Hedge Funds: Regulation, Activism and Corporate Decisions

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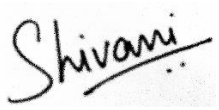

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ABSTRACT

The hedge fund industry has expanded at a spectacular growth rate in terms of assets under management and the number of active hedge funds. The stake and ability of hedge funds to influence the board and managerial decisions make it optimal for them to engage in costly information search, thereby performing monitoring and disciplining roles. Similarly, the influence of hedge funds on corporate decisions and their potentially destabilising power, specifically when they themselves maintain a high degree of opacity at the core of their strategy and specialism, has attracted regulatory concern. Motivated by these concerns that are significant to regulators and policy-making bodies, my thesis examines important aspects of hedge funds which is divided into three empirical chapters.

This PhD thesis, comprised of three empirical chapters, assesses the activity of hedge funds and the regulatory environment facing hedge funds and offers new insights on hedge funds' behaviour and corporate consequences.

The first empirical chapter sheds light on the ongoing debate of whether a hedge fund needs to be regulated. To do so, the first empirical chapter conducts a comparative study of before and after hedge fund regulations in Europe and the US (namely Dodd-Franc Act (DFA) in the US and Alternative Investment Fund Managers Directive (AIFMD) in Europe). An empirical investigation in my first chapter documents the stark effect of hedge fund disclosure regulations on fund performance in Europe in contrast to what is documented in the US studies. The post AIFMD period in Europe experiences an increase in performance contrary to a decline in performance documented in a previous study in the US. The results show that the increase in performance in the European hedge

fund is not limited to the firms affected by the AIFMD alone and has a positive spillover effect on the small funds unaffected by the regulation. The second important revelation of my first empirical chapter is that AIFMD in Europe seems to favour smaller funds as the post-AIFMD-period witnesses improvement in the performance of smaller funds. As such, European evidence is suggestive of the distributional effect of hedge fund regulation benefitting the performance of otherwise constrained small funds. In my third and final set of enquiries, I investigate the volatility consequence of hedge fund regulation and document that the overall fund return volatility has fallen both in the US and Europe. In the ongoing debate in the literature on the merits and demerits of hedge fund regulation, the findings shed important light on the positive volatility outcome of hedge fund regulation.

The second empirical chapter examines firm and industry antecedents of hedge fund activism and documents that the propensity to be an activist target positively depends on the firm and industry characteristics related to agency and information-related problems. This chapter further examines whether competitive forces positively or negatively affect the propensity to attract hedge fund activism. The economic arguments present an unsettled prediction of the effect of industry-level competition and hedge fund activism. According to one side of this debate, competition minimises the danger of asymmetric information to less-informed investors by allowing informed investors to trade together, resulting in more information being captured in the equilibrium price. Therefore, competitive force substitutes, at least in part, the negative effect of asymmetric information. The central postulation of this view is that Hedge Fund activists could specialise as informed investors lowering the information asymmetry. The alternative

view is that, in a monopolistic market, firms possess market power to the extent of coercing prices and output. This may lead to a situation where the value of activism may not translate into eliminating underperformance and undervaluation in the concentrated sectors. The chapter's empirical findings suggest that hedge fund activism is negatively associated with market competition in support of the substitutive argument. The third important revelation in this chapter is the empirical investigation of antecedents of hedge fund activism before and after the change in regulatory and information environment facing hedge funds, i.e. before and after hedge fund regulations (HFRs, henceforth). The empirical enquiry documents that the regime change in the information environment created by hedge fund regulations has enabled activist hedge funds to target firms that are more conservative or are financially constrained. Therefore, hedge fund regulations could be considered to complement and support the information environment for a hedge fund to assess a target and do not necessarily play a substitutive role in information creation as speculated in the literature.

The third empirical chapter investigates the impact of hedge fund activism (HFA) on corporate risk-taking and documents that hedge fund targeted firms would pursue investment conservatism, however aggressive debt policy, thereby directing firms toward short-termism. However, the market seems to reward this short-termistic risk-taking in the form of positive market reactions to hedge fund activism announcements. The second important revelation of the empirical study is that passive hedge funds that turn activists in the later stage would take their familiarity with internal dynamics to further increase short-term oriented risk-taking by exposing the firm to higher earnings volatility and a more levered balance sheet while shunning investment and dividends. This study implies

that the policy discussion should take into account risk-taking consequences that would have long-term costs of hedge fund activism.

Taken together, the thesis highlight the merit of regulation to produce, at least in part, positive market outcomes of lowering return volatility. Return volatility of hedge funds could destabilise the market as they could trigger liquidity dry-ups and volatility spill-overs to the corporate sector. To this end, the thesis underscores the merit of regulating hedge funds. This thesis also sheds important insights on drivers of hedge fund activism and documents the success of hedge funds in correcting firm-level frictions of underperformance and undervaluation of the target firms. However, notwithstanding their success in identifying and correcting underperformance and undervaluation, in the aftermath, they increase the risk-taking of target firms to pursue corporate short-termism. Thus this thesis provides insights to regulators and investors to assess the long term consequences of hedge fund activism in the debate of the overall merit of the wolves (hedge funds) at the door (activism).

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Chapter 1. INTRODUCTION

Hedge fund industry has continued growing at an unprecedented rate (Gillan and Starks, 2007; Brav et al., 2009). A previous study estimates that the total assets under management (AUM) of the hedge fund investment as one industry have grown from $39 billion during the 1990s to over $2.97 trillion in 2015 (Agarwal et al., 2015). This is commensurate with the growing number of active hedge funds rising from 610 to over 10,000 over the same period. In the wake of the higher effect of hedge funds on financial markets, the performance and corporate consequences of the hedge fund have attracted extensive scrutiny (Coffee, 2015).

In conjunction with the increase in the size of the hedge fund industry, the regulatory environment facing hedge funds and (un)intended influence of hedge funds on corporate decisions have evolved over time.

Hedge fund managers could be argued to be motivated to deliver positive returns as their remuneration depends primarily on their fund's performance. In the past, hedge funds have typically charged a 2% (fixed) annual fee of their asset value and an annual 20% (return based performance fee). Although managers of other institutions may receive bonus income based on performance, their incentives are often less significant because they collect a significantly smaller amount of returns due to the Investment Company Act of 1940's performance fee cap.

Hedge funds, unlike many institutional investors like pension funds, are not subject to rigorous fiduciary obligations. A large proportion of hedge fund investors are likely to be large institutions and high net worth individuals. Private placements, which are exempt

from numerous disclosure requirements and other rules, are a common way for hedge funds to raise money.

Hedge funds contend that they are not the same as mutual funds. Because hedge fund managers are not obligated by law to have diverse portfolios, they can take larger positions than other institutional investors. Hedge funds may hold substantial percentage block holdings in the businesses they target and may demand investors to agree to "lock-up" their funds for a period of two years or longer. Hedge funds, as a result, have more trading flexibility than other institutional investors.

Similarly, hedge fund managers have comparatively less conflicts of interest than other investment managers. Unlike mutual funds connected with huge financial institutions, hedge funds, for example, do not offer products to the companies whose stock they own. In contrast to pension funds, hedge funds are not subject to significant state or local political influence or oversight.

From a corporate viewpoint, a hedge fund could act as an informed investor as it is optimal for them to chase costlier information on the target firm, justifying their activist position (O'Hara, 2004). The stake and power of hedge funds to influence the board and managerial decisions make it optimal for them to engage in costly information search, thereby lowering the information asymmetry associated with minority shareholders and the inside decision making. In the following section, this chapter explores some of the stylised features of hedge funds. Arguably, hedge funds present themselves as value-driven activists.

In comparison to earlier institutional investor activism, Hedge Funds Activists (HFA) formulated real and positive financial strategies that are practical and achievable (Clifford,

2008). Besides, the strategies aimed at achieving the organisation's overall economic performance hence contributing positively to the overall product performance, lowering the agency costs, and improving the business strategies at large. Although these changes could somehow influence product market spillover effects, the industrial organisation and competitive strategies literature (Clifford, 2008) argue that cost efficiency and product differentiation in particular organisations could impact oligopolistic industry equilibrium through various channels.

Consequently, organisations are under pressure when activists' investors target their competitors. Despite shedding more light on the HFA (Hedge Funds Activism) through the media, policymakers, and economists' the antecedents and consequences of hedge fund activism are less clearly understood (Cheffins, 2011). Taken together, hedge fund activism is associated with active monitoring and policing corporate decisions.

1.1 Hedge Fund Activism as Corporate Disciplining Tool

Corporate discipline is primarily a mechanism that restricts quasi-rents stemming in firms (Zingales, 1998). It can also be viewed as a mechanism with which firms' finance providers reassure themselves of receiving a return on their investment (Shleifer and Vishny, 1997). Defined as a set of mechanisms, laws, regulations, or complex interactions of these factors, corporate discipline aims to reduce managerial opportunism and/or slack, thus forming the basis of corporate governance (Gillan, 2006). Specifically, from the corporate governance viewpoint, Gillan (2006) divides corporate discipline into two broad categories.

The first type of corporate discipline is internal governance comprised of the board of directors' role, structure and incentives, managerial incentives and compensation; corporate capital structure; bylaw and charter provisions (or antitakeover measures) and systems of internal control.

Similarly, according to Gillan (2006), external governance categories include law and regulation, specifically federal law, self-regulatory organisations, and state law; capital markets, labour markets, the market for corporate control, and product markets; capital market information providers, such as credit, equity, and governance analysts; and markets focusing on accounting, financial, and legal services from parties outside the firm (including auditing, directors' and officers' liability insurance, and investment banking advice); and private sources of external oversight, particularly the media and external lawsuits.

Corporate discipline is one of the important drivers of corporate decisions. From the regulatory perspective, while the general focus of regulators across the world has been towards designing and reforming regulations that aim to promote the smooth functioning of the market by ensuring fairness and transparency in the marketplace, the policy reforms may face unintended consequences (Claessens and Yortuglu, 2013; Vig, 2013). It is, therefore, a relevant concern for regulatory economists to assess the merits and effectiveness of these reforms from various economic outcomes like performance, growth, risk-taking, information environment etc. (Claessens and Yurtoglu, 2013, Vig, 2013, Glendening, 2016).

Over the years, the effect of corporate discipline on corporate decisions has attracted significant research interest in both theoretical and empirical fronts (Jensen and

Ruback, 1983; Hirshleifer & Thakor, 1998; Nenova, (2006); Dharmapala and Khanna, 2013; Lel & Miller, 2015; Glendening et al., 2016 to name a few). Theoretically, in a perfect world with no information asymmetry and agency-related frictions, corporate discipline is not of first-degree importance to optimal corporate decisions as this imposes friction and distorts optimal equilibrium. In this world, corporate discipline can therefore be viewed more like friction than as an enabling factor (Gillan, 2006). However, in the real world that exits amidst information and agency frictions, corporate discipline becomes one of the important drivers of corporate decisions as it lowers the conflict of interest and information asymmetry between controlling insiders and outside investors (Gillan, 2006; Dharmapala and Khanna, 2013; Claessens and Yortuglu, 2013 among others). While the literature on corporate governance also hints at the possibility of rent-seeking behaviour of different actors to maximise their own opportunism and exploitation, others argue that the overall consequence of corporate discipline could Pareto improvement in the financial market in the existence of information and agency related frictions (Pagano, M., & Volpin, 2005; MacNeil and Li, 2006; Bebchuk et al., 2008; Vig, 2013). [1]

The stylised features of a hedge fund, as discussed above, could be argued to qualify hedge funds as having a significant stake, influence and incentive to act as corporate monitors to create adequate corporate discipline. To this end, the thesis derives insights on the (un) intended impact of hedge fund ownership on corporate decisions.

[1] Pareto optimality is a state of allocation of resources from which it is impossible to reallocate so as to make any one individual or preference criterion better off without making at least one individual or preference criterion worse off (Censor, 1977). This optimality test provides the basis of allocation of economic resources when these are scarce.

1.2. Hedge Fund and Regulation

Empirical studies maintain that a hedge fund is largely associated with high returns, and more often than not, high returns could mean they could pursue risky investment strategies. Hedge Fund investment is one investment vehicle that is not meant for the average investor. Since the very foundation of hedge fund investments is based on generating higher returns by taking higher risks, they need to have greater flexibility in the way they operate. Ironically high risk and regulation are not the best of companions. Rawlings et al. (2014) point out that regulatory reforms prompted by the financial crisis of 2008 resulted in new rules accompanied by a transformation in international standards. However, we can find the argument on both sides of the spectrum regarding whether or not hedge funds should be regulated.

This school of thought in favour of no regulation maintains that regulation protecting consumer protection might not be a convincing case for hedge funds (Danıelsson et al.,2005; Cumming et al., 2017; Joenväärä and Kosowski, 2021). Danıelsson et al. (2005) argue that existing regulatory methods focusing on more disclosure regimes and restricted works may not necessarily bring the intended positive outcome. In line with the argument posited by Danıelsson et al. (2005), Cumming et al. (2017), while analysing hedge fund performance, risk, and fund flows before and after the implementation of the Dodd-Frank Act (DFA, henceforth), reveal that relative to non-US peers, US hedge funds that are DFA regulated have poor performance in the post-DFA implementation period.

In the European setting, Joenväärä and Kosowski (2021) investigate the impact of the regulatory restriction on fund performance and risk by comparing conventional and Undertakings for Collective Investment in Transferable Securities (UCITS) hedge funds. Their empirical model estimates the indirect cost of UCITS intervention to be between 1.06% and 4.05% per annum of risk-adjusted returns. Their findings imply that increased regulatory oversight from the 2010 Dodd-Frank reform has imposed new compliance costs and potentially chilled some profitable hedge fund trading and reporting activity.

On the other side of the argument, there is growing consensus globally that systemic risks posed by the hedge funds need to be contained, especially post the financial crisis of 2008. In their survey, Danielsson et al. (2005) concluded that while the direct regulation of hedge funds was unwarranted for the reasons of consumer protection, the systemic concerns that these funds could pose did require regulation of some form. In their opinion, regulation of funds was necessary to contain the possibility and the costs associated with the failure of hedge funds which are systemically important, without hampering the broader benefit to markets from them. Proponents of regulation insist on the need for regulation. According to Beaver et al. (1989), if left without regulation, the market forces would result in information asymmetry among investors, putting some investors at an advantage at the cost of other investors.

The need for regulating hedge funds stems from opacity created by misreporting and under-reporting, excess leverage, liquidity consequence etc., leading to the risk of market failure. With respect to the need to regulate information disclosed by hedge fund advisers, Leto and DiMeglio (2008 cited Bouges and Freund 2014) find that of all the SEC enforcement cases in 2007, the complaints involving investment advisers accounted for

12%. In another study justifying regulatory actions, Heed (2010) points out that the use of excessive leverage facilitated by the private equity setup of funds and financed by investment and commercial banks can cause systemic instability. On the other hand, Verret (2007) pointed out that market liquidity could be impaired on account of hedge fund regulation, consequently leading to an increase in costs for all participants.

The Securities and Exchange Commission (SEC) introduced a new regulatory framework in 2004, requiring hedge funds to register as investment advisors by February 2006. As a result, all funds had to file Form-ADV, which obliged them to disclose conflicts of interest, prior litigation experience, and other operational risk indicators. However, five months later, the ruling was overturned by a US Court of Appeals. This meant that by the time the reversal happened, only one filing had occurred. Brown et al. (2008) examine the impact of this one-time event by comparing each Form ADV to the TASS database's fund data. The authors offer an operational risk metric that is linked to conflicts of interest, leverage, and ownership structure (i.e., the information revealed in the ADV data) but can also be measured using variables found in most major databases. They discovered that significant and sophisticated financial market participants already had access to this information through other routes, making obligatory disclosure unnecessary for them. The majority of investors, on the other hand, did not have this access, and the aggregate flow performance relationship is unaffected by operational risk measures. Thus, the authors argue that mandatory disclosure may help level the informational playing field and that investors could better screen problematic funds through Form ADV documents. In an attempt to analyse the impact of this one-off event on the misreporting by funds, Dimmock and Gerken (2015) found that the passage of a

law requiring most hedge funds to register with the SEC reduced hedge fund misreporting, and after the regulation was overturned in 2006, funds that deregistered increased misreporting when compared to funds that chose to stay registered. They discovered that funds subject to regulatory scrutiny had larger inflows and that the sensitivity of flows to underperformance was reduced. Their results suggest that investors view regulatory oversight as a means to protect their interests.

Misreporting by hedge funds was also analysed by Bollen and Pool (2008, 2009). They find that while a fund manager reports gains, he postpones reporting of losses, and in such cases, reported returns exhibit "conditional serial correlation", which is a leading indicator of fraud. They also contend that fund managers misreport monthly returns, making slightly negative returns far less likely than marginally positive returns. Their analysis finds that the overstatement of results temporarily (with subsequent reversal) is one of the causes of this discontinuity.

In the case of hedge funds, hedge fund regulations like Dodd-Franck Act (DFA, henceforth) and Alternative Investment Fund Managers Directive (AIFMD, henceforth) seek hedge fund advisor registration in an attempt to increase investor protection through enhanced transparency and disclosure regime.

In the existence of opposing views on whether Hedge Fund should be regulated or not, my thesis spread over three empirical chapters aims to provide policy inputs by addressing the gap in the literature in the following areas: a) the effect of regulation on the performance of Hedge Fund; b) the determinants of Hedge Fund Activism and c) Hedge Fund Activism (HFA) on Corporate risk-taking.

1.3 Research questions and main findings

This thesis aims to document hedge fund activity and bring new insights into the effect of regulation on hedge fund performance while also examining the antecedents and consequences of hedge fund activism on corporate decisions. The focus of this study is on three main topics presented in three empirical chapters. Whereas the first chapter explores the impact of hedge fund regulations on fund performance, the second explores the motivations of a hedge fund to initiate activism in a target firm. The third and final empirical chapter examines the corporate risk-taking consequence of hedge fund activism.

1.3.1 Findings of the first empirical chapter

Motivated by the seemingly opposing views on whether or not regulating hedge funds is optimal that I discuss briefly in section 1.2, the first empirical chapter analyses the impact of hedge fund regulations (HFRs, henceforth) on the performance of European and US hedge funds for a period of 2004 to 2017. Hedge fund regulations in my sample countries do not affect all funds based on their assets under management. This helps my empirical set up address the limitation of comparability that the previous study of Cumming et al. (2017) could be subject to and provide policy insights to the regulators.

Employing the US and European setup pre and post hedge fund regulations and exploiting treated and control groups as defined by the regulations, I answer the important question of whether improved disclosure and transparency regimes of HFR have a positive or negative impact on fund performance. Given the policy debate, this question is of

regulatory significance. The finding of my first empirical chapter can be summarised in three important dimensions.

First, my empirical estimations document that the effect of HFR on fund performance in Europe has been in stark contrast with the effect in the US. The post AIFMD period in Europe experiences an increase in performance contrary to a decline in performance documented in a previous study in the US (Cumming et al., 2017). On the contrary, the overall post DFA period has witnessed a significant reduction in performance in line with previous findings of Cumming et al. (2017). However, the increase in performance in the European hedge fund is not limited to the treated firms alone. This has been true for the small funds unaffected by the regulation. Therefore, while there has been a market level improvement in performance, a causal effect cannot be established as the law also seemed to have a positive spillover effect on the unaffected funds.

Second, I document that The AIFMD has a distributive effect on the return based on fund heterogeneity. I have examined the heterogeneous effect of HFR on four important factors: Size, Incentive structure, Leverage and Lock-up period, all of which have an effect on adverse selection cost (Brav et al., 2008). Size would imply reputation or signalling effect in lowering adverse selection costs in the market (Frank and Goyal, 2009). Larger funds have higher returns when compared to smaller funds owing to the reputation impact lowering adverse selection costs. To the extent HFR has a distributive effect on smaller firms, HFR should boost the performance of smaller funds as the new information regime facing funds in the post HFR should lower information friction and adverse selection cost. In line with this theoretical argument, my empirical estimation shows that the AIFMD law seemed to be in favour of smaller funds by improving the performance of smaller funds

in the post AIFMD. As such, European evidence is suggestive of the distributional effect of regulation benefitting the performance of otherwise constrained small funds; HFR seemed Pareto optimal in promoting distributive outcomes intended by regulators. In the US context, however, no such distributional effect is documented consistent with previous studies (Cumming et al., 2017).

In my third and final set of enquiries, I investigate the volatility consequence of HFR. And find that, in the aftermath of HFR, the overall volatility has fallen both in the US and Europe. In the ongoing debate in the literature on the merits and demerit of HFR (Berkel, 2007; Cumming et al., 2017; Joenväärä and Kosowski, 2021), the findings are in line with the positive market outcome of HFR, lowering the volatility of the HF assets-class justifying the role of HFR in bringing positive volatility consequence.

The first empirical chapter on the impact of hedge fund regulations (HFR) on fund performance makes three important contributions to the literature:

First, this study adds to the ongoing debate on the relative merit of HFR. Advocates against HFR argue that the HF industry has thus enjoyed the privilege of being loosely regulated in the past and a part of this is a result of no regulatory burden on the fund managers. Supporting this view, recent empirical studies highlight the deadweight cost of regulatory constraints on fund performance (Cumming et al., 2017; Joenväärä and Kosowski, 2021). This study extends this body of literature by showing evidence from the European and US funds how their merit of HFR outweighs the compliance burden, at least to sub-categories of funds otherwise constrained. My findings add to the broader literature on the merit of regulation in bringing positive market outcomes when facing constraints or friction (Dharmapala and Khanna, 2013; Fauver et al., 2017).

Second, this empirical chapter adds to the burgeoning body of literature in regulatory economics on the distributive effect of the regulation (Berger et al., 2008; Lilienfield Toal et al., 2013; Thapa et al., 2021). This strand of literature maintains that hedge fund regulation would have a distributional consequence (Lilienfield Toal et al., 2013). By eliminating market frictions and improving the information environment, regulation could help otherwise constrained players enjoy positive market outcomes. In line with the argument, my research shows that funds constrained with size, incentive structure, or lock-up period perform better when compared to otherwise unconstrained funds. My findings, therefore, underscore the merit of HFR in bringing a positive distributive effect to the market.

Finally, my study relates to the body of literature examining the effect of regulation on volatility consequences (Cumming et al., 2017; Joenväärä and Kosowski, 2021). This is one of the major concerns of regulators as increased volatility increases the risk of failure and could bring spillover effects on the market, leading to systemic risk (Danıelsson et al., 2005; Fairchild, 2018). My study provides European and US evidence of positive market consequences for the volatility argument. The implication of the findings is regulation could be Pareto-efficient in lowering volatility in the HF markets and, therefore, desirable from the market stability viewpoint, the major concern to the regulators and policymakers (Acharya et al., 2011; Vig, 2013; Cumming et al., 2017).

1.3.2 Findings of the second empirical chapter

In my second empirical chapter, I examine the motivations of an activist hedge fund to target a firm. This is particularly important as activism does not come free. Therefore, a hedge fund becomes an activist only when the fund manager estimates the firm's potential value increase would outweigh the expected cost to interfere. To this end, the focus of this empirical study is to understand the determinants of hedge fund activism. Specifically, I explore six important aspects of antecedents of hedge fund activism which are as follows:

1. Firm antecedents of hedge fund activism
2. Influence of peers in driving hedge fund activism
3. Competition and propensity of hedge fund activism
4. Determinants of hedge fund activism in changing information environment of post Dodd-Frank Act
5. Antecedents that drive a passive hedge fund to switch to activist
6. Market reactions to hedge fund activism announcement.

Using an extensive dataset from SEC filing of the US firms mapping this filing information with target firm characteristics, my empirical work documents important revelations.

First, the firm-level factors that gauge different information and agency problems explain the likelihood that a firm could be a target of hedge fund activism. I document that the smaller the firm, the higher the likelihood of being acquired. Similarly, I find lower firm MB attracts a higher propensity of hedge funds targeting the firm. Further, I

document that hedge fund activism targets underperforming firms with lower operating performance. The finding is in line with the corporate disciplining role of hedge fund activism (Coffee, 2015, Glendening et al., 2016). The aforesaid three results taken together are evidence that corporate, undervaluation and underperformance triggered by higher adverse selection costs are important drivers of hedge fund activism.

On my enquiry of the potential impact of corporate risk-taking of target firms on the propensity to hedge fund activism, the results provide important insights. First, the propensity to hedge fund activism is positively related to investment conservatism (lower Capex) and conservative payout policy (dividend payout). On the other hand, hedge fund activism is revealed to be negatively associated with conservatism related to debt employability and cash-holding. To this end, the finding is in agreement with the theoretical prediction that hedge activism is associated with improving corporate risk-taking (Coffee, 2015; Brav et al., 2018). On the other hand, conservatism related to cash-holding and debt employability seem to deter hedge fund activism. As higher debt employment relates to firm access to external capital (Levine, 2008), the results provide an interesting insight into the hedge fund activism literature in the sense that while hedge funds usually have a higher appetite for higher debt employability (Cumming et al., 2017), they do not tend to improve financial access and would instead target firms which already have better access to the debt market.

In the second set of enquiries, where this thesis studies the peer influence on the propensity to turn activist, the finding that a larger size of peer firms increases the likelihood of hedge fund activists is insightful. This finding is in line with the theoretical argument of the information theory of peer influence and is of policy relevance as activism

is negatively associated with firm size. Thus hedge fund activism is positively associated with a larger size of peers. Similarly, the underperformance of peers and lower cash-holding by peers triggers hedge fund activism.

Similarly, peer influence on the passive hedge funds turning activist suggests that undervaluation, lower cash holding and better operating performance of peer firms trigger passive hedge funds to turn activist. The findings taken together suggest passive hedge fund turning activists may be affected by peers in a different way. Depending on a different information set available to the activists' hedge funds and passive hedge fund turning activist, their response to peers is in line with the rivalry view on decision making (Kandel and Lazear, 1992; Becker, 1993; Prendergast, 1999; Lazear, 2000).

A previous study found that hedge fund activism had a spillover effect on target peers, with a higher likelihood of increasing leverage and payout, lowering capital expenditures and cash, and improving return on assets and asset turnover (Gantchev et al., 2019). To this body of work, my empirical findings imply that there is not only a spillover impact but also a reverse spillover effect, in which a firm's propensity to be targeted by hedge fund activists is influenced by its industry peer characteristics.

In the third set of enquiries, this thesis examines the role of competition on the propensity to hedge fund activism. The literature is divided on the prediction of the effect of competition on the propensity to activism.

According to the first view, competition minimises the danger of asymmetric information to less-informed investors by allowing informed investors to trade collectively, resulting in more information being represented in the equilibrium price (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). Therefore,

competitive force substitutes, at least in part, the negative effect of asymmetric information. Hedge Fund Activists could specialise as informed investors lowering the information asymmetry. To this end, HFA and industry competition serve the same purpose of lowering information asymmetry facing a target firm.

The alternative view is that, in a monopolistic market, firms possess market power to the extent of coercing prices and output (Elia, 2018). To this end, the value of activism may not translate into eliminating underperformance and undervaluation. To this unsettled prediction in the existing literature, my empirical findings suggest hedge fund activism's negative association with market competition supports the substitutive argument. On the other hand, concentrated sectors would attract more activism due to the value of the private information generation role played by the activists (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012).

In my fourth set of inquiries, I examine the role of explanatory power and direction firm antecedents on the propensity to hedge fund activism in the changing information environment before and after the Dodd-Franc Act. It is optimal for hedge fund activists to invest in the search for information, thereby creating better monitoring and governance for the managers and existing board. The strategies adopted by hedge fund activism could lower the conflict of interest between minority shareholders and the activists as activists engage in information production in their process of activism.

The information environment facing Hedge Fund Activism following Dodd-Frank Act could be considered a structural shift (Cumming et al., 2020) and, therefore, may make the information generating role of Hedge fund activism less relevant. To this strand of literature, my empirical enquiry contributes by showing that the regime change in the

information environment created by Dodd-Frank Act has enabled activist hedge funds to target firms that are more conservative (hold more cash) or are financially constrained. Therefore, Dodd-Frank Act could be considered to complement and support the information environment for the hedge fund to assess about a target and does not play a substitutive role in information creation. The evidence is in favour of regulations like the Dodd-Frank Act to improve the information environment. I also document that such an effect does not exist for the passive turned active hedge funds.

The fifth set of empirical investigations, which is the enquiry of passive hedge funds turning activists, reveal that, like other activist hedge funds, passive hedge funds are triggered to be activist by higher adverse selection cost, undervaluation and lower risk-taking appetite. This result could be interpreted as follows. First, a hedge fund may gather inside information about a potential target and enter as an activist. Alternatively, when not certain about the reliability of the information gathered or inability to do so, a hedge fund may enter as a passive investor, gather information about it and turn activist. However, in terms of predictability, both strategies may be optimal and result in the same efficacy in addressing a target firm's adverse selection and agency-related problems. The results show that both types of activism are associated with undervaluation, and higher adverse selection costs are evidence that my research contributes to this debate on what drives hedge fund activism and how.

A further enquiry of other antecedents reveals that the propensity of passive turning activist is positively associated with operating performance. The results are insightful to the minority investors as the propensity of passive hedge funds to turn activist is explained by chasing a potential target that is generating positive operating cash flow

(Coffee, 2015). In essence, it could be optimal for some hedge funds with a lower aptitude to identify and correct the underperformance of a target firm to enter as a passive investor and switch to activist once the potential to perform becomes clearer, thereby correcting the mis-valuation of the performing targets. The results highlight the merit of time to learn about target firms in the form of their passive ownership before turning into activists.

In my final set of enquiries, I investigate the market reaction of activists filing and document positive market responses to activists filing. The result suggests that the market value the information content of activist filing (Brav et al., 2015). This is in line with the economic argument of reduction in information and agency related problems hedge fund activism brings to the target firm.

