Hedge Funds, From Brav et al. (2008)

9

2.2.3. Target Firm Characteristics

Firms targeted by activist hedge funds tend to be smaller, have lower Q^3 values and worse historical stock performances relative to their industry peers which indicates that activist hedge funds are, to some extent, value investors[4] (Brav et al., 2008; Clifford, 2008; Greenwood & Schor, 2009; Klein & Zur, 2009; Boyson & Mooradian, 2011). Furthermore, there have been conflicting findings regarding target firms' profitability relative to peers. For instance, Clifford (2008) and Bebchuk et al. (2015) find that target firms underperform peers prior to intervention while Brav et al. (2008), Klein and Zur (2009) and Boyson and Mooradian (2011) find that they typically outperform their peers prior to intervention. In addition, target firms tend to suffer from lower sales growth, lower payout ratios and lower research and development ("R&D") spending relative to sales prior to intervention (Brav et al, 2008; Clifford, 2008). Lastly, target firms tend to have a larger proportional share of stocks held by institutional investors implying a preference towards firms with a sophisticated ownership base (Brav et al., 2008).

2.2.4. Impact on Stock Returns

As there has been a debate whether hedge fund activism generates value for shareholders, the vast number of researchers within the field has studied market reactions to the announcement of activist hedge funds acquiring an ownership stake in firms. In the novel study conducted by Brav et al. (2008), the authors find that U.S. firms experience abnormal returns of around 7% around the announcement of an intervention by an activist hedge fund. Subsequent researchers find similar results in the U.S. during different event window lengths with abnormal returns ranging from 3.4% to 8.7% (Clifford, 2008; Greenwood & Schor, 2009; Klein & Zur, 2009; Boyson & Mooradian, 2011). The phenomenon of abnormal returns does not seem to be restricted to the U.S. as Becht et al. (2017) find that abnormal returns amount to approximately 9% in Europe, 6% in North America and 3% in Asia. In contrast to prejudicing beliefs that activist hedge funds were to be corporate raiders, the stock market thus appears uniform in the belief that activist hedge funds add value for shareholders, at least in the short-term. Regarding long-term returns, Clifford (2008) finds abnormal monthly returns in target firms ranging from 1% to 1.9% during the three years following an activist hedge fund intervention.

---

[3] Q is a measure of a company's market value of equity and market value of debt in relation to its book value of equity and book value of debt.
[4] Investors who base their investment decisions on fundamental analysis with the aim to acquire a company at a discount to its fair value are referred to as value investors (Swensen, 2010, p.91).

Table 2. Abnormal Returns Around the Announcement Date of an Intervention

Authors	Time Period	Event Date (Days)	Market	Abnormal Return
Becht et al. (2017)	2000-2010	(-20, +20)	Asia	2.7%
Becht et al. (2017)	2000-2010	(-20, +20)	Europe	8.8%
Becht et al. (2017)	2000-2010	(-20, +20)	North America	6.0%
Boyson & Mooradian (2011)	1994-2005	(-10, +10)	U.S.	8.7%
Brav et al. (2008)	2001-2006	(-20, +20)	U.S.	8.4%
Clifford (2008)	1998-2005	(-2, +2)	U.S.	3.4%
Greenwood & Schor (2009)	1993-2006	(-0, +5)	U.S.	3.6%
Klein & Zur (2009)	2003-2005	(-30, +30)	U.S.	10.2%

Table 2 summarizes the findings by different researchers of abnormal returns around the announcement date of an activist hedge fund intervention.

2.2.5. Impact on Firm Value and Operating Performance

Among the body of research on activist hedge fund engagements there has been less focus on the impact activist hedge funds have on the long-term operating performance of the firms they target. Boyson and Mooradian (2011) studied the effects one year following an activist hedge fund intervention. They do not find any statistically significant results with the exception of an industry-adjusted increase in Q significant at the 10 percent level. The lack of uniformly significant results likely stem from the fact that it takes time for the implemented changes to manifest themselves in accounting figures. As such, Clifford (2008) as well as Bebchuk et al. (2015) studied the operational changes for three and five years following an intervention, respectively. Clifford (2008) finds that target firms enjoy improvements in operational efficiency (ROA) during the first two years following an activist hedge fund intervention. The improvements are mainly driven by a reduction in assets, i.e. the denominator, rather than an improvement in earnings before interest, taxes, depreciation and amortizations ("EBITDA"), i.e. the numerator, which decreases. Bebchuk et al. (2015), on the other hand, are able to find results that illustrate how target firms typically underperform peers, measured by Q and ROA, during the time of intervention while improving performance relative to peers during the subsequent five years. Their results indicate that activist hedge funds are not necessarily myopic by boosting short-term profitability at the expense of long-term profitability. Brav, Jiang and Kim (2015) find that ROA deteriorates in target firms during three years prior to activist hedge fund interventions while it reverses for three years following an intervention, further suggesting that activist hedge funds induce productivity improvements. Another aspect of myopic behavior is related to R&D expenditures which Brav, Jiang, Ma and Tian (2018) find that, despite experiencing a reduction in R&D expenditure, target firms' innovation output, as measured by patent counts and citations, increases during the five years following an activist hedge fund intervention.

2.3. Passive investors

2.3.1. Background

Many practitioners as well as academics recognize that consistently generating above-market returns is extremely difficult and would instead recommend a low-cost passive investment strategy (e.g. Kosowski, Timmermann, Wermers & White, 2006; Fama & French, 2010). John Bogle, founder of Vanguard, once famously encapsulated the idea behind passive investing: "Don't look for the needle in the haystack. Just buy the haystack!" (Guthrie, 2020). Most passive investors are regulated with regards to their investment strategies and need for diversification across different securities as well as asset classes (Brav et al., 2008). In order for mutual funds to be classified as diversified, they have to adhere to the 75-5-10 rule stating that: (1) 75% of the securities held must be of an external issuer; (2) no single investment should account for more than 5% of the portfolio; and (3) the fund may not own more than 10% of the issuer's outstanding shares (Investment Company Act of 1940).
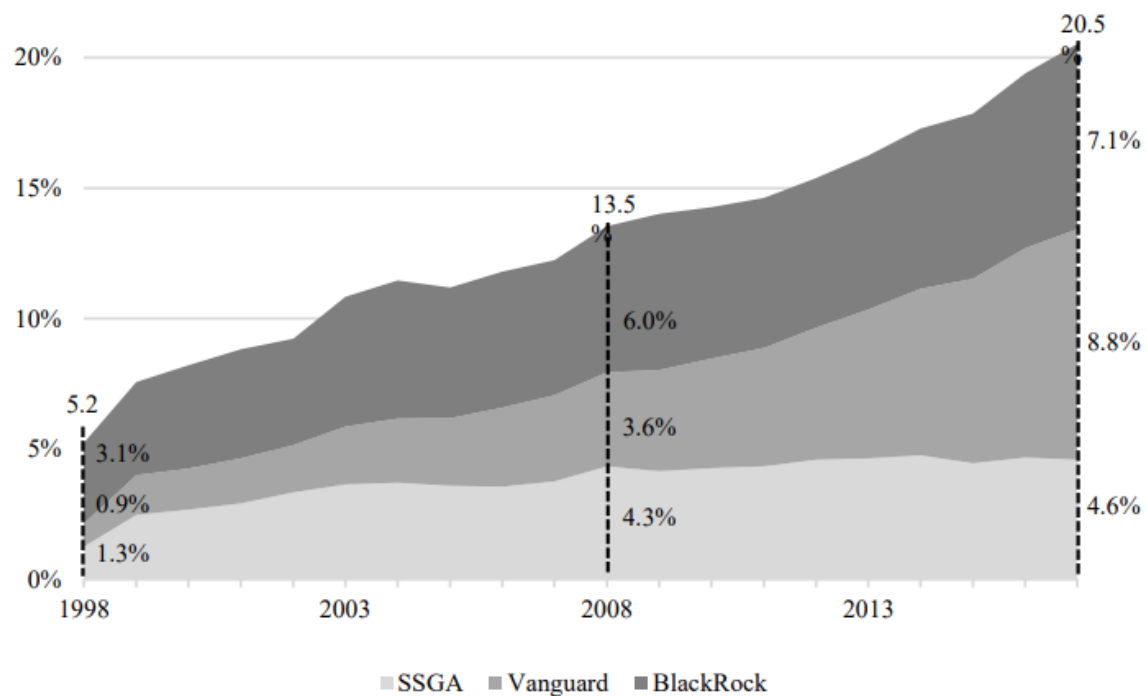
Figure 3. Percentage of Shares on the S&P 500 Held by the Three Largest Passive Investors Over Time, From Bebchuk and Hirst (2019b).

Bebchuk and Hirst (2019b) find that index funds and passively managed equity traded funds ("ETFs") have become the primary passive investment vehicles in today's stock market. An index fund is set up to replicate the return of a specific benchmark index either by full replication or by a sampling strategy. Full replication means that an index fund will construct a portfolio of all the securities included in the specific index and balance the weightings accordingly. A sampling strategy seeks to replicate the risk and return

profile in the index but does not require a fund to hold all the securities included in it (Bebchuk & Hirst, 2019b).

Furthermore, Bebchuk and Hirst (2019b) highlight some structural factors that have paved the way for the success of passive giants such as Blackrock, Vanguard and State Street and provide arguments for why these factors are likely to enable these giants to remain at the forefront in the industry. First of all, there are significant economies of scale associated with operating a large passive fund as the cost base will not be proportional to the fund size, i.e. the majority of all operating expenses will be rather fixed. In contrast to an actively managed fund that will have to invest and heavily allocate resources into research and monitoring of all portfolio companies, a passive fund will have low operating expenses once it is operational. Additionally, Bebchuk and Hirst (2019b) explain that a structural factor that speaks in favor of a continued dominance by the giant passive investors is attributable to the difficulty of disruption from other players as any new index offerings are easily replicable.

2.3.2. Objectives and Tactics

Passive investors such as index funds have incentives to minimize tracking errors from their benchmark index. As their competitors tend to hold the same companies, passive investors would not be able to improve their relative performance with increased efforts to enforce corporate governance gains (Bebchuk & Hirst, 2019a). Consequently, they compete on costs rather than returns which is why they will aim to minimize any expenses in carrying out their replication and aim to increase its assets under management in order to maximize management fees (Appel et al., 2016). For any institutional investor, the agency dilemma is ever imminent as decisions that are in the interest of the fiduciary does not necessarily translate to a gain for the beneficiary[5]. However, for passive investors, the agency dilemma should become less of an issue as their investment decisions should not be influenced by other objectives than to replicate the returns of a benchmark index. At the same time, concerns have been raised in situations when there are ties between the sponsors of a passive fund and a portfolio company the fund is invested in (Fisch, Hamdani & Solomon, 2019). These ties can be problematic either due to private relationships, or due to formal relationships when company-sponsored pension plans are invested in a passive fund. Consequently, this would allow managers to influence its own shareholders as they on the one hand act as an investor to the fund and on the other hand as a portfolio company of that same fund. This may lead passive investors to vote to support management to a larger extent thus creating a circular dilemma of conflicting interests (Bebchuk & Hirst, 2019a).

---

[5] In an institutional setting, fund managers have a fiduciary responsibility to act on behalf of its beneficiaries, i.e. its investors.

2.3.3. Impact on Corporate Governance

While the rise of passively managed funds has arguably been a favorable development for individual investors due to lower management fees, the impact on firm-level corporate governance has become an area of concern. The three giants in passive asset management, BlackRock, Vanguard and State Street, today own c. 7-8% of all the listed shares in the world and 20-25% of all shares included in S&P 500 (Bebchuk & Hirst, 2019b; McLaughlin, 2020). However, although they hold 10,000-15,000 portfolio companies each, BlackRock, Vanguard and State Street still only employ 10-25 people each who are dedicated to corporate governance activities (Krouse, Benoit & McGinty, 2016). This inadequate equation gives rise to the attention constraints of passive investors who are not able to devote the same amount of monitoring to all portfolio companies. These constraints weaken the governance of firms as the lack of monitoring by investors has been documented to result in myopic decision making by managers (Burns, Kedia & Lipson, 2010; Kempf, Manconi & Spalt, 2017).

The key governance mechanism applied by passive investors is the use of their large voting blocks in formal proposals put forth by other shareholders (Appel et al., 2016; Schmidt & Fahlenbrach, 2017). While passive investors might lack the resources to get actively involved in firm-specific operational issues, they have the possibility to enforce more general, high-level corporate governance practices they find to be commonly applicable for a larger set of companies given their holistic experience across industries. For instance, Appel et al. (2016) find that passive investors can prove valuable in ensuring *basic* corporate governance activities such as board independences, removal of takeover defenses, such as poison pills[6], and equal voting rights for shareholders. However, Schmidt and Fahlenbrach (2017) find that passive investors may have a value-destroying impact on more *resource-heavy* corporate governance activities such as elections of board members and monitoring of M&A related activities. These results are not necessarily contradictory but rather complementary as they further illustrate the notion of passive investors being good at high-level, generally applicable, governance while less so when it comes to firm- or industry-specific monitoring activities (Schmidt & Fahlenbrach, 2017). The findings of Schmidt and Fahlenbrach (2017) is supported by Bebchuk and Hirst's (2019a) who find that out of 3,792 nominations to the board of directors of companies listed on Dow Jones between 2007-2018, not a single one was nominated by the three passive investor giants Blackrock, Vanguard nor State Street. In addition, "The Big Three", in conjunction with other mutual funds, have been documented to vote in line with management in 90% of the proposals put forward at general meetings (Fichtner et al., 2017).

---

[6] "Poison pills are takeover defenses issued by a firm's board of directors that can dramatically increase the cost that a hostile buyer would have to pay to acquire the firm" (Davis, 1991, p.583). For instance, following the disclosure of a minority stake by activist investor Carl Ichan in 2012, Netflix adopted a poison pill which allowed its then current shareholders to acquire two shares for the price of one if an outside investor would acquire more than 10% of the shares outstanding (Richwine, 2012).