The second empirical chapter of this thesis on the antecedents of hedge fund activism makes six important contributions to the literature.

Previous studies have identified the role of hedge fund activism as a corporate governance tool (Coffee and Palia, 2015; Gantchev et al., 2019, among others). To this strand of literature, this study documents that adverse selection and agency problems explain the likelihood that a firm could be a target of hedge fund activism. Specifically, my finding supports the argument that corporate undervaluation and underperformance triggered by higher adverse selection costs are important drivers of hedge fund activism.

The second contribution of the second empirical chapter relates to the literature on corporate conservatism and hedge fund activism. Literature on corporate risk-taking appetite depends on the manager's utility from a corporate decision. A rational decision-maker would maximise his utility from corporate decisions (John et al., 2008; Glendening, 2016, among others). Utility comes from three important sources: utility derived from

value-enhancing decisions, utility gained from private benefits and utility from slack (or quiet-life). To this view, utility derived from private benefit or managerial slack encourage them to make a corporate decision that may be sub-optimal to the shareholders encouraging corporate conservatism (Bertrand and Mullainathan, 2003; Vig, 2013). Corporate discipline should shrink insiders' opportunism and slack. Therefore, corporate discipline works in aligning the interest of inside decision-makers and outside investors and encourages insiders to undertake risky but value-enhancing projects (John et al., 2008; Glendening et al., 2016). To this strand of literature, the finding of my second empirical chapter contributes by showing corporate conservatism of a target firm positively triggers hedge fund activism highlighting the disciplining role of hedge fund activism as a corporate governance tool.

The third contribution of the second empirical chapter relates to the strand of literature connecting peer influence influencing corporate finance decisions. Finance literature maintains that peer firms play an important role in shaping corporate decisions, such as through pricing decisions (Bertrand, 1883) and advertisement of goods and services (Stigler, 1968). An increasing number of empirical studies examine the characteristics or behaviour of peer firms and whether they affect a firm's behaviour. Leary and Roberts (2014) is an empirical study that affirms this argument. They document from their empirical estimation model that one standard deviation change in the leverage ratios of peer firms attributes to a ten percentage point change in the firm's debt financing. They further highlight that the peer influence effect is greater than any other antecedents of the capital structure decision of firms. Similarly, studies enquiring the corporate investment policies document that the peer firms' investment behaviour has a spillover effect on a

firm's decision whether to invest or not (Foucault and Fresard, 2014). Information-based argument and rivalry-based argument are the two most established economic views used to understand the influence of peer firms on corporate decisions (Lieberman and Asaba, 2006). While not all firms feel equally threatened by activist targeting in their industry, the influence of peer pressure to affect the competitive front, efficiency and joint (dis)utility from peers would make the peer factors influential on the likelihood of activism. Previous studies in hedge fund activism document that there is a spillover effect of hedge fund activism on target peers in the form of increased likelihood to increase leverage and pay-out, decrease capital expenditures and cash, and improve return on assets and asset turnover (Gantchev et al., 2019). To this small but growing strand of literature, this empirical work suggests that it is not only the spillover effect but also a spill-back effect where the propensity that a firm is targeted by hedge fund activism depends on the firm's industry peer characteristics.

The fourth contribution of the second empirical chapter relates to the strand of literature connecting the effect of competition on corporate decisions. (Empirics show that competition reduces the risk of asymmetric information to uninformed investors due to the collective trading by the informed investors leading to greater information being reflected in the equilibrium price (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). Hedge Fund activists could specialise as informed investors lowering the information asymmetry. Therefore, HFA and industry competition serve the same purpose of lowering information asymmetry facing a target firm and, therefore, substitute each other to correct the firm’s underperformance, underinvestment and undervaluation problems. However, the alternative view posits that in a monopolistic market, firms

possess market power to the extent of coercing prices and output, making no such substitution in operation (Elia, 2018). To this strand of literature, my empirical findings suggest that hedge fund activism is negatively associated with market competition supporting the substitutive argument. In other words, concentrated sectors would attract more activism due to the value of the private information generation role played by the activists (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012).

Finally, the second empirical chapter also contributes to the strand of literature on changing information landscape and hedge fund activism. Due to their stake and incentive, it is optimal for hedge fund activists to invest in the search for information, thereby creating better monitoring and governance for the managers and existing board. The strategies adopted by hedge fund activism could lower the conflict of interest between minority shareholders and the activists as activists engage in information production in their process of activism (Coffee and Palia, 2015; Brav et al., 2018). The information environment facing Hedge Fund Activism following Dodd-Frank Act could be considered a structural shift (Cumming et al., 2020) and, therefore, may make the information generating role of Hedge fund activism less relevant. To this strand of literature, the findings imply that hedge fund regulation complements and supports an information environment for the hedge fund to assess about a target and does not play a substitutive role in information creation. The evidence is in favour of regulations like the Dodd-Frank Act to improve the information environment. Lastly, this chapter documents the positive market response associated with hedge fund activism.

1.3.3 Findings of the third empirical chapter

This empirical chapter examines the effect of hedge fund activism on corporate risk-taking. The motivation behind this possible nexus between hedge fund activism and corporate risk-taking is driven by the fact that risk-taking is an important driver of corporate growth and innovation (John, Litov and Yeung, 2008; Faccio, Marchica and Mura, 2011). Prior studies have shown that firm's willingness to undertake risks toward profitable ventures is an essential foundation of long-term economic growth (DeLong and Summers 1991; Acemoglu and Zilibotti 1997; Baumol, Robert, and Schramm 2007; John, Litov, and Yeung 2008). Sustained economic growth, in essence, leads to economic development. Thus, understanding the antecedents of corporate risk-taking would be important to policymakers. On the other hand, the ability of hedge fund activism to challenge managerial actions to the extent of forceful replacement of incumbent decision-makers makes hedge fund activism a powerful mechanism of corporate discipline, thus affecting a firm's decision making. The nexus of hedge fund activism and corporate risk-taking, therefore, is a policy-relevant question.

Hedge fund activism constitutes one of the important corporate governance tools (Brav et al., 2008; Brav et al., 2018). Literature highlights three stylised features, among other characteristics, that distinguish hedge funds from other institutional investors in their ability to influence the corporate governance of target firms.

Firstly, asset managers of hedge funds have more solid incentives to generate returns as they receive a performance fee, in addition to the fixed management fees, for managing the assets. The personal stake complements the higher performance fees these

managers undertake in the assets they invest. Secondly, hedge funds face lighter regulatory interventions and oversights when compared to mutual funds or pension funds since these funds are only available to sophisticated investors, including institutional investors and high net-worth individuals. Therefore, hedge funds enjoy higher flexibility to interfere with the target firms. Added to this comes no restrictions on the use of derivatives instruments or margin trading on their investment. These are significant advantages for activist shareholders who want to have an unrestricted influence on the choices of the target companies (DesJardine and Durand, 2020). Finally, most hedge funds have lock-up measures in place that prevent investors from withdrawing their money. Given that hedge fund activists typically invest for more than a year in target companies to implement their strategies, this feature allows managers to focus on intermediate- and long-term activist goals. Taken together, the three stylized aspects suggest that hedge fund activism is an important corporate disciplining tool for reducing managerial slack, adverse selection, and agency-related issues (Glendening et al., 2016).

Corporate discipline is the workhorse driver of corporate risk-taking. Hedge fund activism, as a corporate discipline tool, could affect corporate risk-taking. Therefore, this could discourage managerial slack or consumption of private benefits, thereby increasing the long-term value-enhancing risk-taking (Lel and Miller, 2015; Bena et al., 2017). In line with the positive consequence, Brav et al. (2018) found that firms targeted by activists enhance their innovation efficiency over a five-year period following hedge fund involvement in their empirical study of how hedge fund activism affects corporate innovation.

On the other hand, there is a material concern over the short-termism of hedge fund activism. For instance, a recent study by DesJardine and Durand (2020) investigating how hedge fund activism affects firms' financial and social performance reveals a clear trade-off associated with hedge fund activism. They document that while there are short-term benefits to the shareholders reflected in the form of market price reactions and immediate profitability, this short-lived performance does not persist and is associated with a medium-term to long-term cost to stakeholders, in the form of decreased operating cash flow, investment spending and social performance. This has raised concerns of regulators and policymakers with mandates to work towards improving economic growth and social performance metrics.

The mixed empirical evidence of the effect of HFA on corporate consequences motivates this study to examine the effect of HFA on corporate risk-taking from the framework of short-term and long-term debate. Policymakers and investors equally are concerned whether the abundantly documented positive market response associated with hedge fund activism could deliver the expectations of the market. The third chapter aims to contribute to this direction. While in my second empirical chapter, I show the positive market response associated with hedge find activism announcement, in this chapter, I extend that to trace how hedge fund activism shapes corporate risk-taking appetite.

To examine the risk-taking consequences, this empirical chapter specifically examines four specific questions, which are as follows.

1. Does hedge fund activism affect corporate risk-taking?
2. Does risk-taking associated with hedge fund activism lead a target firm to be more short-sighted or long-termistic?

3. Whether there is stock liquidity consequence of target firms associated with hedge fund activism.
4. The final research question of this study is to examine whether a hedge fund, which first enters a target firm as a passive investor and subsequently turns activist, impacts the risk-taking of target firms differently.

Literature in organisational theory maintains the advantage for insiders in an organisational setting to initiate change (Gioia et al., 2010). An investor may learn about firm internal dynamics to be better able to influence corporate decisions (Eggers, 2012; Chen and Feldman, 2018). I borrow from this literature on investor learning to examine if the passive hedge funds, which later turn into activists (switchers, henceforth), affect the corporate risk-taking appetite of the target firms differently.

This empirical study employs comprehensive US data on hedge fund activism from 1995 to 2017 on the effect of HFA has the following important revelations:

First, HFA is associated with an increase in return volatility when gauged by both measures: book measure of risk-taking and market-based measure of risk-taking. To this end, employing both book and market-based measure of risk-taking are widely accepted in literature, I document a positive association between hedge fund activism and corporate risk-taking. The managerial discipline induced by hedge fund activism seems to have expanded the risk-taking appetite in line with previous literature on corporate discipline (John et al., 2008; Koirala et al., 2018).

Second, I examine whether risk-taking associated with hedge fund activism is long-termistic in nature. I do so by examining the effect of hedge fund activism on six important corporate decisions: i.e. Leverage, Cash holding, Capital Expenditure,

R&D Expenditure, Dividend payout, and share buyback. The current investigation reveals that while hedge fund activism is associated with a decrease in capital expenditure, R&D and cash holding, on the one hand, while an increase in leverage and dividend payouts. Therefore, it can be argued the risk-taking effects of HFA is two-fold. While firms pursue higher financial risk (more use of debt) and liquidity risk (lower cash holding), they undertake lower investment risk (lower investments and R&D). This findings is in in line with the short-termism argument of HFA (Strine, 2016; DesJardine & Durand, 2020). I further examine the payout policy of activist targeted firms. The empirical investigation reveals that higher risk-taking is associated with an aggressive payout policy. Taken together, the HFA is associated with lower real and innovative investments while pursuing higher financial and liquidity risk exposing firms to higher insolvency risk. HFA do, however, align the interest of other shareholders by maintaining higher dividends.

Third, this chapter examines the liquidity consequence of hedge fund activism and finds that hedge fund activism causes stock illiquidity, a concern raised by regulators (Berkel, 2007; Cumming et al., 2017). With eroding liquidity in the market coupled with gearing up the target firms, hedge fund activism could undermine corporate stability giving one good reason for regulators to regulate this specialised investor class. To this end, my research is relevant to policymaking.

The final set of results of the third empirical chapter on the HFA show that the learning window (time between a hedge fund entering as a non-activist in a firm and turning into an activist) supplies decision power that a non-activist turned activist enjoys when compared to other activists peers in that, this activist can pursue higher risk-taking without compensating with higher payouts as the activists would do otherwise. The result,

however, may further make firms more short-termistic as this evolution of HFA makes operating earnings more volatile and balance-sheet more levered without simultaneous compensating effect in the form of an increase in real and innovative investments (Strine, 2016; DesJardine & Durand, 2020).

While my second empirical chapter documents friction related to adverse selection and agency problems form important drivers to trigger a hedge fund to initiate activism to a target firm, in the third empirical chapter, I extend this to explore whether hedge fund activism can deliver the intended promise of bringing positive change to corporate decisions from risk-taking perspective. Corporate risk-taking is important for growth and innovation (John et al., 2008; Koirala et al., 2020).

My third empirical chapter on the risk-taking consequence of hedge fund activism makes two important contributions to the literature (Klein & Zur, 2011; Gantchev, 2013; Brav, Jiang, & Kim, 2015; Strine, 2016; Chen & Feldman, 2018; DesJardine & Durand, 2020). First, it contributes to the ongoing open question of long-termism vs short-termism consequence of hedge fund activism by looking at the effect of hedge fund activism on corporate risk-taking as gauged by earnings volatility and idiosyncratic volatility in line with the corporate disciplining role played by hedge fund activism (Brav et al., 2008; Coffee and Palia., 2015). However, this empirical study finds that hedge fund targeted firms would pursue higher risk-taking, investment conservatism and aggressive debt policy, thereby directing firms toward short-termism, consistent with the argument of DesJardine & Durand (2020). This, however, contradicts the conclusion reached by Brav et al., 2018. This study implies that the policy discussion should take into account risk-taking consequences that would have long term costs of hedge fund activism.

Second, this study contributes to the strand of literature on the evolution of Hedge fund activism on the corporate consequence. Coffee and Palia (2010) show that target firms bleed of short-termism with the strike of the wolf (HFA) in terms of the negative effect of hedge fund activism on labour market consequences. To this strand of literature, empirical results of the study imply that the non-activist turned activist heightens short-term oriented risk-taking by exposing the firm to higher earnings volatility and a more levered balance sheet while shunning investment and dividends.

1.4 Contribution

My thesis contributes to the literature on Hedge Fund Activism and the regulatory consequence of hedge fund performance. The first empirical chapter on the impact of hedge fund regulations (HFR) on fund performance makes three important contributions to the literature:

Empirical chapter one adds to the ongoing debate on the relative merit of HFR. Advocates against HFR argue that the HF industry has thus enjoyed the privilege of being loosely regulated in the past and a part of this is a result of no regulatory burden on the fund managers. Supporting this view, recent empirical studies highlight the deadweight cost of regulatory constraints on fund performance (Cumming et al., 2017; Joenväärä and Kosowski, 2021). This study extends this body of literature by showing evidence from the European and US funds how their merit of HFR outweighs the compliance burden, at least to sub-categories of funds otherwise constrained. As highlighted elsewhere in the text, the European set up is remarkably different from the US context. Leveraging this difference in US and European setups, my findings add to the broader literature on the merit of regulation in bringing positive market outcomes when facing constraints or friction (Dharmapala and Khanna, 2013; Fauver et al., 2017).

Second, this empirical chapter adds to the burgeoning body of literature in regulatory economics on the distributive effect of the regulation (Berger et al., 2008; Lilienfield Toal et al., 2013; Thapa et al., 2021). This strand of literature maintains that hedge fund regulation would have a distributional consequence (Lilienfield Toal et al., 2013). By eliminating market frictions and improving the information environment, regulation could help otherwise constrained players enjoy positive market outcomes. In line with the argument, my research shows that funds constrained with size, incentive structure, or lock-up period perform better when compared to otherwise unconstrained funds. My findings, therefore, underscore the merit of HFR in bringing a positive distributive effect to the market.

This study relates to the body of literature examining the effect of regulation on volatility consequences (Cumming et al., 2017; Joenväärä and Kosowski, 2021). This is one of the major concerns of regulators as increased volatility increases the risk of failure and could bring spillover effects on the market, leading to systemic risk (Danıelsson et al., 2005; Fairchild, 2018). My study provides European and US evidence of positive market consequences for the volatility argument. The implication of the findings is regulation could be Pareto-efficient in lowering volatility in the HF markets and, therefore, desirable from the market stability viewpoint, the major concern to the regulators and policymakers (Acharya et al., 2011; Vig, 2013; Cumming et al., 2017).

The second empirical chapter of this thesis on the antecedents of hedge fund activism makes five important contributions to the literature.

Previous studies have identified the role of hedge fund activism as a corporate governance tool (Coffee and Palia, 2015; Gantchev et al., 2019, among others). To this strand of literature, this study documents that adverse selection and agency problems explain the likelihood that a firm could be a target of hedge fund activism. Specifically, my finding supports the argument that corporate undervaluation and underperformance triggered by higher adverse selection costs are important drivers of hedge fund activism.

The second contribution of the second empirical chapter relates to the literature on corporate conservatism and hedge fund activism. Literature on corporate risk-taking appetite depends on the manager's utility from a corporate decision. A rational decision-maker would maximise his utility from corporate decisions (John et al., 2008; Glendening, 2016, among others). Utility comes from three important sources: utility derived from value-enhancing decisions, utility gained from private benefits and utility from slack (or quiet-life). To this view, utility derived from private benefit or managerial slack encourage them to make a corporate decision that may be sub-optimal to the shareholders encouraging corporate conservatism (Bertrand and Mullainathan, 2003; Vig, 2013). Corporate discipline should shrink insiders' opportunism and slack. Therefore, corporate discipline works in aligning the interest of inside decision-makers and outside investors and encourages insiders to undertake risky but value-enhancing projects (John et al., 2008; Glendening et al., 2016). To this strand of literature, the finding of my second empirical chapter contributes by showing corporate conservatism of a target firm positively triggers hedge fund activism highlighting the disciplining role of hedge fund activism as a corporate governance tool.

The third contribution of the second empirical chapter relates to the strand of literature connecting peer influence influencing corporate finance decisions. Finance literature maintains that peer firms play an important role in shaping corporate decisions, such as through pricing decisions (Bertrand, 1883) and advertisement of goods and services (Stigler, 1968). An increasing number of empirical studies examine the characteristics or behaviour of peer firms and whether they affect a firm's behaviour. Leary and Roberts (2014) are an empirical study that affirms this argument. They document from their empirical estimation model that one standard deviation change in the leverage ratios of peer firms attributes to a ten percentage point change in the firm's debt financing. They further highlight that the peer influence effect is greater than any other antecedents of the capital structure decision of firms. Similarly, studies enquiring the corporate investment policies document that the peer firms' investment behaviour has a spillover effect on a

firm's decision whether to invest or not (Foucault and Fresard, 2014). Information-based argument and rivalry-based argument are the two most established economic views used to understand the influence of peer firms on corporate decisions (Lieberman and Asaba, 2006). While not all firms feel equally threatened by activist targeting in their industry, the influence of peer pressure to affect the competitive front, efficiency and joint (dis)utility from peers would make the peer factors influential on the likelihood of activism. Previous studies in hedge fund activism document that there is a spillover effect of hedge fund activism on target peers in the form of increased likelihood to increase leverage and pay-out, decrease capital expenditures and cash, and improve return on assets and asset turnover (Gantchev et al., 2019). My empirical work extends this small but growing strand of literature by showing that it is not only the spillover effect but also a spill-back effect where the propensity that a firm is targeted by hedge fund activism depends on the firm's industry peer characteristics. Peer characteristics are important considerations of hedge funds when selecting their target firms.

The fourth contribution of the second empirical chapter relates to the strand of literature connecting the effect of competition on corporate decisions (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). Empirics show that competition reduces the risk of asymmetric information to uninformed investors due to the collective trading by the informed investors leading to greater information being reflected in the equilibrium price (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). On the other hand, Hedge Fund activists could specialise as informed investors lowering the information asymmetry. Therefore, HFA and industry competition serve the same purpose of lowering information asymmetry facing a target firm and, therefore, substitute each other to correct the firm’s underperformance, underinvestment and undervaluation problems. However, the alternative view posits that in a monopolistic market, firms possess market power to the extent of coercing prices and output, making no such substitution in operation (Elia, 2018). To this strand of literature, my empirical findings suggest

that hedge fund activism is negatively associated with market competition supporting the substitutive argument. In other words, concentrated sectors would attract more activism due to the value of the private information generation role played by the activists (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012).

As the fifth and final contribution, the second empirical chapter extends the strand of literature on changing information landscape and hedge fund activism. Due to their stake and incentive, it is optimal for hedge fund activists to invest in the search for information, thereby creating better monitoring and governance for the managers and existing board. It also documents a positive market response to HFA. The strategies adopted by hedge fund activism could lower the conflict of interest between minority shareholders and the activists as activists engage in information production in their process of activism (Coffee and Palia, 2015; Brav et al., 2018). The information environment facing Hedge Fund Activism following Dodd-Frank Act could be considered a structural shift (Cumming et al., 2020) and, therefore, may make the information generating role of Hedge fund activism less relevant. To this strand of literature, the findings imply that hedge fund regulation complements and supports an information environment for the hedge fund to assess about a target and does not play a substitutive role in information creation. The evidence is in favour of regulations like the Dodd-Frank Act to improve the information environment. The chapter also documents the positive market response to hedge fund activism.

While my second empirical chapter documents friction related to adverse selection and agency problems form important drivers to trigger a hedge fund to initiate activism to a target firm, in the third empirical chapter, I extend this to explore whether hedge fund activism can deliver the intended promise of bringing positive change to corporate decisions from risk-taking perspective. Corporate risk-taking is important for growth and innovation (John et al., 2008; Koirala et al., 2020).

To this end, the third empirical chapter makes at least three important contributions. First, it contributes to the ongoing open question of long-termism vs short-termism consequence of hedge fund activism by looking at the effect of hedge fund activism on corporate risk-taking as gauged by earnings volatility and idiosyncratic volatility in line with the corporate disciplining role played by hedge fund activism (Brav et al., 2008; Coffee and Palia., 2015). However, this empirical study finds that hedge fund targeted firms would pursue higher risk-taking investment conservatism and aggressive debt policy, thereby directing firms toward short-termism, consistent with the argument of DesJardine & Durand (2020). This, however, contradicts the conclusion reached by Brav et al., 2018. This study implies that the policy discussion should take into account risk-taking consequences that would have long term costs of hedge fund activism.

Second, this chapter contributes to the strand of literature on the evolution of Hedge fund activism on the corporate consequence. Coffee and Palia (2010) show that target firms bleed of short-termism with the strike of the wolf (HFA) in terms of the negative effect of hedge fund activism on labour market consequences. To this strand of literature, empirical results of the study imply that the non-activist turned activist heightens short-term oriented risk-taking by exposing the firm to higher earnings volatility and more levered balance sheet while shunning investment and dividends (Strine, 2016; DesJardine & Durand, 2020).

Third, the liquidity consequence of hedge fund activism is an important concern raised by regulators in their stance on regulating the hedge fund industry (Berkel, 2007; Cumming et al., 2017). With respect to the need to regulate, Verret (2007) pointed out that market liquidity could be impaired on account of hedge fund regulation, consequently leading to an increase in costs for all participants. He further argues that funds might choose to move offshore if subject to excessive regulation and suggests self-regulation and the environment of regulatory competition to be the mode of regulation going forward. Riviere (2010) notes the concerns of systemic risks posed by the hedge funds are legitimate but emphasises that it is neither limited to one fund nor national

and needs to be dealt with at a global level criticising a lack of global convergence and coordination for regulating hedge funds. Similarly, Cassar and Gerakos (2010, 2011) suggest that one of the major factors driving smoothening of self-reported returns is asset illiquidity. My study extends this literature by showing the firm targeted by hedge fund activism becomes less liquid in the aftermath. With eroding illiquidity in the market coupled with gearing up the target firms, hedge fund activism could undermine corporate stability giving one good reason for regulators to regulate this specialized investor class. To this end, my research is relevant to policymaking.

1.5 Structure of the thesis

The remaining part of this thesis continues as follows. Chapter 2 documents the regulatory framework around hedge funds and assesses the impact of hedge fund regulation on fund performance. Chapter 3 assesses antecedents determining or deterring hedge fund activism. Chapter 4 focuses on the risk-taking consequence of hedge fund activism. Finally, Chapter 5 offers a discussion of the overall findings and concludes.

1.6 Appendix

Appendix A1.1. Note on Hedge Fund characteristics

There is no universally accepted definition of a hedge fund. The traditional hedge fund is a partnership led by a general partner, with investors acting as limited partners having little or no say in the hedge fund's operations. The four stylized features of the SEC roundtable debate on hedge funds are as follows: These are pooled, privately organised

investment vehicles that are managed by professional investment advisors that have a large stake in the company and are compensated based on performance, and these funds are not generally available to the general public.

Because their remuneration is based mostly on the success of their fund, hedge fund managers are compelled to provide positive returns. Hedge funds have traditionally charged a 2% (fixed) annual fee on their asset value and a 20% annual fee (return based performance fee). Although managers of other institutions may receive bonus income based on performance, their incentives are often less important because they collect a significantly smaller amount of returns due to the Investment Company Act of 1940's performance fee cap.

Unlike many institutional investors, such as pension funds, hedge funds are not bound by strict fiduciary obligations. Large institutions and HNI are expected to be the bulk of hedge fund investors. Hedge funds often raise money through private placements, which are exempt from many disclosure requirements and other laws.

Hedge funds argue that they are not the same as mutual funds. Because hedge fund managers are not obligated by law to have diverse portfolios, they can take larger positions than other institutions. Hedge funds, unlike mutual funds, may hold substantial percentage block holdings in the businesses they target and may demand investors to agree to "lock up" their funds for a period of two years or longer. Mutual funds, on the other hand, are required by law to maintain diversified portfolios and sell securities within one day of an investor's redemption. Furthermore, because hedge funds are exempt from the Investment Company Act, they are allowed to trade on margin and engage in derivatives trading,

which is not open to other institutions like mutual and pension funds. As a result, hedge funds have more trading flexibility than other financial organisations.

Similarly, hedge fund managers are less likely to have conflicts of interest than fund managers of other asset classes. Unlike mutual funds linked with huge financial institutions, hedge funds, for example, do not offer products to the companies whose stock they own. Hedge funds, unlike pension funds, are not subject to considerable governmental or local political influence or oversight.

Hedge fund managers have a vested interest in making a profit. Although many private equity and venture capital funds have similar traits, their focus on private capital markets distinguishes them from hedge funds. Hedge fund activists are more likely to target private enterprises or ongoing private transactions, while private equity investors are more likely to acquire a significant share of ownership. However, the lines between these investors are not always clear, and there is some overlap, especially between some private equity companies and activist hedge funds. Furthermore, hedge funds (and private equity firms) frequently follow various strategies, with some hedge funds focusing solely on activist investing (Brav et al., 2010).

Appendix A1.2. Note on Hedge Fund Activism

In the 1990s, a set of regulatory changes that allowed free engagement and communication between public shareholders, the management, and the general public were adopted (Armour, 2009). The proxy rule introduced was meant to strike a balance between public shareholders and the management by making it possible for minority

shareholders to engage in the investment. The proxy rule change motivated the public shareholders and strengthened their powers by allowing them to form de facto investor cartels and to freely criticise the management (Briggs, 2006). Allowing free communication between shareholders and the public eliminated the imbalance between the shareholders and the management, and this intensified the hedge funds' influence. Activist shareholders were captivated by the fact that they could allow criticising a company genuinely as long as it was not fraudulent statements.

Hedge Funds Activist (HFA) went a milestone further by implementing in-house business strategies such as capital structuring and corporate governance. However, in comparison to earlier institutional investor activism, HFA formulated real and positive financial strategies that are practical and achievable (Clifford, 2008). Besides, the strategies aimed at achieving the organisation's overall economic performance hence contributing positively to the overall product performance, lowering the agency costs, and improving the business strategies at large. Although these changes could somehow influence product market spillover effects, the industrial organisation and competitive strategies literature (Clifford, 2008) argue that cost efficiency and product differentiation in particular organisations could impact oligopolistic industry equilibrium through various channels.

Consequently, organisations are under pressure when activists' investors target their competitors. Despite shedding more light on the HFA (Hedge Funds Activism) through the media, policymakers, and economists' the antecedents and consequences of hedge fund activism are less clearly understood (Cheffins, 2011).

Appendix A1.3. Common Hedge Fund Strategies

Style	Strategy	Description
Tactical Trading	Global Macro	Make opportunistic, leveraged, directional investments in equity, bond, commodity and currency markets globally. They employ a top-down approach and invest based on fundamental political, market and economic views. Heavy use of derivatives in portfolios is common
	Managed Futures and Commodity Trading Advisors	These funds primarily trade futures contracts (financial) and listed commodities, usually for client accounts. The traders a grouped into either discretionary or systematic. While discretionary traders employ technical and fundamental analysis in arriving at trade decisions; systematic trades employ a quantitative framework to analyse historical price movements to forecast how prices will move in future
Equity Long/Short or Directional Trading	Global	Invest in global equities
	Regional	Choose a specific region (i.e. the Asia Pacific) to invest in
	Sector	Choose a specific sector (i.e. Pharma) to invest in
	Emerging Markets	Invest in securities (sovereign bonds, equity and bonds) of emerging market countries may employ long-only strategies
	Short-Selling	Use short positions in equity markets to profit from
	Market Timing	Respond to various market factors varying between long and short positions (in a wide variety of assets viz. "money market funds" and "mutual funds") during short time periods.
	Futures	Primarily invest in futures contracts (underlying could be either commodity or an index)
Event-Driven	Event-Driven or Corporate Life Cycle	Primarily profit from trade claims, equity or debt in companies that are engaged in mergers and acquisitions, spin-off, reorganisation, bankruptcy, share buy-back or recapitalisation. While some funds may invest in a broader range of events, as mentioned, some others could concentrate their investments in distressed securities or risk arbitrage.
	Distressed Securities	Primarily invest in equity (preferred stock, warrants or common stock) or debt (corporate debt, bank debt or trade claims) of companies in either operational or financial difficulties. Companies going through bankruptcy, reorganisations or distressed sales. Such investments usually turn around in the long-term and thus impose long redemption or lock-up periods for investors.