2.3.4. Impact on Firm Value and Operating Performance

There is a lack of research with regards to the impact of passive investors on firm's operating performance which could be due to the notion that passive investors seldom engage in firm-specific corporate policies which makes it difficult to establish a causal linkage. However, while finding no evidence that passive ownership is associated with changes in e.g. leverage, capital expenditure, R&D expenditure or relative cash holdings, Appel et al. (2016) find some evidence in sub-samples of their study where passive ownership is related to an improvement in future operating performance in terms of Q and ROA.

2.4. The Interaction Between Activist Hedge Funds and Passive Investors

From a theoretical perspective, some researchers argue that passive investors and activist hedge funds complement each other and can together address some of the governance problems facing public corporations. For example, in the view of Gilson and Gordon (2013), activist hedge funds play an important role in identifying poorly managed companies that could benefit from corporate changes but lack the voting power to enforce such changes themselves. Passive investors, on the other hand, do not typically identify firm-specific problems but they can provide the voting power needed to implement changes proposed by activist hedge funds. In line with this reasoning, Appel et al. (2019) have studied the effect passive investors have on the campaigns, tactics and success of all types of shareholder activists[7]. The authors find that shareholder activists to a larger extent seek board representation, use more confrontational tactics and set more ambitious goals when intervening in firms with a higher level of passive ownership. They are also able to show that shareholder activists are more successful in obtaining board representation, removing takeover defenses as well as pursuing M&A related activities in these cases. Furthermore, they find that higher passive ownership is associated with an increased likelihood that shareholder activist campaigns result in higher firm value as measured by initial stock returns around the announcement date of a shareholder activist engagement. As a result, the authors conclude that the growth of passive investors should facilitate activism. However, there have also been opposing voices raised to this statement where, e.g., Bebchuk and Hirst (2019a) argue that the lack of incentives, in combination with inherent business ties to corporate managers, will discourage passive investors from confronting management. It would also prevent passive investors from providing the needed voting support to activist hedge funds. This "pro-management" standpoint has been empirically supported by Brav, Jiang, Tao and Pinnington (2018) who find that passive investors are less likely than other institutional investors to support proposals put forth by activist hedge funds.

---

[7] I.e. not only activist hedge funds but also including activism performed by pension funds, individuals and non-profit organizations.

2.4.1. Illustrative Examples

2.4.1.1. Trian Partners and DuPont

In August 2013, activist hedge fund Trian Partners, led by American businessman Nelson Peltz, announced it had accumulated a 2.7% stake in the industrial giant DuPont. Trian Partners had identified significant potential for improvements in corporate governance, urging for cost control and change to the company's conglomerate structure. As a result, the activist hedge fund launched a public proxy campaign in the fall of 2014 to replace four executives on the board of directors. DuPont, under the leadership of CEO Ellen Kullman, responded by targeting passive investors to rally support for the upcoming vote. People familiar with the process reported that "DuPont took its case directly to the index funds, traditionally 'passive' investors and other governance and voting professionals throughout the campaign" (Brownstein, Katz, Niles & Rosenblum, 2015). Such a strategy proved successful as the management of DuPont was able to gather the support from all "The Big Three", i.e. BlackRock, Vanguard and State Street, resulting in a victory with 53.5% of the votes. Interestingly, however, almost all the actively managed funds voted in favor of Trian Partners (Brav, Jiang, Tao & Pinnington, 2018; Gara, 2015).

2.4.1.2. Elliott Management and Telecom Italia

Elliot Management, a U.S. based activist hedge fund run by Paul Singer, acquired a 9% stake in the Italian telecommunications company Telecom Italia in the spring of 2018. The activist hedge fund was concerned about the company's poor governance, general performance and potential conflicts of interest with its majority shareholder, media conglomerate Vivendi, who controlled 24% of the company (Reid, 2018). Vivendi stood accused of benefiting from the services of Telecom Italia as an affiliated company at the expense of other shareholders. Thus, one of the arguments Elliott presented to shareholders was that Telecom Italia should restructure its product portfolio, highlighting that the company "is uniquely positioned in the Italian market and operates an outstanding collection of assets that, if properly managed, should produce substantial, consistent returns" (*Bloomberg*, 2018). Elliott's campaign to replace the board attracted a lot of attention and the vote ultimately came down to the 7% stake collectively held by BlackRock, Vanguard and State Street. Shareholders were asked to either go with the proposal of Elliott, which included the nomination of 10 independent Italian professionals, or the proposal of Vivendi, which included a list of its own employees and its CEO as the proposed Chairman. BlackRock, Vanguard and State Street all decided to cast their votes on Elliott's proposal which was sufficient to win the vote (Mahtani, 2018).

3.   Development of Hypotheses

The dynamics between the inherently different characteristics of activist hedge funds and passive investors open for intriguing questions regarding high-level corporate governance as well as firm-level operational impact. As illustrated in Section 2.4, there is currently no consensus in how the interplay between activist hedge funds and passive investors on a corporate governance level turns out, and neither has the operational outcomes been established. We recognize that the interaction between the two could have two potential outcomes. Either the large ownership stakes of passive investors facilitate hedge fund activism as it enables activist hedge funds to rally support from fewer, larger block holders (Appel et al., 2019). This would lead to greater opportunities for operational improvements. Alternatively, the "pro-management" standpoint from passive investors makes them side with management and inhibits hedge fund activism thus leading to fewer opportunities for operational improvements (Brav, Jiang, Tao & Pinnington, 2018; Fichtner et al., 2017).

However, as there is a positive association between abnormal returns and the level of passive ownership in firms around the time of shareholder activist intervention (Appel et al., 2019), there is reason to believe that the stock market anticipates the interaction between activist hedge funds and passive investors to be more likely to result in future value creation. Any potential value creation should reasonably reflect improvements in operating performance if activist hedge funds are able to enforce more effective operational changes and corporate policies in the interaction with passive investors. Hence, the most compelling argument is that passive ownership should facilitate hedge fund activism and consequently, our hypotheses are as follows:

Hypothesis 1 (H1): *Passive ownership in target firms has a positive impact on long-term target firm value*

Hypothesis 2 (H2): *Passive ownership in target firms has a positive impact on long-term target firm operating performance*

4. Methodology

4.1. Research Design

In order to operationalize our research question, the development of long-term firm value and operating performance is compared to a model of expected performance up to three years following an intervention by an activist hedge fund. Firm value is proxied by Q while operating performance is proxied by ROA which is further explained in Section 4.1.1. The model of expected performance is outlined in Section 4.1.2 and the event period is defined in Section 4.1.3. To measure the impact of passive ownership, target firms are divided into two groups: Group A and Group B. Group A contains target firms that have a relatively high level of passive ownership while Group B contains firms with a relatively low level of passive ownership. This is described in more detail in Section 4.1.4. Subsequently, we test whether the changes in abnormal performance during the event period of three years following an activist hedge fund intervention is different between the two groups. Lastly, we conduct a series of multiple linear regressions on the changes in abnormal performance to test whether passive ownership is a determinant of abnormal performance while controlling for other factors. The tests and the regressions are described in further detail in Section 4.3.

4.1.1. Measures of Firm Value and Operating Performance

To empirically evaluate our hypotheses, we identify two accounting ratios commonly used in financial academia in general and within research on activist hedge funds in particular (e.g. Boyson & Mooradian, 2011; Bebchuk et al., 2015). For value creation we use Q which is the sum of a company's market value of equity and market value of debt in relation to its book value of equity and book value of debt. Bebchuk et al. (2015) argue that Q is able to capture the value appreciation attributable to investors while it also allows for measures of efficiency in governance practices and ownership structures. Despite the fact that many firms may have publicly traded debt such as bonds as well as non-traded debt such as loans, we make a simplified assumption that the market value of debt is equal to the book value of debt in accordance with other research of this kind (e.g. Brav et al., 2008; Bebchuk et al., 2015).

$$Q_{i,t} = \frac{Market\ value\ of\ equity_{i,t} + market\ value\ of\ debt_{i,t}}{Book\ value\ of\ equity_{i,t} + book\ value\ of\ debt_{i,t}} \tag{1}$$

To measure operating performance, we focus on ROA defined as EBITDA divided by the opening book value of total assets (Brav et al., 2008). ROA is a solid accounting ratio to study for analyses on operating performance as it captures both profitability and capital

efficiency. ROA is derived from the EBITDA-margin, a reflection of the earnings power of a business, multiplied by the asset turnover, which in turn is a measure of how efficiently a company can generate sales from its assets. It is important to note that ROA can be defined differently, with for instance EBIT instead of EBITDA and the average book value of assets instead of the opening book value of assets. Our choice of EBITDA stems partly from the fact that it seems to be the most common among studies of this kind (e.g. Brav et al., 2008; Clifford, 2008; Klein & Zur, 2009; Bebchuk et al., 2015) and partly because it allows for better comparison across firms as it e.g. disregards the effect of different depreciation schemes in addition to acquisition related effects captured in amortizations. The choice of opening book value of assets rather than the average is due to that the use of average assets would lead to a higher level of data attrition since firms in our sample lack accounting data for certain years. For instance, by using the average book value of assets where one firm lacks data for one year, two years' worth of data would be lost simply because it is not possible to calculate the average. A way to overcome this would be to follow Bebchuk et al. (2015) who use the average book value of assets but use the closing book value of assets for firms that lack data during one of two consecutive years. However, we argue that such a method would not be viable since it ultimately ends up comparing two different measures.

$$ROA_{i,t} = \frac{EBITDA_{i,t}}{Book\ value\ of\ assets_{i,t-1}} \tag{2}$$

4.1.2. Model of Expected Performance

In order to determine any abnormal changes in firm value and operating performance in our sample firms, we must first establish what the normal, or expected, changes are in firm value and operating performance for these firms. We thus construct a benchmark of control firms to which changes in firm value and operating performance of our sample firms can be compared. Barber and Lyon (1996) highlight three viable options that researchers typically use for constructing a set of control firms, namely by matching on: (1) industry; (2) industry and size; and (3) industry and pre-event performance. In line with Bebchuk et al. (2015), we choose to apply option (1) and match our control firms based on industry classification. When matching on industry, researchers typically do this either by matching control firms on the two-digit- or the four-digit SIC[8] code (Barber & Lyon, 1996). The evident tradeoff is that the four-digit SIC code provides fewer, but more similar, control firms to our target firms while the two-digit SIC code provides a significantly larger set of control firms but with a broader industry classification. The four-digit SIC code does not provide any stronger statistical power than the two-digit SIC code (Barber & Lyon, 1996) and as matching on the four-digit SIC code would in some cases result in only a couple of control firms, we choose to match on the two-digit SIC

---

[8] SIC (Standard Industrial Classification) codes are used in the U.S. for categorizing what industry a company belongs to, based on its business activities.

code. We exclude any target firms that have less than five control firms within its industry. Going forward we denote *P* as the performance of target firm *i* in year *t,* and *PI* as the performance of control firms within the same industry as target firm *i* in year *t*. Equation 3 outlines how the expected performance of target firms could be assumed to be equal to the level of industry performance:

$$E(P_{i,t}) = PI_{i,t} \tag{3}$$

However, one limitation with equation 3 is that it ignores the pre-event performance of target firms in relation to their industries. For example, if a target firm has been performing considerably worse than its industry peers over the years before it gets targeted, it would be unreasonable to assume that it would perform in line with the industry in the short term. The deviation from the expected performance would thus be understated. To overcome this drawback, Barber and Lyon (1996) recommend using a change-oriented model where the historical performance of target firms in relation to their industry is considered. This modified specification then states that the expected change in performance of a target firm is equal to the change in the industry performance:

$$E(\Delta P_{i,t}) = (PI_{i,t} - PI_{i,t-1}). \tag{4}$$
$$= \Delta PI_{i,t} \tag{5}$$

It is important to note that when evaluating the change in firm value and operating performance, we study the absolute change rather than the relative change. For example, an increase in ROA from 5 percent to 10 percent is defined as an increase of 5 percentage points rather than an increase of 100 percentage points. Both Q and ROA are already composed as relative values, if we were to study the relative change it would be problematic for low and negative values. Target firms who experience losses would need to be excluded and target firms who start out from low levels would be treated as extreme values. Not only would this result in a loss of observations but it would also bias the test statistic (Barber & Lyon, 1996). With this in mind, we are now able to define the abnormal change in performance, *ΔAP*, for target firm *i* during year *t,* as the observed change in performance, *ΔP*, less the expected change in performance, *E(ΔP)*:

$$\Delta AP_{i,t} = \Delta P_{i,t} - E(\Delta P_{i,t}) \tag{6}$$

4.1.3. Event Period

In line with Clifford (2008), we measure the abnormal change in performance for target firms over a period of up to three years following an intervention, that is until *(t+3)*. The abnormal change in performance is consistently based on the year prior to the activist hedge fund intervention, denoted *(t-1)*. This is to ensure that the base performance is unaffected by the presence of the activist hedge fund, in line with other research of this

kind (e.g. Clifford, 2008; Boyson & Mooradian, 2011). One could argue that the event period should match the holding period of an activist hedge fund. While this would be interesting to analyze it is neglected primarily due to two reasons. Firstly, regardless of how long the holding period of an activist hedge fund is, it is reasonable to assume that the governance functions they put in place will bear long-term effects and not diminish directly after their exit. For example, if an activist hedge fund pursues the divestment of a business unit it will likely significantly reduce the asset base and not reverse immediately. This argument also validates a longer event period than the documented activist hedge fund holding period of 1-2 years (Brav et al., 2008; Greenwood & Schor, 2009; Boyson & Mooradian, 2011) as operational changes take time to manifest themselves. Secondly, it is difficult to accurately determine the exit date of an activist hedge fund as they still may own shares corresponding to less than the 5% threshold for regulatory filings which serves as public documentation of their positions.

4.1.4. Definition of Passive Ownership

We use Bushee's (2001) classifications of institutional investors to classify investors as active or passive. He classifies institutional investors as either "quasi-indexers", "transient" or "dedicated" based on parameters such as portfolio diversification and turnover. In line with e.g. Appel et al. (2016) and Schmidt and Fahlenbrach (2017), we classify the first definition as passive and the latter two as active. One potential issue with the classifications constructed by Bushee (2001) is that fund managers often manage a large number of funds that frequently have classifications that change over the years. To overcome this, Bushee (2001) has provided a permanent manager classification number that aggregates fund holdings on a manager level and makes the fund manager classification permanent over time. We acknowledge here that a potential drawback of using the permanent classification number is that a fund manager can be classified as active while still managing a few funds that are passive. However, we follow Appel et al. (2016) who uses the permanent classification number as it is not likely to affect the results. The practical steps of collecting this data is outlined in Section 4.2.3. Other viable methods to classify investors include analyses of the fund name to detect any string of text that would imply that it is an index fund, or if the CRSP[9] Mutual Fund database classifies it as an index fund, and then classify all other funds as active (Appel et al., 2016, 2019).

After having classified investors as either active or passive, we subsequently divide our sample into two groups: (1) Group A consisting of target firms with a high level of passive ownership and; (2) Group B consisting of target firms with a low level of passive ownership. The level of passive ownership is based on the average ownership stake during the year prior to, *(t-1)*, and during the year of intervention, *(t=0),* by an activist hedge fund. The cut-off for determining the group allocation is then based on the median value

---

[9] The Center for Research in Security Prices

of this level of passive ownership. As this is a critical measure, three robustness tests of this procedure are performed in Section 6.3. First, we calculate the median value by year instead of the whole sample period as the growth of passive investors has increased during recent years (Section 6.3.1.). Secondly, we adjust the cut-off for determining the group allocation by calculating the top and bottom quartiles rather than the median value (Section 6.3.2.). Lastly, we determine passive ownership based on the average ownership stake for the *three* years around intervention, that is *(t-1), (t=0)* and *(t+1),* rather than only measuring it for *two* years around intervention, that is *(t-1)* to *(t=0)* (Section 6.3.3.). Nevertheless, with our primary approach, this means that Group A consists of the target firms where the passive ownership is greater than 35.1% and Group B of target firms where the passive ownership is less than, or equal to, 35.1% and is illustrated in Table 3 below. The percentage of passive ownership in target firms varies from 0.2% of the shares outstanding up to 79.2% where the first quartile is 17.6% and the third quartile is 51.5%. The mean and median percentage of passive ownership is 35.2% and 35.1%, respectively, with a standard deviation of 20.7%.

Table 3. Distribution of Passive Ownership Around the Time of Intervention

Variable	N	Mean	Std Dev	Min	Q1	Median	Q3	Max
Passive Ownership	1,641	35.2%	20.7%	0.2%	17.6%	35.1%	51.5%	79.2%

Table 3 shows the distribution of average passive ownership in target firms around the time of an activist hedge fund intervention, that is *(t-1)* and *(t=0)*.

The reasoning behind establishing the passive ownership stake around the time of intervention is that corporate decisions made by the activist hedge funds take time to manifest themselves (Bebchuk et al., 2015) and actions taken at time *(t)* may not be adequately illustrated in the reported accounting figures until a couple of years later. In addition, as activist hedge funds reportedly have a holding period of 1-2 years (Brav et al., 2008; Greenwood & Schor, 2009; Boyson & Mooradian, 2011), the majority of actions taken by activist hedge funds are most likely to be taken early on in order for them to reap the benefits of such corporate changes. As such, measuring passive ownership during the years following the intervention does not seem to be as critical. Another viable option for measuring passive ownership would be to use a continuous variable, i.e. the actual percentage held by passive investors. However, doing so is troublesome since it is theoretically unreasonable that an incremental change of e.g. 2 percentage points around low levels of passive ownership would have the same effect as it would around high levels of passive ownership or around controlling thresholds. In other words, an increase from e.g. 2% to 4% of total ownership is unlikely to have the same effect as an increase from 49% to 51% which means that any estimated marginal effect would be unreliable.

4.2.   Sample Selection and Data Collection

Although activist hedge funds have become a global phenomenon, the U.S. market still presents unrivaled advantages to conduct this kind of study due to the mere volume of firms targeted by activist hedge funds in combination with the accessibility of data regarding activist hedge fund events and classifications of investors. As such, we limit the geographical scope to the U.S. A comprehensive table of information regarding which databases were accessed for collecting the respective data items, and what their corresponding data codes are, is presented in Appendix B.

4.2.1.   Activist Hedge Fund Events

The first crucial step when conducting a study of this kind is to identify and verify the specific events when activist hedge funds acquire their initial ownership stakes in target firms. This is typically a very tedious and time-consuming task as there is no comprehensive database covering these types of engagements. As such, it appears customary among researchers in the U.S. to hand-collect the data by identifying Schedule 13D filings via SEC's system EDGAR (e.g. Brav et al. 2008, 2015; Clifford, 2008). A 13D filing is an official announcement stating the intent to be an active owner in a public firm required to be issued by investors in the U.S. when the acquirer crosses a 5% ownership threshold. The statement needs to be issued within 10 days of acquiring such an ownership stake. An issue with such a method, however, is that it only captures the fraction of engagements where activist hedge funds cross the 5% threshold potentially neglecting a significant number of events. To mitigate such a shortcoming, and in order to verify event dates, researchers typically extend the process via news searches in Factiva to find engagements below 5% of ownership.

By contacting Professor Alon Brav at Duke University, we were fortunate enough to bypass this extensive search process as we were provided with an extended version of the dataset of activist events used in Brav et al. (2008, 2015). This comprehensive dataset contains 4,260 activist hedge fund events from 1994 to 2016. The dataset includes information on the acquiring hedge funds' names, identifiers of the target firms such as CUSIP[10]-codes, Global Company Keys ("GVKEYs") as well as the date of the initial investment. By using the dataset from Brav et al. (2008, 2015) we limit the selection bias in our sample as a manual hand-collection from our part would likely be focused on news searches that to a greater extent is biased towards those cases where activist hedge funds have gained the most media attention and thus possibly achieved the most extreme outcomes.

In line with our intention to measure long-term effects up to three years following an intervention, we cap the dataset to include events up until 2015 allowing for us to collect

---

[10] The Committee on Uniform Security Identification Purposes

financial- and ownership data until year end 2018. Due to the lack of data availability we also exclude events prior to 2000 which means that our final sample includes events from 2000 to 2015. Sometimes multiple activist hedge funds target the same company. This can either take place at, or around, the same time when multiple activist hedge funds team up and together target the same company, a joint effort commonly referred to as "wolf packs". It could also be multiple investments that occur independent of each other. In both these cases a single target firm can thus constitute multiple events. As such, in line with Clifford (2008), we only include the investment made by the first activist hedge fund and exclude any subsequent investments in the same target firms for a period of two years. Table 4 illustrates how our initial data processing reduces the sample from 4,260 to 2,663 events.

4.2.2. Financial Data

To collect financial data on firm value and operating performance we access Compustat available from Wharton Research Data Services ("WRDS") and use the target firms' GVKEYs as the identification code. Another alternative would be to use CUSIP-codes, but we find the GVKEYs to be more accurate for our sample. We collect data on an annual basis as we are interested in data points from two years before an intervention to three years following, that is from *(t-2)* to *(t+3)*, which means we treat each calendar year's events separately. While the study is focused on the time period *(t-1)* to *(t+3)* it is necessary to have data during *(t-2)* to be able to compute growth and return metrics. We still keep the events in which data points are missing for an entire year in order not to suffer from selection bias, in line with Bebchuk et al. (2015). Still, 520 target firms lack sufficient financial data and are excluded from the sample. We repeat this procedure in order to collect the same financial data for our control firms in Compustat based on the two-digit SIC code. We exclude any target firms that have less than five control firms within their industry and lose seven observations based on this criterion.

4.2.3. Ownership Data

In order to collect information on ownership data of the target firms, we access the S34 database provided by Thomson Reuters via WRDS that covers institutional investors on a fund manager level. This database includes all stocks held by institutional investors on all stock exchanges in North America. The data is based on the Form 13F that institutional investors with more than USD 100m in AUM have to file with the SEC on a quarterly basis. In some cases, Thomson Reuters reports the incorrect total number of shares outstanding in a company which is why we follow the recommendation of WRDS and collect this data from CRSP, in line with Appel et al. (2016, 2019). This allows us to sum all shareholdings per institutional investor in a company and divide this figure by the total shares outstanding. We then match the manager numbers collected from the S34 database with Bushee's (2001) classifications in order to classify investors and determine the percentage of passive ownership in a target firm by its reporting date. We measure this

on an annual basis in accordance with the financial data. When ownership data is missing for a target firm during the year prior to, and during, intervention, either from the S34 database or from Bushee's (2001) classifications, we exclude these events losing 495 events. The final sample selection of 1,641 events is illustrated in Table 4 below.

Table 4. Sample Selection

Comment	Number of events
Gross list provided by Alon Brav with events from 1994-2016	**4,260**
- Events before 2000	-587
- Events after 2015	-246
- Missing data on identification codes	-172
- Firms targeted multiple times	-592
After first sample selection	**2,663**
Financial data	
- Missing financial data from Compustat	-520
- Less than five control from in its industry with available data	-7
After financial data	**2,136**
Ownership data	
- Missing ownership data or investor classifications	-495
After ownership data	**1,641**
Final sample	**1,641**

4.3. Statistical Testing

The evaluation of our research question and hypotheses is conducted through two steps of statistical testing. The first step is a series of univariate tests where we begin by comparing the actual change in performance of target firms in Group A and Group B with their expected performance to determine the abnormal change. The groups are compared to each other to test whether the abnormal change in performance of Group A develops differently relative to its control group vis-à-vis Group B. These univariate tests enable us to evaluate whether target firms with a high level of passive ownership (Group A) perform differently from target firms with a low level of passive ownership (Group B). Any such differences give an indication whether the level of passive ownership affects activist hedge funds' ability to improve the operations in target firms. However, in order to validate the results, we conduct a second type of statistical testing. That is, we run a series of multiple linear regressions on the abnormal changes in performance to further establish whether passive ownership is a determinant to abnormal changes in Q and ROA while controlling for other factors.

4.3.1. Univariate Analysis

In order to test whether the abnormal change in performance of target firms in each group differs from their respective change in expected performance, we conduct two tests: the one-sample t-test and the Wilcoxon signed rank test. The t-test establishes whether the *average* abnormal change in performance is different from zero, i.e. that the actual

average change in performance is equal to the expected average change in performance. The Wilcoxon signed rank test establishes whether the *median* abnormal change in performance is different from zero. Subsequently, we test whether the abnormal change in performance differs in Group A vis-à-vis Group B where the two-sample t-test is used for *averages* while the Mann-Whitney test is used for *medians*. The tests of differences give an indication as to whether passive ownership has an impact on target firm value and operating performance without taking other factors into consideration. As such, the tests of differences in Q test H1 whereas the tests of differences in ROA test H2.

It is important to mention that t-tests rely on three separate assumptions, i.e. that the variables in the sample are: (1) normally distributed; (2) continuous; and (3) independent. A Shapiro-Wilk test is conducted to test the data for normality which indicates that the data is indeed normally distributed and significant at the 1% level after a winsorization on the 1st and 99th percentiles. Since the variables in the sample are accounting based by nature, thus being able to take on any value, the assumption of continuity holds as well. Finally, the assumption of independence also holds as the target firms have been removed from the control group thus not affecting their own expected performance. In contrast to the t-tests, the Wilcoxon signed rank and the Mann-Whitney tests are non-parametric which means that they do not rely on any assumption regarding the distribution of the data. According to Barber and Lyon (1996), non-parametric tests such as the Wilcoxon signed rank test are uniformly more powerful than parametric tests such as the t-tests when samples contain extreme values. However, when the data is winsorized at the 1st and 99th percentiles, the power is typically similar across both types of tests.

4.3.2. Multiple Regression Analysis

We subsequently turn to a multiple regression analysis in order to establish whether the level of passive ownership is a determinant of abnormal changes in performance. All regressions are adjusted for heteroskedasticity as well as clustering at the industry-level since certain variables are likely to be correlated within an industry, e.g. growth.

In order to validate the results from the univariate analysis on Q, a first regression (1) is run with the abnormal changes in Q since the year prior to an intervention *(t-1)* as the dependent variable, which serves as a proxy for abnormal changes in firm value, and (*PassiveHigh)* as the independent variable of interest with a range of control variables. Consequently, the following regression is run for H1:

Regression (1):

$$\Delta Q_{i,t} = \beta_0 + \beta_1 PassiveHigh_{i,t} + \beta_2 \Delta Growth_{i,t} + \beta_3 \Delta Leverage_{i,t}$$
$$+ \beta_4 \Delta Profitability_{i,t} + \beta_5 Size_i + \beta_6 Age_i + \gamma_n Year_{i,t} + \varepsilon_{i,t} \qquad (7)$$

Where:
i represents target firm
t represents relative year from year of intervention
ΔQ = abnormal change in Q since one year prior to intervention, *(t-1)*, until *(t)*
PassiveHigh = 1 if a target firm has an above-median level of passive ownership around the time of intervention
ΔGrowth = abnormal change in sales growth since one year prior to intervention, *(t-1)*, until *(t)*
ΔLeverage = abnormal change in leverage since one year prior to intervention, *(t-1)*, until *(t)*
ΔProfitability = abnormal change in EBITDA-margin since one year prior to intervention, *(t-1)*, until *(t)*
Size = the natural logarithm of a firm's market capitalization at one year prior to intervention, *(t-1)*
Age = the natural logarithm of the number of years since the firm first appeared in the merged CRSP/Compustat database at one year prior to intervention, *(t-1)*
Year = yearly dummies equal to 1 depending on year of intervention

In order to validate the results from the univariate analysis on ROA, a second regression (2) is run with the abnormal changes in ROA since the year prior to an intervention *(t-1)* as the dependent variable, which serves as a proxy for abnormal changes in operating performance, and (*PassiveHigh)* as the independent variable of interest with a range of control variables. Consequently, the following regression is run for H2:

Regression (2):

$$\Delta ROA_{i,t} = \beta_0 + \beta_1 PassiveHigh_{i,t} + \beta_2 \Delta Growth_{i,t} + \beta_3 \Delta Leverage_{i,t}$$
$$+ \beta_4 Size_i + \beta_5 Age_i + \gamma_n Year_{i,t} + \varepsilon_{i,t} \qquad (8)$$

Where:
i represents target firm
t represents relative year from year of intervention
ΔROA = abnormal change in ROA since one year prior to intervention, *(t-1)*, until *(t)*
PassiveHigh = 1 if a target firm has an above-median level of passive ownership around the time of intervention
ΔGrowth = abnormal change in sales growth since one year prior to intervention, *(t-1)*, until *(t)*
ΔLeverage = abnormal change in leverage since one year prior to intervention, *(t-1)*, until *(t)*
Size = the natural logarithm of a firm's market capitalization at one year prior to intervention, *(t-1)*
Age = the natural logarithm of the number of years since the firm first appeared in the merged CRSP/Compustat database at one year prior to intervention, *(t-1)*
Year = yearly dummies equal to 1 depending on year of intervention

4.3.2.1.   Dependent Variables

The dependent variables of interest in our regressions are the abnormal changes in Q and ROA since the year prior to intervention *(t-1)* as defined in Section 4.1.2. Abnormal changes in Q are used in the regression (1) for testing H1 whereas abnormal changes in ROA are used in regression (2) for testing H2.