	Risk Arbitrage or Merger Arbitrage	Invest in events like leveraged buy-outs, mergers or acquisitions, and hostile takeovers, among others. For instance, they profit from going short in the shares of the acquiring company and simultaneously going long in the target company.
	Event-Driven Multi-Strategy	As the name suggests, these funds exploit various events and invest in distressed securities, risk arbitrage, small-cap or micro cap-companies raising funds privately
Relative Value Arbitrage	Convertible Arbitrage	Seek to exploit pricing anomalies between convertible bonds and the underlying equity. A typical investment is to long the convertible bond and to hedge a portion of the equity risk by selling short the underlying common stock. Most managers employ leverage, ranging from zero to 6:1. (i.e. for every $1 of investor capital, $6 is invested in securities using a margin account)
	Fixed Income Arbitrage	Employ a variety of strategies that seek to exploit pricing anomalies within and across global fixed income markets, involving investment in fixed income instruments hedged to eliminate or reduce exposure to changes in the yield curve. The pricing anomalies are due to factors such as investor preferences, an exogenous shock to supply or demand, or structural features of the fixed income market. Typical strategies are yield curve arbitrage, sovereign debt arbitrage, corporate versus Treasury yield spreads, municipal bond versus Treasury yield spreads, cash versus futures and mortgage-backed securities arbitrage.
	Market Neutral - Arbitrage	Exploit pricing inefficiencies between related equity securities and simultaneously neutralise exposure to market risk. Neutrality is achieved by exactly offsetting long positions in undervalued equities and short positions in overvalued equities, usually on an equal dollar or zero beta basis.
	Market Neutral - Securities Hedging	Invests equally in long and short equity portfolios, generally in the same sectors of the market. Leverage may be used to enhance returns. Usually low or no correlation to the market. Sometimes uses market index futures to hedge out systematic risk.
	Statistical Arbitrage	Exploit pricing inefficiencies between related equity securities, neutralising exposure to market risk by combining long and short positions and utilising quantitative analysis of technical factors. Portfolios are usually structured to be market, industry, sector, and dollar neutral.
Fixed Income	Convertible Bonds	Focus on yield or current income rather than solely on capital gains. Primarily include long-only convertible bonds.

	Diversified	Invest in a variety of fixed income strategies, including municipal bonds, corporate bonds, and global fixed-income securities.
	High-Yield	Invest in non-investment-grade debt
	Mortgage-Backed	Invest in mortgage-backed securities, including government agency, government-sponsored enterprise, private-label fixed- or adjustable-rate mortgage pass-through securities, fixed or adjustable-rate collateralized mortgage obligation (CMOs), real estate mortgage investment conduits (REMICs), and stripped mortgage-backed securities (SMBSs). Funds may look to capitalize on security-specific pricing inefficiencies.
Others	Funds of Funds	Invest with multiple managers through a fund or a managed account. A Fund of Funds manager has discretion in choosing which strategies to invest in and may allocate funds to numerous managers within a single strategy or to numerous managers in multiple strategies.
	Multi-Strategy	Employ various strategies simultaneously to realize short and long-term gains. Other strategies may include systems trading such as trend following and various diversified technical strategies.

Note. This table presents a brief summary of the most common strategies adopted by hedge funds for investments. The table is based on Lhabitant and Vicin (2004) and Edwards and Gaon (2003)

Chapter 2. HEDGE FUND REGULATION AND FUND PERFORMANCE

2.1 Introduction

The ever increasing debate in policy and legal spheres as early as 2000 and particularly in the wake of the global financial meltdown in 2007-2008, regulators in the US and Europe regulated hedge funds, which initially enjoyed the reputation of operating in an unregulated business environment and a specialized class of investment, only available sophisticated investors (Danıelsson et al., 2005; Stulz, 2007; Cumming et al., 2017; Joenväärä, and Kosowski, 2021). Advocates conjecture that hedge funds being a specialised investment class, are only accessible to sophisticated investors; regulating hedge funds is a mistake. They argue, "Regulation is in some sense incompatible with the fundamental role and character of hedge funds" and that "hedge funds are designed by law with maximum flexibility."[2] One of the factors why hedge funds claim to be unique, in part, comes from the expertise and experience of fund managers as money specialists. Advocates note that hedge fund managers are, in general, swift to identify changing market trends and attempt to profit from such developing trends before other mainstream investors identify and follow the trends. The ability of HF to act swift has to do, at least in part, with the freedom and flexibility to apply their skills for the advantage of the investors. In line with the aforesaid argument, the hedge fund industry has enjoyed the privilege of being loosely regulated in the past. Recent empirical studies on the

[2] See Cumming and Dai (2009)

deadweight cost of regulatory constraints corroborate this view (Cumming et al., 2017; Joenväärä and Kosowski, 2021).

However, regulatory authorities' stance differs from the aforesaid view. Regulators maintain that the systemic risk these funds can pose cannot be written off completely. The primary fear concerning the systemic effects of hedge funds is that the probable collapse of a single hedge fund could impact the entire financial system. There are several characteristics, such as very high gearing, transparency concern, counter-party risks, herding, the employment of complex financial instruments and market liquidity dry-up, that could have a negative impact on the financial stability, thus necessitating regulation of hedge funds (Berkel, 2008). Consequently, hedge funds have witnessed an increase in regulatory oversight globally post the 2008 financial crisis, including Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act or DFA) in the US and The Alternative Investment Fund Managers Directive (AIFMD) in the EU. The changing regulatory environment is affecting the way hedge funds operate and disclose their books and important events. This is in line with the economic view that systemic concerns of hedge funds could be materially serious to warrant some forms of regulatory intervention (Danıelsson et al., 2005).

From the theoretical standpoint, the relative merit of regulating hedge funds is inconclusive.

On the one hand, a view widely maintained by regulators is that the risk these funds can pose cannot be written off completely. The arguments in favour of regulating hedge funds can be divided into four categories: the risks they could possibly cause to the financial stability, the risks brought on to their investors and volatility (Berkel, 2008). On

the other hand, an alternative school of thought maintains that arguments in favour of direct regulation protecting consumers might not be convincing (Danıelsson et al.,2005; Cumming et al., 2017; Joenväärä and Kosowski, 2021). Danıelsson et al., 2005 argue that existing regulatory methods with the focus on more disclosure regimes and restricted works may not necessarily bring the intended positive outcome. In line with the argument posited by Danıelsson et al. (2005), Cumming et al. (2017), while analysing hedge fund performance, risk, and fund flows before and after the implementation of the Dodd-Frank Act (DFA, henceforth), reveal that relative to non-US peers, US hedge funds that are DFA regulated have poor performance in the post-DFA implementation period. However, the evidence on the effect of DFA on the risk they document was mixed. They further find evidence that there is more fund outflow (or less fund inflow) for certain US hedge fund strategies after the implementation of DFA, thereby underscoring the impact of regulatory costs on the fund performance.

While a previous study by Cumming et al. (2017) has an important revelation on the negative effect of regulatory burden on hedge fund performance, the study of Cumming et al. (2017) has two important limitations.

First, while the Dodd-Franc Act did not affect all firms, the firms not affected by the act were not considered in the analysis, thereby ignoring an important aspect of the Act to not-include unaffected firms. In the post-regulation period, if the unaffected firms are affected at least as much as or in the direction witnessed to the affected funds, the implied causal effect could be undermined (Angrist and Pishke, 2008). For a causal effect of regulation to be credible, the change in the post to pre-performance of unaffected funds (control group) should be indistinguishable in the economic sense.

Second, the study of Cumming et al. (2017) uses non-US funds as a comparison (control) group. While this is common practice in academic research (Bargeron et al., 2010), the fact to note is that the rest of the world (excluding US and European countries implementing AFMID) comprises many countries across all major continents in the world. These countries could face different unique economic episodes and contexts around Dodd-Frack implementation and, therefore, may not constitute an ideal benchmark. Grouping the rest of the world as a comparison group can pose an important limitation in the interpretation and generalization of the results.

In light of the aforesaid seemingly opposing advocacies on the effect of regulation on the performance of hedge funds and the limitation of the empirical design employed by the previous study, this study analyses the impact of hedge fund regulations (HFRs, henceforth) on the performance and volatility of European and US hedge funds for a period between 2004 to 2017. As hedge fund regulations in sample countries do not affect all funds based on their assets under management, I address this limitation of comparability in my study by employing a control group as classified by regulation. Furthermore, using European hedge funds allows a comparative study of US and European HFRs simultaneously providing policy insights to the regulators.

First, employing the US and European setup and exploiting treated and control groups as defined by the regulations, I answer the important question of whether improved disclosure and transparency regimes of HFR have a positive or negative impact on fund performance. Given the policy debate, this question is of regulatory significance.

Second, not all hedge funds share equal power to create potential distortion in the market or destabilise the financial system. In fact, while some funds are potentially

coercively powerful, others are small and constrained, prone to high adverse selection costs. Literature has highlighted the distributive effect of law and reform whereby regulation may benefit some category of the entity while negatively affecting other funds (Lilienfield-toal et al., 2012). The aim of regulators in the distributive effect is to empower these otherwise constrained funds. To the extent that hedge fund regulation, through its transparency and disclosure requirement, lowers adverse selection costs, the effect of regulation should have a positive impact on smaller and otherwise constrained funds (Brav et al., 2008). Gauging the heterogeneity of size and fund characteristics, I, therefore, examine the distributive impact of hedge fund regulation on fund performance.

Finally, I examine an important regulatory concern, the volatility consequences of hedge fund regulations. As hedge funds adopt opaque investment strategies, their performance could be more volatile due to higher adverse selection costs, ceteris paribus (Kim and Zhang, 2014). Hedge fund regulation improves the transparency and disclosure environment facing investors in hedge funds. To this end, the volatility of hedge funds should be lower in the post hedge fund regulation.

Similarly, hedge funds hold significant exposures in assets and are often highly levered. Notwithstanding the argument that views that hedge funds are too-small-to-matter, according to Harmes (2005), hedge funds' investments could be important for policymakers because of their ability to become heavily leveraged and serve as market leaders. Because hedge funds typically make large investments, their actions could have a significant price impact, making it difficult for other investors to unwind their positions. In his study of the role of hedge funds in financial crises, market volatility, market manipulation, and systemic risk, Harmes (2005) discovered that hedge fund exposure can

have liquidity and volatility consequences. Therefore, in my third research question, I examine the important concern of volatility consequence of hedge fund regulations.

Exploiting changes in regulatory interventions in European and US hedge fund markets and employing a battery of empirical estimation models with affected and unaffected hedge funds as defined by regulations, my study answers the following important revelations.

First, the effect of HFR on fund performance in Europe has been in stark contrast with the effect in the US. The post AIFMD period in Europe experiences an increase in performance contrary to a decline in performance documented in a previous study in the US (Cumming et al., 2017). In terms of economic magnitude, the post AIFMD performance translates to a range of 19.05%-31.66 increase in monthly return. On the contrary, the overall post DFA period has witnessed a significant reduction in performance in line with previous findings of Cumming et al. (2017). In terms of economic magnitude, the reduction in the post DFA period translates to 31.66% per month, with an average monthly return of 60 basis points for US firms for our study period.

However, the increase in performance in the European hedge fund is not limited to the treated firms alone. This has been true for the small funds unaffected by the regulation. Therefore, while there has been a market level improvement in performance, a causal effect cannot be established as the law seemed to have a positive spillover effect on the unaffected funds as well.

I further examine the effect of HFR on managerial alpha as a robustness test of fund performance.[3] In terms of managerial alpha, the performance of hedge funds by European funds is no different than the pre-AIFMD regime. The implication of this could, in part, the disclosure regime post-HFR could make managerial skills redundant to have any managerial alpha. On the contrary, managerial alpha has declined overall in the US in the post DFA period. However, the reduction in the alpha of funds affected by DFA is lower than smaller sized funds unaffected by regulation. In fact, the affected funds in the US experience 13 basis points lower than the overall fall in the post DFA period. To this extent, the disclosure regime could be implied to have a more assuaging factor when compared to the unaffected firms. This is an important revelation when compared to a recent study in the US, implying the performance deterring effect of DFA (Cumming et al., 2017).

Second, The AIFMD has a distributive effect on the return based on fund heterogeneity. I have examined the heterogeneous effect of HFR on four important factors: Size, Incentive structure, Leverage and Lock-up period, all of which have an effect on adverse selection cost (Brav et al., 2008).

Size would imply reputation or signalling effect in lowering adverse selection costs in the market (Frank and Goyal, 2009). Larger funds have higher returns when compared to smaller funds owing to the reputation impact lowering adverse selection costs. To the extent HFR has a distributive effect on smaller firms, HFR should boost the performance of smaller funds as the new information regime facing funds in the post HFR

[3] Managerial alpha is widely used measure of fund performance of hedge funds that gauges the managerial superior performance when compared with the benchmarks of diversified hedge fund portfolios (Fung and Heish, 2004; Bali et al., 2012)

should lower information friction and adverse selection cost. In line with this theoretical argument, my empirical estimation shows AIFMD law seemed to be in favour of smaller funds by improving the performance of smaller funds in the post AIFMD. As such, European evidence is suggestive of the distributional effect of regulation benefitting the performance of otherwise constrained small funds; HFR seemed Pareto optimal in promoting distributive outcomes intended by regulators. In the US context, however, no such distributional effect is documented consistent with previous studies (Cumming et al., 2017).

Next, I examined the effect of HFR on incentive structure heterogeneity. I document that the effect of AIFMD and DFA in the post-implementation phase is positive to fund performance, with funds having lower incentive structures. Overall, HFRs seem to positively contribute to the performance of funds with a lower incentive structure, thereby lowering the intermediation cost of the hedge fund investments. To this end, HFR could improve investors' inclusion by improving the performance of funds with lower incentive fees. The substitution of law for incentive packages also implies the lowering of adverse selection costs (Glendening et al., 2016).

I further estimate the effect of HFR on leverage heterogeneity. The estimates show that the employment of leverage does not make a difference in the post HFR performance. The results are consistent for Europe and the US. I interpret this as evidence that differential performance that a fund may book following HFR is immaterial due to better transparency and disclosure regime. The superior return should be based on the strategy and not on financing size and argument postulated by Modigliani and Miller (1958) in the capital structure irrelevance model.

Finally, I examined the effect of HFR on fund performance based on lock-up period heterogeneity. Due to information asymmetry, investors with a longer lock-up period would require more returns (Akerlof, 1978). Managers, on the other hand, due to time assurance, would be able to focus on the right investment strategies without abrupt withdrawal risk, thereby generating a higher return, all else equal (Cumming and Davis, 2009; Cumming et al., 2017). However, in a changed regime following HFR, the transparency and disclosure requirement should lower the information asymmetry cost, thereby making the lock-up period less relevant (Akerlof, 1978). In line with the aforesaid argument, the lock-up period is found to be generating a lower return in the post HFE period in the US. The results in Europe are indistinguishable from zero, implying no difference in performance based on lock-up period heterogeneity.

In my third and final set of enquiries, I investigate the volatility consequence of HFR. My estimation reveals that, in the aftermath of HFR, the overall volatility has fallen both in the US and Europe. In the ongoing debate in the literature on the merits and demerit of HFR (Berkel, 2007; Cumming et al., 2017; Joenväärä and Kosowski, 2021), the findings are in line with the positive market outcome of HFR, lowering the volatility of the HF assets-class justifying the role of HFR in bringing positive volatility consequence.

With the three sets of investigations on the effect of HFR on fund performance and the differential effect of HFR on performance based on heterogeneous fund characteristics, my study makes three important contributions to the literature.

First, the study adds to the ongoing debate on the relative merit of HFR. The ability of HF to act swiftly has to do with the freedom and flexibility to apply their skills for the advantage of the investors. Advocates against HFR argue that the HF industry has thus

enjoyed the privilege of being loosely regulated in the past and a part of this is a result of no regulatory burden on the fund managers. Supporting this view, recent empirical studies highlight the deadweight cost of regulatory constraints on fund performance (Cumming et al., 2017; Joenväärä and Kosowski, 2021). My study extends this body of literature by showing evidence from the European funds how their merit of HFR outweighs the compliance burden, at least to sub-categories of funds otherwise constrained. My findings add to the broader literature on the merit of regulation in bringing positive market outcomes when facing constraints or friction (Dharmapala and Khanna, 2013; Fauver et al., 2017). While HFR is unique to every investment market, the evidence I document, suggests the positive market outcome of HFR in the European markets.

Second, my research adds to the burgeoning body of literature in regulatory economics on the distributive effect of the regulation (Berger et al., 2008; Lilienfield Toal et al., 2013; Thapa et al., 2021). This strand of literature maintains that regulation would have a distributional consequence (Lilienfield Toal et al., 2013). By eliminating market frictions and improving the information environment, regulation could help otherwise constrained players enjoy positive market outcomes. In line with the argument, my research shows that funds constrained with size, incentive structure, or lock-up period perform better when compared to otherwise unconstrained funds. My findings, therefore, underscore the merit of HFR in bringing a positive distributive effect to the market.

Finally, my study relates to the body of literature examining the effect of regulation on volatility consequences (Cumming et al., 2017; Joenväärä and Kosowski, 2021). This is one of the major concerns of regulators as increased volatility increases the risk of failure and could bring spillover effects on the market, leading to systemic risk

(Danıelsson et al., 2005; Fairchild, 2018). My study provides European and US evidence of positive market consequences for the volatility argument. The implication of the findings is regulation could be Pareto-efficient in lowering volatility in the HF markets and, therefore, desirable from the market stability viewpoint, the major concern to the regulators and policymakers (Acharya et al., 2011; Vig, 2013; Cumming et al., 2017).

2.2 Related literature and Research Questions

In recent years, the performance of hedge funds has attracted the interest of policymakers, regulators and academia. This interest is corroborated in the coverage by the popular press. For instance, an industry report by Moodys suggests that there exists a myriad of challenges impacting many hedge funds as the markets and regulatory environments facing hedge funds continue to evolve (2011, 1). Besides the shift of Hedge Funds' investor base towards more institutional investors, the bargaining power over incentives and strategies enjoyed by Hedge funds have come under extensive scrutiny (Philipau, 2011; 2019). In the changing landscape of regulatory regimes facing hedge funds, there is an ongoing debate on whether or not HFR would bring positive outcomes to hedge funds as an asset class. The literature is divided into two seemingly opposite sides.

2.2.1. Against Hedge Fund Regulation

This school of thought maintains that regulation protecting consumer protection might not be convincing (Danıelsson et al.,2005; Cumming et al., 2017; Joenväärä and

Kosowski, 2021). Danıelsson et al., 2005 argue that existing regulatory methods with the focus on more disclosure regimes and restricted works may not necessarily bring the intended positive outcome. In line with the argument posited by Danıelsson et al. (2005), Cumming et al. (2017), while analysing hedge fund performance, risk, and fund flows before and after the implementation of the Dodd-Frank Act (DFA, henceforth), reveal that relative to non-US peers, US hedge funds that are DFA regulated have poor performance in the post-DFA implementation period.

In the European setting, Joenväärä and Kosowski, 2021 investigate the impact of the regulatory restriction on fund performance and risk by comparing conventional and Undertakings for Collective Investment in Transferable Securities (UCITS) hedge funds. Their empirical model estimates the indirect cost of UCITS intervention to be between 1.06% and 4.05% per annum of risk-adjusted returns. Their findings imply that increased regulatory oversight from the 2010 Dodd-Frank reform has imposed new compliance costs and potentially chilled some profitable hedge fund trading and reporting activity. (Cumming et al. (2017), Dimmock and Gerken (2016), and

The measurement of hedge fund performance is complex given their flexibility to invest in a wide range of financial assets and employ an equally diverse range of strategies with varying return and risk profiles. In initial attempts to better understand hedge fund risk-return, researchers compared hedge fund returns to mutual fund returns which were more familiar. Liang (1999) finds hedge funds deliver higher returns as compared to mutual funds reflecting better skills of hedge fund managers, and also points the hedge fund returns to be more volatile in comparison with mutual fund returns. Ackermann et al. (1999) also find hedge fund returns to be superior and more volatile when compared to

mutual funds. They point out that hedge fund managers' flexibility in investment choices, substantial managerial incentive and investment, and loose regulation aid their performance.

In an attempt to further examine the reasons for hedge funds' outperformance, Agarwal et al. (2009a) compared mutual funds with "hedged mutual funds" (mutual funds employing strategies similar to hedge funds, however, do not enjoy remuneration structure or regulatory freedom, unlike hedge funds) and hedge funds. They find hedge funds to outperform "hedged mutual funds" and "hedged mutual funds" to outperform traditional mutual funds. They also point out that relatively high flexibility in the choice of investments, better incentives for hedge fund managers and relatively lower regulatory oversight abet hedge fund outperformance. Eling and Faust (2010) examine data from emerging markets to further analyse hedge funds' outperformance. Given the restrictions on the use of derivatives and short selling in emerging markets, they analyse what other factors help hedge funds in their outperformance. They point that in emerging markets, hedge funds outperform on account of being swifter in reallocating their assets or simply by being more proactive.

Bali et al. (2013) employed utility-based parametric and non-parametric performance measures to analyse which hedge fund strategies outperformed fixed income and equity markets in the US. They point out that for 17 years starting 1994, the equity index underperformed the emerging market indices and long/short equity strategies. For medium to short term horizons (holding period up to two years), the US bond markets underperformed the global macro, multi-strategy, long/short equity and managed futures hedge fund strategies. At longer holding period horizons (four to five years), the treasury

market underperformed most strategies employed by hedge funds. Overall, hedge fund strategies seem to outperform mutual funds, hedged mutual funds, US equity and bond markets considering various investment period horizons.

2.2.2. For Hedge Fund Regulation

A hedge fund is almost always associated with high returns, and more often than not, high returns always mean there is high risk involved. This is one investment vehicle not meant for the average investor. Since the very foundation of hedge fund investments is based on generating higher returns by taking higher risks, they need to have greater flexibility in the way they operate. Ironically high risk and regulation are not the best of companions. Rawlings et al. (2014) point that regulatory reforms prompted by the financial crisis of 2008 resulted in new rules accompanied by a transformation in international standards.

The existing literature examines if direct regulation of hedge funds is required and the impact of regulation on hedge funds. There is growing consensus globally that systemic risks posed by the hedge funds need to be contained, especially post the financial crisis of 2008. Danielsson et al. (2005), in their survey, concluded that while the direct regulation of hedge funds was unwarranted for the reasons of consumer protection, the systemic concerns that could be posed by these funds did require regulation of some form. In their opinion, regulation of funds was necessary to contain the possibility and the costs associated with the failure of hedge funds which are systemically important, without hampering the wider benefit to markets from them. Proponents of regulation insist on the

need for regulation. According to Beaver et al. (1989), if left without regulation, the forces of the market would result in information asymmetry among investors, putting some investors at an advantage at the cost of other investors. On the contrary, in view of Gonedes (1980), mandatory regulation might not yield desired results as it merely reallocates wealth. He argues that investors could pay for information where regulation is absent, to the extent that they are not indifferent with regards to being less informed or more informed. He points out that mandatory regulation will decrease the willingness of an investor to acquire information on a personal account and consequently result in a decline in the total information available about entities.

With respect to the need to regulate information disclosed by hedge fund advisers, Leto and DiMeglio (2008 cited Bouges and Freund 2014) find that of all the SEC enforcement cases in 2007, the complaints involving investment advisers accounted for 12%. In another study justifying regulatory actions, Heed (2010) points that the use of excessive leverage facilitated by the private equity setup of funds and financed by investment and commercial banks can cause systemic instability. On the other hand, Verret (2007) pointed out that market liquidity could be impaired on account of hedge fund regulation, consequently leading to an increase in costs for all participants. He further argues that funds might choose to move offshore if subject to excessive regulation and suggests self-regulation and the environment of regulatory competition to be the mode of regulation going forward. Riviere (2010) argues that there is a misunderstanding with regard to how hedge funds function and what their role in financial markets is. They are associated with empty voting, volatility, short-termism, tax avoidance, activism and risk-taking that potentially can destabilize the markets. He emphasises that not all of these

concerns are true, while some might be. He further points out that while hedge funds did not result in the financial crises, regulators around the world unanimously agree on the need for enhanced regulation of hedge funds. Riviere (2010) notes the concerns of systemic risks posed by the hedge funds are legitimate but emphasises that it is neither limited to one fund nor national and needs to be dealt with at a global level criticising a lack of global convergence and coordination for regulating hedge funds.

Misreporting by fund advisers is one other important concern. Cassar and Gerakos (2010, 2011) find that reporting the official NAV of the fund after the elimination of the manager from the reporting setup, reputational incentives and prudent monitoring by providers of leverage decrease the probability of misstating the financials and of regulatory investigations going forward. In their examination of the extent of smoothening of self-reported returns by hedge fund managers, they find intentional smoothening to be more likely in funds where the fund managers exercise greater discretion over pricing fund investments and funds that use pricing sources that are not readily verifiable. They suggest that one of the major factors driving smoothening of self-reported returns is asset illiquidity.

Stulz (2007), while comparing hedge funds to mutual funds, predicted that several changes in the industry would result in hedge funds resembling mutual funds more closely. The increased regulatory oversight as a result of concerns that the financial markets may destabilize on account of high risks taken by hedge funds will curb the flexibility with which these firms operate and eventually lead to convergence of hedge fund returns with those of the mutual fund industry.

The context of regulation does revolve around the flexibility with which these funds operate. In an attempt to assess the impact of regulation on the performance and style of hedge funds, Aragon et al. (2013) compare offshore US hedge funds to onshore funds. They find that while the onshore funds have more liquid investments, they also have higher share restrictions in place for investors. The restrictions aid the funds in mitigating funding risk, given onshore funds have restrictions on the number of investors they have and on advertising. On the other hand, offshore funds have higher AUM, and their fund inflows are relatively more sensitive to their performance. The offshore funds also have better advertising ability. Since offshore funds can raise capital relatively easily, they also have a higher probability of posting lower returns to scale. The authors find that onshore funds outperformed offshore funds starting 1994 to 2001. However, this outperformance eroded in the following years.

In another attempt to study the difference in the flexibility in which funds operate, Undertakings for Collective Investment in Transferable Securities (UCITS) hedge funds are compared to other hedge funds by Joenväärä and Kosowski (2021). UCITS hedge funds are funds registered in the European Union that are subject to harsher leverage and short-selling limitations, as well as greater liquidity requirements. The risk-adjusted performance of UCITS funds is found to be lower than that of their less restricted counterparts. Investors, on the other hand, gain from investing in these vehicles because UCITS funds are less likely to underreport returns. The authors attribute the disparity in performance to UCITS' inability to use leverage and invest in illiquid assets, which limits their investing options.

Cumming and Dai (2009) study how the difference in regulations across different countries impact fund inflows. They find that funds that operate in countries that have fewer restrictions on channels of distribution witness higher fund inflows and lower sensitivity of the fund flows to fund performance. Funds in countries that have restrictions on where the service providers affiliated with funds could be located experienced lower fund inflows. They further find that tax laws applicable also have an influence on the investors' decision to allocate capital. They conclude that a hedge fund's fundraising capability is significantly impacted by the regulation it is subject to. Cumming and Dai (2010a) also study how hedge fund performance and structure are affected by regulation in the hedge funds space. The authors admit that not needing registration and less stringent regulatory oversight could aid funds that are set up to benefit managers using captured fees in spite of bad fund performance. They observe that restrictions on channels of distribution, service providers' location and requirements of minimum capital lead to the underperformance of funds associated with higher fees. However, they also acknowledge that these restrictions succeed in lowering the risk associated with hedge funds, as indicated by a decrease in the standard deviation of returns.

The Securities and Exchange Commission (SEC) passed a new regulatory framework in 2004, requiring hedge funds to register as investment advisors by February 2006. As a result, all funds were compelled to file Form ADV, which required them to disclose conflicts of interest, prior litigation experience, and other operational risk indicators. However, five months later, the ruling was overturned by a US Court of Appeals. This meant that by the time the reversal happened, only one filing had occurred. Brown et al. (2008) examine the impact of this one-time event by comparing each Form

ADV to the TASS database's fund data. The authors offer an operational risk metric that is linked to conflicts of interest, leverage, and ownership structure (i.e., the information revealed in the ADV data) but can also be measured using variables found in most major databases. They discovered that significant and sophisticated financial market participants already had access to this information through other routes, making obligatory disclosure unnecessary for them. The majority of investors, on the other hand, did not have this access, and the aggregate flow performance relationship is unaffected by operational risk measures. As a result, the authors conclude that required disclosure might help level the informational playing field and that investors could better screen problematic funds using Form ADV papers. Dimmock and Gerken (2015) find that the passing of regulation requiring most hedge funds to register with the SEC reduced hedge fund misreporting and that after the regulation was overturned in 2006, funds that deregistered increased misreporting when compared to funds that chose to stay registered. They discovered that funds subject to regulatory scrutiny had larger inflows and that the sensitivity of flows to underperformance was reduced. According to their findings, investors see regulatory scrutiny as safeguarding their interests.

Misreporting by hedge funds was also analysed by Bollen and Pool (2008, 2009). They find that while a fund manager reports gains, he postpones reporting of losses, and in such cases, reported returns exhibit "conditional serial correlation", which is a leading indicator of fraud. They also claim that fund managers misreport monthly returns, making slightly negative returns far less likely than marginally positive returns. Their analysis finds that the overstatement of results temporarily (with subsequent reversal) is one of the causes of this discontinuity.

In another study by Cumming and Dai (2010b), the authors find that differences in regulation of funds are associated significantly with the tendency of fund managers to report monthly returns incorrectly (to smoothen returns). They find that use of wrappers and return misreporting are associated positively, especially for funds that lack lockup provision. They also find that funds in jurisdictions that limit where the key service providers of the fund can be located and require minimum capital have relatively less propensity to report monthly returns incorrectly. They identify that funds with less stringent surveillance are more likely to misreport. La Porta et al. (1997, 1998, 2006 cited Cumming and Dai 2010b) argue that funds in the oversight of English common law are less likely to misreport than funds in civil law countries as the regulation is generally stronger. These studies highlight that misreporting is not an uncommon practice in the hedge fund space. In light of these findings, the higher disclosure requirements mandated by the recent regulatory changes are necessary to curb such unethical practices. They also point to the need for harmonisation in global regulatory standards.