4.3.2.2. Independent Variable of Interest

For both regressions, (1) and (2), the independent variable of interest is passive ownership. As outlined in section 4.1.4, Group A and Group B is constructed based on the level of passive ownership prior to, and during, the year of intervention by an activist hedge fund. As a result, we treat passive ownership as a dummy variable *(PassiveHigh)* which takes on the value 1 for target firms in Group A with a high level of passive ownership and the value 0 for target firms in Group B with a low level of passive ownership. In line with our hypothesis that passive investors facilitate hedge fund activism, we expect *(PassiveHigh)* in regression (1) and (2) to have a positive impact on target firms' abnormal changes in Q and ROA, respectively. Table 5 summarizes the expected effect of passive ownership in the respective hypothesis.

Table 5. Expectations for Independent Variable of Interest

Hypothesis	Dependent Variable	Independent Variable of Interest	Expected Sign
1	ΔQ	PassiveHigh	$+$
2	ΔROA	PassiveHigh	$+$

4.3.2.3. Control Variables

In order to isolate the effect of how the level of passive ownership affects abnormal changes in performance, it is necessary to control for other factors that may be determinants of the variable of interest. As such we include a number of control variables in the regressions. We adjust for year-specific performance which could be results of macroeconomic shocks or other trend-specific factors by including year-fixed effects *(Year)*. We control for any effects attributable to *(Size)* and *(Age)*, in line with Bebchuk et al. (2015), as larger firms may enjoy performance-enhancing attributes as an effect of e.g. economies of scale and as older firms may be more mature and thus perform more in line with its industry. In order to make firms more comparable across observations, and in line with prior research (e.g. Bebchuk et al., 2015), *(Size)* is defined as the natural logarithm of a firm's market capitalization and *(Age)* as the natural logarithm of the number of years since a firm first appeared in the merged CRSP/Compustat database. Both variables are held constant based on the values during the year prior to intervention. Furthermore, we control for abnormal changes in sales growth *(ΔGrowth)* as the rate at which a firm is growing is likely to affect both firm value as well as operational efficiency. In addition, we control for abnormal changes in leverage *(ΔLeverage),* defined as book value of debt in relation to book value of assets, as financial theory suggests that higher levels of debt can potentially reduce agency costs as it pressures management to allocate firm resources more efficiently thus affecting performance (Jensen, 1993). By that argument, one could assume that increased leverage would have a positive effect on abnormal performance, but it could also be argued that increased leverage leads

management to pursue less risky strategies which would inhibit abnormal performance. To further isolate the impact of passive ownership on Q specifically, we control for profitability as proxied by the EBITDA-margin *(ΔProfitability)* as it is reasonable to assume that increases in profitability will result in a higher firm value. As EBITDA is a component of ROA, it would not be sensible to add this control variable for ROA as well.

5.   Results

This section provides the empirical results of the study. We begin with an overview of our sample as presented through descriptive statistics in section 5.1. In order to establish whether passive investors have an impact on target firms' value and operating performance, we subsequently turn to the statistical results in section 5.2.

5.1.   Descriptive Statistics

The final sample consists of 1,641 activist hedge fund events. Target firms are divided into one of the 12 Fama-French industry groups based on their four-digit SIC code as presented in Table 6 below.

Table 6. Distribution of Target Firms by Industry Classification

Number	Industry	Group A		Group B		Full Sample	
		Count	%	Count	%	Count	%
1	Consumer Non-Durables	41	5%	37	5%	78	5%
2	Consumer Durables	25	3%	17	2%	42	3%
3	Manufacturing	92	11%	52	6%	144	9%
4	Energy	36	4%	25	3%	61	4%
5	Chemicals	27	3%	19	2%	46	3%
6	Business Equipment	177	22%	198	24%	375	23%
7	Telecommunications & Media	28	4%	31	4%	59	4%
8	Utilities	16	2%	8	1%	24	1%
9	Wholesale & Retail	118	14%	65	8%	183	11%
10	Healthcare	72	9%	102	12%	174	11%
11	Financials	75	9%	151	18%	226	14%
12	Other	113	14%	116	14%	229	14%
Total		**820**	**100%**	**821**	**100%**	**1,641**	**100%**

Table 6 shows the distribution of target firms by industry and group allocation.

The distribution of Group A (target firms with a high level of passive ownership) and Group B (target firms with a low level of passive ownership) is fairly similar to the full sample with no major deviations, apart from an overrepresentation of Financials in Group B[11]. Business Equipment represents the largest industry group for the full sample (23%), and for each of the groups respectively, with 375 events in total. This means that the final sample has a small industry-bias towards Business Equipment, which includes IT, Electronic and Business Services. Clifford (2008) who uses a different sample also finds that Business Equipment & Services represent the largest industry group which indicates

---

[11] In Section 6.3.5., an alternative method is used which removes this discrepancy by excluding financial firms and results in qualitatively similar findings as the main research specifications.

that we do not have a sample bias but rather that Business Equipment firms seem to represent characteristics that activist hedge funds seek to target.

Table 7. Distribution of Target Firms by Year of Intervention

Year	Group A		Group B		Full Sample	
	Count	%	Count	%	Count	%
2000	16	2%	40	5%	56	3%
2001	14	2%	36	4%	50	3%
2002	15	2%	45	5%	60	4%
2003	23	3%	46	6%	69	4%
2004	29	4%	48	6%	77	5%
2005	62	8%	63	8%	125	8%
2006	79	10%	79	10%	158	10%
2007	103	13%	78	10%	181	11%
2008	69	8%	69	8%	138	8%
2009	42	5%	50	6%	92	6%
2010	46	6%	42	5%	88	5%
2011	45	5%	49	6%	94	6%
2012	57	7%	41	5%	98	6%
2013	67	8%	45	5%	112	7%
2014	82	10%	46	6%	128	8%
2015	71	9%	44	5%	115	7%
Total	**820**	**100%**	**821**	**100%**	**1,641**	**100%**

Table 7 shows the distribution of target firms by year of intervention and group allocation.

Table 7 shows the distribution of target firms by the year of intervention of an activist hedge fund. The distribution of Group A and Group B is fairly similar during the period from 2005 to 2011. During the early period there is an overrepresentation of target firms in Group B whereas in the latter period there is an overrepresentation of target firms in Group A which is attributable to the increasing presence of passive investors during recent years.[12] The number of activist hedge fund campaigns has more than doubled over the period for the full sample with a significant drop during the financial crisis in 2008. Although the number of activist hedge fund campaigns did recover and started to gradually increase from 2010 onwards, the number would not reach its pre-crisis level for the remaining period.

---

[12] In Section 6.3.1., an alternative method is used that gives an equal distribution across both groups during the whole sample period and results in qualitatively similar findings as the main research specifications.

Table 8. Ex-Ante Target Firm Characteristics

Firm Characteristic		Group A		Group B		Full Sample	
		Raw Value	Vs. Industry	Raw Value	Vs. Industry	Raw Value	Vs. Industry
Q	Mean	1.708	0.006	1.594	-0.080	1.655	-0.031
	Median	1.396	-0.151	1.189	-0.193	1.314	-0.165
ROA	Mean	0.113	0.020	0.022	-0.055	0.070	-0.015
	Median	0.116	0.013	0.038	-0.023	0.088	-0.005

Table 8 shows the ex-ante target firm characteristics in terms of mean and median values of Q and ROA as well as industry-adjusted values of Q and ROA by group allocation, one year prior to an activist hedge fund intervention, that is *(t-1)*.

The full sample in Table 8 indicates that firms targeted by activist hedge funds tend to have a lower valuation than their industry peers while also slightly underperforming in terms of ROA during the year prior to intervention. The sub-industry Q values support the notion of activist hedge funds seeking to target firms that are undervalued relative to their industry. Furthermore, the deviations from industry performance is not fully uniform across both groups as Group B underperforms its industry with regards to Q in terms of both average and median performance while Group A only underperforms in terms of median performance. However, as the average metric is affected by extreme values, the median performance serves as a better proxy for how the typical target firm performs relative to its industry which makes it safe to conclude that target firms tend to have lower valuations regardless of the level of passive ownership. There is a large difference between the two groups in terms of ROA where Group A has high levels of raw ROA values while also outperforming its industry peers whereas Group B has low levels of ROA and underperforms relative to its industry peers. However, as the analysis is based on the relative change compared to target firms' industry, such a difference between the groups is not critical. The findings of Q are in line with prior research which have found that target firms typically have lower valuations than peers (Brav. et al, 2008; Klein & Zur, 2009; Boyson & Mooradian, 2011). In terms of ROA, prior researchers have found conflicting results which potentially can be explained by the use of different control groups.

5.2.   Statistical Results

The results from the univariate tests are presented in Section 5.2.1. and give an indication as to whether target firms perform differently based on the level of passive ownership. In order to validate these results, we subsequently turn to a multiple regression analysis in Section 5.2.2. which allows us to determine whether passive ownership is a determinant to abnormal changes in performance.

5.2.1. Univariate Analysis

Table 9. Evolution of Abnormal Q Over Time, By Level of Passive Ownership

ΔQ		*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
Group A	Mean	-0.068***	0.020	0.081*	0.086*
	Median	-0.038**	0.016	0.029***	0.071***
	N	509	442	410	383
Group B	Mean	0.007	0.103*	0.188***	0.260***
	Median	0.016	0.043***	0.058***	0.076***
	N	377	329	296	259
Difference (A-B)	Mean	-0.075	-0.083	-0.107	-0.174**
	Median	-0.054**	-0.027	-0.029	-0.005*

Table 9 reports the abnormal changes in Q from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*. The one-sample t-test shows the mean abnormal change in performance while the two-sample t-test shows the difference in mean abnormal change in performance between Group A and Group B. The Wilcoxon signed rank test shows the median abnormal change in performance while the Mann-Whitney test shows the difference in median abnormal change in performance between Group A and Group B. N represents the number of target firms included in each time period. *, ** and *** indicate that the abnormal performance is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 9 presents the mean and median abnormal changes in Q from the year prior to an activist hedge fund intervention, (*t-1*), up until three years following, *(t-1 to t+3)*. There is a substantial amount of data attrition from one time period to the next which is common in studies of this kind and mainly attributable to M&A related activities (e.g. Clifford, 2008; Bebchuk et al., 2015; Appel et al., 2019). As was presented earlier in Table 8, both Group A and Group B underperform in Q relative to their industry peers during the year prior to intervention. The results in Table 9 indicate that it takes two years following an intervention for target firms in Group A to experience a higher performance than expected relative to the year prior to intervention. In contrast, it only takes one year following the intervention for target firms in Group B to experience a higher performance than expected relative to the year prior to intervention. These results indicate that target firms with a low level of passive ownership are able to catch up with, and subsequently outperform, their industry peers sooner than target firms with a high level of passive ownership. Over the whole period, both Group A and Group B experience a higher performance than expected in Q three years following an activist hedge fund intervention indicating that activist hedge funds are able to induce value-enhancing changes irrespective of the level of passive ownership. These results are in line with prior research of Bebchuk et al. (2015) and Boyson and Mooradian (2011). While Group A consistently underperforms relative to Group B, the median difference between the groups seems to diminish over time and is only statistically significant during the year of intervention as well as three years after. For Group A, the median (mean) abnormal change in Q is 0.071 (0.086) higher than expected three years following intervention. For Group B, the median (mean) abnormal change in Q is 0.076 (0.260) higher than expected. The median (mean) abnormal change

in Q three years after intervention is thus 0.005 (0.174) lower for target firms with a high level of passive ownership and is statistically significant at the 10 (5) percent level. Conclusively, we find no support for H1, i.e. that target firms with high levels of passive ownership would outperform target firms with low levels of passive ownership in terms of firm value. Rather, our results indicate the opposite relationship.

Table 10. Evolution of Abnormal ROA Over Time, By Level of Passive Ownership

∆ROA		*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
Group A	Mean	-0.0162***	-0.0131***	-0.0063	-0.0059
	Median	-0.0088***	-0.0070***	-0.0056***	-0.0009
	N	781	660	600	529
Group B	Mean	-0.0060	-0.0004	-0.0015	0.0073
	Median	-0.0017***	0.0016	0.0009	0.0031
	N	705	565	472	394
Difference (A-B)	Mean	-0.0102*	-0.0127*	-0.0048	-0.0132
	Median	-0.0071*	-0.0086**	-0.0065*	-0.0040

Table 10 reports the abnormal changes in ROA from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*. The one-sample t-test shows the mean abnormal change in performance while the two-sample t-test shows the difference in mean abnormal change in performance between Group A and Group B. The Wilcoxon signed rank test shows the median abnormal change in performance while the Mann-Whitney test shows the difference in median abnormal change in performance between Group A and Group B. N represents the number of target firms included in each time period. *, ** and *** indicate that the abnormal performance is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 10 presents the mean and median abnormal changes in ROA from the year prior to an activist hedge fund intervention, (*t-1*), up until three years following, *(t-1 to t+3)*. As mentioned before, the data attrition from one time period to the next is likely attributable to M&A related activities (Clifford, 2008; Bebchuk et al., 2015; Appel et al., 2019). As was presented in Table 8, during the year prior to intervention Group A demonstrates a higher ROA relative to its industry peers whereas Group B underperforms relative to its industry peers. The results in Table 10 reveals that target firms in Group A underperforms in ROA relative to their industry peers up until two years following the intervention, although the abnormal negative change decreases during each time period and is no longer statistically different from zero three years following intervention. For Group B, the abnormal change in ROA is statistically insignificant across most time periods, with the exception of the year of intervention. This indicates that target firms with low levels of passive ownership start to develop in line with their industry one year following intervention. While Group A consistently underperforms relative to Group B, the median difference between the groups seems to diminish over time and is no longer statistically significant after three years. For Group A, the median (mean) abnormal change in ROA is 0.09 (0.59) percentage points lower than expected three years following intervention. For Group B, the median (mean) abnormal change in ROA is 0.31 (0.73) percentage

points higher than expected. The median (mean) abnormal change in ROA three years after intervention is thus 0.40 (1.32) percentage points lower for target firms with a high level of passive ownership although not statistically significant. In line with our results of changes in firm value above, we find no support for H2, i.e. that target firms with high levels of passive ownership would outperform target firms with low levels of passive ownership in terms of operating performance. Rather, our results indicate the opposite relationship.

The results from the univariate analyses do not indicate any support for H1 or H2. Although not uniformly significant, the results indicate that there is a small difference in performance between firms with high and low levels of passive ownership. However, there are naturally other factors than simply the level of passive ownership that may explain this difference which is why any conclusive interpretation of the impact of passive ownership is based on the multiple regression analysis in the following section.

5.2.2. Multiple Regression Analysis

Table 11. Multiple Regression on Abnormal Changes in Q

ΔQ	(1) t-1 to t=0	(2) t-1 to t+1	(3) t-1 to t+2	(4) t-1 to t+3
PassiveHigh	-0.020	-0.034	0.015	-0.117
	(-0.51)	(-0.52)	(0.15)	(-1.02)
ΔGrowth	0.112**	0.169*	0.231	-0.038
	(2.02)	(1.88)	(1.66)	(-0.23)
ΔProfitability	-0.071*	0.022	0.010	0.007
	(-1.96)	(0.36)	(0.31)	(0.33)
ΔLeverage	0.902**	0.581**	-0.030	0.104
	(2.15)	(2.64)	(-0.13)	(0.27)
Size	-0.039***	-0.032**	-0.044**	-0.023
	(-2.96)	(-2.41)	(-2.31)	(-0.95)
Age	0.007	0.027	-0.008	0.038
	(0.30)	(0.91)	(-0.19)	(1.10)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.074	0.044	0.049	0.024
Observations	809	705	642	585

Table 11 reports the results from multiple linear regression (1) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*. The dependent variable is the abnormal change in Q. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are

Table 11 shows the results for the four regressions run on the abnormal changes in firm value of target firms up until three years following the intervention by an activist hedge fund. The results do not indicate that passive ownership is a determinant of abnormal changes in target firms' value. While the coefficient for the independent variable of interest *(PassiveHigh)* is negative for the majority of the time periods, *(t-1* to *t=0), (t-1* to *t+1),* and *(t-1* to *t+3)*, it is not statistically significant. In other words, this indicates that the relatively poorer abnormal development in Q of Group A compared to Group B, which was illustrated in Table 9, is not necessarily affected by the initial level of passive ownership. Nevertheless, the interpretation for the *(PassiveHigh)* coefficient would be that a high level of passive ownership in a target firm, around intervention, contributes to a 0.020 lower abnormal change in Q during the period (*t-1* to *t=0)*, 0.034 lower abnormal change during the period (*t-1* to *t+1)*, 0.015 higher abnormal change during the period (*t-1* to *t+2*) and 0.117 lower abnormal change during the period (*t-1* to *t+3*). As the results do not indicate that a higher level of passive ownership facilitates activist hedge funds' ability to enforce value-enhancing changes in target firms, we do not find statistical support for H1. While no one, to the best our knowledge, has studied the operational impact of passive investors on firms specifically targeted by activist hedge funds, Appel et al. (2016) find that passive investors in general may be related to future improvements in firm value (Q) and operating performance (ROA). This relationship does not seem to be applicable for firms targeted by activist hedge funds. Moreover, our findings also indicate that the documented initial larger positive stock price reaction in target firms with high passive ownership found in Appel et al. (2019) could either be an overreaction, and unfounded, or it is attributable to other factors.

Furthermore, the R-squared values for the regression models are low at 0.074, 0.044, 0.049 and 0.024 for each time period which means that a large portion of the variation in the dependent variable is not explained by the model specifications while also resulting in some of control variables being insignificant. Nevertheless, (*ΔGrowth*) has a statistically significant positive coefficient for the first two periods with an interpretation of its coefficient being that when the abnormal change in growth increases by 1 percentage point, the abnormal change in Q increases by 0.00112 and 0.00169 during the first and second time period, respectively. Furthermore, (*ΔLeverage*) has a positive impact on the abnormal changes in Q during the first two years whereas (*Size*) has a negative impact on the abnormal changes in Q during the first three years. Notably, (*ΔProfitability)* is negatively associated with abnormal changes in Q during the first year which may seem counterintuitive but bear in mind that increases in profitability from one year to another may not change the future outlook of a firm which firm valuation is a reflection of.

Table 12. Multiple Regression on Abnormal Changes in ROA

ΔROA	(1) t-1 to t=0	(2) t-1 to t+1	(3) t-1 to t+2	(4) t-1 to t+3
PassiveHigh	-0.010	-0.012	-0.010	-0.020*
	(-1.18)	(-1.58)	(-1.21)	(-1.79)
ΔGrowth	0.060***	0.057***	0.072***	0.074***
	(5.91)	(3.99)	(3.84)	(3.88)
ΔLeverage	-0.082***	-0.122***	-0.096***	-0.085**
	(-4.62)	(-3.10)	(-3.63)	(-2.36)
Size	-0.000	-0.001	0.002	0.001
	(-0.08)	(-0.85)	(0.83)	(0.38)
Age	-0.005	-0.002	-0.004	-0.001
	(-1.03)	(-0.39)	(-0.51)	(-0.15)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.095	0.088	0.079	0.077
Observations	1,465	1,207	1,054	909

Table 12 reports the results from multiple linear regression (2) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*. The dependent variable is the abnormal change in ROA. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

Table 12 shows the results for the four regressions run on the abnormal changes in operating performance in target firms up until three years following the intervention by an activist hedge fund. The results do not indicate that passive ownership is a determinant of abnormal changes in target firms' operating performance. While the coefficient for the independent variable of interest (*PassiveHigh*) is negative for all four time periods, *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, it is only statistically significant at a 10-percent level for the time period *(t-1 to t+3)*. In other words, this indicates that the relatively poorer abnormal development in ROA of Group A compared to Group B, which was illustrated in Table 10, is not necessarily affected by the initial level of passive ownership. Nevertheless the interpretation for the (*PassiveHigh)* coefficient would be that a high level of passive ownership in a target firm, around intervention, contributes to a 1 percentage point lower abnormal change in ROA during the period *(t-1 to t=0)*, 1.2 percentage points lower abnormal change during the period (*t-1 to t+1)*, 1 percentage point lower abnormal change during the period (*t-1 to t+2)* and 2 percentage points lower abnormal change during the period (*t-1 to t+3)*. As the results do not indicate that a higher level of passive ownership facilitates activist hedge funds' ability to improve the long-term operating performance in target firms, we do not find statistical support for H2.

37

While Appel et al. (2016) find that passive investors in general may be related to future improvements in operating performance, we do not find this relationship to hold for firms specifically targeted by activist hedge funds.

The R-squared values for these regression models are also low at 0.095, 0.088, 0.079 and 0.077 for each time period which means that a large portion of the variation in the dependent variable is not explained by the model specifications. It is worth highlighting that the control variable ($\Delta Growth$) has a positive coefficient and is statistically significant during all time periods. This means that target firms who experience abnormal changes in growth do so while also managing to achieve abnormal changes in ROA. Moreover, the control variable ($\Delta Leverage)$ is statistically significant and negatively associated with abnormal changes in ROA for each time period which is a potential indication that higher abnormal changes in leverage lead target firms to pursue safer, lower yielding business activities (Jensen, 1993).

6. Discussion

6.1. Interpretation of Results

The purpose of this paper is to analyze how passive investors influence activist hedge funds' ability to improve target firms' value and operating performance. Based on our results from the univariate analyses, we find suggestive evidence that firms with low levels of passive ownership tend to perform slightly better with regards to abnormal changes in Q and ROA during various time periods up until three years following the activist hedge fund intervention. However, when controlling for other factors in the multivariate analyses that may have possible explanatory power over abnormal changes in performance, such as firm size, age, growth and leverage, we find no evidence that the changes in performance is attributable to the level of passive ownership.

Table 13. Summary of the Impact of Passive Ownership on Target Firms

Variable	Year	Univariate Analyses		Multivariate Analyses	
		Expectations	*Results*	*Expectations*	*Results*
Δ Q	*t*	(+)	(-)**	(+)	(-)
	t+1	(+)	(-)	(+)	(-)
	t+2	(+)	(+)	(+)	(-)
	t+3	(+)	(-)*	(+)	(-)
Δ ROA	*t*	(+)	(-)*	(+)	(-)
	t+1	(+)	(-)**	(+)	(-)
	t+2	(+)	(-)*	(+)	(-)
	t+3	(+)	(-)	(+)	(-)*

Table 13 provides an overview of the findings from the statistical test of difference between Group A and B as well as the findings from the multiple linear regressions. The univariate analyses indicate whether Group A outperforms (+) or underperforms (-) Group B. The multivariate analyses show whether the coefficient of the independent variable of interest *(PassiveHigh)* has a positive (+) or negative (-) impact on abnormal changes in firm value and operating performance. *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

Prior literature has provided evidence against the myopic claims that activist hedge funds would be corporate raiders with a short-term focus by showing that they actually improve the long-term firm value and operating performance in target firms (e.g. Clifford, 2008; Bebchuk et al., 2015). In terms of firm value, our findings confirm that such positive developments hold regardless of the level of passive ownership although target firms with a low level of passive ownership tend to experience a slightly higher value appreciation than target firms with high levels of passive ownership as illustrated by the results from the univariate analysis presented in Table 9. However, as was presented in Table 11, the change in abnormal performance is not statistically affected by the level of passive ownership which means that the difference in performance is attributable to other factors.

In terms of operating performance, our findings suggest that target firms with a high level of passive ownership typically underperform during most of the time periods following an intervention as illustrated in Table 10. Target firms with low levels of passive ownership, on the other hand, appear to develop in line with their expected performance, i.e. in line with their industry peers. Again, however, the abnormal change in performance is not statistically explained by the level of passive ownership which means that the difference in performance is attributable to other factors as seen in Table 12.

6.2. Potential Explanation of Results

The conflicting results in previous research on the interaction between activist hedge funds and passive investors with regards to corporate governance illustrate the difficulty in ascertaining whether passive investors facilitate or inhibit activism and is further supported by our inconclusive evidence regarding passive investors' impact on target firms' value and operating performance. Albeit largely statistically insignificant, our findings still lean more towards the latter notion of passive ownership somewhat inhibiting hedge fund activism. This notion would be in line with the findings of Schmidt and Fahlenbrach (2017) that passive investors may have a value-destroying effect when it comes to more resource-heavy corporate governance monitoring which is what underperforming firms targeted by activist hedge funds typically are in need of. In particular, our findings do not support the claim of Appel et al. (2019) that passive investors facilitate hedge fund activism as target firms with high levels of passive ownership tend to underperform target firms with low passive ownership. However, it is important to highlight that this inference should be done with some caution as the target groups' characteristics were somewhat different during the year prior to intervention. Target firms with low levels of passive ownership were at that point underperforming relative to their industry peers whereas target firms with high levels of passive ownership were underperforming in terms of Q but slightly outperforming their industry peers with regards to ROA. This means that it cannot be ruled out that the different developments during the period up to three years following an intervention can be explained by the phenomenon of mean reversion.[13]

While the purpose of this paper is to establish a difference in target firms' value and operating performance based on the level of passive ownership, it is not considered whether activist hedge funds change their behaviour in the presence of passive investors. For example, it has not been established whether activist hedge funds might adjust the size of their ownership stakes depending on the level of passive ownership, nor has it been established if they adjust the length of their holding periods. For instance, suppose that an increasing presence of passive investors would reduce the dispersed ownership

---

[13] Mean reversion refers to a situation where a firm experiences a reversion in performance towards the firm's long-term normal performance (or its normal industry performance) after having experienced temporary high or low levels of performance (Barber & Lyon, 1996).

base seen in public firms thus allowing activist hedge funds to be able to acquire smaller ownership stakes but still gather the support needed for corporate change. If that is the case, hedge fund activism would most likely be associated with lower campaign costs which ultimately means that the required value appreciation needed for activist hedge funds to fulfill their return requirements is lower. As such, it does not necessarily have to be true that high levels of passive ownership inhibit activism, but rather that activist hedge funds in those cases have lower costs to compensate for which means that they incorporate less value-enhancing changes and perhaps exit their positions earlier. Such an inference would be in line with the findings of Appel et al. (2019). They find that shareholder activists are more successful when intervening in firms with higher levels of passive ownership and could explain why we find a tendency of firms with high levels of passive ownership experiencing lower abnormal changes in performance. On the other hand, a more concentrated ownership base in public firms could also mean that activist hedge funds would see their position, as a relatively large shareholder, challenged and their power to influence target firms may become diluted. If passive investors do not facilitate hedge fund activism, as suggested above, it would become more difficult and more expensive for activist hedge funds to enforce value-enhancing changes. It would most likely result in longer campaigns, requiring more resources as well as higher returns. As such, without taking factors such as the size of ownership stakes and the time of holding periods into account, it is seemingly difficult to achieve a holistic view of the interplay between passive investors and activist hedge funds and arrive at a convincing conclusion.