There are previous studies that analyse the impact of regulation, in the form of registration or disclosures, on returns in the securities market, though not particularly in the case of hedge funds. Stigler (1964) argues that there is a negligible distinction in the returns of registered securities when compared to the returns of securities that were not required to register. Jarrell (1981) pointed out that over a period of five years, the "net-of-market returns" to investors of new equity offerings were not enhanced by mandatory registration requirements. Simon (1989) finds that markets in which information costs are low, the regulation does not alter mean returns.

In the context of disclosing information voluntarily, Bouges and Freund (2014) point that firms have an incentive to voluntarily disclose the information if the production costs do not outweigh the benefits. They argue that voluntary disclosure will help firms signal their superior quality. Welker (1995) argues that bid-ask spreads and disclosure policy have a significant negative relationship in spite of controlling for trading volume, share price and return volatility. According to Botosan (1997), in firms where information asymmetry is high, as a consequence of low analyst coverage, higher disclosure is linked to the cost of capital being lower. On the other hand, in firms with high analyst coverage, she finds no relationship between the cost of capital and level of disclosure, concluding market appreciates disclosure where there is a lack of other information sources. According to Healy et al. (1999), higher disclosure ratings are accompanied by an increase in equity returns of the firm, analyst coverage, institutional holding in firms equity and liquidity of the firm's stock. These studies highlight that increased voluntary disclosures impact a firm's returns positively. However, several studies explain why voluntary disclosures are not made by managers. Baginski et al. (2002) find that environments that are less litigious promote disclosures and that a manager may not want to disclose information which is private on account of associated proprietary costs. Dye (2001) argues that entities will choose to disclose only that information that is favourable to them. Clinch and Verrecchia (1997) find that increasing competition among firms deters the probability of higher disclosure since the disclosed information is also accessible to competitors once it is public. Hence unless the costs of increased disclosure are outweighed by benefits in the securities market, managers are less likely to increase disclosures voluntarily. On the

flip side, investors will undervalue the entity's investment value in the absence of sufficient disclosures, leaving the entity no choice but to disclose the information.

In the case of hedge funds, both DFA and AIFMD seek hedge fund advisor registration in an attempt to increase investor protection through enhanced transparency. Bouges and Freund (2014), who conducted a comparative analysis of returns, controlling for the style of investment, by hedge funds registered (voluntarily) with SEC during the financial crisis and funds which remained unregistered, found the mean returns of both registered and unregistered funds not to be significantly different.

In other studies examining the impact of regulation on hedge funds, Cumming et al. (2012) examine if regulating hedge funds impacts the persistence of their performance and find that requirement of minimum capital, restrictions on where the service providers can be located and restrictions on channels of distribution impact the persistence of hedge fund returns by either increasing or decreasing the probability of persistence. Kaal (2014) surveyed hedge fund managers post the effective date for registration by advisers under DFA's Title IV to examine if an inverse relationship existed between compliance cost per unit and the fund size of the hedge fund advisors. He estimated the compliance costs associated with Title IV of the DFA to range from $50,000 to $100,000 based on the response of 47.67% of the 86 fund advisors who responded to the question of compliance costs in the survey. His findings point out that there was no evidence of the cost of compliance per unit being inversely related to the size of the hedge fund managed by the advisers, which is subject to regulation. Another global survey by the Managed Fund Association, Alternative Investment Management Association and KPMG in the year 2013 estimated the compliance costs for funds with AUM less than $1 billion to be around

$700,000 per annum on an average compared to $6 million and $14 million per annum for funds with AUM less than $5 billion and funds were managing $5 billion or more respectively. The survey also estimated compliance costs to be in the range of 5 - 10% of the total operating costs for hedge funds. It further states that compliance costs post-2008 have resulted in an average increase of 10% in operating costs per annum. However, a clearer picture with regard to the cost of compliance is needed.

In one of the first attempts to investigate the influence of DFA on hedge fund performance, Kaal et al. (2014) discovered that the DFA has no effect on fund performance. DFA also has a short-term positive influence on hedge fund performance, according to him. Cumming et al. (2014), on the other hand, find that, when compared to non-US hedge funds, US hedge funds regulated under Dodd-Frank have lower fund alphas in the post-Dodd-Frank implementation period, which is both statistically and economically significant, while the evidence on its impact on risk (standard deviations) and information ratios is mixed. They also claim that hedge funds with assets under management of more than $150 million are more affected by Dodd-Frank than smaller funds. They also presented evidence that US hedge funds experienced fund outflows post the implementation of DFA. The evidence of fund outflows is contrary to that of Dimmock and Gerken (2015), who had found that funds with regulatory oversight experienced higher inflows and the sensitivity of flows to underperformance decreased. Work prior to Kaal et al. (2014) and Cumming et al. (2014) has not attempted to provide a systematic analysis of the Dodd-Frank Act in terms of its impact on hedge fund returns. The impact of AIFMD on hedge fund risk-return is still less explored in the academic literature. A comparison of how both these regulatory exogenous shocks impact hedge fund risk return

could help in better understanding the impact of regulation on hedge fund performance which could guide future policy actions. Given the need for global harmonization of regulatory oversight of hedge funds, a comparison of the impact the two major regulations (DFA and AIFMD) have on hedge fund risk-return is essential. Both DFA and AIFMD have similar objectives of investor protection and containing systemic risk. Given the similar objectives of both these regulations, their impact on hedge funds' risk and return should also be similar. However, if it emerges that the impact of both these regulations on hedge fund risk-return is different, as pointed out by Verret (2007), hedge fund advisers subject to stringent regulation will move to a location where the impact of regulation is more favourable to them. Hence, there will further need to examine the reasons causing these differences and propose measures to eliminate such differences, if any.

A synthesis of the aforesaid extensive literature review leads to an emergence of three major themes in favour of HFR. The first is on the argument of investor protection. The second is the argument of achieving distributive goals to allow participation of otherwise constrained funds, while the third and final economic view is towards promoting financial stability. Each of the arguments would lead to a specific research question I examine in this empirical chapter.

2.2.1.1 Investors Protection Argument

The argument put forward towards regulation stems from the policy objectives of protecting investors' interests. For instance, in the UK, the FCA, one of the two major regulators, has a regulatory objective to protect consumers. Specifically, in its handbook, FCA articulates:

"Our strategic objective is to ensure that the relevant markets function well, and our operational objectives are to:

- protect consumers: we secure an appropriate degree of protection for consumers

- protect financial markets: we protect and enhance the integrity of the UK financial system

- promote competition: we promote effective competition in the interests of consumers." [4]

As specified by FCA, most of the regulators converge in their stance on investor protection in the market. Investment protection without market scrutiny increases moral hazard on the investors' part while increasing adverse selection costs on the sellers of investment. In line with the regulatory stances, Joenväärä and Kosowski (2021) found that the UCITS regulation protects investors; thus, some investors may prefer UCITS funds to higher-performing traditional hedge funds. They also show that management firms with a history of poor performance and outflows are more inclined to start UCITS hedge funds. These companies will be able to gather greater capital flows as a result of the increased demand for more regulated and transparent products among investors. To this end, the end investor protection argument supports HFR. To the extent investor protection improves performance (La Porta et al., 1995), HFR should improve fund performance.

In line with the aforesaid, my first research question aims to investigate whether HFR improves fund performance. While the economic view in favour of investigation

[4] https://www.handbook.fca.org.uk/handbook/glossary/G2976.html retrieved on 20 August 2021 16:02 PM.

may suggest a positive association, the compliance burden would suggest otherwise. I discuss this alternative argument in a separate section.

Research Question 1.

Does improved disclosure and transparency regimes of HFR improve fund performance?

2.2.1.2 The distributive nature of regulation

While regulators are wary about the distortive power of hedge funds due to their sheer size (Berkel, 2007), not all hedge funds share equal power to create potential distortion in the market or destabilize the financial system. In fact, while some funds are potentially coercively powerful, others are small and constrained, prone to high adverse selection costs. The aim of regulators in the distributive effect is to empower these otherwise constrained funds. To the extent that hedge fund regulation, through its transparency and disclosure requirement, lowers adverse selection costs, the effect of regulation should have a positive impact on smaller and otherwise constrained funds (Brav et al., 2008).

I, therefore, extend the examination of the impact of the hedge fund regulation on fund performance by exploring fund heterogeneity to examine the distributive consequence of regulation as my second research question. Regulations aim to achieve the distributional objective (Lilienfield et al., (2013). All else equal, the regulators aim to encourage small funds to participate in the market, which would improve market competition and lowers the impact of spillovers due to big funds failing. Concentrated markets have higher contagion and spillover risks. Therefore, regulators would want to

achieve through the disclosure and transparency regime more participation of smaller funds and otherwise constrained funds. In the absence of regulation, the smaller funds, due to higher information asymmetry costs, would not be able to offer credible confidence to the investors (Glendening et al., 2016). This will result in equilibrium; the industry concentrated on big funds with most of the funds under management while leaving small funds barely investors or assets.

From a theoretical standpoint, consider a reform that increases the disclosure and transparency requirement of hedge funds. This could have two opposing effects on hedge fund performance. The first effect stems from the adverse selection cost of investment stemming from the information asymmetry of these opaque funds. The adverse selection cost of the investors of a hedge fund is lowered due to the better information environment brought by the regulation, thereby lowering the cost of capital. This should improve the performance of hedge funds in equilibrium.

The second and contrarian effect occurs from the loss of managerial specialism (Bargeron et al., 2010). To the extent disclosure regime makes the proprietary skill-set of fund managers accessible to competitors, thereby making the managerial skill-set less specialized and more imitable. This view asserts that disclosure regimes negatively affect fund performance (Cumming et al., 2017).

For the large hedge funds, the reputation of funds offsets the adverse selection cost, making the former mechanism less beneficial and overwhelming the loss of managerial specialism channel. For the small hedge funds and funds with higher adverse selection costs, the reform affects the reduction of adverse selection more than the loss of managerial specialism. As a result, the effect of hedge fund regulation could have a

distributive effect on funds depending on their size and their adverse selection costs. To the extent regulation would bring distributive effect, I formulate my second research question as follows.

Research Question 2

Do disclosure and transparency regimes of HFR achieve a positive distributive effect on fund performance based on fund characteristics?

To employ size and adverse selection related differences across funds, I employ firm heterogeneity based on the size of funds under management, performance fees, managers' skill and compensation, and restrictions on withdrawal of funds.

2.2.1.2.1 Size (Assets under Management)

There is an array of literature that analyses the performance measurement of hedge funds and the factors which affect hedge fund performance. One of the few factors found to impact hedge fund performance in literature is its size, measured by the assets under management of the fund. Getmansky (2005) finds that the performance of a fund has a concave relationship with the size of the fund and that a fund's optimal asset size can be determined by balancing the impact of past returns, competition, inflow of funds, positioning in favourable category and impact of the market on the fund. He suggests investors should choose funds based on optimal size. De Souza and Gokcan (2003) find that performance of a fund is positively related to its size, suggesting that while a large size lowers average costs, funds that perform poorly find it difficult to lure investors.

Gregoriou and Rouah (2002) find that performance of a hedge fund or a fund of hedge funds is independent of its size. They, however, propose that there is a need to re-

test the relationship between a fund's performance and its size over a longer period citing that there could be some factors that could negatively impact performance with an increase in a fund's size, for instance, an increase in administrative duties can bring down the speed of operations. However, Teo et al. (2003), in their analysis of fund characteristics, styles and properties which result in performance persistence, find that in line with the explanation of "economies of scale", fund returns are positively related to fund size. Harri and Brorsen (2004) find that hedge fund returns are strongly negatively related to their capitalization, suggesting that fund managers generate returns by exploiting market inefficiencies; however, these opportunities are limited beyond a certain point, and further suggest that managers stop adding new funds to the fund at this point.

Amenc et al. (2003) employ a wide array of models to analyse fund managers' risk-adjusted performance. In their examination of the impact of the size of the fund on its performance, they find that irrespective of the model choice, the average alpha for smaller funds was less than the average alpha for larger funds. The statistical significance of the results in most cases indicated that, on average, small funds underperformed large funds, establishing a positive relationship between fund size and performance. Liang (1999) also finds a positive relationship between fund assets and fund performance.

2.2.1.2.2 Performance Fee

Another fund factor that impacted hedge fund performance was the performance fee charged by the fund. Amenc et al. (2003) found that across most models employed, funds charging their investors performance fees of 20% or more generated higher alpha than funds that charged lower performance fees, suggesting a direct relationship between incentive fees and fund performance. Nevertheless, the difference was statistically

insignificant when the implicit factor model was employed. On similar lines, De Souza and Gokcan (2003) also find a positive correlation between the performance fee charged by funds and the returns generated by them. They explain higher performance fees deliver better fund returns backed by the fact that as managers' performance improves, he starts charging higher fee or managers with a proven track record command higher performance fees. Liang (1999) also finds a positive relationship between performance fees and fund performance. On the flip side, Schneeweis et al. (2002) examine the impact of performance fees on various styles of funds, viz. Growth, Small, Value funds, and find that performance fee has a negative effect on fund performance. Teo et al. (2003) find post fee returns to be lower for funds with greater performance fees when compared to funds charging lesser performance fees. Since the investors earn only post fee returns, the authors conclude that performance fees have an indirect relationship with fund performance.

2.2.1.2.3 Managers' skill and compensation

The impact of fund managers' abilities and total managerial compensation on fund performance was also studied by researchers. The ability of managers is closely linked to the development of alpha (the proportion of hedge fund return which cannot be explained by exposure to systematic risk). Hedge fund managers generate considerable, positive risk-adjusted returns, according to Liang (1999), Ackermann et al. (1999), and Fung and Hsieh (2004). Agarwal et al. (2009b) also discovered that funds with higher managerial incentives perform better. However, Liang and Schwarz (2011) find that managers keep funds open for new investments even beyond the optimum size, deterring their performance. This tendency of managers to hoard assets is explained by the fact that the

AUM determines the absolute compensation the fund manager draws. Yin (2016) also finds that both fund managers and fund management firms raise additional funds at the cost of fund performance since compensation managers draw increases with the growth in assets under management. De Souza and Gokcan (2003) find that performance of a fund is positively affected by the investment of the manager's personal assets in the fund.

2.2.1.2.4 Restrictions on withdrawal of funds

The length of the lockup period also does impact the performance of funds. Teo et al. (2003) find the performance of hedge funds investing in Asia to have a direct and statistically significant relationship with the holding company's size and length of lockup period. They, however, find performance to be independent of minimum investment size. Schneeweis et al. (2002) also find the lockup period to impact fund returns. They point that funds following a similar strategy delivered better returns with quarterly redemptions when compared to monthly redemptions. Liang (1999) also finds a positive relationship between the duration of the lockup period and fund performance. Aragon (2007) also finds that funds with restrictions on redemptions generate excess returns, which are roughly four to seven per cent more than funds that do not have such restrictions in place. He finds an inverse relationship between lockup periods and a fund's liquidity, suggesting such restrictions aid investment in illiquid assets, consequently aiding the performance of these funds. Agarwal et al. (2009b) argue that funds with longer redemption, lockup and notice periods are associated with better fund performance. Schaub and Schmid (2013) analyse the impact of the lockup period on fund performance in times of financial crisis and find that hedge funds with restrictions on redemptions generate lower alphas and returns during

the crisis. They point that such restrictions fail to protect funds against asset-liability mismatch and find the gap further widens during a financial crisis. Ramadorai (2012) points that secondary market prices illiquidity of a fund and that shares in a hedge fund with greater restrictions on liquidity often find that investors are willing to pay more for funds with lower restrictions.

To the extent the disclosure and transparency regime lowers the adverse selection cost of small (less reputable) or otherwise constrained funds, the regulatory intervention would be Pareto-efficient to bring about this distributive consequence in the market. The improved disclosure and transparency regime eliminates market friction to allow more participation from constrained funds, thereby improving the attractiveness of these funds to the investors (Vig 2013).

In line with the distributive effect argument, my second research question examines the distributive impact of hedge fund regulation on fund heterogeneity.

2.2.1.3 The Volatility and Financial stability Argument

One major concern of regulators to intervene in the HF industry with higher disclosure and transparency regime results from the possibility that HFR could lower extreme volatility in the hedge fund market. Regulators are wary of the destabilizing effect of Hedge funds. Higher volatility leads to poor market outcomes as it is extremely risky for the market participants to participate due to the increased required rate of return to compensate for the losses (Bekaert and Harvey, 2005). While HF is only open for the specialized classes of investors, including sophisticated high net-worth individual and institutional investors, they experience very high volatility (Stulz, 2005).

There are two economic views that explain the relationship between hedge fund regulation and stock volatility. First, hedge funds adopt opaque investment strategies. Opaque assets are more volatile due to higher adverse selection costs, ceteris paribus (Kim and Zhang, 2014). HFR is a disclosure and transparency reform improving greater transparency and disclosure of material information of hedge funds, including exposures. To this end, the volatility of hedge funds lowers in the post hedge fund regulation.

Second, hedge funds hold significant exposures in assets and are often highly levered. Notwithstanding the neoclassical argument that views that hedge funds are too-small-to-matter, According to Harmes (2005), hedge funds' investments could be important for policymakers because of their ability to become heavily leveraged and serve as market leaders. Because hedge funds typically make substantial investments, their actions could have a significant price impact, making it harder for other investors to unwind their positions. When hedge funds provide liquidity and stability when other investors try to sell their positions in down markets, this behaviour could have a reverse impact.

In line with the aforesaid economic view on the effect of hedge fund and volatility, Harmes (2005), in the enquiry of the role played by hedge funds in financial crises, market volatility, market manipulation, and systemic risk, reveal that hedge funds' exposure could have liquidity and volatility consequences. Furthermore, recent episodes following GFC 2007-2008 heighten the regulatory concern that how higher volatility could trigger market failure and contagion effect on the other sector of the economy. Therefore regulators are of the view to adopt measures to lower extreme volatility through higher disclosure and

transparency regime. In line with this view held by regulators and previous studies, I formulate my third research question.

Research Question 3.

Does improved disclosure and transparency regimes of HFR lower hedge fund volatility?

2.2.3. Perception of Hedge Fund Regulation

There is a wide contrast in the perception of regulation in the United States and Europe. While fund managers perceived regulation to be detrimental to fund performance on account of additional regulatory burden and associated time and cost, on the contrary, regulation is popular and viewed favourably in Europe. One of the main reasons for this could be the improvement in investor confidence as the regulation is aimed at investor protection. Another reason for the popularity of regulation in Europe could be that UCITS (Undertakings for the Collective Investment in Transferable Securities), which is a regulatory framework employed for the sale of mutual funds across Europe, are popular among investors in Europe as they are perceived to be safe by investors. The success of UCITS sets the president of regulation, making investments safer and thus contributing to the positive perception around hedge fund regulation in Europe.

2.3 Data

The data has been obtained from the Lipper TASS database. The comparison of the US with the European countries requires me to focus on 22 countries in the European

continent and the US for the sample period 2003 to 2017. The very thin presence of hedge funds in some of the eastern European countries with only one or two observations or observations without pre-period forces me to exclude those from our sample. Furthermore, we start our data with 562642 observations of 8716 unique funds domiciled in 17 countries. Missing information on different categorical and fund-related information, along with keeping data for funds with 1 million USD and above under management to remove penny funds, limits our sample to 108495 monthly observations of 2065 unique hedge funds in the US, while 72475 observations of 2061 funds in European countries including the UK, as shown in Table 2.1 Panel A. [5]

2.3.1. Dependent variables

There are two important dependent variables employed in my estimation models. First is the performance. For this, I employ a month-on-month percentage change in fund performance (based on the NAV of the fund assets). This measure is simple, less prone to estimation model related biases and is a widely used measure of hedge fund performance in the literature (Cumming et al., 2017). Similarly, I supplement two additional measures of fund performance, i.e. Managerial Alpha- based on the seven-factor model of Fung and. Hsieh (2004) and the nine-factor models of Bali et al. (2012) are similar to the strategy

[5] A caveat in the data is on the nature of database that may affect the inference of the empirical chapter. Previous studies have highlighted TASS database faces issues including incorrect data and extreme values, anomalies in observations. To control for the effect of extreme outliers affecting my result, I winsorize returns and financials data at top and bottom 1%.

adopted by Cumming et al.(2017). Specifically, I compute alpha based on 7 and 9 factor models as equations 2.1 and 2.2.

$$Y_{it} = \propto_i + \beta_1 MKT_t + \beta_2 SMB_{\boldsymbol{t}} + \beta_3 \Delta 10Y_{\boldsymbol{t}} + \beta_4 \Delta CrdSprt_{\boldsymbol{t}} + \beta_5 BDTF_{\boldsymbol{t}} + \beta_6 FXTF_{\boldsymbol{t}} + \beta_7 CMTF_{\boldsymbol{t}} + \epsilon_{it}, \quad 2.1$$

where Y_{it} is a monthly return of hedge funds, and factors include $[MKT_t,\ SMB_{\boldsymbol{t}}, \Delta 10Y_{\boldsymbol{t}}, \Delta CrdSprt_{\boldsymbol{t}}, BDTF_{\boldsymbol{t}}, FXTF_{\boldsymbol{t}}, CMTF_{\boldsymbol{t}}]$. MKT_t and $SMB_{\boldsymbol{t}}$ are factors from Fama and French (1997),

and

$$Y_{it} = \propto_i + \beta_1 MKT_i + \beta_2 SMB_{\boldsymbol{t}} + \beta_3 HML_{\boldsymbol{t}} + \beta_4 MOM_{\boldsymbol{t}} + \beta_5 \Delta 10Y_{\boldsymbol{t}} + \beta_6 \Delta CrdSprt_{\boldsymbol{t}} + \beta_7 BDTF_{\boldsymbol{t}} + \beta_8 FXTF_{\boldsymbol{t}} + \beta_9 CMTF_{\boldsymbol{t}} + \epsilon_{it} \quad 2.2$$

where Factors include:

$[MKT_t,\ SMB_{\boldsymbol{t}}, HML_{\boldsymbol{t}}, MOM_{\boldsymbol{t}}, \Delta 10Y_{\boldsymbol{t}}, \Delta CrdSprt_{\boldsymbol{t}}, BDTF_{\boldsymbol{t}}, FXTF_{\boldsymbol{t}}, CMTF_{\boldsymbol{t}}]$.

The nine-factor model is a vector containing the four factors of Fama, French, and Carhart (1997), two factors of Fung and Hsieh (2004), and three factors of Fung and Hsieh (2001). The bond trend-following factor (BDTF) is defined by Fung and Hsieh (2001) as the return of the Primitive Trend Following Strategy (PTFS) bond lookback straddle. Fung and Hsieh (2001) calculated the currency trend-following factor as the return of the PTFS currency lookback straddle, while CMTF calculated the commodities trend-following factor as the return of the PTFS commodity lookback straddle.

For diversified hedge fund portfolios, the seven-factor model of Fung and Hseish (2004) has been documented to explain up to 80 per cent of monthly return variations. Similarly, Bali et al. (2012) nine-factor model combines the HML of Fama-French (1997) and momentum (Calhart 1997) factors in the seven factors. These factor models are documented to produce better estimates of diversified hedge fund portfolios than the simple market model (Bali et al., 2012).

The managerial alpha is defined as the difference between the fund's monthly return and that predicted by the seven (or nine) factor model in equation 2.1 (2.2).

The second dependent variable is the Volatility gauged as a 36-month rolling SD of the Rate of return. As sensitivity tests, I further employ 36-month rolling volatility of managerial alpha based on the seven-factor model of Fung and. Hsieh (2004) and nine factor models of Bali et al. (2012). Besides, as this chapter uses the same estimation methods to compute return, alpha and volatility as used in the previous study by Cumming et al. (2017), this facilitates comparison with previous studies.

Multivariate Empirical Estimations

To test my first research question on the effect of hedge fund regulation on funds, I employ an empirical estimation model as shown in equation (2.3).

$$y_{it} = \propto_i + \beta_1 \, Treated_i + \beta_2 After_{\boldsymbol{t}} + \beta_3 [\, Treated_i \times After_{\boldsymbol{t}}] + \boldsymbol{X_{i,t-1}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it} \qquad (2.3)$$

Where the dependent variable y_{it} is a fund performance gauged by fund month on month performance. Treated is a categorical dummy taking the value of one for the funds exposed to HFR (Dodd-Franc Act (DFA, henceforth) or Alternative Investment Fund

Managers Directive (AIFMD, henceforth)). After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. $X_{i,t-1}$ represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects $\boldsymbol{\lambda_s}$The strategies include popular strategies like Convertible Arbitrage, Dedicated Short Bias strategy, Emerging Markets, Equity Market Neutral, Event-Driven, Fixed Income Arbitrage, Fund of Funds, Global Macro, Long/Short Equity Hedge Managed Futures, Multi-Strategy, and Options Strategy and others.

In this empirical estimation model 2.3, β_1 measures the difference between the monthly return of treated and control hedge funds. Similarly, β_2 measures the difference between the return of post minus pre HFR period. Finally, β_3 measures the average treatment effect of the treated for causality.

In order to answer my second research question to estimate the distributive effect of HFR on fund performance based on fund heterogeneity, I employ the following regression model 1.2. The triple interaction coefficient measures the differential effect of HFR based on fund heterogeneity.

$$y_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_{\boldsymbol{t}} + \beta_3 [Treated_i \times After_{\boldsymbol{t}}] + \beta_4 [Treated_i \times After_{\boldsymbol{t}} \times Fund - Heterogeneity] + \boldsymbol{X_{i,t-1}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it} \quad (2.4)$$

In the empirical estimation model 2.4, β_3 (the coefficient of a triple interaction term β_4 $[Treated_i \times After_{\boldsymbol{t}} \times Fund - Heterogeneity]$) is the parameter of interest

and measures the average treatment effect of the treated based on fund heterogeneity. All other symbols are explained in equation 2.3.

Finally, to estimate the effect of HFR on volatility as postulated in my third research question, I employ the estimation model 2.5.

$$\varrho_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_{\boldsymbol{t}} + \beta_3 [Treated_i \times After_{\boldsymbol{t}}] + \boldsymbol{X_{i,t-1}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it} \quad (2.5)$$

where ϱ_{it} 36-month rolling volatility of monthly return. All other symbols are as explained in model 2.3.

2.3.2 Descriptive statistics

Table 2.1 presents the descriptive statistics of European and US Hedge Funds for the period 2003-2017. As shown in Table 2.1 Panel B, this includes 108495 monthly observations of 2065 unique hedge funds in the US while 145293 observations of 2061 funds in European countries, including the UK. The country-wise distribution as presented in Panel A shows that the US possess almost half of the sample observation, while in Europe, British Virgin Island (UK) and Luxembourg have the highest presence of the funds.

2.3.3 Univariate estimates - Monthly Return and Volatility

2.3.1.1 Monthly Return

I start with a simple t-test analysis of differences in the mean value of the monthly return of hedge funds before and after the HFRs in the US and in Europe. Here monthly

return of hedge funds is computed as a month-on-month percentage change in fund performance (based on the NAV of the fund assets). This measure is simple, less prone to estimation model related biases and is a widely used measure of hedge fund performance in the literature (Cumming et al., 2017). Table 2.3 shows that there has been an improvement in the overall performance of European Funds post-AIFMD period. In terms of economic magnitude, the increase of 7 basis points translates to 33.33% of the average monthly return of European Funds (with an average monthly return of 21 basis points during the period). However, the returns are, in absolute terms, considerably lower than their US-domiciled peers. Figure 2.2 provides a visual representation of the results of Panel A of Table 2.3.

On the contrary to the findings in Europe, following DFA in the US, there has been a drop in overall performance gauged by the monthly rate of return of NAV (expressed in decimal points) of the funds in the US. In terms of economic magnitude, the drop translated to an average of 15 basis points. Given the average monthly return of a US firm is 60 basis during the sample period, the drops translate to the economic magnitude of 25% of the average return. The findings in the US are in line with previous empirical work by Cumming et al. (2017).

In summary, the impact of HFR on fund performance in Europe weakens the fear of the economic view that HFR destroys the performance of hedge funds (Danıelsson et al., 2005; Stulz, 2007; Cumming et al., 2017; Joenväärä and Kosowski, 2021). Transparency and disclosure regime may provide external monitoring to encourage managers towards generating a better performance in line with the theoretical argument that regulation could trigger performance (John et al., 2008). My findings, however, do

not seem to corroborate with the recent findings of Cumming et al. (2017) in the US. Using a matching estimator approach, Joenväärä and Kosowski (2017) estimate the indirect cost of AIFMD regulation to be between 1.06% and 4.05% per annum in terms of risk-adjusted returns. Given the results are subject to the sample selection technique, my results give the overall market picture of hedge funds in Europe with assets under management worth USD 1 million or above. Furthermore, a simple before and after analysis, while they are simple and powerful to estimate overall market consequences, may not be sufficient to assign causality (Angrist and Pishke, 2007). To alleviate this concern, I supplement the univariate analysis with a multivariate difference-in-difference (diff-in-diff) analysis in section 2.3.4.

2.3.1.2 Fund Heterogeneity

While I discuss how Hedge fund regulations in Europe and US have an overall differential effect on the performance of funds, in this section, I explore the effect of HFRs on performance based on different fund characteristics that may affect performance. Guided by the literature discussed in section 2, I focus on four important heterogeneity: Size, Incentive structure, Leverage and Lock-up period.