Furthermore, as can be seen in Table 9 and Table 10, there is a substantial amount of data attrition from one time period to the next which is common in studies of this kind and most likely attributable to M&A related activities (e.g. Clifford, 2008; Bebchuk et al., 2015; Appel et al., 2019). The effects of M&A related activities may be of significance to our results as activist hedge funds and other shareholder activists have been documented to specifically pursue M&A related activities in target firms with high levels of passive ownership (Appel et al., 2019). For instance, if the presence of passive investors would enable activist hedge funds to more easily pursue M&A related activities, one could expect that the most promising firms in Group A would become natural targets for buyouts, mergers or acquisitions encouraged by activist hedge funds. Given such a scenario, the change in abnormal performance seen in Group A could be negatively biased as the remaining firms would consist of less promising firms. This could potentially explain why we in Table 9 see an increasing *mean* difference in abnormal changes in firm value at the same time as a decreasing *median* difference in abnormal changes in firm value between the two groups throughout the sample period. As such, should the data attrition in Group A result in a negative bias, the indication of target firms with low levels of passive ownership performing better may become invalid.

6.3. Robustness Tests

6.3.1. Robustness Test I - Change in the Classification of Passive Ownership

Table 7 indicates that firms targeted during the early period of the sample are overrepresented in Group B whereas firms targeted during the latter period of the sample are overrepresented in Group A which is attributable to the growth of passive investors during more recent years. To account for this, we divide target firms into the two groups based on the median level of passive ownership during each year. I.e. firms targeted in the year 2000 are placed in Group A or B depending on whether they have a level of passive ownership above or below the median level of passive ownership that specific year. An overview of interventions during each year with this classification is found in Appendix C.1., Table 14. Appendix C.1., Tables 15-18, shows the results from the univariate and multivariate analyses. The results from the univariate analyses are largely the same with slightly lower significant abnormal changes in Q and somewhat higher significance in terms of abnormal changes in ROA. With regards to the multivariate analysis on abnormal changes in Q, the effect of passive ownership remains insignificant. The effect of passive ownership on abnormal changes in ROA, however, becomes statistically significant at a 10 percent level across all time periods. Conclusively, the results are still qualitatively the same as in the main analysis as we cannot safely conclude that the lower abnormal changes in ROA for Group A is not due to mean reversion.

6.3.2. Robustness Test II - Change in the Definition of Passive Ownership

When dividing target firms into Group A and Group B conditional on them being above or below the median level of passive ownership around the time of intervention, many firms will have similar levels of passive ownership. This can have adverse effects on the results which is why we run an analysis where target firms are divided into Group A if they have a level of passive ownership around the intervention above the top quartile and Group B if it is below the bottom quartile. The remaining firms are excluded. Appendix C.2., Tables 19-22, shows the results which are qualitatively the same as the results from the original analysis.

6.3.3. Robustness Test III - Change in the Measurement of Passive Ownership

In order to control for any changes in passive ownership following an intervention, we run the analysis where we divide the target firms into Group A and Group B based on the average level of passive ownership during an additional year, that is *(t-1)* until *(t+1)*. By that definition, firms above the median level of passive ownership are allocated to Group A and vice versa. Again, the results are qualitatively the same as in the original analysis and are illustrated in Appendix C.3., Tables 23-26.

6.3.4. Robustness Test IV - Change in the Model of Expected Performance

In the main analysis, expected performance was based on the *median* change in a target firm's industry while we in Appendix C.4., Tables 27-30, rerun the analysis on the *mean* change in a target firms' industry. The results are still qualitatively the same as in the main model specifications.

6.3.5. Robustness Test V – Excluding Financial Firms

Table 6 indicates that there is an overrepresentation of financial firms in Group B which could affect the results in the main analysis. To account for this, we rerun the analysis while excluding financial firms entirely which amount to 226 events. Appendix C.5., Tables 31-34, shows the results which are qualitatively the same as in the main model specifications.

6.3.6. Multicollinearity

In order to address potential multicollinearity, we estimate variance inflation factors ("VIF") for all variables. By using VIFs, we are able to quantify the level of correlation between explanatory variables where a VIF below 10 is considered to be low enough to not consider multicollinearity an issue (Garcia, Garcia, Lopez Martin & Salmeron, 2015). The VIFs in Appendix D, Tables 36-37 (note that the yearly dummies have been disregarded in the tables) indicate that multicollinearity is not likely to be an issue despite the high correlation between (*PassiveHigh)* and (*Size)* seen in Appendix D, Table 35.

6.4. Limitations

The interaction between activist hedge funds and passive investors is evidently very complex. Our study hinges on the assumption that changes in target firms' value and operating performance is affected by the extent to which passive investors support or oppose proposals put forth by activist hedge funds. Therefore, it is important to recognize that should such a relationship not hold, any inferences made about passive investors facilitating or inhibiting hedge fund activism become invalid. Moreover, as one of the most critical steps when investigating abnormal levels of performance is to establish the expected level of performance, the peer group design is of high importance. While considering target firms' pre-event performance in relation to the overall industry performance, it would be even more accurate to only include control firms with similar performance and, if possible, size as our target firms prior to intervention. The benefit of such a method is that it would eliminate, or at least heavily reduce, the effects of mean reversion which is problematic when a target firm prior to intervention substantially deviates from its industry peers. However, such a procedure would require significantly more attention and was not feasible to pursue given the time constraints. Another critical step relates to the group allocation used in the study. We divide our sample into two

groups based solely on the level of passive ownership in each target firm without taking other factors into consideration which may have adverse implications on a comparative study of this kind. For instance, there could still be inherent differences among target firms in terms of e.g. the ownership stakes and holding periods of activist hedge funds which could change the interpretation of our findings. Further understanding of the interaction between activist hedge funds and passive investors could also have been achieved had our study included more firm characteristics that activist hedge funds typically seek to change such as R&D expenditure, capital expenditure and changes in the asset base.

Furthermore, it would be preferable to include ownership data for our control firms and to run a regression analysis on both target firms and control firms with interaction dummies for firms that are targets and have high levels of passive ownership. However, due to an expiration of access to the data concerning ownership, such a method was not possible to pursue. Another popular method when studying the impact of passive ownership is the use of an instrumental variable strategy based on the Russell 1000 and Russell 2000 index classification where the level of passive ownership varies significantly around the cut-off between the two indices due to index weightings (e.g. Burns et al., 2010; Boone & White, 2015; Appel et al., 2016, 2019). As this approach would require us to only include firms within a specific range of the cutoff between the two indices, it would result in a significant loss of observations. While the purpose of conducting three separate robustness tests in order to control for other classifications, definitions and measurements of passive ownership, this limitation may still affect the validity of our results.

7.   Conclusion

In this paper we study the impact of passive ownership on the long-term value and operating performance of firms targeted by activist hedge funds. With respect to the concurrent rise of activist hedge funds and passive investors, the changing nature of stock ownership in public firms in the U.S. has raised some intriguing questions of how this development would affect the outcomes of hedge fund activism and ultimately the impacts on firm performance. Using a comprehensive sample of 1,641 activist hedge fund campaigns in the U.S. from 2000 to 2015, we measure the abnormal change in target firms' value and operating performance proxied by Tobin's Q and ROA, respectively, from the year prior to an intervention up to three years following. Based on univariate and multivariate analyses, our findings indicate that target firms with a low level of passive ownership tend to perform slightly better than target firms with a high level of passive ownership, both in terms of firm value and operating performance. However, we find no statistical support that this tendency for outperformance is attributable to the level of passive ownership. More specifically, we find no support for the recent claim, and our hypotheses, that activist hedge funds would be more successful in creating value and improving the operating performance in target firms where the level of passive ownership is high.

The conflicting results in previous research on the interaction between activist hedge funds and passive investors with regards to corporate governance illustrate the difficulty in ascertaining whether passive investors facilitate or inhibit activism. This is further supported by our inconclusive evidence regarding passive investors' impact on target firms' value and operating performance and highlights the importance of additional research on the topic. As this paper did not consider whether activist hedge funds change their behavior in the presence of passive investors, it would be of interest to conduct a comprehensive study covering some of the characteristics which were discussed in this paper, but not investigated. For instance, do activist hedge funds change the size of their ownership stakes or holding periods in the presence of larger block holdings of passive investors? Finally, we suggest the use of qualitative methods in order to learn how activist hedge funds view the development of passive investors and how, if at all, it impacts them in terms of their strategies, return requirements and abilities to enforce operational changes.

References

Admati, A. R. & Pfleiderer, P. (2009). The 'Wall Street Walk' and Shareholder Activism: Exit as a Form of Voice. *The Review of Financial Studies*, 22 (7), 2445–2485.

Appel, I., Gormley, T., & Keim, D. (2016). Passive Investors, not Passive Owners. *Journal of Financial Economics*, 121 (1), 111–141.

Appel, I., Gormley, T. & Keim, D. (2019). Standing on the Shoulders of Giants: The Effect of Passive Investors on Activism. *The Review of Financial Studies*, Volume 32, Issue 7.

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.

Bebchuk, L., Brav, A., & Jiang, W. (2015). The Long-Term Effects of Hedge Fund Activism. *Columbia Law Review*, 115 (5), 1085–1155.

Bebchuk, L. A., & Hirst, S. (2019a). Index Funds and the Future of Corporate Governance: Theory, Evidence, and Policy (No. w26543). *National Bureau of Economic Research.*

Bebchuk, L. A., & Hirst, S. (2019b). "The Specter of the Giant Three." *IDEAS Working Paper Series from RePEc*

Becht, M., Franks, J., Grant, J. and Wagner, H.F. (2017). Returns to hedge fund activism: An international study. *The Review of Financial Studies*, 30(9), pp.2933-2971.

Berle, A. and Means, G. (1932). The Modern Corporation and Private Property. *New York: Harcourt, Brace & World*

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.

Bloomberg, (2018). Elliott Believes a Truly Independent Board is Required to Improve Governance and Performance at Telecom Italia. *Bloomberg*, 16 March. Retrieved from https://www.bloomberg.com/press-releases/2018-03-16/elliott-believes-a-truly-independent-board-is-required-to-improve-governance-and-performance-at-telecom-italia

Boone, A. L. & White, J. T. (2015). The Effect of Institutional Ownership on Firm Transparency and Information Production. *Journal of Financial Economics*. 117 (3), 508–533.

Boyson, N. & Mooradian, R. (2011). Corporate Governance and Hedge Fund Activism. *Review of Derivatives Research*. 14 (2), 169–204.

Brav, A., Jiang, W., Partnoy, F., Thomas, R. (2008). Hedge Fund Activism, Corporate Governance, and Firm Performance. *Journal of Finance.* 63 (4), 1729–1775.

Brav, A., Jiang, W., Kim, Hyunseob. (2015). The Real Effects of Hedge Fund Activism: Productivity, Asset Allocation, and Labor Outcomes. *The Review of Financial Studies*. 28 (10), 2723–2769.

Brav, A., Jiang, W., Ma, S., Tian, X. (2018). How Does Hedge Fund Activism Reshape Corporate Innovation? *Journal of Financial Economics*. 130 (2), 237–264.

Brav, A., Jiang, W., Tao, L., & Pinnington, J. (2018). Picking Friends Before Picking (Proxy) Fights: How Mutual Fund Voting Shapes Proxy Contests 3. *European Corp. Governance Inst., Working Paper* No. 601/2019.

Brownstein, A. R., Katz, D. A., Niles, S. V., Rosenblum, S. A. (2015). Winning a Proxy Fight – Lessons from the DuPont-Trian Vote. *Harvard Law School Forum on Corporate Governance*, May 18. Retrieved from https://corpgov.law.harvard.edu/2015/05/18/winning-a-proxy-fight-lessons-from-the-dupont-trian-vote/

Burns, N., Kedia, S. and Lipson, M. (2010). Institutional Ownership and Monitoring: Evidence from Financial Misreporting. *Journal of Corporate Finance*. 16(4), pp.443-455.

Bushee, B. (2001). Do Institutional Investors Prefer Near-Term Earnings over Long-Run Value? *Contemporary Accounting Research* 18:207–46.

Clifford, C. P. (2008). Value Creation or Destruction? Hedge Funds as Shareholder Activists. *Journal of Corporate Finance.* 14 (4), 323–336.

Davis, G. (1991). Agents Without Principles? The Spread of the Poison Pill Through the Intercorporate Network. *Administrative Science Quarterly*. 36 (4), 583–613.

Fama, E. F. & French, K. R. (2010). Luck versus Skill in the Cross-Section of Mutual Fund Returns. *Journal of Finance.* 65 (5), 1915–1947.

Fichtner, J., Heemskerk, E., & Garcia-Bernardo, J. (2017). Hidden Power of the Big Three? Passive Index Funds, Re-concentration of Corporate Ownership, and New Financial Risk. *Business and Politics*, 19(2), 298–326.

Fisch, J. E., Hamdani, A., & Davidoff Solomon, S. (2019). The New Titans of Wall Street: A Theoretical Framework for Passive Investors. *University of Pennsylvania Law Review,* Forthcoming, 18-12.

Gara, A. (2015). Trian Concedes Defeat in Proxy War with DuPont's Ellen Kullman. *Forbes,* May 13. Retrieved from https://www.forbes.com/sites/antoinegara/2015/05/13/trian-dupont-ellen-kullman-nelson-peltz/#5c1847a417bc

Garcia, C.B., Garcia, J., López Martin, M.M., & Salmeron, R. (2015). Collinearity: revisiting the variance inflation factor in ridge regression. *Journal of Applied Statistics*, 42(3), 648-661.

Gilson, R. & Gordon, J. (2013). The Agency Costs of Capitalism: Activist Investors and the Revaluation of Governance Rights. *Columbia Law Review*. 113 (4), 863–927.

Gittelsohn, J. (2019). Passive U.S. Equity Funds Eclipse Active in Epic Industry Shift. *Bloomberg,* 11 September. Retrieved from https://www.bloomberg.com/news/articles/2019-09-11/passive-u-s-equity-funds-eclipse-active-in-epic-industry-shift

Greenwood, R. & Schor, M. (2009). Investor Activism and Takeovers. *Journal of Financial Economics.* 92 (3), 362–375.

Guthrie, J. (2020). The Fallacy Behind the Rise of Passive Fund Management. *Financial Times,* 15 January. Retrieved from https://www.ft.com/content/1c4382c6-36cb-11ea-a6d3-9a26f8c3cba4

Investment Company Act of 1940.

Jensen, M. C. & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*. 3.4: 305–360

Jensen, M. C. (1989). Eclipse of the Public Corporation. *Harvard Business Review.* 67.5: 61–74.

Jensen, M. C. (1993) The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems. *Journal of Finance.* 48 (3), 831–880.

Karpoff, J. M. (2001). The Impact of Shareholder Activism on Target Companies: A Survey of Empirical Findings. *Working paper.* University of Washington.

Kempf, E., Manconi, A. & Spalt, O. (2017). Distracted Shareholders and Corporate Actions. *The Review of Financial Studies.* 30(5), pp.1660-1695.

Klein, A. & Zur, E. (2009). Entrepreneurial Shareholder Activism: Hedge Funds and Other Private Investors. *Journal of Finance.* 64 (1), 187–229.

Kosowski, R., Timmermann, A., Wermers, R. & White, H. (2006). Can Mutual Fund "Stars" Really Pick Stocks? New Evidence from a Bootstrap Analysis. *The Journal of Finance.* 61(6), pp.2551-2595.

Krouse, S., Benoit, D., McGinty, T. (2016) Meet the New Corporate Power Brokers: Passive Investors. *Wall Street Journal*, 25 October. Retrieved from https://www.wsj.com/articles/the-new-corporate-power-brokers-passive-investors-1477320101

Mahtani, S. (2018). Groupe Bolloré and Elliott Go Head-to-head over Telecom Italia. *Financial Times*, May 3. Retrieved from https://ftalphaville.ft.com/2018/05/03/1525348786000/Guest-post--Groupe-Bollor--and-Elliott-go-head-to-head-over-Telecom-Italia-/

McLaughlin, D., Massa, A. (2020). The Hidden Dangers of the Great Index Fund Takeover. *Bloomberg*, 9 January. Retrieved from https://www.bloomberg.com/news/features/2020-01-09/the-hidden-dangers-of-the-great-index-fund-takeover

Reid, D. (2018). Paul Singer's Elliott Management Wins Bitter Battle for Control of Telecom Italia. *CNBC*, May 4. Retrieved from https://www.cnbc.com/2018/05/04/paul-singers-elliott-management-wins-bitter-battle-for-control-of-telecom-italia.html

Richwine, L. (2012). Netflix Seeks to Fend Off Icahn With Poison Pill. *Reuters*, November 5. Retrieved from https://www.reuters.com/article/us-netflix-poisonpill/netflix-seeks-to-fend-off-icahn-with-poison-pill-idUSBRE8A40QM20121105?fbclid=IwAR09DpoG_J1Uk-_9mtcgosEGfi7v2LF35MDD98YG2Ln1ehSJR4LFuRmuDkU

Schmidt, C. & Fahlenbrach, R. (2017). Do Exogenous Changes in Passive Institutional Ownership Affect Corporate Governance and Firm Value? *Journal of Financial Economics.* 124 (2), 285–306.

Smith, M. P. (1996) Shareholder Activism by Institutional Investors: Evidence from CalPERS. *Journal of Finance.* 51 (1), 227–252.

Swensen, D. F. (2009) *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment* (2. rev. and updated ed.). New York: Free Press.

The Economist. (2015). Capitalism's Unlikely Heroes: Why Activist Investors are Good for the Public Company. *The Economist*, February 5. Retrieved from https://www.economist.com/leaders/2015/02/05/capitalisms-unlikely-heroes

Appendices

Appendix A – List of Terms

Term	Definition
Abnormal Return/Performance	Return or performance in excess of expected return/performance
Activist Hedge Fund	"(1) […] 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 registration requirements" (Brav et al., 2008)
Block Holder	An investor that holds a significant ownership stake in a firm
Corporate Governance	Mechanisms and processes of monitoring, controlling and operating firms
Fiduciary and Beneficiary	The fiduciary is someone responsible for managing an investor's (beneficiary's) capital
Hedge Fund Activism	Shareholder activism conducted by activist hedge funds
Intervention/Campaign/Event/ Engagement	The point in time when an activist hedge fund acquires an ownership stake in a firm
Minority Stake	A non-controlling ownership stake in a firm
Mean Reversion	Situation where a firm experiences a reversion in performance towards the firm's long-term normal performance (or its normal industry performance) after having experienced temporary high or low levels of performance (Barber & Lyon, 1996).
Passive Investors	Collective name for passive institutional investors, i.e. investors that typically do not engage in active monitoring of firms
Poison Pills	"Takeover defenses issued by a firm's board of directors that can dramatically increase the cost that a hostile buyer would have to pay to acquire the firm" (Davis, 1991, p.583).
Shareholder Activism	Initiatives of "[…] monitoring and attempting to bring about changes in the organizational control structure of firms (targets) not perceived to be pursuing shareholder-wealth-maximizing goals" (Smith, 1996, p.227)
SIC-Code	Code used in the U.S. for categorizing industries based on business activities
Target Firm	A firm that an activist hedge fund has acquired an ownership stake in
Value Investor	"Investors who base their investment decisions on fundamental analysis with the aim to acquire a company at a discount to its fair value" (Swensen, 2010, p.91).
Winsorization	A way to normalize data by transforming extreme values
Wolf Packs	When multiple activist hedge funds target the same company simultaneously

Appendix B – List of Variable Definitions, Data Codes and Databases

Item	Code	Database/Source	Included In	Definition
Activist Hedge Fund Interventions	n.a.	Professor Alon Brav	n.a.	Name of activist hedge fund, identification number for firm targeted and date of intervention
Book Value of Equity	TEQ	Compustat	Q	Book value of equity
Book Value of Total Assets	AT	Compustat	Leverage, ROA	Book value of total assets
Book Value of Total Liabilities	LT	Compustat	Leverage, Q	Book value of total liabilities
Earnings Before Interest, Taxes, Depreciation and Amortization	EBITDA	Compustat	Profitability, ROA	Earnings before interest, taxes, depreciation and amortization
First Effective Date of Link	LINKDT	CRSP/Compustat merged	Age	Date when firm first appeared in the merged CRSP/Compustat database
Global Company Key	GVKEY	Compustat	Identification Code	Unique firm identification number
Manager Number	MGRNO	Thomson Reuters S34	Passive Ownership	Unique institutional investor identifier
Market Value of Equity	MKVALT	Compustat	Q, Size	Market value of equity
Number of Shares Outstanding	SHROUT	CRSP	Passive Ownership	Number of shares outstanding
Quasi-Indexer	n.a.	Brian Bushee's Website	Passive Ownership	Basis of classification of passive investors. Classification based on portfolio diversification and turnover (high diversification, low turnover). For more information, see Bushee (2001)
Sales/Turnover Net	SALE	Compustat	Growth, Profitability	Annual net sales
Shares Held	SHARES	Thomson Reuters S34	Passive Ownership	Number of shares held per institutional investor with more than USD 100m in assets under management
Standard Industry Classification Code	SIC	Compustat	Industry Code	SIC (Standard Industrial Classification) codes are used in the U.S. for categorizing which industry a company belong to, based on its business activities

Appendix C – Robustness Tests

C.1. Test I – Change in the Classification of Passive Ownership

In Test 1, we use the median value of passive ownership per year to determine group belonging rather than by the whole sample period's median as the presence of passive investors has increased during recent years. The distribution between Group A and Group B thus becomes even by year which is illustrated in Table 14 below.

Table 14. Distribution of Target Firms by Year of Intervention (Passive Ownership Classified by Year)

Year	Group A Count	%	Group B Count	%	Full Sample Count	%
2000	28	3%	28	3%	56	3%
2001	25	3%	25	3%	50	3%
2002	30	4%	30	4%	60	4%
2003	34	4%	35	4%	69	4%
2004	38	5%	39	5%	77	5%
2005	62	8%	63	8%	125	8%
2006	79	10%	79	10%	158	10%
2007	90	11%	91	11%	181	11%
2008	69	8%	69	8%	138	8%
2009	46	6%	46	6%	92	6%
2010	44	5%	44	5%	88	5%
2011	47	6%	47	6%	94	6%
2012	49	6%	49	6%	98	6%
2013	56	7%	56	7%	112	7%
2014	64	8%	64	8%	128	8%
2015	57	7%	58	7%	115	7%
Total	**818**	**100%**	**823**	**100%**	**1,641**	**100%**

Table 14 shows the modified distribution of target firms by year of intervention and group. The original distribution is found in Table 7.

C.1. Test I – Change in the Classification of Passive Ownership (Q)

Table 15. Evolution of Abnormal Q Over Time (Passive Ownership Classified by Year)

ΔQ		t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
Group A - Group B	Mean	-0.038	-0.010	-0.041	-0.077
	Median	-0.054*	-0.012	-0.003	-0.008

Table 15 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in Q from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.1. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 16. Multiple Regression on Abnormal Changes in Q (Passive Ownership Classified by Year)

ΔQ	(1) t-1 to t=0	(2) t-1 to t+1	(3) t-1 to t+2	(4) t-1 to t+3
PassiveHigh	-0.049	-0.047	-0.038	-0.050
	(-1.01)	(-0.61)	(-0.50)	(-0.48)
ΔGrowth	0.113*	0.157	0.234	-0.056
	(1.97)	(1.61)	(1.50)	(-0.31)
ΔProfitability	-0.075*	0.037	0.020	0.020
	(-1.85)	(0.54)	(0.58)	(0.81)
ΔLeverage	0.903**	0.579**	-0.022	0.108
	(2.18)	(2.61)	(-0.10)	(0.28)
Size	-0.050***	-0.044***	-0.047***	-0.034
	(-3.18)	(-2.98)	(-3.02)	(-1.45)
Age	0.005	0.027	-0.007	0.039
	(0.20)	(0.93)	(-0.17)	(1.15)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.074	0.044	0.049	0.022
Observations	809	705	642	585

Table 16 reports the results from the modified multiple linear regression (1) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.1. The dependent variable is the abnormal change in Q. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.1. Test I – Change in the Classification of Passive Ownership (ROA)

Table 17. Evolution of Abnormal ROA Over Time (Passive Ownership Classified by Year)

ΔROA		t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
Group A vs. Group B	Mean	-0.0103**	-0.0170**	-0.0123	-0.0167
	Median	-0.0079**	-0.0079**	-0.0083**	-0.0055*

Table 17 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in ROA from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0)*, *(t-1 to t+1)*, *(t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.1. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 18. Multiple Regression on Abnormal Changes in ROA (Passive Ownership Classified by Year)

ΔROA	(1) t-1 to t=0	(2) t-1 to t+1	(3) t-1 to t+2	(4) t-1 to t+3
PassiveHigh	-0.010*	-0.014*	-0.015**	-0.014*
	(-1.72)	(-1.92)	(-2.02)	(-1.75)
ΔGrowth	0.065***	0.063***	0.081***	0.082***
	(6.56)	(4.50)	(4.52)	(4.46)
ΔLeverage	-0.088***	-0.118***	-0.095***	-0.084**
	(-5.24)	(-2.95)	(-3.45)	(-2.29)
Size	-0.000	-0.001	0.003	0.000
	(-0.19)	(-0.83)	(1.17)	(0.17)
Age	-0.005	-0.002	-0.003	-0.001
	(-0.99)	(-0.34)	(-0.46)	(-0.19)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.103	0.092	0.087	0.082
Observations	1,465	1,207	1,054	909

Table 18 reports the results from the modified multiple linear regression (2) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0)*, *(t-1 to t+1)*, *(t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.1. The dependent variable is the abnormal change in ROA. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.2. Test II – Change in the Definition of Passive Ownership (Q)

In Test II, we adjust the cut-off for determining the group allocation by calculating the top and bottom quartiles rather than the median value of passive ownership.

Table 19. Evolution of Abnormal Q Over Time (Passive Ownership Q1 vs Q3)

ΔQ		t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
Group A vs. Group B	Mean	-0.018	0.007	-0.008	-0.039
	Median	-0.043*	-0.004	-0.033*	-0.025

Table 19 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in Q from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.2. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 20. Evolution of Abnormal Q Over Time (Passive Ownership Q1 vs Q3)

ΔQ	(1) t-1 to t=0	(2) t-1 to t+1	(3) t-1 to t+2	(4) t-1 to t+3
PassiveHigh	-0.071	-0.100	-0.108	-0.264*
	(-1.39)	(-1.07)	(-1.01)	(-1.97)
ΔGrowth	0.249*	0.147	0.493**	0.008
	(1.97)	(0.95)	(2.04)	(0.03)
ΔProfitability	-0.120***	0.003	-0.063	-0.140*
	(-3.48)	(0.04)	(-0.30)	(-1.69)
ΔLeverage	1.213***	1.189***	0.804***	0.709**
	(2.70)	(3.12)	(4.58)	(2.57)
Size	-0.025**	-0.005	0.012	0.024
	(-2.04)	(-0.31)	(0.52)	(0.85)
Age	0.071**	0.074*	0.010	0.082*
	(2.07)	(1.77)	(0.24)	(1.89)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.233	0.135	0.137	0.094
Observations	436	386	359	326

Table 20 reports the results from the modified multiple linear regression (1) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.2. The dependent variable is the abnormal change in Q. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has a level of passive ownership in the top quartile between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.2. Test II – Change in the Definition of Passive Ownership (ROA)

Table 21. Evolution of Abnormal ROA Over Time (Passive Ownership Q1 vs Q3)

ΔROA		t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
Group A vs. Group B	Mean	-0.0041	-0.0163*	-0.0147	-0.0180
	Median	-0.0062	-0.0087*	-0.0102*	-0.0030

Table 21 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in ROA from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.2. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 22. Multiple Regression on Abnormal Changes in ROA (Passive Ownership Q1 vs Q3)

	(1)	(2)	(3)	(4)
ΔROA	t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
PassiveHigh	-0.004	-0.002	-0.011	-0.014
	(-0.43)	(-0.14)	(-0.89)	(-0.95)
ΔGrowth	0.062***	0.075***	0.117***	0.149***
	(4.95)	(4.36)	(5.98)	(5.58)
ΔLeverage	-0.033	-0.103**	-0.038	-0.028
	(-1.39)	(-2.12)	(-0.92)	(-0.85)
Size	-0.001	-0.003	0.002	0.000
	(-0.44)	(-1.11)	(0.80)	(0.06)
Age	-0.007*	-0.005	-0.001	0.001
	(-1.69)	(-0.89)	(-0.16)	(0.12)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.097	0.115	0.133	0.214
Observations	748	624	556	487

Table 22 reports the results from the modified multiple linear regression (2) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.2. The dependent variable is the abnormal change in ROA. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has a level of passive ownership in the top quartile between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.3. Test III - Change in the Measurement of Passive Ownership (Q)

In Test III, we calculate passive ownership based on the average ownership stake for the three years around intervention, that is *(t-1), (t=0)* and *(t+1)*, rather than only measuring it for two years around intervention, that is *(t-1)* to *(t=0)*.