2.3.1.2.1 Size Effect

The size of assets under management could have an implication on performance. A larger size may proxy the reputation of the asset manager's expertise and, therefore, would have a higher return. However, there is no clear indication in the literature on how HFR should affect the performance of funds managing larger assets under management compared to smaller funds. To investigate the size effect, I divide the entire sample into

five quintiles to see how an HFR has affected different size quintiles. Results are tabulated in panels B and C of table 2.3. We can see in table 2.3 that, except for quintile 1, all other size quintile has a higher return in the post AIFMD period. However, in terms of statistical significance, the difference is significant for quintiles 3 and 4, implying the positive effect of HFR is driven by the improvement of the performance of mid-size funds. Large-sized funds have used their size to lower incentive misalignment between asset managers and investors. However, to the extent the mid-cap funds may not have that advantage, the improved disclosure regime helps lower the adverse selection cost and, therefore, may be beneficial. On the other extreme, the HFR did not have an improvement in its performance, indicating the cost of compliance may be higher for the small-sized funds.

On the contrary, in the US, there has been a decline in the return across the size quintiles except for the largest sized fund (the difference of 3 basis is statistically indistinguishable from zero). This implies large funds can substitute the negative effect of HFR due to their size effect. Taken together, larger funds may have their expertise due to which they neither benefit from regulation (Europe) nor are negatively affected by HFR (US). Law may, however, have a distributive effect on small and mid-sized funds.

2.3.1.2.2 Incentive Structure

The incentive structure has implications on fund performance. The investor would pay higher incentives and remuneration for funds with better performance. Similarly, higher management and incentive structure signal the reputation of HF manager's capability to perform better in the ex-ante. Alternatively, higher incentives and management fees could, in part, represent a compensation scheme to address higher

information asymmetry (citation needed). In panels A and B of Table 2.4, I show the before and after difference in fund performance around AIFMD and DFA. Panel A of Table 2.4 has the following important revelations.

First, the overall monthly return of funds with higher incentive fees is higher in Europe (51 basis points vs 19 basis points). However, the US being a more mature HF market than Europe, no such difference exists in the US.

Second, there has been an increase (8 basis points) in the monthly return of funds with lower incentive fees in the post AIFMD period, while there is a moderately significant decrease in the performance of funds with higher incentive fees. Taken together, the findings of Europe following AIFMD indicate that incentive fees could substitute missing regulatory scrutiny in the form of disclosure and transparency.

Third, while the overall HF market experienced a dip in the post DFA period, the decline was driven by funds with lower incentive fees (a significant decline of 16 basis points). However, no statistically significant change in the performance of funds with higher incentive fees. These findings highlight the importance of management fees against some assurance against bad performance ex-ante when the market is performing badly. In other words, fund managers charge higher to protect the investors against bad performance.

Panel B of Table 2.4 with management fees corroborates my findings in Panel A for Europe. However, in the case of the US, funds with higher and lower management fees experience a decline in performance in the post-DFA regime.

2.3.1.2.3 Leverage

This chapter shows the effect of Leverage on the fund performance following HFR in Panel C of Table 2.4. In Europe, univariate estimation reveals that better monthly return of funds in the post AIFMD period is driven by funds using higher leverage (increase in monthly performance by 28 basis points), while funds with lower leverage (below median) show no difference in performance in the post HFR regime. The results could be interpreted as the creditors in the European market seemed to be comfortable with higher leverage due to the improved regulatory regime facing otherwise opaque HFs, which subsequently translated into better performance.

However, the effect of HFR in the regulation has been similar to the higher and lower quantile of leverage. Overall, the market experienced a fall in fund performance almost equally in higher and lower levered firms in the US.

2.3.1.2.4 Lock-up Period

Another factor I consider that would affect HF performance is the lock-up period. A higher lock-up period would allow fund managers more flexibility in mobilizing funds. On the other hand, it increases adverse selection cost to the investors as they are stuck with the same fund managers for a longer period (cite). Consistent with the adverse selection cost, the return of funds with a higher lock-up period is higher in both pre and post HFR periods and in Europe and the US.

In terms of before and after estimates, in Europe, the better performance is driven by funds with a lower lock-up period (a significant 7 basis point increase). The findings present the possibility that HFR substitutes the need for a longer lock-up period for fund

managers. HFs with a higher lock-up period do not experience a statistically significant difference in performance in the post-AIFMD regime.

In the US, both categories of funds, with a higher and lower lock-up period, have experienced a decline in their performance. However, the fall is lower in the funds with a lower lock-up period. Taken together, the findings of Europe and the US post HFR suggest that HFR may substitute fund level adaptation to chase higher returns.

2.3.1.3 Volatility

I report the effect of HFR on fund performance following European and US regulations. In this section, I further investigate the effect of HFR on funds volatility. I gauge volatility by rolling 36-month standard deviation of the monthly return of a fund. I present my results in Table 2.5.

The estimates of before and after volatility of a fund return around HFR in Panel A reveal that in the post HFR, the volatility of return has lowered significantly both in Europe and the US. In Europe, the decline in the volatility of return is estimated to be an average of 32 basis points, while 12 basis points in the case of the US. Figure 2.3 presents the bar plot of estimates presented in panel A of Table 2.5.

Panel B and Panel C further examine the effect of the volatility of European and US funds on different size quintiles. In Europe, as shown in Panel B of Table 2.5, the volatility of return has declined across all size quintiles. Overall, the effect of AIFMD in lowering the volatility of fund return has been consistent across size heterogeneity.

In the case of the US, as I show in Panel C of Table 2.5, larger funds (quintiles 3-5) experience a decline in volatility in monthly return, while the volatility of smaller funds (quintiles 1-2) has increased.

The possibility of systematic risk, the concern of regulators, is greater for larger funds. The findings that lower volatility in the US funds following AIFMD is driven by larger funds further underscore the merit of HFR in bringing positive volatility outcome in the market.

Taken together, the evidence presented in table 2.4 is in support of the merit of HFR. Lower volatility is one of the desired market outcomes of HFR. Lower volatility lowers the possibility of systematic risk and any adverse market outcomes arising therefrom. The univariate analysis adds some support to answer my third research question. However, to alleviate the concern of other control variables driving my results, I perform multivariate analysis in section 2.3.4.

2.3.4. Multivariate results - Overall Performance and Volatility

2.3.1.4 Hedge Fund Regulation and Fund Performance

I present multivariate regression in a diff-in-diff framework to examine the effect of HFRs on the performance of Hedge funds to answer my first research question. In Table 2.6a and Table 2.6b, I present results from Europe and the US.

Models 1-7 of table 2.6a estimate the effect of AIFMD. While model 1 presents before and after effect (gauged by the coefficient of After AIFMD), the difference between those affected by regulation vs those unaffected (gauged by the coefficient of Treated) and

the interaction of Treated and After-AIFMD (gauged by DiD AIFMD), the subsequent models add additional controls that affect fund performance. In model 1, estimation reveals that in the post AIFMD period, there is a moderately significant improvement in overall monthly return. In terms of economic magnitude, the effect is 5 basis points per month, on average. With 21 basis points of European funds, on average, in our sample period, this translates to a 19.05% increase (5÷21). However, the increase in return is not limited to the treated firms alone. This has been true for the small funds unaffected by the regulation. Therefore, while there has been a market level improvement in performance, a causal effect cannot be established as the law seemed to have a positive spillover effect on the unaffected funds as well. The findings remain consistent with the addition of other fund control from models 2-7. In the full model, the economic magnitude of the post-AIFMD performance effect increased to 38.1% (8÷31).

In terms of the effect of the fund characteristics on performance, the estimation reveals that HF fund size has a positive effect on its performance. Thus, size carries the reputation or signalling effect of better performance and lower adverse selection costs. Similarly, incentive fees have a positive effect on performance, thereby implying incentive fees as a measure of managerial specialism. Higher management fee, on the other hand, seems to be an operational overhead, thereby negatively affecting fund performance. In the partial effect, higher leverage seems to negatively affect fund performance, all else being equal. The negative relation may capture the increased financial risk or default risk associated with higher leverage, thereby leading to subdued performance. Finally, the lock-up period has a positive effect on fund performance,

implying flexibility higher lock-up period provides managers to channelise funds to value relevant investment opportunities without worrying about abrupt withdrawal shocks.

Similarly, I present the results of the effect of DFA on fund performance in table 2.6b. The results from the US have two important revelations:

First, the overall post DFA period has witnessed a significant reduction in performance in line with previous findings of Cumming et al. (2017). In terms of economic magnitude, 19 basis points reduction in the post DFA period translates to 31.66% per month, with an average monthly return of 60 basis points for US firms for our study period.

Second, the decline in performance is not unique to affected firms. In other words, small funds not affected by this regulation also witnessed a significant decline in performance in the post-DFA event. In fact, compared to the unaffected firms, the performance of affected firms lowered less (by 11 basis points as per the full specification model 7), resulting in a positive diff-in-diff coefficient. In terms of control variables, the relationship is mostly in line with theory and similar to the European case. A contrarian result, when compared to the European case, is the positive effect of management fees on fund performance. This implies management fees are redundant overhead in Europe, while this fee contributes positively to fund performance in the US.

2.3.1.4.1 Robustness Test - Managerial Alpha

I conduct the multivariate analysis with managerial alpha as a robustness test for the main variable. Managerial alpha is based on abnormal return based on seven factors

and nine factors asset price models employed in previous studies in hedge fund studies (Cumming et al., 2017). The regression output is tabulated in table 2.7. In terms of managerial alpha, the performance of hedge funds by European funds is no different than the pre-AIFMD regime. On the contrary, managerial alpha has declined overall in the US in the post DFA period. However, the alpha of funds affected by DFA is lower than smaller sized funds unaffected by regulation. In fact, the affected funds in the US experience 13 basis points lower than the overall fall in the post DFA period. To this extent, the disclosure regime could be implied to have a more assuaging factor when compared to the unaffected firms. This is an important revelation when compared to a recent study in the US implying the performance deterring effect of DFA (Cumming et al., 2017)

2.3.1.5 Hedge Fund Regulation and Distributive Effect based on Fund Heterogeneity

In this section, to answer my second research question about the distributive effect of Hedge fund regulation on fund performance, I gauge fund heterogeneity. Guided by literature, I focus on Size, Incentive structure, Leverage and Lock-up Period.

2.3.1.5.1 Size Effect

Table 2.8 presents the differential effect of HFRs on fund performance based on size heterogeneity.

The results of size heterogeneity in the European funds have an interesting revelation. First, including the size effect triple interaction term, both coefficients of

interest, i.e. diff-in-diff-in-diff coefficient (Treated × After-AIFMD × Size), the diff-in-diff coefficient (Treated × After-AIFMD) turn significant.

In terms of economic effect, the effect of AIFMD has been positive with a positive effect of return in the post AIFMD period as indicated by the After-AIFMD coefficient (8 basis points).

The treatment effect of the treated has been positive, i.e. overall, the law has positively affected the funds that need to comply with the regulation (an increase of 67 basis points).

The AIFMD has a distributional effect on the return based on size heterogeneity. Larger funds have lower returns when compared to smaller funds. Therefore, the AIFMD law seemed to be in favour of smaller funds. From policy implications, the law seemed to be promoting the performance of smaller funds. Due to disclosure requirements, the smaller funds seem to perform well, which, otherwise, would suffer from higher adverse selection costs or lower reputation costs to attract investors' confidence. As such, European evidence is suggestive of the distributional effect of regulation benefitting the performance of otherwise constrained funds, to the extent smaller size measure funds constrained. HFR seemed Pareto efficient.

In the US context, no such distributional effect is documented. The only consistent inference from the US market is the post-DFA decline in fund performance, in line with the earlier study by Cumming et al. (2017).

2.3.1.5.2 Incentive Structure

To gauge incentive structure, I employ two important proxies, incentive fees and management fees. The estimates from the incentive structure heterogeneity are tabulated in Table 2.9. The management fees seem to proxy better in the US in explaining the effect of DFA, while incentive fees explain the incentive structure heterogeneity significantly in Europe. Table 2.9 has the following important revelation:

The overall fund return is positive in Europe and negative in the US post-HFR regime. The effect of HFRs in both Europe and the US is positive on the treated funds after including the incentive heterogeneity in the estimation model.

The effect of AIFMD in the post-implementation phase is positive to fund performance with funds having lower incentive fees. The same is true for DFA, however, with management fee heterogeneity. Overall, HFRs seem to positively contribute to the performance of funds with a lower incentive structure, thereby lowering the intermediation cost of the hedge fund investments. To this end, HFR could improve investors' inclusion by improving the performance of funds with lower incentive fees. The substitution of law for incentive packages also implies the lowering of adverse selection costs.

2.3.1.5.3 Leverage

In the multivariate analysis, I further examine if the heterogeneity of funds in the leverage employment explains the difference in their performance post HFR. I employ the triple interaction estimation model and report the findings in table 2.10. The estimates show that the employment of leverage does not make a difference in the post HFR

performance. The results are consistent in Europe and the US. I interpret this as evidence that differential performance that a fund may book following HFR is immaterial due to better transparency and disclosure regime. The superior return should be based on the strategy and not on financing size and argument postulated by Modigliani and Miller as back as 1958 in the capital structure irrelevance model.

2.3.1.5.4 Lock-up Period

My final fund heterogeneity stems from the Lock-up period. The lock-up period gives a time assurance for managers to focus on the investment strategies rather than worrying about the sudden withdrawal shock. Due to information asymmetry, the view on lock-up would be different between the fund managers and the investors. Investors with a longer lock-up period would require more returns. Managers, on the other hand, due to time assurance, would be able to focus on the right investment strategies without abrupt withdrawal risk, thereby generating a higher return, all else equal. However, in a changed regime following HFR, the transparency and disclosure requirement lowers the information asymmetry cost, thereby making the lock-up period less relevant. In line with the aforesaid argument, the lock-up period is found to be generating a lower return in the post HFE period in the US. The results in Europe are indistinguishable from zero, implying no difference in performance based on lock-up period heterogeneity.

2.3.1.6 Volatility consequence of HFR

In this section, the chapter investigates the effect of volatility consequence of HFR to answer the third research question. This section presents the effect of HFR on the volatility of stock returns. One of the rationales for introducing regulations like AIFMD

and DFA was to lower the higher volatility facing the HFR. This extreme performance could trigger systemic risk in the other markets in an economy and justify regulatory intervention. It is, therefore, relevant to study the volatility consequence of HFR. The estimates of the volatility consequence are presented in table 2.12 for Europe and table 2.13 for the US.

Table 2.12 on the volatility consequence of AIFMD on HF return volatility provides several insightful revelations. First, in the aftermath of AFMID, the overall volatility has fallen in the range of 31-41 basis points (gauged by the coefficient After-AIFMD). The findings are in line with the positive market outcome of HFR, lowering the volatility of the HF assets class.

Second, the funds affected by AIFMD overall had lower volatility than those unaffected by AIFMD, largely because of the size effect. Unaffected funds, by definition of HFR, were smaller funds based on the fund size. Third, the fall in the volatility of unaffected funds was higher than those affected by regulation, thereby resulting in the interaction term (Treated × After-AIFMD) being positive. Therefore, while in the post-AIFMD, both affected and unaffected funds experience a decline in volatility, the fall in the volatility of affected is lower than those not affected by HFR, thereby making it difficult to imply the causal effect of HFR on the volatility consequence.

In terms of control variables, volatility is negatively associated with fund size implying the reputation that size brings lowers the volatility, at least in part. Another important revelation on the effect of fund characteristics is the effect of incentive structures. While incentive structure (as gauged by Incentive fee and Management fee)

could encourage fund managers to chase higher performance, this could also trigger greater volatility, thereby increasing the risk. The findings of my regression suggest that higher incentive structure funds pursue higher risk reflected by higher volatility in fund returns. When only controlling for leverage, the results show leverage also contributes to higher fund return volatility. In the full model with all regressors, the estimation shows leverage, however, has a negative effect on volatility (coefficient being -0.0006 and significant at 1%), all else being equal. This implies that after taking other fund characteristics into account, the employment of higher leverage performs the role of delegated monitoring for the investors (Diamond, 1985) and would lower the volatility of fund return.

The results in the US corroborate with what I document in Europe. Overall, the markets experience a decline in volatility in the post DFA period. On the contrary, the interaction term, Treated × After-DFA, is negative and significant, suggesting the causal effect of DFA in lowering the volatility of fund return in the US, an inference that would further highlight the merit of having HFR. In a sense, DFA was a successful regulation to the extent regulators are concerned with volatility and the adverse consequence and spillover effect volatility could have on the other markets.

This chapter further employs two additional sensitivity checks by employing two alternative measures of fund volatility, i.e. volatility of alpha (based on 7 and 9-factor models) and tests whether results are consistent with the findings of table 2.12 and 2.13. I tabulate this result in table 2.14. The results are mostly similar. However, the coefficients lose statistical significance occasionally.

Overall, the findings lend support to regulators in introducing HFR as it would result in positive volatility consequences in line with the regulators' intended objective of policy intervention (Berkel, 2007). The regulatory concern is that hedge fund adopts opaque investment strategies. Opaque assets are more volatile due to higher adverse selection costs, ceteris paribus (Kim and Zhang, 2014). HFR is a disclosure and transparency reform improving greater transparency and disclosure of material information of hedge funds, including exposures. To this end, the volatility of hedge funds could have lowered in the post hedge fund regulation.

Furthermore, hedge funds have large asset exposures and are frequently leveraged. According to Harmes (2005), hedge funds' investments could be relevant for policymakers due to their ability to become heavily leveraged and their big positions. Because hedge funds typically make substantial investments, their actions could have a significant price impact, making it harder for other investors to unwind their positions. Alternatively, when hedge funds provide liquidity and stability when other investors try to sell their positions in down markets, this behaviour could have the reverse effect. In either case, this could lead to high volatility to the extent of undermining market stability and spreading contagion (Hermes, 2005; Berkel, 2007). To this end, by lowering the volatility of funds, the results suggest HFR creates Pareto efficiency, leading to better volatility equilibrium in the post-regulation regime. These findings underscore the role of intervention in lowering market friction (Vig, 2013).

2.3.5. Addressing the issue of Endogeneity

The difference in differences (DiD) measure reduces the role of confounding variables not controlled in the models by double differencing (Vig, 2013). This eliminates, at least in part, the endogeneity problem (Angrist and Pishke, 2008). The fixed effect model controls for time invariant heterogeneity (Greene, 2001). Similarly, all the control variables are used in lagged form to eliminate the possibility of reverse causality.

However, owing to the fact that treated and control firms may differ from each other in firm characteristics, I additionally control for other important firm level factors that may compete with my risk-taking explanatory variable in leading to changes in firm risk-taking. Drawing from literature, these control variables include fund attributes like Size, Incentive Fee, Management fee, Leverage and Lock-Up Period. I further control for fund strategies fixed effect to address any fund level difference driving my results. My empirical estimation models do not employ the matching technique. While matching techniques are popular in diff-in-diff estimations, they are not free of limitations. A triangulation of results in the future using these matching techniques could have a merit which I identify as a future agenda.

2.4 Discussion

The debate of whether regulation is essential is an old and one of the most debated questions in the literature on public policy. To regulate or not to regulate hedge funds

occupies a central concern of regulatory economics (Berkel, 2007; Stulz,2007; Cumming et al., 2017). There are proponents on either side of the argument.

On the one hand, advocates of no regulation maintain that regulation protecting consumer protection might not be convincing due to the specialised investment class offered by hedge funds favouring opacity of these funds; and that they are only accessible to a limited set of investors: i.e. sophisticated investors and institutional investors (Danıelsson et al., 2005; Cumming et al., 2017; Joenväärä, and Kosowski, 2021). Danıelsson et al., 2005 argue that existing regulatory methods with the focus on more disclosure regimes and restricted works may not necessarily bring the intended positive outcome. These opponents are of the view that regulation destroys the very essence of hedge funds and may translate these into other regulated asset classes like mutual funds and pension funds (Cumming et al., 2017)).

On the other side, there are many who believe hedge funds should be regulated (Berkel, 2007). The arguments for regulating hedge funds fall into four categories: the threats they pose to financial stability, their impact on market dynamics and integrity, the risks they pose to their investors, and other threats. I will attempt to describe these categories in detail further down.

The main issue about hedge funds' systemic repercussions is that the failure of just one of them might have far-reaching consequences for the whole financial system. Leverage, opacity, fraudulent behaviour, herding, the usage of complex financial instruments, and the depletion of market liquidity are all factors that could threaten financial stability (Brav et al., 2008).

One means through which hedge funds might achieve amplification of their gains is through the use of leverage. The risk of high leverage stems from the fact that, unlike regulated financial institutions, hedge funds have no maximum limit on the amount of leverage they can use. Hedge fund defaults are more likely and more severe as a result of this. Due to the high magnitude of hedge fund investments, liquidation may have caused major swings in market pricing, as well as affecting the positions of hedge fund counterparties and other market participants. This could cause a 'domino effect' or market spillover, which would raise regulatory issues. The combination of leverage and other risks could create more dangerous scenarios, where hedge fund defaults could have major systemic effects.

The increased use of leverage may pose a number of threats to the financial system. First, as a result of the leveraged positions, the hedge fund's risk exposure will increase. Furthermore, unwinding leveraged holdings may have an impact on creditors' solvency. Similarly, because there is less capital available to absorb losses, leveraged institutions are more vulnerable to losses. Finally, unwinding large bets quickly can have a negative impact on market pricing and volatility. As a result, prices in other markets may be altered, thereby affecting the fund's and its counterparties' positions (Berkel, 2008).

Their limited high opacity, when combined with the leverage, is a troubling problem for financial stability. The lack of transparency arises from prime brokers' limited ability to determine the fund's exposures to other parties. Many hedge firms create side letters to address this issue. Side letters are used to communicate information about a hedge fund's exposures to prime brokers or specific investors with the goal of keeping the information hidden. As a result, there may be differences in information between

counterparties and investors, affecting the hedge fund's risk profile. Hedge fund holdings are difficult to value accurately due to the usage of increasingly sophisticated financial instruments. As a result, investors must rely on the fund's publicly available information. Because a manager may have the incentive and power to alter the portfolio's worth, the genuine value may not be displayed. This could lead to erroneous fees and appraisals. Because credit is typically delivered through securities lending and derivative contracts, effective supervision of contracts between banks and hedge funds is extremely difficult. The challenge for supervisors stems from the numerous methods in which assets are utilised as collateral for various transactions, as well as the resulting risk.

In addition to the concerns about financial stability and high leverage, there is also concern about hedge funds' propensity to cause market liquidity to dry up (Berkel, 2007; Sakda, 2010). Because hedge funds typically make substantial investments, their actions could have a significant price impact, making it harder for other investors to unwind their positions. When hedge funds provide liquidity and stability when other investors try to sell their positions in down markets, this behaviour could have a reverse impact.

Hedge funds should ideally target knowledgeable investors, such as self-certified high-net-worth individuals (HNIs) and institutional investors, who have an appetite for risk and are familiar with hedge fund methods (Brav et al., 2008). The increased accessibility of hedge fund products to retail investors and the general public via pension funds has presented new regulatory challenges.

To the aforesaid concern, my research sheds important light on the impact of the hedge fund regulation on fund performance and volatility. To achieve this important policy concern, this chapter formulates three important research questions. Motivated by

the theoretical tension for and against regulating Hedge funds, this chapter employs a large sample of European and US hedge fund for the study period of 2004 to 2017 and examine the effect of hedge fund regulation on fund performance and volatility and a differential effect of regulation on performance based on fund heterogeneity. This study employs the difference in difference, and triple difference estimation framework, which literature suggests is well suited to investigate the effect of regulation. Using different univariate and multivariate analysis and a battery of robustness tests, my empirical investigation has important revelations.

First, the overall hedge fund industry experienced a decline in performance, which is similar to what has been documented in the previous study by Cumming et al. (2017). However, when using a different set of the control group (funds that are not affected by HFR), the results of Cumming et al. (2017) may not be sufficient to conclude causality (Angrist and Pishke, 2008). In fact, the reduction of performance is equally pronounced among unaffected funds opening up the possible interpretation that the post changing market factors post-financial crisis 2008-09 could have led to the fall of fund performance due to increased scrutiny the funds have faced by regulators and investors. This interpretation is consistent with Sullivan's (2020) recent study, which found that, after fees and costs, hedge fund managers as a group have shown a marked decline in risk-adjusted alpha in the ten years following the global financial crisis, when adjusted for stock/bond market risk.

Second, hedge fund regulation has a distributional effect on the return based on fund heterogeneity. In line with the distributive effect of regulation on smaller firms, this study shows that hedge fund regulation positively affects the performance of smaller funds

as the new information regime facing funds in the post-regulation should lower information friction and adverse selection cost in Europe. In the US context, however, no such distributional effect is documented. Next, this chapter finds the substitution of law to incentive package lowering of adverse selection cost. I further find some evidence that in a regime switch following HFR, the transparency and disclosure requirement should lower the information asymmetry cost, thereby making the lock-up period less relevant in the post HFR period in the US.

This chapter's final set of findings on the volatility consequence suggests a positive market outcome of HFR, lowering the volatility of the HF assets class, justifying the role of HFR in bringing positive volatility consequences.

2.5 Conclusion

The findings of this chapter open up a new discussion to the ongoing debate on the relative merit of regulation. The ability of hedge funds to act swiftly has to do with the freedom and flexibility to apply their skills for the advantage of the investors. Advocates against HFR argue that the HF industry has thus enjoyed the privilege of being loosely regulated in the past and a part of this is a result of no regulatory burden on the fund managers. The findings of this study add to broader literature the merit of regulation in bringing positive market outcomes when facing constraints or friction. Similarly, this chapter adds to the regulatory economics debate on the distributive effect of regulation. The implication of my research is in line with the view that by eliminating market frictions and improving the information environment, regulation could help otherwise constrained

players enjoy positive market outcomes. Finally, this study underscores the importance of regulation in lowering destabilising ability of hedge funds by reducing volatility. The implication of the findings is that regulation could be Pareto-efficient in lowering volatility in the HF markets and, therefore, desirable from a market stability viewpoint, which could be an important policy input to the regulators.

2.6 Tables and Figures

Table 2.1. Sample distribution by country and fund investment strategy

Panel A. By countries

Countries	Count	Percentage
Denmark	474	0.262
Estonia	57	0.031
Finland	358	0.198
France	4766	2.634
Germany	388	0.214
Ireland	7787	4.303
Isle of Man	150	0.083
Italy	6570	3.630
Luxembourg	15504	8.567
Malta	1895	1.047
Netherlands	860	0.475
Spain	958	0.529
Sweden	2160	1.194
Switzerland	3571	1.973
United Kingdom	262	0.145
United States	108495	59.952
Virgin Islands (British)	26715	14.762
Total	180970	100.000
Panel B: By fund categories.		
Convertible Arbitrage	3893	2.151
Dedicated Short Bias	523	0.289
Emerging Markets	5891	3.255
Equity Market Neutral	8273	4.571
Event Driven	13131	7.256
Fixed Income Arbitrage	5033	2.781
Fund of Funds	59808	33.049
Global Macro	6839	3.779
Long/Short Equity Hedge	54610	30.176
Managed Futures	806	0.445
Multi-Strategy	12164	6.722
Options Strategy	723	0.400
Other	8184	4.522
Undefined	1092	0.603
Total	180970	100.000

Note: Panel A of Table 2.1 presents the distribution of observation of 17 countries from 2003-2017, whereas Panel B presents sample distribution by hedge fund strategies.

Table 2.2. Summary Statistics

Panel A: Summary Statistics (overall sample)						
Variables	count	mean	P50	SD	P1	P99
Return	180970	0.0044	0.0051	0.0351	-0.1103	0.1138
Alpha(7)	180970	-0.0000	-0.0002	0.0331	-0.1084	0.1090
Alpha(9)	180970	0.0000	-0.0005	0.0309	-0.0961	0.1045
Return Volatility	177581	0.0270	0.0211	0.0204	0.0021	0.0991
Volatility-alpha7	177581	0.0260	0.0205	0.0187	0.0036	0.0899
Volatility-alpha9	177581	0.0242	0.0185	0.0175	0.0044	0.0848
Incentive Fee	180970	0.1471	0.2000	0.0756	0.0000	0.2500
Management Fee	180970	0.0137	0.0150	0.0050	0.0000	0.0250
Avg. Leverage	180970	0.4215	0.0000	0.9084	0.0000	5.0000
Max. Leverage	180970	0.8751	0.0000	1.5828	0.0000	9.0000
Lock-up Period	180970	4.4141	0.0000	7.3604	0.0000	30.0000
Panel B: Summary Statistics Europe						
Return	72475	0.0021	0.0036	0.0303	-0.0979	0.0934
Alpha(7)	72475	-0.0020	-0.0015	0.0286	-0.0952	0.0887
Alpha(9)	72475	-0.0000	-0.0002	0.0264	-0.0856	0.0888
Return Volatility	70926	0.0232	0.0179	0.0180	0.0021	0.0917
Volatility-alpha7	70926	0.0224	0.0175	0.0165	0.0035	0.0831
Volatility-alpha9	70926	0.0201	0.0146	0.0159	0.0039	0.0791
Incentive Fee	72475	0.1160	0.1000	0.0806	0.0000	0.2500
Management Fee	72475	0.0141	0.0150	0.0054	0.0000	0.0300
Avg. Leverage	72475	0.3280	0.0000	0.8564	0.0000	5.0000
Max. Leverage	72475	0.8815	0.0000	1.6202	0.0000	9.0000
Lock-up Period	72475	1.1305	0.0000	4.5147	0.0000	12.0000
Panel C: Summary Statistics US						
Return	108495	0.0060	0.0064	0.0379	-0.1172	0.1261
Alpha(7)	108495	0.0013	0.0009	0.0357	-0.1159	0.1215
Alpha(9)	108495	0.0000	-0.0008	0.0336	-0.1025	0.1148
Return Volatility	106655	0.0296	0.0239	0.0215	0.0022	0.1025
Volatility-alpha7	106655	0.0284	0.0232	0.0196	0.0038	0.0925
Volatility-alpha9	106655	0.0269	0.0216	0.0180	0.0052	0.0870
Incentive Fee	108495	0.1679	0.2000	0.0642	0.0000	0.2500
Management Fee	108495	0.0134	0.0150	0.0046	0.0000	0.0200
Avg. Leverage	108495	0.4839	0.0000	0.9363	0.0000	5.0000
Max. Leverage	108495	0.8708	0.0000	1.5573	0.0000	9.0000
Lock-up Period	108495	6.6075	3.0000	8.0459	0.0000	36.0000

Note: Table 2.2 presents the descriptive statistics of variables used in the study. Sample period ranges from 2003-2017. All variables are defined in the text or Appendix A2.1.