Table 23. Evolution of Abnormal Q Over Time (Measure Passive Ownership t-1 to t+1)

ΔQ		*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
Group A vs. Group B	Mean	-0.083	-0.062	-0.084	-0.117
	Median	-0.059*	-0.017	-0.035*	-0.005

Table 23 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in Q from the year prior to intervention (*t-1*) up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.3. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 24. Multiple Regression on Abnormal Changes in Q (Measure Passive Ownership t-1 to t+1)

ΔQ	(1) *t-1 to t=0*	(2) *t-1 to t+1*	(3) *t-1 to t+2*	(4) *t-1 to t+3*
PassiveHigh	-0.051	-0.023	-0.006	-0.064
	(-1.23)	(-0.37)	(-0.07)	(-0.57)
ΔGrowth	0.143**	0.169*	0.232*	-0.041
	(2.30)	(1.91)	(1.69)	(-0.24)
ΔProfitability	-0.095***	0.020	0.007	0.008
	(-3.32)	(0.34)	(0.22)	(0.37)
ΔLeverage	0.750*	0.580**	-0.031	0.096
	(1.87)	(2.63)	(-0.14)	(0.25)
Size	-0.027**	-0.034**	-0.041**	-0.031
	(-2.09)	(-2.65)	(-2.25)	(-1.29)
Age	-0.004	0.026	-0.009	0.036
	(-0.11)	(0.87)	(-0.19)	(1.02)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.065	0.044	0.049	0.022
Observations	714	705	642	585

Table 24 reports the results from the modified multiple linear regression (1) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.3. The dependent variable is the abnormal change in Q. The independent variable of interest (*PassiveHigh*) takes on the value 1 if a target firm has an above-median level of passive ownership years around intervention, that is *(t-1), (t=0)* and *(t+1)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.3. Test III - Change in the Measurement of Passive Ownership (ROA)

Table 25. Evolution of Abnormal ROA Over Time (Measure Passive Ownership t-1 to t+1)

ΔROA		*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
Group A vs. Group B	Mean	-0.0043	-0.0133*	-0.0007	-0.0031
	Median	-0.0059	-0.0083**	-0.0072*	-0.0039

Table 25 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in ROA from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0)*, *(t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.3. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 26. Multiple Regression on Abnormal Changes in ROA (Measure Passive Ownership t-1 to t+1)

	(1)	(2)	(3)	(4)
ΔROA	*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
PassiveHigh	-0.005	-0.011	-0.005	-0.005
	(-0.94)	(-1.49)	(-0.49)	(-0.38)
ΔGrowth	0.068***	0.056***	0.071***	0.071***
	(6.38)	(4.00)	(3.79)	(3.83)
ΔLeverage	-0.083***	-0.123***	-0.097***	-0.087**
	(-2.78)	(-3.10)	(-3.62)	(-2.38)
Size	0.000	-0.001	0.001	-0.001
	(0.10)	(-0.77)	(0.70)	(-0.28)
Age	-0.003	-0.002	-0.004	-0.002
	(-0.81)	(-0.37)	(-0.52)	(-0.22)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.111	0.087	0.077	0.073
Observations	1,215	1,207	1,054	908

Table 26 reports the results from the modified multiple linear regression (2) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.3. The dependent variable is the abnormal change in ROA. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership around intervention, that is *(t-1), (t=0)* and *(t+1)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.4. Test IV - Change in the Model of Expected Performance (Q)

In Test IV, we benchmark target firm's changes in value and operating performance to the industry *mean* performance instead of the industry *median* performance.

Table 27. Evolution of Abnormal Q Over Time (Benchmark Mean Industry Change)

ΔQ		*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
Group A vs. Group B	Mean	0.090	0.170	0.196	0.136
	Median	-0.018	-0.135*	-0.028	-0.129*

Table 27 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in Q from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.4. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 28. Multiple Regression on Abnormal Changes in Q (Benchmark Mean Industry Change)

ΔQ	(1)	(2)	(3)	(4)
	t-1 to t=0	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
PassiveHigh	-0.088	-0.198	-0.179	-0.410
	(-0.44)	(-0.78)	(-0.63)	(-1.31)
ΔGrowth	0.086	0.300	0.515	0.073
	(0.31)	(1.21)	(1.58)	(0.17)
ΔProfitability	-0.241**	-0.274**	-0.360***	-0.319***
	(-2.09)	(-2.14)	(-3.53)	(-3.30)
ΔLeverage	3.915***	2.926***	2.092***	2.213***
	(4.80)	(4.48)	(3.09)	(3.06)
Size	0.052	0.074	0.066	0.107
	(0.65)	(0.80)	(0.67)	(1.03)
Age	0.105	0.118	0.128	0.123
	(1.30)	(1.29)	(1.13)	(1.21)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.296	0.223	0.201	0.190
Observations	809	705	642	585

Table 28 reports the results from the modified multiple linear regression (1) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.4. The dependent variable is the abnormal change in Q. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.4. Test IV - Change in the Model of Expected Performance (ROA)

Table 29. Evolution of Abnormal ROA Over Time (Benchmark Mean Industry Change)

ΔROA		t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
Group A vs. Group B	Mean	-0.0127	-0.0172*	-0.0078	-0.0129
	Median	-0.0120	-0.0194*	-0.0151*	-0.0139

Table 29 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in ROA from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.4. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 30. Multiple Regression on Abnormal Changes in ROA (Benchmark Mean Industry Change)

	(1)	(2)	(3)	(4)
ΔROA	t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
PassiveHigh	-0.002	-0.003	0.003	-0.002
	(-0.21)	(-0.28)	(0.29)	(-0.12)
ΔGrowth	0.058***	0.044***	0.061**	0.071***
	(3.87)	(3.18)	(2.57)	(2.93)
ΔLeverage	-0.287***	-0.264***	-0.226***	-0.207***
	(-8.49)	(-8.54)	(-8.58)	(-6.91)
Size	-0.003	-0.004*	-0.001	-0.003
	(-1.35)	(-1.76)	(-0.55)	(-1.07)
Age	0.000	0.001	-0.001	0.002
	(0.02)	(0.09)	(-0.12)	(0.25)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.277	0.207	0.171	0.162
Observations	1,465	1,207	1,054	909

Table 30 reports the results from the modified multiple linear regression (2) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3),* which is defined in Section 6.3.4. The dependent variable is the abnormal change in ROA. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.5. Test V – Excluding Financial Firms (Q)

In Test V, we exclude all financial firms, which amount to 226, from the sample as they are overrepresented in Group B.

Table 31. Evolution of Abnormal Q Over Time (Excl. Financial Firms)

ΔQ		t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
Group A vs. Group B	Mean	-0.070	-0.059	-0.047	-0.091
	Median	-0.066*	-0.043	-0.064*	-0.056

Table 31 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in Q from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.5. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 32. Multiple Regression on Abnormal Changes in Q (Excl. Financial Firms)

	(1)	(2)	(3)	(4)
ΔQ	t-1 to t=0	t-1 to t+1	t-1 to t+2	t-1 to t+3
PassiveHigh	-0.039	-0.054	0.039	-0.063
	(-0.77)	(-0.80)	(0.39)	(-0.59)
ΔGrowth	0.105*	0.194*	0.238	-0.012
	(1.95)	(1.98)	(1.65)	(-0.07)
ΔProfitability	-0.071**	0.015	0.006	0.004
	(-2.02)	(0.24)	(0.18)	(0.20)
ΔLeverage	0.886**	0.561**	-0.015	0.121
	(2.05)	(2.63)	(-0.07)	(0.31)
Size	-0.036**	-0.030**	-0.052***	-0.036
	(-2.67)	(-2.19)	(-2.76)	(-1.62)
Age	0.005	0.012	-0.036	0.021
	(0.19)	(0.39)	(-0.75)	(0.60)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.078	0.046	0.056	0.024
Observations	732	643	590	540

Table 32 reports the results from the modified multiple linear regression (1) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3),* which is defined in Section 6.3.5. The dependent variable is the abnormal change in Q. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

C.5. Test V – Excluding Financial Firms (ROA)

Table 33. Evolution of Abnormal ROA Over Time (Excl. Financial Firms)

Δ ROA		*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
Group A vs. Group B	Mean	-0.0119*	-0.0183**	-0.0132	-0.0237**
	Median	-0.0043	-0.0090*	-0.0087*	-0.0080*

Table 33 reports the results from the modified univariate test of difference in Group A and Group B's abnormal changes in ROA from the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is further defined in Section 6.3.5. The two-sample t-test (the Mann-Whitney test) shows the difference in mean (median) abnormal change in performance between Group A and Group B. *, ** and *** indicate that the difference is statistically different from zero at the 10-, 5 and 1 percent level, respectively.

Table 34. Multiple Regression on Abnormal Changes in ROA (Excl. Financial Firms)

	(1)	(2)	(3)	(4)
ΔROA	*t-1 to t=0*	*t-1 to t+1*	*t-1 to t+2*	*t-1 to t+3*
PassiveHigh	-0.015	-0.018	-0.018	-0.028
	(-1.14)	(-1.44)	(-1.19)	(-1.33)
ΔGrowth	0.066***	0.067***	0.083***	0.081***
	(6.36)	(4.50)	(4.17)	(3.93)
ΔLeverage	-0.015	-0.018	-0.018	-0.028
	(-1.14)	(-1.44)	(-1.19)	(-1.33)
Size	-0.080***	-0.121***	-0.090***	-0.077**
	(-4.44)	(-2.97)	(-3.21)	(-2.19)
Age	0.001	-0.001	0.003	0.001
	(0.25)	(-0.37)	(0.74)	(0.31)
Year FE	Yes	Yes	Yes	Yes
R-squared	0.103	0.098	0.085	0.084
Observations	1,271	1,052	925	802

Table 34 reports the results from the modified multiple linear regression (2) since the year prior to intervention *(t-1)* up to three years following *(t-1 to t=0), (t-1 to t+1), (t-1 to t+2)* and *(t-1 to t+3)*, which is defined in Section 6.3.5. The dependent variable is the abnormal change in ROA. The independent variable of interest *(PassiveHigh)* takes on the value 1 if a target firm has an above-median level of passive ownership between the year prior to intervention and the year of intervention, that is *(t-1)* and *(t=0)*. All independent variables are defined in Section 4.3.2. Each column shows the independent variable's coefficients and t-statistics are shown in brackets. All standard errors are adjusted for heteroskedasticity as well as clustering at the industry level (2 digit SIC-code). *, ** and *** indicate statistical significance at the 10-, 5 and 1 percent level.

Appendix C – Correlation Matrix

Table 35. Correlation Matrix

	ΔQ	*ΔROA*	*PassiveHigh*	*ΔGrowth*	*ΔProfitability*	*ΔLeverage*	*Size*	*Age*
ΔQ	1.0000							
ΔROA	0.1621	1.0000						
PassiveHigh	-0.0661	-0.0358	1.0000					
ΔGrowth	0.0677	0.1741	0.0064	1.0000				
ΔProfitability	0.0103	0.4319	-0.0351	0.2631	1.0000			
ΔLeverage	0.0621	-0.1065	0.0678	-0.0288	-0.0798	1.0000		
Size	-0.0835	-0.0553	0.6473	-0.0420	-0.0132	0.0867	1.0000	
Age	-0.0001	0.0110	0.2003	0.0124	-0.0781	-0.0563	0.2500	1.0000

Table 35 reports the correlation between all variables used in the regressions.

Appendix D – Variation Inflation Factors

Table 36. Variation Inflation Factors (VIF) Abnormal Changes in Q

| | (1) | | (2) | | (3) | | (4) | |
| | *t-1 to t=0* | | *t-1 to t+1* | | *t-1 to t+2* | | *t-1 to t+3* | |
Variable	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Size	1.81	0.551	1.86	0.536	1.91	0.522	1.92	0.520
PassiveHigh	1.74	0.574	1.78	0.563	1.81	0.552	1.83	0.545
ΔProfitability	1.23	0.812	1.13	0.885	1.07	0.936	1.09	0.914
ΔGrowth	1.22	0.821	1.12	0.891	1.06	0.942	1.08	0.929
Age	1.10	0.905	1.11	0.904	1.11	0.899	1.13	0.885
ΔLeverage	1.03	0.972	1.03	0.967	1.07	0.935	1.06	0.942
Mean VIF	1.36		1.34		1.34		1.35	

Table 36 reports the variance inflation factors (VIF) for the regression run on abnormal changes in Q for each time period. Note that the yearly dummy variables used in the original regressions are omitted in the table.

Table 37. Variation Inflation Factors (VIF) Abnormal Changes in ROA

| | (1) | | (2) | | (3) | | (4) | |
| | *t-1 to t=0* | | *t-1 to t+1* | | *t-1 to t+2* | | *t-1 to t+3* | |
Variable	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Size	1.51	0.660	1.53	0.665	1.50	0.664	1.51	0.662
PassiveHigh	1.47	0.678	1.48	0.673	1.47	0.680	1.49	0.671
ΔGrowth	1.11	0.904	1.10	0.911	1.11	0.900	1.11	0.900
Age	1.02	0.984	1.02	0.985	1.02	0.978	1.02	0.979
ΔLeverage	1.01	0.989	1.03	0.971	1.04	0.963	1.05	0.952
Mean VIF	1.22		1.23		1.23		1.24	

Table 37 reports the variance inflation factors (VIF) for the regression run on abnormal changes in ROA for each time period. Note that the yearly dummy variables used in the original regressions are omitted in the table.