Table 2.3. Comparative monthly return before and after HFR

Panel A: Overall Sample

Category	Domicile	Before	After	Diff	t-stat	p-value
1	Europe	0.0020	0.0027	0.0007***	2.4398	0.0147
2	US	0.0064	0.0049	-0.0015***	-5.4994	0.0000

Panel B: Europe

Quintile	Domicile	Before-AIFMD	After-AIFMD	Diff	t-stat	p-value
1	Europe	0.0012	0.0011	-0.0001	-0.1568	0.8754
2	Europe	0.0019	0.0024	0.0005	0.7717	0.4403
3	Europe	0.0013	0.0027	0.0014**	1.9989	0.0456
4	Europe	0.0018	0.0039	0.0020***	3.5569	0.0004
5	Europe	0.0038	0.0041	0.0003	0.5297	0.5963

Panel C. US.

Quintile	Domicile	Before-DFA	After-DFA	Diff-DFA	t-stat	p-value
1	US	0.0067	0.0047	-0.0020**	-2.3668	0.0180
2	US	0.0060	0.0038	-0.0022***	-3.4450	0.0006
3	US	0.0060	0.0043	-0.0017***	-3.1279	0.0018
4	US	0.0068	0.0053	-0.0015***	-3.0251	0.0025
5	US	0.0063	0.0060	-0.0003	-0.5978	0.5500

Note: Panel A of Table 2.3 shows the before and after statistics of monthly fund performance in Europe and the US. While Panel B and C present 5 quintiles sorted by size for Europe and US, respectively. ***,** &* indicate significance at 1%,5% and 10% respectively.

Table 2.4. Fund Heterogeneity and Performance before and after HGR

Panel A: Monthly return by low and high incentive fees

Category.	Before-AIFMD	After-AIFMD	Diff	t-stat	p-value
Below Md.	0.0019	0.0027	0.0008***	2.8455	0.0044
Above Md.	0.0051	0.0016	-0.0036	-1.7266	0.0844
	Before-DFA	After-DFA	Diff	t-stat	p-value
Below Md.	0.0064	0.0048	-0.0016***	-5.8096	0.0000
Above Md.	0.0064	0.0080	0.0016	0.9629	0.3357

Panel B: Monthly return by low and high management fees

Category.	Before-AIFMD	After-AIFMD	Diff	t-stat	p-value
Below Md.	0.0021	0.0030	0.0010***	3.2585	0.0011
Above Md.	0.0050	0.0060	0.0010	0.8178	0.4135
	Before-DFA	After-DFA	Diff	t-stat	p-value
Below Md.	0.0057	0.0048	-0.0009***	3.0119	0.0026
Above Md.	0.0089	0.0051	-0.0037***	6.0907	0.0000

Panel C: Monthly return by low and high leverage

Category.	Before-AIFMD	After-AIFMD	Diff	t-stat	p-value
Below Md.	0.0023	0.0023	0.0000	0.0674	0.9462
Above Md.	0.0012	0.0040	0.0028***	4.7305	0.0000
	Before-DFA	After-DFA	Diff	t-stat	p-value
Below Md.	0.0062	0.0048	-0.0013***	4.1555	0.0000
Above Md.	0.0067	0.0051	-0.0016***	3.5769	0.0003

Panel D: Monthly return by low and high lock-up period

Category.	Before-AIFMD	After-AIFMD	Diff	t-stat	p-value
Below Md.	0.0017	0.0024	0.0007***	2.6131	0.0090
Above Md.	0.0050	0.0060	0.0010	0.8178	0.4135
	Before-DFA	After-DFA	Diff	t-stat	p-value
Below Md.	0.0058	0.0047	-0.0010***	2.9621	0.0031
Above Md.	0.0069	0.0051	-0.0018***	4.5303	0.0000

Note: Table 2.4 presents the fund performance based on heterogeneity (based on above and below the median value) of the fund as arranged by incentive fees (Panel A), management fees (Panel A), leverage (Panel C) and lock-up period (Panel D). ***,** &* indicates significance at 1%,5% and 10% respectively.

Table 2.5. Volatility

Panel A.						
Category	Domicile	Before	After	Diff	t-stat	p-value
Volatility	Europe	0.0238	0.0206	-0.0032	-19.0386	0.0000
Volatility	US	0.0299	0.0287	-0.0012	-8.0672	0.0000
Panel B						
Size-Quintile	Domicile	Before-AIFMD	After-AIFMD	Diff	t-stat	p-value
1	Europe	0.0269	0.0242	-0.0027	6.7317	0.0000
2	Europe	0.0263	0.0197	-0.0067	16.7497	0.0000
3	Europe	0.0235	0.0195	-0.0040	9.9725	0.0000
4	Europe	0.0208	0.0186	-0.0022	6.7263	0.0000
5	Europe	0.0213	0.0199	-0.0014	4.6654	0.0000
Panel C						
Size-Quintile	Domicile	Before-DFA	After-DFA	Diff	t-stat	p-value
1	US	0.0359	0.0389	0.0029	6.0483	0.0000
2	US	0.0315	0.0330	0.0015	4.0668	0.0000
3	US	0.0290	0.0283	-0.0007	-2.2436	0.0249
4	US	0.0275	0.0258	-0.0017	-6.3018	0.0000
5	US	0.0257	0.0228	-0.0028	-11.0188	0.0000

Note: Panel A of Table 2.5 shows the before and after statistics of monthly fund volatility (36 months rolling) in Europe and the US, whereas Panel B and C present the 5 quintiles sorted by size for Europe and US, respectively. ***,** &* indicates significance at 1%,5% and 10% respectively.

Table 2.6a. Fund Performance and HFR: AIFMD-Europe

Dependent variable: Monthly return	1	2	3	4	5	6	7
DiD AIFMD [Treated × After-AIFMD]	0.0008 (0.0005)	0.0006 (0.0005)	0.0006 (0.0005)	0.0008 (0.0005)	0.0008 (0.0005)	0.0008 (0.0005)	0.0004 (0.0005)
Treated	0.0007*** (0.0003)	-0.0015*** (0.0004)	0.0006** (0.0003)	0.0007*** (0.0003)	0.0007*** (0.0003)	0.0009*** (0.0003)	-0.0010*** (0.0004)
After	0.0005 (0.0003)	0.0005* (0.0003)	0.0007** (0.0003)	0.0005 (0.0003)	0.0005 (0.0003)	0.0005* (0.0003)	0.0008** (0.0003)
Size		0.0008*** (0.0001)					0.0006*** (0.0001)
Incentive Fee			0.0160*** (0.0014)				0.0152*** (0.0015)
Management fee				-0.0225 (0.0226)			-0.0437** (0.0223)
Avg. Leverage					0.0000 (0.0002)		-0.0003** (0.0002)
Lock-Up Period						0.0002*** (0.0000)	0.0001*** (0.0000)
Fund strategy FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
r2 (within)	0.01	0.01	0.01	0.01	0.01	0.01	0.01
N	72,475.00	72,475.00	72,475.00	72,475.00	72,475.00	72,475.00	72,475.00

Note: Table 2.6a presents output of the estimation model

$y_{it} = \propto_i + \beta_1 \, Treated_i + \beta_2 After_t + \beta_3 [\, Treated_i \times After_t] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it}$,

where the dependent variable y_{it} is a fund performance gauged by the fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.6b. Fund Performance and HFR: DFA USA

Dependent variable: Monthly return	1	2	3	4	5	6	7
DiD DF	0.0012***	0.0012***	0.0012***	0.0011**	0.0012***	0.0013***	0.0011**
[Treated × After-DFA]	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
treated	0.0001	-0.0001	0.0002	0.0001	0.0001	0.0001	-0.0001
	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)
After	-0.0019***	-0.0019***	-0.0018***	-0.0019***	-0.0019***	-0.0019***	-0.0019***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Size		0.0001					0.0001
		(0.0001)					(0.0001)
Incentive Fee			0.0101***				0.0080***
			(0.0015)				(0.0016)
Management fee				0.1936***			0.1695***
				(0.0267)			(0.0275)
Avg. Leverage					-0.0002*		-0.0003**
					(0.0001)		(0.0001)
Lock-Up Period						0.0001***	0.0001***
						(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
r2 (within)	0.01	0.01	0.01	0.01	0.01	0.01	0.01
N	108495.00	108495.00	108495.00	108495.00	108495.00	108495.00	108495.00

Note: Table 2.6b presents output of the estimation model
$y_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_t + \beta_3 [Treated_i \times After_t] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it}$,
where the dependent variable y_{it} is a fund performance gauged by fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.7. Robustness Check: Managerial Alpha

	AIFMD		DFA	
Dependent variable:	Alpha7	Alpha9	Alpha7	Alpha9
DiD AIFMD	0.0002	0.0004		
[Treated × After-AIFMD]	(0.0005)	(0.0005)		
DiD DF			0.0014***	0.0013***
[Treated × After-DFA]			(0.0005)	(0.0004)
Treated	-0.0007*	-0.0003	-0.0002	0.0000
	(0.0004)	(0.0003)	(0.0004)	(0.0004)
After	0.0002	-0.0016***		
	(0.0003)	(0.0003)		
After DF			-0.0020***	-0.0040***
			(0.0003)	(0.0003)
Size	0.0005***	0.0004***	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Incentive Fee	0.0131***	0.0106***	0.0073***	0.0072***
	(0.0014)	(0.0013)	(0.0015)	(0.0014)
Management fee	-0.0268	-0.0166	0.1767***	0.1674***
	(0.0212)	(0.0201)	(0.0261)	(0.0249)
Avg. Leverage	-0.0004***	-0.0004***	-0.0003***	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lock-Up Period	0.0001***	0.0001***	0.0001***	0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes	Yes	Yes
r2 (within)	0.00	0.00	0.00	0.00
N	72,475.00	72,475.00	108495.00	108495.00

Note: Table 2.7 presents output of the estimation model
$y_{it} = \propto_i + \beta_1 \, Treated_i + \beta_2 After_t + \beta_3 [\, Treated_i \times After_t] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it}$,
where the dependent variable y_{it} is a fund performance gauged by managerial alpha using seven and nine factor models as explained in the text. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.8. Heterogeneous Effect of HFR on Hedge Fund Performance - Size Effect

	AIFMD-Europe	DFA-US
DiDiD- Size Effect AIFMD	-0.0011***	
[Treated × After-AIFMD × Size]	(0.0003)	
DiDiD- Size Effect DFA		0.0002
[Treated × After-DFA × Size]		(0.0004)
DiD AIFMD	0.0067***	
[Treated × After-AIFMD]	(0.0018)	
DiD DF		0.0004
[Treated × After-DF]		(0.0023)
Treated	-0.0012***	-0.0003
	(0.0004)	(0.0004)
After-AIFMD	0.0008**	
	(0.0003)	
After - DF		-0.0019***
		(0.0003)
Size	0.0007***	0.0001
	(0.0001)	(0.0001)
Incentive fee	0.0152***	0.0079***
	(0.0015)	(0.0016)
Management fee	-0.0418*	0.1707***
	(0.0223)	(0.0275)
Av. Leverage	-0.0003**	-0.0003**
	(0.0002)	(0.0001)
Lock-Up Period	0.0001***	0.0001***
	(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes
r2 (within)	0.01	0.01
N	72,475.00	108495.00

Note: Table 2.8 presents output of the estimation model

$y_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_t + \beta_3[Treated_i \times After_t] + \beta_4[Treated_i \times After_t \times Size] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it}$,

where the dependent variable y_{it} is a fund performance gauged by fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.9. Heterogeneous Effect of Regulation on HF Performance - Incentive Effect

	AIFMD-Europe		DFA-US	
	Incentive Fee	Mgmt. Fee	Incentive Fee	Mgmt. Fee
DiDiD- Inc. Effect AIFMD [Treated × After-AIFMD × Incentive]	-0.0157*** (0.0041)	-0.0733 (0.0803)		
DiDiD- Inc. Effect DFA [Treated × After-DFA × Incentive]			-0.0038 (0.0041)	-0.1675** (0.0764)
DiD AIFMD [Treated × After-AIFMD]	0.0023*** (0.0007)	0.0013 (0.0011)		
DiD DF [Treated × After-DF]			0.0022*** (0.0007)	0.0040*** (0.0012)
Treated	-0.0010*** (0.0004)	-0.0010*** (0.0004)	-0.0003 (0.0004)	-0.0003 (0.0004)
After-AIFMD	0.0008** (0.0003)	0.0008** (0.0003)		
After - DF			-0.0019*** (0.0003)	-0.0019*** (0.0003)
Size	0.0006*** (0.0001)	0.0006*** (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Incentive fee	0.0162*** (0.0016)	0.0152*** (0.0015)	0.0082*** (0.0017)	0.0082*** (0.0016)
Management fee	-0.0429* (0.0223)	-0.0395* (0.0233)	0.1717*** (0.0276)	0.1795*** (0.0285)
Av. Leverage	-0.0004** (0.0002)	-0.0003** (0.0002)	-0.0003** (0.0001)	-0.0003*** (0.0001)
Lock-Up Period	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)
Fund strategy FE	Yes	Yes	Yes	Yes
r2 (within)	0.01	0.01	0.01	0.01
N	72,475.00	72,475.00	108495.00	108495.00

Note: Table 2.9 presents output of the estimation model

$$y_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_t + \beta_3[Treated_i \times After_t] + \beta_4[Treated_i \times After_t \times \text{Incentive}] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it},$$

where the dependent variable y_{it} is a fund performance gauged by fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.10. Heterogeneous Effect of HFR on Hedge Fund Performance - Leverage Effect

	AIFMD-Europe	DFA-US
DiDiD- Leverage Effect AIFMD	0.0003	
[Treated × After-AIFMD × Leverage]	(0.0005)	
DiDiD- Leverage Effect DFA		0.0001
[Treated × After-DFA × Leverage]		(0.0001)
DiD AIFMD	0.0003	
[Treated × After-AIFMD]	(0.0005)	
DiD DF		0.0016***
[Treated × After-DF]		(0.0005)
Treated	-0.0010***	-0.0003
	(0.0004)	(0.0004)
After-AIFMD	0.0008**	
	(0.0003)	
After - DF		-0.0019***
		(0.0003)
Size	0.0006***	0.0001
	(0.0001)	(0.0001)
Incentive fee	0.0152***	0.0079***
	(0.0015)	(0.0016)
Management fee	-0.0440**	0.1708***
	(0.0223)	(0.0275)
Av. Leverage	-0.0004**	-0.0003**
	(0.0002)	(0.0001)
Lock-Up Period	0.0001***	0.0001***
	(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes
r2 (within)	0.00	0.00
N	72,475.00	108495.00

Note: Table 2.10 presents output of the estimation model

$$y_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_t + \beta_3[Treated_i \times After_t] + \beta_4[Treated_i \times After_t \times \text{Leverage}] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it},$$

where the dependent variable y_{it} is a fund performance gauged by fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.11. Heterogeneous Effect of HFR on HF Performance - Lock-up Period Effect

	AIFMD-Europe	DFA-US
DiDiD- Lock-up Period Effect AIFMD	-0.0000	
[Treated × After-AIFMD × Lock-up Period]	(0.0002)	
DiDiD- Lock-up Period DFA		-0.0001**
[Treated × After-DFA × Lock-up Period]		(0.0000)
DiD AIFMD	0.0004	
[Treated × After-AIFMD]	(0.0005)	
DiD DF		0.0023***
[Treated × After-DF]		(0.0006)
Treated	-0.0010***	-0.0003
	(0.0004)	(0.0004)
After-AIFMD	0.0008**	
	(0.0003)	
After - DF		-0.0019***
		(0.0003)
Size	0.0006***	0.0001
	(0.0001)	(0.0001)
Incentive fee	0.0152***	0.0079***
	(0.0015)	(0.0016)
Management fee	-0.0437*	0.1720***
	(0.0223)	(0.0275)
Av. Leverage	-0.0003**	-0.0003**
	(0.0002)	(0.0001)
Lock-Up Period	0.0001***	0.0001***
	(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes
r2 (within)	0.00	0.00
N	72,475.00	108495.00

Note: Table 2.11 presents output of the estimation model

$$y_{it} = \propto_i + \beta_1\, Treated_i + \beta_2 After_t + \beta_3[\, Treated_i \times After_t] + \beta_4[Treated_i \times\ After_t \times \text{Lock} - \text{up Period }] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it},$$

where the dependent variable y_{it} is a fund performance gauged by fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.12. The effect of HFR on Volatility - AIFMD-Europe

	1	2	3	4	5	6	7
DiD AIFMD [Treated × After-AIFMD]	0.0025***	0.0028***	0.0019***	0.0026***	0.0025***	0.0025***	0.0024***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Treated	-0.0040***	-0.0012***	-0.0045***	-0.0039***	-0.0041***	-0.0038***	-0.0002
	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0002)
After-AIFMD	-0.0041***	-0.0042***	-0.0033***	-0.0038***	-0.0041***	-0.0040***	-0.0032***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Size		-0.0011***					-0.0015***
		(0.0001)					(0.0001)
Incentive fee			0.0462***				0.0459***
			(0.0009)				(0.0009)
Management fee				0.3589***			0.2940***
				(0.0142)			(0.0140)
Av. Leverage					0.0003***		-0.0006***
					(0.0001)		(0.0001)
Lock-Up Period						0.0002***	0.0002***
						(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
r2 (within)	0.01	0.02	0.06	0.03	0.01	0.02	0.07
N	70,926.00	70,926.00	70,926.00	70,926.00	70,926.00	70,926.00	70,926.00

Note: Table 2.12 presents output of the estimation model
$\varrho_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_t + \beta_3 [Treated_i \times After_t] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it}$,
where the dependent variable ϱ_{it} is fund volatility gauged by 36 months rolling standard deviation of fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.13. The effect of HFR on Volatility - DFA-US

	1	2	3	4	5	6	7
DiD DFA	-0.0023***	-0.0025***	-0.0029***	-0.0025***	-0.0022***	-0.0022***	-0.0029***
[Treated × After-DFA]	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Treated	-0.0053***	0.0033***	-0.0048***	-0.0053***	-0.0053***	-0.0053***	0.0031***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
After-DFA	-0.0003**	0.0003*	0.0001	-0.0004**	-0.0005***	-0.0003*	0.0006***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Size		-0.0032***					-0.0029***
		(0.0001)					(0.0001)
Incentive fee			0.0543***				0.0527***
			(0.0008)				(0.0009)
Management fee				0.2397***			0.1129***
				(0.0151)			(0.0150)
Av. Leverage					-0.0018***		-0.0024***
					(0.0001)		(0.0001)
Lock-Up Period						0.0001***	0.0001***
						(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
r2 (within)	0.01	0.04	0.04	0.02	0.02	0.02	0.07
N	106655.00	106655.00	106655.00	106655.00	106655.00	106655.00	106655.00

Note: Table 2.13 presents output of the estimation model

$\varrho_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_t + \beta_3 [Treated_i \times After_t] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it}$,

where the dependent variable ϱ_{it} is fund volatility gauged by 36 months rolling standard deviation of fund's month on month percentage change in NAV. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Table 2.14. The effect of HFR on Volatility - Robustness Tests

	AIFMD		DFA	
	Vol-Alpha7	Vol-Alpha9	Vol-Alpha7	Vol-Alpha9
	1	2	3	4
DiD AIFMD	0.0022***	0.0022***		
[Treated × After-AIFMD]	(0.0003)	(0.0003)		
DiD DF			-0.0024***	-0.0017***
[Treated × After-DFA]			(0.0003)	(0.0002)
Treated	-0.0001	-0.0001	0.0026***	0.0023***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
After-AIFMD	-0.0026***	-0.0026***		
	(0.0002)	(0.0002)		
After-DFA			0.0007***	0.0001
			(0.0002)	(0.0001)
Size	-0.0014***	-0.0014***	-0.0028***	-0.0026***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Incentive fee	0.0450***	0.0450***	0.0532***	0.0575***
	(0.0008)	(0.0008)	(0.0008)	(0.0007)
Management fee	0.2573***	0.2573***	0.1110***	0.1952***
	(0.0128)	(0.0128)	(0.0137)	(0.0126)
Av. Leverage	-0.0006***	-0.0006***	-0.0022***	-0.0014***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lock-Up Period	0.0001***	0.0001***	0.0001***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Fund strategy FE	Yes	Yes	Yes	Yes
r2 (within)	0.08	0.08	0.08	0.09
N	70,926.00	70,926.00	106655.00	106655.00

Note: Table 2.14 presents output of the estimation model
$\varrho_{it} = \propto_i + \beta_1 Treated_i + \beta_2 After_t + \beta_3 [Treated_i \times After_t] + \boldsymbol{X_{it}\zeta} + \boldsymbol{\lambda_s} + \epsilon_{it}$,
where the dependent variable ϱ_{it} is the volatility of managerial alpha gauged by seven and nine-factor models as explained in the text. Treated is a categorical dummy taking the value of one for the funds exposed to HFR. After is a time dummy that takes the value of one for months after the HFR is imposed and zero otherwise. X_{it} represents a vector of fund controls, including Size (natural logarithm of assets in millions of USD), incentive fees, management fees, average leverage, and lock-up period used in the model as described in section 1.2.2. The models further control for strategy fixed effects λ_s. Heteroscedasticity robust Standard error clustered at fund level are reported in parentheses.*, ** and *** indicate significance at 10%,5% and 1% respectively. Sample period 2003-2017.

Figure 2.1. Time series plot of the monthly performance of Hedge Funds

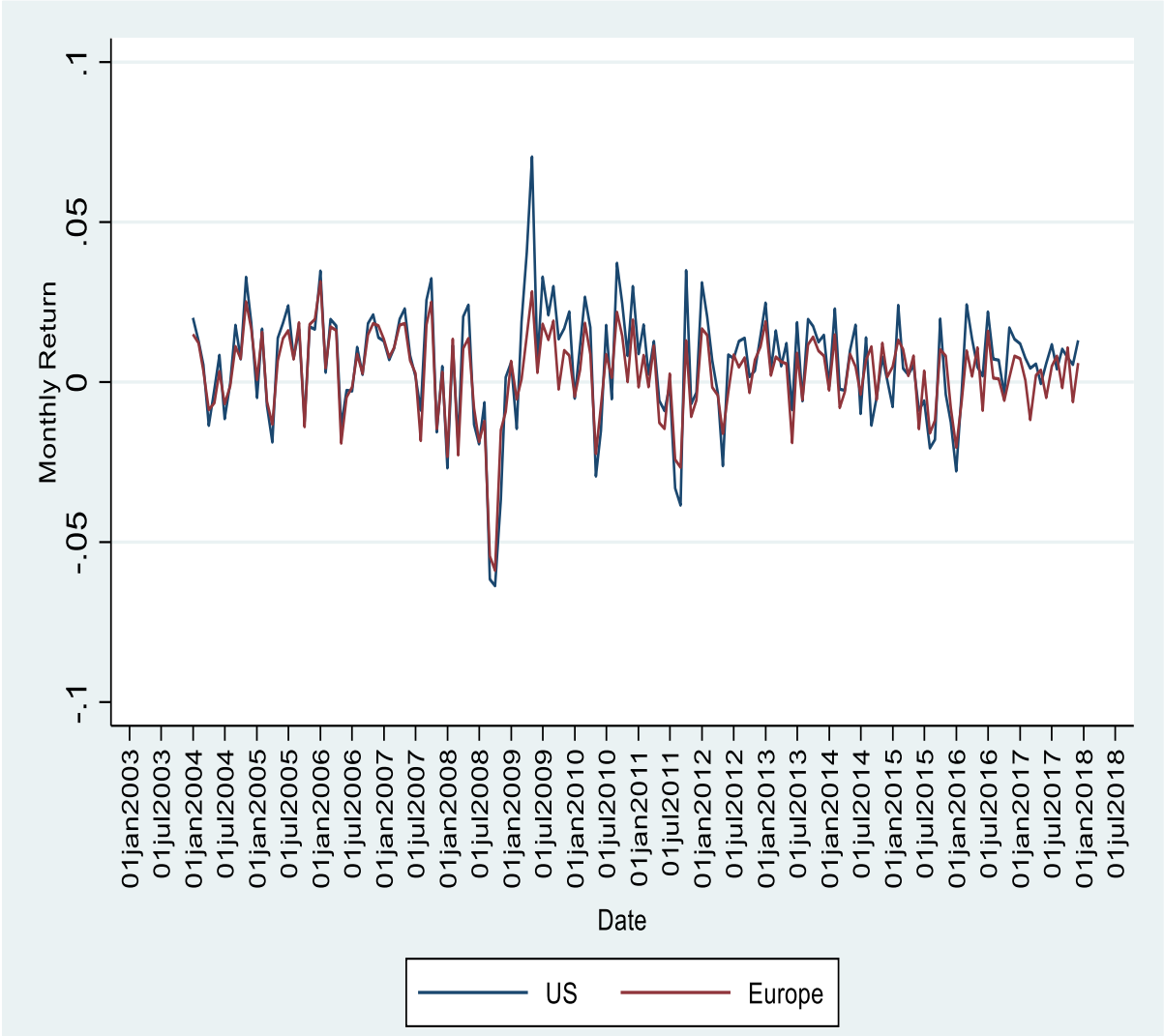
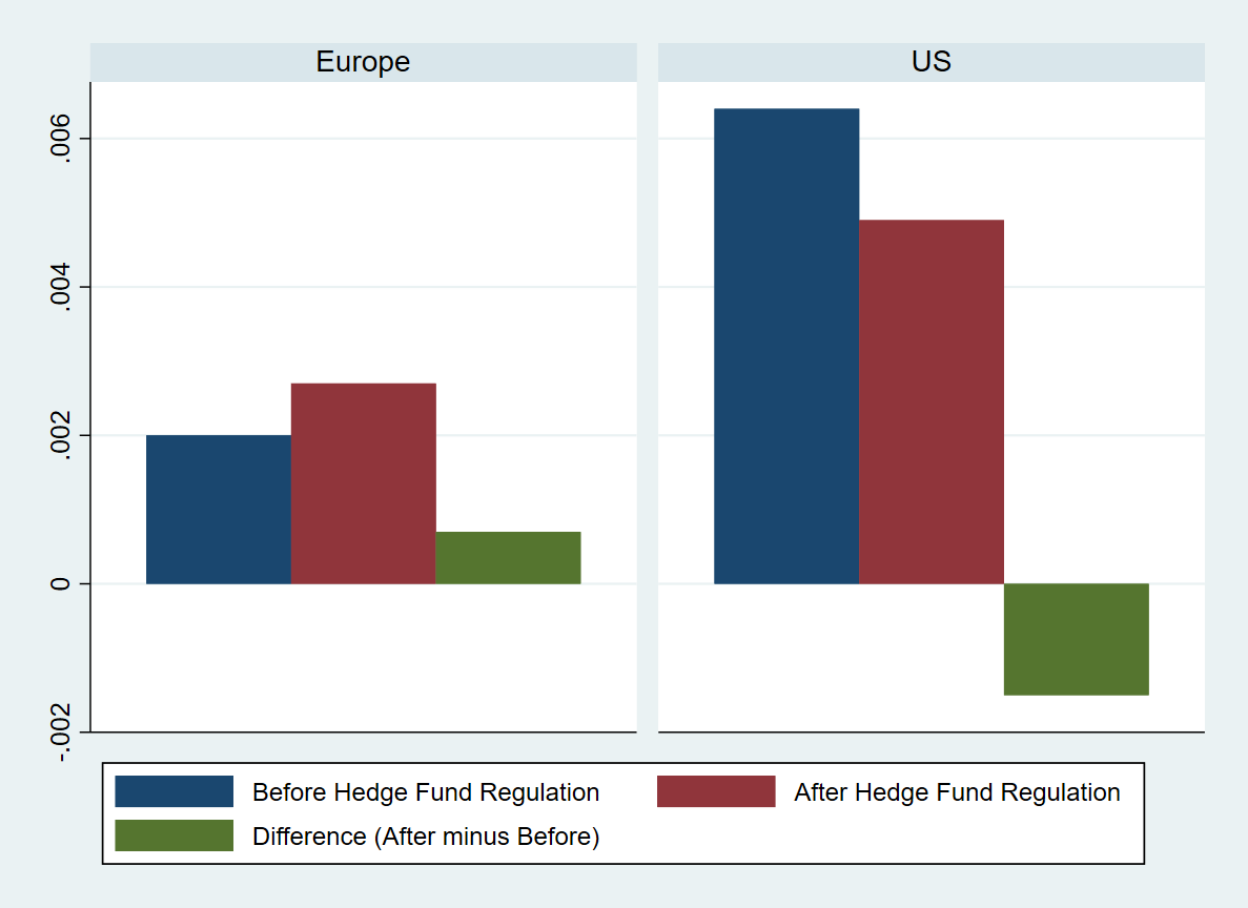
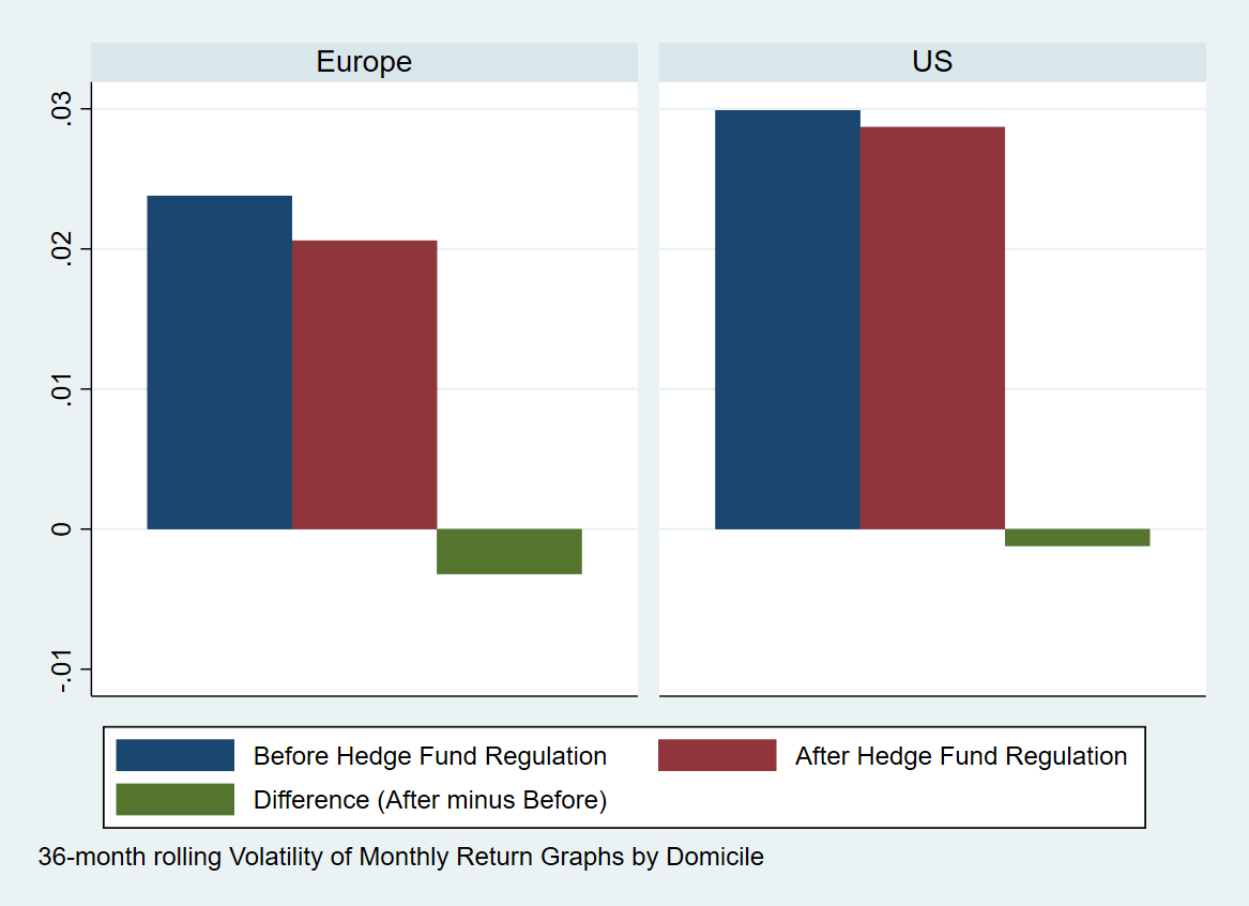


Figure 2.2. Monthly return - Europe and US



Note: The graph plots the average monthly return before and after Hedge Fund Regulation and the difference in return (after minus before) for Europe (AIFMD) and the US (DFA).

Figure 2.3. Monthly return volatility - Europe and US



Note: The graph plots the 36-month rolling volatility of monthly return before and after Hedge Fund Regulation and the difference in return (after minus before) for Europe (AIFMD) and the US (DFA).

2.7 Appendix

Appendix A2.1. Definition of variables

This table shows the construction of the variables. Explanations are provided in the description of the variables in the text.

Variables	Calculation	Source
σ(RoA)-forward 5yr	5 yr − rolling forward σ(RoA) where RoA=EBITDA/Total Assets	Compustat NA
σ(RoA)-forward 3yr	3 yr − rolling forward σ(RoA)	Compustat NA
Idiosyncratic Volatility	12 month forward rolling standard deviation of residual of return predicted by market-model.	Compustat NA
Stock return volatility	12 month forward rolling standard deviation of monthly stock return	Compustat NA
Debt/ TA	Total Debt /Total Assets ()	Compustat NA
Capex/TA	Capital Expenditure /Total Assets	Compustat NA
Cash-holding	Total Cash holding/Total Assets	Compustat NA
$Dividend_{i,t}$	Total dividend scaled by total equity	Compustat NA
$Buyback_{i,t}$	Total Share buybacks scaled by total equity	Compustat NA
Average daily turnover	Average number of shares traded within a day in a given stock as a fraction of total shares outstanding.	
$Amihud_{i,t}$	$\frac{1}{iT}\sum_{i=1}^{T}\frac{\lvert Daily\ return_i\rvert}{Daily\ trading\ Volume_i}$	Compustat NA
Bid-ask spread	Implied bid-ask spread is based on Corwin and Schultz (2012). The spread measures the transaction cost of round trip, and therefore higher spread implies illiquid stock.	Compustat NA
$Activism_{it}$	Categorical variable that takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise.	SEC filing
$Switcher_{it}$	Categorical variable that takes the value of 1 if passive hedge fund of a target firm i turns activist in year t and zero otherwise.	SEC filing
Firm Control		
Firm Size	ln (Book-value of Total Assets)	Compustat NA
Tangibility	Property, Plant and Equipment / Total Assets	Compustat NA
Return on equity	Net income/Total Shareholder equity	Compustat NA
Tangibility	Total PPE/Total Asset	Compustat NA
Market to book	Total market capitalization to book value of equity	Compustat NA
Industry	65 unique industries based on SIC-2 digits non-financial firms	Compustat NA

Appendix A2.2. Regulations introduced in the aftermath of the financial crisis of 2008

	DFA	AIFMD
	Regulations introduced in the aftermath of the financial crisis of 2008	
Objective	Improve investor protection, contain systemic risk	
Proposed	Jun 2009	Apr 2009
Came into force	Jul 21, 2010[6]	Jul 21, 2011[7]
Effective date	Jul 21, 2011 Oct 31, 2011[8] Mar 2012[9]	Member States had until 22 Jul 2013[10] to transpose the AIFMD into national law. Existing AIFMs performing activities under the AIFMD before 22 Jul 2013 had one year until 22 Jul 2014[11] to submit an application for authorisation. Any new AIFM in the EU had to be complaint starting 22 Jul 2013
		AIFMD makes provision for the passport, which is currently reserved for EU AIFMs and AIFs, to be potentially extended in future
Accredited Investor	the net worth of a person, or joint net worth with spouse, at the time of purchase is more than $1,000,000, excluding the value of the primary residence	
	15 clients exemption **eliminated** for investment advisers (less than 15 clients and do not hold out to the public as an investment advisor)	covers managers of all collective investment undertakings other than **UCITS**
	An investment adviser who manages between **$25 million and $100 million** is required to be registered in the state where it has a principal office and place of business and	i) Any AIF manager in the EU that manages one or more AIF, regardless of the AIF's domicile ii) Any European manager that markets AIFs to EU professional investors

[6] signed into law
[7] adopted, https://www.aima.org/en/aifmd/
[8] https://www.sec.gov/spotlight/dodd-frank/hedgefundadvisers.shtml
[9] Cumming et al (2016)
[10] after a 12 month transitional period
[11] fully came into effect, UK pushed the date further to 2015 (transitional provision)

	would be subject to examination by that state if required to register	
	Mid-sized adviser is required to register with the SEC if the adviser's home state insufficiently regulates it. May choose SEC registration if the adviser otherwise would be burdened with multiple state (15 or more) registrations	i) Any non-EU manager that manages one or more EU AIF starting 2015. ii) Any non-EU manager that markets funds to EU professional investors. iii) Non-EU AIFMs were needed to be authorized by the regulator in their member state of reference – i.e. where European operations are effectively based and must appoint a local representative starting 2015 iv) Until 2015, the marketing of funds was to be allowed via the national private placement regime (NPPR), which differed from one member state to other [non-EU alternative investment fund managers (AIFMs) and non-EU alternative investment funds (AIFs) managed by EU AIFMs are subject to the national private placement regime (NPPR) of each of the member states where the AIFs are marketed or managed]
	Investment advisers with assets **above $100 million** must register with the SEC	
Exemptions	Investment advisers who solely advise **venture capital funds, advisers solely to qualifying private fund** clients (managing less than **$150 million**) are exempted from compliance	Managers with AUM fewer than **€100mn, or €500mn (unleveraged) with a five year lock-up**[12], can side-step most of the regime as they do not require authorization but **must still register** (annual reporting requirements only)
Exemptions	Exempt advisers would be required to provide **basic identifying information** about their owners and affiliates, the private funds the advisers manage, any business	Holding companies, Securitization SPVs, Pension Funds, Employee Savings Scheme, AIFMs with AUM less than €100million, AIFMs with AUM less than €500million plus a 5 year lock-up period

[12] These 'small authorized AIFMs' do not have a right to market AIFs they manage to other EU member states and therefore need to consult the national law in each jurisdiction. Many sub-threshold firms have chosen to opt in to the full AIFMD, in order to better appeal to, and access, European investors.

	activities that may present conflicts of interest and the disciplinary history of the adviser and its employees	(Smaller AIFMs will be subject to registration and annual reporting requirements only) and UCITS
	"**foreign private adviser**" exempted from registration i) has **fewer than 15** U.S. clients and private fund investors ii) has **less than $25 million** in aggregate **RAUM**[13] from U.S. clients and private fund investors iii) does **not** have a **place of business** in the United States, and iv) does not hold itself out generally to the public in the U.S.	
	advisers who provide investment advice to the family office are exempted	
	advisers to licensed small business investment companies also are exempted	
Marketing (Fund Distribution)		For non-EU managers, Marketing is defined as "a direct or indirect offering or placement at the initiative of the AIFM or on behalf of the AIFM of units or shares of an AIF it manages to or with investors domiciled or with a registered office in the EU". This broad definition brings placement agents (who market on behalf of an AIFM) and the AIFM under the scope of AIFMD. Marketing could also cover any ongoing 'investor relations' activities (in certain circumstances).
		Non-EU managers marketing non-EU AIFs in EU can rely on existing private placement regimes[14].
Exemption (Fund Distribution)		"reverse solicitation" exemption -investor approaches the AIFM, then the AIFM need not be

[13] RAUM is calculated on a gross basis without deducting any outstanding indebtedness or other accrued but unpaid liabilities

[14] Some member states do not have PPRs in place. Within member states that have PPRs in place some regimes are more burdensome in their requirements than others.

		AIFMD compliant in spite of having an EU investor.
Private Placement		Non-EU managers marketing non-EU AIFs can continue marketing post-AIFMD to EU member states via NPPRs[15] (updated and tightened in many cases). Managers seeking to use private placement must ensure the relevant member state has a private placement regime in place and that a cooperation agreement exists with the home country.
		Managers under full compliance need only report to the member state regulator, but those accessing private placement will be required to submit Annex IV reporting to each local authority within every jurisdiction marketed to
Capital requirement		Alternate Investment Fund Manager needs to pay €300,000 in capital for an internally managed AIF Higher adequacy is required for assets beyond €250 million
Remuneration of 'identified staff		Identified staff (senior management, risk and compliance professionals) Variable pay (sustainable and justified) - at least 50% in units of the AIF (of which 40% to 60% should be deferred over a period of three to five years). The variable pay can be reduced using clawbacks.

15 NPPRs differ from one member state to other.

Leverage	Need to disclose the use of leverage, including off-balance-sheet leverage	Disclosure of leverage, new "gross" and "commitment" methods must be used to calculate leverage
Depositary Requirement		AIF managers with an EU AIF must appoint a single depositary domiciled in Europe to provide safekeeping of financial instruments, record-keeping and verification of assets, carry out cash flow monitoring and a number of oversight duties, all with strict liability
Valuation of assets	Fair value reporting of fund assets, including illiquid securities.	Slightly more details on Valuation are required under AIFMD. Valuation is to be conducted independently or by an external valuer[16].
Conflict of Interest		managers are required to create conflict of interest policies to identify and mitigate potential issues and carry out annual audits
Reporting Obligations	Form ADV[17], Form PF	Annexe IV[18]
Private Fund Investment Advisers Registration Act of 2010 (Title IV)	Required information: i) assets under management and use of leverage, including off-balance-sheet leverage ii) counterparty credit risk exposure iii) trading and investment positions iv) valuation policies and practices v) types of assets held vi) side arrangements or side letters, whereby certain investors in a fund obtain more favourable rights or entitlements than other investors vii) trading practices	

[16] external valuer will have responsibility of any losses suffered by the manager as a result of the external valuer's negligence or intentional failure
[17] SEC's investment adviser registration form
[18] applies to all EU and non-EU managers marketing into the EU, whether utilising the PPR or not, annually, semi-annually or quarterly depending on Regulatory Assets under Management (RAUM). Annex IV reporting data is 50% to 75% similar to Form PF in the US.

Reporting Obligations	Form ADV (DFA)	Form PF (DFA)	Annexure IV
		"Small Advisers" file annually Advisers with at least $1.5 billion in hedge fund AUM must file Form PF quarterly with respect to their hedge funds	
Volker Rule	The Volcker Rule is part of Dodd-Frank and prohibits banks from owning, investing, or sponsoring hedge funds or any proprietary trading operations for their own profit.		
New provisions regarding the use of Swaps	use of Swaps, reporting of Swap transactions, identifying the major swap participant		
Disqualification	Of advisers that have demonstrated improper conduct in the past		
State level regulation	May be required to register with and/or submit notice filings[19] to one or more state securities regulators		
Subject to state anti-fraud laws	State may not require registration by an SEC-registered adviser, state authorities do have the right to inspect the adviser for alleged violations of state anti-fraud laws		

[19] adviser should consult the investment adviser statutes of the states in which it has a place of business or clients

Chapter 3. WHAT DRIVES HEDGE FUND ACTIVISM?

AN ENQUIRY OF FIRM AND INDUSTRY ANTECEDENTS OF HEDGE FUND ACTIVISM

3.1 Introduction

Hedge fund activism and its consequence on corporate decisions have been one of the important topics in shareholder activism and corporate governance literature ((Brav et al., 2015; Bessler et al., 2016; Wong, 2020). Similarly, as argued in Chapter 2, literature on business regulations also widely discusses the possibility that hedge fund activism could destabilise the market. Therefore, it is relevant to understand the economic imperative behind hedge fund activism and their (un)intended consequences on corporate decisions.

The reasons for an activist hedge fund to target a company are examined in this chapter. This is especially crucial because activism isn't cheap. Activism is an expensive endeavour. As a result, it is suggested that hedge funds should keep the majority of their holdings passive. According to Edmans et al. (2013), asset managers' high performance-based fees force hedge funds to select whether or not to intervene optimally. As a result, a hedge fund only becomes an activist when the fund manager believes that the company's potential value rise outweighs the predicted cost of intervening. To that aim, the goal of this empirical study is to learn more about the factors that influence hedge fund activism. Specifically, I explore five important aspects of antecedents of hedge fund activism:

Firstly, I examined the firm antecedents of hedge fund activism. Drivers of hedge fund activism could be theoretically explained by economic predictions of agency and information-related problems facing a firm. Agency related friction argument and its effect on corporate decision making can be traced to the seminal works of Jensen and Meckling (1976), Myers (1977), and Leland-Pyle, (1977). These papers postulated that the market frictions prompted by unobservable actions, limited ability of contracting, and asymmetric information largely result in second-best outcomes in which corporate ownership distribution is realized only at substantial cost. The costs could assume different forms of excessive perquisite consumption, overinvestment, underinvestment, sub-optimal performance etc., leading to destruction in firm value. While shareholders (principal), in theory, can lower the impact of sub-optimal decision making by the managers (agents), the free-rider problem hinders a minority shareholder from acting as an effective corporate monitor. Free-rider problem in corporate monitoring is an incentive-driven behavioural phenomenon that deters stakeholders from monitoring managerial actions efficiently. The view is that for a free rider, no incentive lies in contributing to a collective resource (monitoring) as they can exercise the benefits without even having to contribute. As a consequence, the other monitors cannot be adequately compensated for their efforts of costly monitoring.

In the corporate setup, the free-rider problem associated with costly information search and a lower proportion of stock holding can make monitoring sub-optimal for general shareholders (Demsetz and Lehn, 1985). From an information search viewpoint, an activist hedge fund could act as an informed investor as it is optimal for them to chase

costlier information on the target firm (O'Hara, 2004). The stake and power of hedge funds to influence the board and managerial decisions make it optimal for them to engage in costly information search, thereby lowering the information asymmetry associated with minority shareholders and the inside decision making. To the extent hedge funds have an incentive to act as an informed investor, they target a firm that is potentially exposed to higher adverse selection costs and information asymmetry driven frictions and aim to correct the mis-valuation of target firms.

Another related argument suggests agency driven conflict of interest could provide an incentive for a manager to underinvest in value relevant projects or underperform to enjoy managerial slack (John et al., 2008; John et al., 2015). Hedge fund activism could create a disutility in the managerial slack that would otherwise incentivise a manager to pursue corporate conservatism. To this end, hedge fund activism would target firms with higher agency problem of underperformance or corporate conservatism.

Taken together, information asymmetry and agency related situation facing a firm would explain whether a firm could be targeted by an activist hedge fund where hedge fund activism is driven by correcting undervaluation, underperformance and corporate conservatism. To this end, this chapter explores agency and information related mechanisms in explaining firm determinants of hedge fund activism.

Secondly, this chapter extends the exploration of firm antecedents to incorporate the potential influence of peers in driving hedge fund activism. In the real world, where decision-makers do not possess perfect information on relevant factors for their decision-making, learning from peers can support them to acquire more useful information and

lower adverse selection problem associated with limited information. In this regard study by Conlisk (1980) reveals that familiarity that comes from experience or knowledge that is gained from experiments is more costly and time-consuming than mimicking. Therefore it is optimal for firms with imperfect information to rationally mimic the tactics of peers to lower the failure risks (Milliken, 1987). Under a frictional environment with limited and uncertain information, it could be problematic for activists to estimate the outcomes of particular activism decisions, as it raises the likelihood of undesirable outcomes and the risk of losses and failure. Therefore, activists not only learn from firm antecedents but also from the firm peers in the market with imperfect information. Thus, taking a decision to turn into an activist or initiate activism is more likely to learn from peer firms' prospects to reduce failure risk (Foucault and Fresard, 2014; Gantchev, Gredil, and Jotikasthira, 2019).[20] To this extent, this empirical research extends the exploration of firm antecedents to incorporate industry peers as a potential driver of hedge fund activism.

Thirdly, the role of competition in hedge fund activism is examined in this empirical study. According to theories, when there is more competition, the degree of utility of private information generated by informed traders is lower for a given level of asymmetric information (e.g., Holden and Subrahmanyam 1994; Foster and Viswanathan 1996). This occurs as a result of competition, which causes private information to be

[20] An increasing number of empirical studies examine the characteristics or behaviour of peer firms and whether they affect a firm's behaviour (Leary and Roberts, 2014; Foucault and Fresard, 2014).

reflected in prices more quickly. This effect has significant consequences for information asymmetry pricing.

The first is that competition lessens the need for market makers to price protect since asymmetric information is used less. Second, because intelligent investors' collective trading leads to more information being represented in the equilibrium price, competition minimises the risk of asymmetric information to uninformed investors (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). Taken together, competitive force substitutes, at least in part, the negative effect of asymmetric information. In other words, prices become more informative about fundamental value, making the role of informed investors less relevant. Hedge Fund activists could specialise as informed investors lowering the information asymmetry. To this end, HFA and industry competition serve the same purpose of lowering information asymmetry facing a target firm and associated adverse selection costs. Therefore, hedge fund activism should target a firm in a less competitive market, all else being same.

Alternatively, in a monopolistic market, firms possess market power to the extent of coercing prices and output (Elia, 2018). To this end, the value of activism may not translate into eliminating underperformance and undervaluation. The prediction of this alternative view is that competition is positively associated with the propensity that a firm would be targeted by an activist. The empirical enquiry in this chapter aims to contribute to this theoretical tension in the literature on hedge fund activism. There are two seemingly opposing theoretical predictions of the effect of competition on hedge fund activism.

Fourthly, Hedge fund activism could be argued to be associated with information production to lower the adverse selection cost of existing shareholders (Gillan and Starks, 2007; Brav, Jiang and Kim, 2015). The most common Hedge fund activism on the target firms includes changing and challenging management policies or board decisions; pursuing a board seat for varied purposes related to input or control of information; bringing about changes in corporate governance in the target firm to affect how the firm is governed and monitored; forcing a sale or buyout of a unit; and altering cash distributions to shareholders in the form of dividends or share buyback (Brav, Jiang and Kim, 2015). While the hedge funds use some of the same strategies as those employed by the traditional institutional activists—including shareholder proposals, direct negotiations, and use of the media—they also adopt other strategies like an outright takeover, proxy contests or litigation, among others (Gillan and Starks, 2007). It is optimal for hedge fund activists to invest in the search for information, thereby creating better monitoring and governance for the managers and existing board. The strategies adopted by hedge fund activism could lower the conflict of interest between minority shareholders and the activists as activists engage in information production in their process of activism.

Alternatively, regulatory intervention like corporate governance reform aims to achieve the same outcome of lowering adverse selection costs in the market, however, through disclosures and more transparent reporting regimes. To the extent the value of hedge fund activism is more effective in a regime with higher information opacity, the regime switch towards better disclosure regimes should make the information production role of hedge fund activism less relevant. This study employs this economic argument and

exploits the passage of The Dodd-Frank Act in the US that has created a regime switch in the information environment facing hedge fund activism and examine whether determinants of hedge fund activism in these two seemingly different information environment are different.

Fifthly, this chapter explores whether the determinants of hedge fund activism are different for a hedge fund that engage in activism directly when compared to a passive hedge fund that turns activists later during its ownership stake in the firm.

There are two economic explanations for the antecedents of passive hedge funds turning activist when compared to other direct activist hedge funds. Activism does not come cheaper (Edmans et al., 2013). Because activism is costly, it may be best for hedge funds to keep most of their holdings passive. Therefore, a hedge fund becomes an activist when the fund manager estimates the firm's potential value increase outweighs the expected cost to intervene. When not certain about the reliability of the information a hedge fund gathers about a potential target, it might enter as a passive investor, gather information about it and turn activist only when able to gather sufficient information on prospects and potential (Edmans et al., 2013). However, in terms of predictability, both of the strategies may result in the same outcome.

Alternatively, a passive hedge fund turning activist has the advantage of time to learn about a firm before turning activist. Keeping hedge fund level antecedents constant, it could be argued that the difference in the learning window provides passive investors with extra stimulus or "*learning window*" to revise their priori information set may make the antecedents differently affecting the passive hedge funds turning activists. In other

words, the firm antecedents explaining hedge fund activism may not necessarily work in the same direction or magnitude (intensity) to affect the propensity of passive hedge fund to switch to activist. This chapter aims to shed insights on motivations on passive hedge funds turning activists in light of aforesaid economic views.

Finally, this chapter closes the loop by examining the value relevance of hedge fund activism. In an efficient capital market, the price reflects the new relevant information (Grossman, 1976; Grossman and Stiglitz, 1980). To the extent hedge fund activism aims to correct information asymmetry and agency related problem facing a firm, market should respond positively to the corporate announcements associated with hedge fund activism.

This chapter employs an extensive set of hedge fund filing data and traces target firms associated with the activist hedge fund filing for the US firms. The SEC filing requirement is such that while funds file 13G to indicate their regular shareholding in the firm, they file 13D to indicate that they own more than 20% of the stock or turn activist. Furthermore, the financial penalty regime of non-compliance with the filing requirement implies that the filing of SEC on 13D and 13G provides a cleaner distinction to any activist holding or passive investment a hedge fund aims to hold in a target firm. Using this unique dataset and mapping this with target firm characteristics, this chapter's empirical work documents important revelations:

First, the firm-level factors that gauge different information and agency problem explain the likelihood that a firm could be a target of hedge fund activism. All else equal, I document that the smaller the firm, the higher the likelihood of being acquired. Previous

studies maintain that firm size is a simple and effective measure for information asymmetry (Bessler, 2015). To this end, the finding is evidence that firm-level information asymmetry acts as an important driver of hedge fund activism. This confirms the corporate governance role played by hedge fund activism (Bessler, 2015; Brav et al., 2008). Similarly, I find lower firm MB attracts a higher propensity of hedge funds targeting the firm. To the extent lower MB is a measure of undervaluation, the finding is in line with the economic prediction that hedge fund activism target undervalued asset and create value by correcting this undervaluation. Larger the cost of adverse selection and agency related conflict, the greater is the downward push to the valuation of an asset, and therefore larger is the effect of hedge fund activism on correcting this undervaluation, all else equal (Brav 2015; Bessler, 2015). On my enquiry of the impact of operating performance on firm propensity to be a target of hedge fund activism, this study documents that hedge fund activism targets underperforming firms, ceteris paribus. The finding is in line with the corporate disciplining role of hedge fund activism (Coffee, 2015). The aforesaid three results taken together are evidence that corporate underperformance and undervaluation triggered by higher adverse selection costs are important drivers of hedge fund activism.

On my enquiry of the potential impact of corporate risk-taking of target firms on the propensity to hedge fund activism, the results provide important insights. First, the propensity to hedge fund activism is positively related to investment conservatism (lower Capex) and conservative payout policy (dividend payout). On the other hand, hedge fund activism is revealed to be negatively associated with conservatism related to debt employability and cash-holding. To this end, the finding is in agreement with the

theoretical prediction that hedge activism is associated with improving corporate risk-taking (Coffee, 2015; Brav et al., 2018). On the other hand, conservatism related to cash-holding and debt employability seem to discourage hedge fund activism. As higher debt employment relates to firm access to external capital (Levine, 2008), the results provide an interesting insight into the hedge fund activism literature in the sense that while hedge funds normally have a higher appetite for higher debt employability (Cumming et al., 2017), they do not tend to improve financial access rather would target firms which already have better access to the debt market.

The enquiry of passive hedge funds turning activists reveals that, like other activist hedge funds, passive hedge funds are triggered to be activist by higher adverse selection costs, undervaluation and lower risk-taking appetite. This result could be interpreted as follows. First, a hedge fund may gather inside information about a potential target and enter as an activist. Alternatively, when not certain about the reliability of the information gathered or inability to do so, a hedge fund may enter as a passive investor, gather information about it and turn activist. However, in terms of predictability, both of the strategies may be optimal and result in the same efficacy in addressing adverse selection and agency related problems of a target firm. The results that both types of activism are associated with undervaluation and higher adverse selection costs is a piece of evidence that my research contributes to this debate on what really drives hedge fund activism and how.

A further enquiry of other antecedents reveals that the propensity of passive turning activist is positively associated with operating performance. The results are

insightful to the minority investors as the propensity of passive hedge funds to turn activist is explained by chasing a potential target that is generating positive operating cash flow (Coffee, 2015). In essence, it could be optimal for some hedge funds with a lower aptitude to identify and correct the mis-valuation of the target to enter as a passive investor and switch to activist once the potential to perform becomes clearer, thereby correcting the mis-valuation of the performing targets. The results highlight the merit of time that some hedge funds may find it optimal to buy to learn about target firms in the form of their passive ownership before turning into activists.

In the second set of enquiry, where this chapter examines the peer influence on the propensity to turn activism, the finding that a larger size of peer firms increases the likelihood of hedge fund activists is insightful, in line with the theoretical argument of information theory of peer influence and of policy relevance as activism is negatively associated with firm size. Thus hedge fund activism is positively associated with a larger size of peers. Similarly, the underperformance of peers and lower cash-holding by peers triggers hedge fund activism.

Similarly, peer influence on the passive hedge funds turning activist suggests that undervaluation, lower cash holding and better operating performance of peer firms trigger passive hedge funds to turn activist. The findings taken together suggest passive hedge fund turning activists may be affected by peers in a different way. Depending on a different information set available to the activists' hedge funds and passive hedge fund turning activist, their response to peers is in line with the rivalry view on decision making (Kandel and Lazear, 1992; Becker, 1993; Prendergast, 1999; Lazear, 2000).

Previous research has shown that hedge fund activism has a spillover effect on target peers, with a higher likelihood of increasing leverage and payout, lowering capital expenditures and liquidity, and improving return on assets and asset turnover (Gantchev et al., 2019). My empirical findings reveal that it is not merely the spill-over effect; rather, it is the spill-back effect, in which a firm's propensity to be targeted by hedge fund activism is influenced by the firm's industry peer characteristics.

In my third set of enquiries, I examine the role of competition on the propensity to hedge fund activism. The literature is divided on the prediction of the effect of competition on the propensity to activism.

The first view is that competition reduces the risk of asymmetric information to uninformed investors as a result of the collective trading by the informed investors, leading to greater information being reflected in the equilibrium price (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). Therefore, competitive force substitutes, at least in part, the negative effect of asymmetric information. Hedge Fund activists could specialise as informed investors lowering the information asymmetry. To this end, HFA and industry competition serve the same purpose of lowering information asymmetry facing a target firm.

The alternative view is that, in a monopolistic market, firms possess market power to the extent of coercing prices and output (Elia, 2018). To this end, the value of activism may not translate into eliminating underperformance and undervaluation. To this unsettled prediction in the existing literature, this study's empirical findings suggest that hedge fund activism is negatively associated with market competition supporting the substitutive

argument. On the other hand, concentrated sectors would attract more activism due to the value of the private information generation role played by the activists (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012).

In my fourth set of enquiry, I examine the role of explanatory power and direction firm antecedents on the propensity to hedge fund activism in the changing information environment before and after Dodd-Franc Act. It is optimal for hedge fund activists to invest in the search for information, thereby creating better monitoring and governance for the managers and existing board. The strategies adopted by hedge fund activism could lower the conflict of interest between minority shareholders and the activists as activists engage in information production in their process of activism.

The information environment facing Hedge Fund Activism following Dodd-Frank Act could be considered a structural shift (Cumming et al., 2020) and, therefore, may make the information generating role of Hedge fund activism less relevant. To this strand of literature, my empirical enquiry contributes by showing that the regime change in the information environment created by Dodd-Frank Act has enabled activist hedge funds to target firms that are more conservative (hold more cash) or are financially constrained. Therefore, Dodd-Frank Act could be considered to complement and support an information environment for a hedge fund to assess about a target and does not play a substitutive role in information creation. The evidence is in favour of regulations like the Dodd-Frank Act to improve the information environment. I also document that such an effect does not exist for the passive turned active hedge funds.

In my final set of enquiries, I investigate the market reaction to activists filing. Employing three techniques of generating cumulative abnormal returns, including the simple market-adjusted abnormal return, abnormal return based on the market model and abnormal return based on the Fama-French 3 factor model to gauge market reaction, my results document positive market response to activists filing. The result suggests that the market value the information content of activist filing (Brav et al., 2015). This is in line with the economic argument of reduction in information and agency related problems hedge fund activism brings to the target firm.

The rest of the chapter is structured as follows. Section 3.2 discusses related literature to lead to hypothesis statement. Section 3.3 explains data and variables, while section 3.4 discusses empirical results. Finally, section 3.5 concludes the chapter.

3.2 Related literature and hypothesis development

The literature on hedge fund activism hinges on the corporate disciplining role played by activist hedge funds. Hedge funds act as a hybrid between delegated portfolio managers, and this is because they work as pension and mutual funds as well as corporate raiders. The unique advantage that hedge funds possess over the others is that they have powerful negotiation capability and increased incentives. These characteristics have contributed significantly to the rise and popularity of hedge funds over the traditional corporate raiders (Krishnan, 2016). Hedge funds activism contributes to the increase of the possibility that an organizational form may be a vital determinant of either success or failure of shareholder activism. These distinguishing features possessed by the hedge

funds contribute to the consistency of their results hence increasing the operating performance and achieving their activist agendas.

A typical hedge fund is structured as a partnership with a general partner in charge. As a result, investors are largely passive participants in the hedge fund industry. Because their income is based entirely on their performance, hedge fund managers must have strong incentives to achieve positive returns (Brav, Jiang, Ma, & Tian, 2018). In general, a typical hedge fund charges a fixed yearly fee of 2% of assets plus a 20% performance fee based on the fund's annual returns. Managers of other institutions, on the other hand, can receive performance-based bonuses; however, their incentives aren't taken into account because the Investment Company Act of 1940 limits performance fees.

Hedge fund managers, on the other hand, can take more significant positions because they are not bound by the law and can manage diversified portfolios. Hedge funds can own a larger share of particular companies and may compel investors to put their money in escrow for two years (Briggs, 2006). Furthermore, hedge funds are exempt from the Investment Company Act's regulations, allowing them to trade openly within certain margins and engage in derivatives trading. These tactics, among others, are not available to pension and mutual funds, making hedge funds a distinct category. As a result, hedge funds have an advantage over other institutions in terms of trading.

Hedge funds, unlike many other institutional investors, are not subject to too stringent fiduciary standards like those imposed by the ERISA. The majority of hedge fund investors are rich people with significant institutions. Hedge fund firms raise capital through private placements, which are not subject to any disclosure or other laws (Briggs,

2006). Despite the fact that hedge funds are subject to antifraud sections of US securities laws, they are not subject to any further significant regulation, such as investing requirements.

Finally, when compared to other institutions' management, hedge fund managers face fewer problems and conflicts of interest. Unlike mutual funds, hedge funds do not sell their products to organizations whose stock has been held for a long time (Clifford, 2008). Unlike pension funds, hedge funds are not influenced by political or local factors in any way. Hedge fund managers have strong competencies and self-interested motives to generate profits. Despite the fact that many private equity firms have venture capital funds focused on specific industries, hedge funds are defined by their aggressiveness in investing in specific private capital markets.

Private equity investors, on the whole, target private companies, and they can occasionally acquire larger percentage ownership shares than hedge fund activists. Venture capital investors, on the other hand, who are prominent participants in private companies, are able to accurately combine the company selling or going public, and as a result, they invest much earlier than hedge funds activism and individual shares. Nonetheless, competition among these investors grows fierce, and as a result, hedge funds employ different methods, bolstering the institutional investment sector's activist spirit.

Attempts to influence a firm’s strategic decisions or its management occur through two major interventional approaches. Traditional activists, which include individual investors, venture capitalists, private equity firms, and asset management groups, often engage in activities such as talking to the media, preparing proposals, writing shareholder

letters or speaking engagements with the shareholders, and introducing corporate social responsibility. Hedge fund activists, in contrast, are more robust in their demands to targeted firms. They often seek board representation, replacement of CEOs, litigation, influence management's decisions and participate in firms' strategic business decisions and the breakup of conglomerates. Unlike traditional investors, hedge fund managers engage in more activist activities toward target firms. Consequently, small hedge funds can have a significant influence on company policies.

Hedge fund activists, despite their smaller holdings of company stocks, can affect company policies tremendously. With the rise of institutional shareholding, the federal government relaxed regulations to encourage "shareholder democracy" in the late 1980s and early 1990s. The system was intended to encourage shareholders to have a say in company decisions. The regulations required shareholder investors and mutual funds to use proxy-voting firms to achieve shareholder democracy in order to justify their voting decisions. This created a need for a corporate voting mechanism and later led to hedge fund activism. This allowed proxy-advisory firms to be set up and have compulsory voting on company decisions. Consequently, institutional investors have started hiring proxy-advisory firms and have become increasingly dependent on their advisory services in making voting decisions. To understand the theoretical underpinning that guides my set of antecedents, I divide the review of studies into three area clusters: firm antecedents, industry peer antecedents and competition.

3.2.1. Firm antecedents of hedge fund activism

Previous studies on hedge fund activism have identified information related and agency related mechanisms explaining hedge fund activism creating value for a target firm.

Agency related friction is a widely researched area in the corporate finance literature and can trace its origin to the seminal works of Jensen and Meckling (1976), Myers (1977), and Leland-Pyle, (1977). The postulation is that the market frictions prompted by unobservable actions, limited ability of contracting, and asymmetric information largely result in second-best outcomes in which corporate ownership distribution is realized only at substantial cost. The costs could assume different forms of excessive perquisite consumption, overinvestment, underinvestment, sub-optimal performance etc., leading to destruction in firm value.

Specifically, the agency and asymmetric information problems translate into three, however, related categories of effect on corporate decisions. These are effects on undervaluation, under-performance and corporate conservatism.

3.2.1.1 Adverse selection and hedge fund activism

In the firm setup, the free-rider problem associated with costly information search and a lower proportion of stock holding can make monitoring sub-optimal for general shareholders (Demsetz and Lehn, 1985). The stake and power of hedge funds to influence the board and managerial decisions make it optimal for them to engage in costly information search on the target firm (O'Hara, 2004) and therefore act as an informed investor. Thus hedge fund activism could lower the adverse selection cost. To the extent

hedge funds have an incentive to act as informed investors, they target a firm that is potentially exposed to higher adverse selection costs and information asymmetry and create value for the target firm. In line with the adverse selection problem facing a firm, I postulate my first hypothesis on firm antecedent as follows.

$H_{3.1.1}$: adverse selection cost of target firms attracts hedge fund activism

Previous studies maintain size can be taken as a measure of the degree of adverse selection. Bessler (2015) argues that firm size is a simple yet powerful corporate governance proxy in the face of information asymmetry, with larger size reflecting lower adverse selection costs. I, therefore, use firm size to gauge the degree of adverse selection cost facing a firm.

Size proxies many unobserved firm heterogeneity. These explanations have gained prominence in hedge fund activism literature:

First, in terms of riskiness, a larger size may lower the risk of failure. Wide-ranging financial assets, larger infrastructures, and a huge workforce allow firms to endure continued episodes of weaker financial performance with a lower threat of failure (Audia and Greve, 2006; Voss, Sirdeshmukh and Voss, 2008). This buffering effect of a huge inventory of resources lowers the performance level at which the organization's survival is in question. On the contrary, smaller endowments of resources raise the degree of a firm's point of survival. Therefore, size could proxy for lower survival risk. This could address the problem of adverse selection associated with investors' risk-taking aptitude.

Second, size also gauges the degree of firm maturity in the life cycle. Young and growing companies, in general, would have a smaller size (John et al., 2008; Rao et al., 2020). In terms of riskiness, the survival of young firms is higher when compared to their mature peers. To the extent small size proxy young firms, small size capture firms with a high risk of failure (Faccio et al., 2011). To the extent young firms face more adverse selection problem due to their new and yet unproven business model, larger firms can be argued to have lower adverse selection cost to this end.

Third, Roberts and Dowling (2002) maintain that size gauge the firm's ability to generate a competitive advantage. This competitive advantage may arise from three important channels:

a. the economies of scale that lowers cost per unit when the total firm cost is allocated to a large unit of production (or services);
b. the economies of scope of producing different related items using the existing set of resources that large firms bring; and
c. the firm size also proxy the firm's ability to generate learning benefits that translate into cost and process efficiency.

These explanations, taken together, indicate firm size is a simple yet powerful corporate governance proxy in the face of information asymmetry, with a larger size reflecting lower adverse selection costs (Bessler, 2015). I gauge size to measure the degree of adverse selection cost and hypothesize in line with $H_{4.1.1}$ that hedge fund activism targets small firms, ceteris paribus.

3.2.1.2 Undervaluation and hedge fund activism

Corporate discipline is associated with the identification of misevaluation of assets to take corrective action (Gillan and Starks, 2006). Such actions could translate into influencing corporate decisions so as to eliminate dead-weight costs or efficiency-related due to agency-related or information related inefficiencies (Brav et al., 2015). In the information-based argument, information imperfection occupies the central factor that drives firms' learning behaviour. In the real world, where investors do not possess perfect information on a firm, this increases the adverse selection problem associated with limited information, thereby creating a downward push to the firm value as adverse selection cost would add to the required rate of return. Hedge Fund Activism is linked in the literature to influence corporate information towards creating value relevant shift. Information search and active monitoring create search costs. The associated search cost and free-rider problem make it prohibitively costly for the minority shareholders to actively search for information to monitor a company.[21] Similarly, the agency-related view asserts that the stake funds hold and the expertise they bring to discipline managers from deriving private utility makes their activism more aligned with the shareholders' interest. The larger the cost of adverse selection and agency related conflict, the greater is the downward push to the valuation of an asset, and therefore larger is the effect of hedge fund activism on correcting this undervaluation. Given the size of the stake and expertise of hedge funds, it

[21] Corporate monitoring does not necessarily limits to the monitoring through the representatives like board members and committee members. An efficient market allows different form of monitoring, voting with the feet is an effective way where an unhappy shareholder can influence a bad govern firm by the way of sale and exit. The downward price pressure should, then act as factor for managers to act in the best of shareholders' interest (Duan, and Jiao, 2016).

is optimal for them to initiate activism to improve firm under-pricing and underperformance (Brav et al., 2015). To this end, it could be hypothesized that hedge fund activists would target an undervalued firm. A firm with a lower MB implies it is undervalued (Rao et al., 2020), all else being equal. I, therefore, state my second hypothesis on firm antecedent as follows.

$H_{3.1.2}$: Undervaluation of target firms triggers hedge fund activism

I gauge the degree of undervaluation by using MB as a measure of the degree of undervaluation in line with existing literature (Coffee, 2015; Brav et al., 2018). To this end, $H_{3.1.2}$ implies lower MB of the target firm would trigger hedge fund activism, all else remaining equal.

3.2.1.3 Target's underperformance and hedge fund activism

Hedge fund activism has been linked to business performance in the literature. Aslan and Kumar (2016), for example, look at 299 changes from 1994 to 2007 to see how activism compares to a passive investment. They detect unfavourable effects on rival firms' market shares and profit margins in the three years after the shift. Boyson, Gantchev, and Shivdasani (2017) use 159 switches to examine the value creation channel of hedge fund activism. They claim that once the transfer is completed, the portfolio company is more likely to receive a takeover offer. They conclude that "beyond stock selecting abilities, the hedge fund's activist engagement has an incremental influence in stimulating takeovers." Finally, Brav, Jiang, Ma, and Tian (2018) discover 79 activist initiatives as a result of the changeover. They find that when a hedge fund converts from

a passive to an active position, the target company's innovation increases, as measured by the number of new patents and citations. In light of the evidence that suggests hedge fund activism is linked to underperformance, I propose the following hypothesis on the positive relationship between underperformance and hedge fund activism.

$H_{3.1.3.}$ Underperformance cost of target firms triggers hedge fund activism

I use operating profitability, i.e. Earnings before interest, taxes, depreciation and amortization (EBITDA), as a proportion of total assets to gauge firm underperformance. Operating profitability measures the degree to which an asset is utilized to generate income from core business operations. In essence, this measures the efficiency of asset utilization. All else equal, lower operating profitability implies firm underperformance.

3.2.1.4 Corporate conservatism and hedge fund activism

According to the HFA's corporate discipline perspective, the HFA reduces managerial opportunism, hence fostering long-term risk-taking (Lel and Miller, 2015; Bena et al., 2017). According to this economic viewpoint, the impact of HFA on business risk-taking is proportional to the value that corporate discipline provides to enterprises (John, Litov and Yeung, 2008). The HFA can be an effective corporate governance technique for reducing agency concerns (Fama and Jensen, 1983; Jensen and Ruback, 1983). The quantity and impact of insider benefits could be reduced as a result of greater company oversight.

Alternatively, an HFA increases the propensity for underperforming incumbent managers to be replaced and acts as a credible managerial disciplining tool that lowers

managerial slack or tendency to enjoy a quiet life (Bertrand and Mullainathan, 2003). Additionally, the replacement threat motivates directors to be more careful as corporate monitors, as these directors face the risk of being dismissed by the acquiring team when a firm becomes a target as a result of poor performance (Hirshleifer and Thakor, 1998; Lel and Miller, 2015). When a hedge fund activist investor is present, a stronger corporate discipline minimises information asymmetry between insiders and investors in the capital market through increased disclosure and independent monitoring, lowering the information-related cost of capital (Stulz, 1999; Healy and Palepu, 2001). This occurs through a reduced propensity of adverse selection, as argued by the theory of lemons by Akerloef (1978).

Taken together, corporate discipline predicts a potential positive relation between HFA and corporate risk-taking as a managerial discipline could discourage managerial slack or consumption of private benefit, thereby discouraging corporate conservatism. Therefore, the HFA should discourage investment short-termism and encourage long-term risk-taking through managerial discipline (Weisbach, 1988; Khanna and Palepu, 2000; Fauver et al., 2017; Lu and Wang, 2018). Monitoring provided by HFA could also reduce managerial slack, which would otherwise encourage them to pursue a quiet life (Bertrand, Mehta and Mullainathan, 2002).

$H_{3.1.4.}$ Corporate conservatism of target firms triggers hedge fund activism

I employ a set of firm antecedents to explore the corporate conservatism that attracts hedge fund activism.

Cash-holding

Literature maintains various motives of corporate cash-holding. Of which precautionary, speculative, transaction and agency motives, among others, are the most common motives documented in the literature. For instance, Keynes (1936) proposes that one of the major reasons for storing cash is to hedge against the risk of cash flow shortages, which can happen in many cases, including the possibility of finding an attractive opportunity when other sources of funding are costly or unavailable or when the company is financially distressed (Brisker, Çolak, and Peterson 2013). Additionally, agency problem (Jensen and Meckling 1976) and information asymmetry (Myers and Majluf 1984) could also play a role in raising the cost of external funding compared to internal funds. Consequently, holding cash could reduce this risk.

There is substantial evidence that cash is held for precautionary reasons. For instance, Opler et al. (1999) provide evidence supporting the view that cash is held for precautionary reasons. Consistent with the precautionary hypothesis, firms that have good access to the capital market (large firms and firms with high credit ratings) tend to hold less cash. Also, smaller firms and firms with high market-to-book and risker operations hold more cash. Moreover, Bates, Kahle, and Stulz (2009) attribute the increase in the cash-to-assets ratio to the increasing risks associated with cash flows as well as to the changes in firm operations (lower levels of inventories and higher levels of R&D). The relationship between cash holding and the riskiness of a firm is strongly supported in the literature (Han and Qiu 2007; Riddick and Whited 2009). Additionally, Brisker, Çolak, and Peterson (2013) find that the inclusion of firms on the S&P 500 index leads to a

reduction in cash holdings by 32% due to an increase in their transparency, reduction in their uncertainty, and an increase in their ability to raise external funds at a reasonable cost. Moreover, firms in countries with a culture of uncertainty avoidance hold more cash, suggesting that cash is held for precautionary reasons (Chen et al., 2015).

Further, the literature suggests that cash can also be held for speculative motives to take advantage of attractive opportunities (Brisker, Çolak, and Peterson 2013). When opportunities arise, and the firm cannot access external capital at a reasonable cost, having a significant cash balance may reduce the risk of forgoing such opportunities. Harford (1999) finds that companies with higher cash balances are more likely to diversify by acquisition, despite the fact that these transactions appear to be value-destroying. It is worth noting that the speculative motive can also be seen as part of the precautionary motive, given that it is driven by avoiding the risk of missing good opportunities. Overall, the empirical literature provides evidence supporting the view that cash is held for precautionary reasons.

Similarly, Keynes (1936) further argues that firms need cash to maintain their usual activities and transactions, highlighting the transaction motives of holding cash. In many cases, there is a time lag between spending and generating cash since firms tend to incur some expenses before selling their products or services. The cash shortage due to the time disparity between spending and collecting can be bridged by holding a suitable cash balance, borrowing the amount needed, and/or selling assets to raise the amount needed to finance these transactions. Myers and Majluf (1984) suggest that companies may rationally hold cash to finance their transactions since liquidating assets to meet the

short-term cash demand is more costly than holding cash. Miller and Orr (1966) provide evidence that the cost of liquidating assets may encourage firms to hold more cash. Also, the transactional demand for cash is less pronounced in larger companies, suggesting an economy of scale effect on the cash held for transactional reasons (Mulligan 1997).

The separation of ownership and management leads to conflicts of interest (Jensen and Meckling 1976). One of these conflicts relates to cash holdings since managers are inclined to hoard cash even in the absence of attractive investment opportunities (Jensen1986). The cash amount held for agency motives is the amount that exceeds the cash held for precautionary and transactional reasons (Bates, Kahle, and Stulz 2009).

The empirical evidence for the relationship between the agency problem and cash holdings is mixed. Dittmar, Mahrt-smith, and Servaes (2003) provide evidence that companies with a manifested agency problem seem to hold more cash. In contrast, Harford, Mansi, and Maxwell (2008) find that firms with stronger governance hold more cash. Also, Nikolov and Whited (2014) find that managerial perks' consumption, which is more pronounced in companies with lower institutional and large investors, is strongly related to cash holding. They also suggest that low managerial ownership is a critical reason for the increasing cash balances. Ozkan and Ozkan (2004) find that ownership structure affects cash holdings, with a non-monotonic relationship existing between managerial ownership and cash holdings. Cash is also found to have a lower value in companies with a strong agency problem (Dittmar and Mahrt-Smith 2007; Pinkowitz, Stulz, and Williamson 2006).On the contrary, Bates, Kahle, and Stulz (2009) do not find empirical support for the argument that the agency problem plays a role in the recent cash

stockpiling in the US. To the extent hedge fund activism is associated with shattering corporate conservatism, the propensity to activism is higher for firms holding more cash as a precautionary motive. To the extent $H_{3.1.4.1,}$ I expect Hedge fund activism is positively associated with the target firm's higher cash-holding.

Notwithstanding $H_{3.1.4.1}$, cash-holding could also imply a firm's access to capital where firms with constrained access to capital hold less than optimal cash required by the firm. To the extent hedge fund activism lowers this constraint, this argument posits a negative association between cash-holding and propensity to activism.

There is a third view on corporate cash-holding decisions. Literature, mostly stemming from accounting literature, argue corporate cash is negative debt (Faulkender and Wang, 2006; Acharya et al., 2011). The rationale is that valuation models subtract the amount of cash holding from the value of debt outstanding to compute the firm's leverage. This practice reflects the interpretation that cash is negative of debt: due to the fact that cash balances are readily available to redeem corporate debt. To this end, the direction of prediction of the effect of cash holding on hedge fund activism should be seen as one would interpret the impact of negative debt.

Corporate underinvestment

The relationship between HFA and corporate investment is related to the theory of risk-taking (John, Litov and Yeung, 2008; Faccio, Marchica and Mura, 2011). The theory of underinvestment predicts a positive relation between HFA and corporate risk-taking because the managerial discipline that HFA brings to the firm could align managers' interests with the shareholders' interests (John, Litov and Yeung, 2008; Koirala et al.,

2020). Therefore, this could discourage managerial slack or consumption of private benefits, thereby increasing the risk-taking appetite (Lel and Miller, 2015; Bena et al., 2017).

There is an alternative view of short-termistic risk-taking. This view which is popular in sociology as *temporal traps,* argues that facing managers, as an unintended consequence of increased activism stipulated risk-taking, does not reflect in real investment (Hayes and Abernathy, 2007; Ladika and Sautner, 2020). I hypothesize in line with the former argument that lower capital investment is associated with a propensity to activism. In line with $H_{3.1.4.2}$ on corporate conservatism, I examine whether hedge fund activists target firms with lower capital investment (Capex).

Hedge Fund Activism and debt employability

There are two contrasting viewpoints on the impact of leverage on activism propensity. Higher leverage could indicate a greater willingness to take risks, as using more debt would increase the danger of financial difficulty (Bargeron et al., 2010; Faccio et al., 2016). Faccio et al. (2016) claim that when a firm encounters a (negative) shock connected to underlying business conditions, the higher the leverage, the larger the (negative) impact on the firm's profitability and the higher the possibility of default. In their empirical study on the role of gender on corporate risk-taking, Faccio et al. (2016) use Leverage alongside Survival Likelihood and Earnings Volatility to show that firms led by female CEOs have lower leverage, less volatile earnings, and a higher chance of survival than firms led by male CEOs. HFA would select enterprises with lower debt employability if they wanted to improve their risk-taking appetite.

There is an alternative view on leverage as the proxy of financial access (Rao et al., 2020). Higher leverage is associated with higher access to debt capital. To the extent HFA aim to bring better financial access, they would target firms with lower debt employability. To the extent higher debt implies higher financial risk in line with $H_{3.1.4.3}$, I expect that Hedge fund activists target firms with lower leverage.

Dividend policy

In a world with the existence of agency problem between corporate outsiders and insiders, dividends can play an important role. By undertaking a higher payout policy, insiders return corporate profits to outside insiders and hence are no longer able to use this free cash flow for their private consumption. Consistent with the bird in the hand argument, dividends are more valued than earnings retained in the business as retained profit might fly away through private consumption and, therefore, may not translate as future dividends (John et al., 2015). Besides, by paying dividends, firms commit themselves to capital markets scrutiny for additional capital needs in future and hence paying dividends provides a form of corporate discipline (La Porta et al., 2000). Therefore higher corporate discipline is associated with a higher payout policy. This is an outcome argument postulated by (La Porta et al., 2000).

There is an alternative argument that dividend payout and corporate discipline may substitute for each other, which is a substitution argument. When shareholders feel safe, they are willing to accept a lower payout policy and high reinvestment rates from a firm with outstanding prospects because they know that if the company's investments pay off, they will be able to reap large profits. A mature corporation with weak investment

potential, on the other hand, would not be permitted to invest unprofitably. As a result of improved corporate discipline, a company may be able to implement lower payment rules, ceteris paribus. Activism should be related to higher payout policies to the extent that HFA is connected with corporate discipline. $H_{3.1.4.4}$ expects hedge fund activists to target corporations that follow a conservative lower payout policy, which is consistent with our hypothesis.

3.2.2. Firm antecedents of the propensity of passive hedge funds turning activists

Hedge fund activism has the ability to affect corporate decisions through influencing managerial discipline and affecting the information environment facing a firm. In that regard, in the previous section, I discuss theoretical arguments and empirical evidence regarding the prediction of different firm antecedents that would attract hedge fund activism. To this discussion, the passive hedge funds switching to become activists are like any other activist peers. However, there is a unique difference between passive hedge funds turning activists. The passive hedge fund has the advantage of the time to learn about a firm before turning activists. Therefore the antecedents I discuss in section 3.2.1 may not necessarily work in the same direction or magnitude (intensity) to affect the propensity to switch. While there could be a hedge fund level antecedents to switch as studied by Elia (2018), I argue that the difference in the learning window provides passive investors with extra stimulus to revise their priori or information set may make the antecedents differently affecting the passive hedge funds turning activists.

$H_{3.2}$: There is a difference in the explanatory ability of the antecedents of hedge fund activism and passive hedge fund turnings activists

I test $H_{3.2}$ against the null hypothesis that there is no difference between the firm antecedents of hedge fund activism and the passive hedge funds turn activists.

3.2.3. Peer influence of hedge fund activism

The idea that peer pressure has an impact on decision-making is not a new one in the literature (Kandel and Lazear, 1992; Becker, 1993; Prendergast, 1999; Lazear, 2000). Partnerships and peer pressure may go hand in together. When a person empathises with individuals whose utility she affects, incentives are produced. Peer influence, in essence, is believed to impact decision-making in organisations where earnings are shared among people in comparable situations. Larger partnerships have more free-rider issues and put in less effort when there is no peer pressure. Peer pressure, on the other hand, has the potential to reverse this relationship. In businesses, norms emerge to establish an expected degree of work. Peer pressure shapes norms and mutual monitoring. A norm is an equilibrium phenomenon that occurs as a result of peer pressure because deviations from the norm create disutility within an industry. Within a sector, peer pressure leads to mutual monitoring and acceptance of specific behavioural norms (Kandel and Lazear, 1992).

Previous empirical studies corroborate this theoretical view of peer pressure (Gantchev, Gredil, and Jotikasthira, 2019). The first source is the fact that activism intensity across industries is different. My data corroborates this assertion (Table 3.2). While not all firms feel equally threatened by activist targeting in their industry, the

influence of peer pressure to affect the competitive front, efficiency and joint (dis)utility from peers would make the peer factors influential on the likelihood of activism.

Peer firms are said to play a crucial influence in determining company decisions, such as pricing decisions (Bertrand, 1883) and advertising goods and services, according to finance literature (Stigler, 1968). A growing number of empirical studies look into the qualities or behaviour of peer firms to see if they have an impact on a company's behaviour. In an empirical investigation, Leary and Roberts (2014) support this claim. They show that a ten-percentage-point shift in a firm's debt financing can be explained by a one-standard-deviation change in peer businesses' leverage ratios, according to their empirical estimate model. They go on to say that the peer influence effect is bigger than any other factor influencing a firm's capital structure decision. Similarly, studies enquiring the corporate investment policies document that the peer firms' investment behaviour has a spillover effect on a firm's decision whether to invest or not (Foucault and Fresard, 2014).

Information-based argument and rivalry-based argument are the two most established economic views used to understand the influence of peer firms on corporate decisions (Lieberman and Asaba, 2006).

Aslan & Kumar (2016), who examined the product market spillover effects of hedge funds, considered activists on the industry rivals of target firms. The study found that hedge fund activism negatively influences the real and stockholder wealth of rival firms. Further hedge fund activism was found to affect rivals firms' product market performance. The spillover effects illustrated in the study are more pronounced in less concentrated,

low entry barrier industries. In conclusion, the authors state that these results confirm the presence of strategic target selection by hedge funds. To arrive at their conclusion, Aslan and Kumar controlled for industry concentration, observable rival characteristics and unobservable industry, and time effects. Further, the authors included controls for firm-level variables such as the use of firm performance and firm-level unobserved heterogeneity. Further, the authors examined a large number of switches from passive to active (299 switches) from 1994-2007. The authors gauge the effects of hedge fund activism on the residual component of rivals' performance by "controlling for changes in their investment opportunities" (p.4).

In the information-based argument, information imperfection occupies the central factor that drives firms' learning behaviour. Managers and decision-makers can learn and acquire new information from their peers' policies and strategies, which also then direct their corporate decisions. Learning from peers can help decision-makers obtain more usable information and reduce the adverse selection problem associated with limited information in the real world when decision-makers do not have perfect information on relevant elements for their decision-making. In this regard study by Conlisk (1980) reveals that familiarity that comes from experience or knowledge that is gained from experiments is more costly and time-consuming than mimicking. Therefore, it is optimal for firms with imperfect information to rationally mimic the tactics of peers to lower the failure risks (Milliken, 1987). It is difficult for activists to anticipate the implications of a particular activism decision in a frictional environment with limited and uncertain information, as this increases the possibility of unwanted results and the risk of losses and failure. As a

result, activists learn not just from corporate antecedents but also from firm peers in the market with incomplete knowledge. As a result, making the decision to become an activist or to start activism is more likely to learn from the experiences of peer enterprises in order to lower the risk of failure (Foucault and Fresard, 2014; Gantchev, Gredil, and Jotikasthira, 2019).

Another prominent economic view is the rivalry-based argument. This viewpoint asserts that learning behaviour is frequently used to defuse competition and maintain relative market positions. Firms imitate one other in the launch of new processes and products, the adoption of management methods and organisational rules, as well as the timing and types of choices, as learning behaviour aids in gaining a competitive edge (Klemperer, 1992) and reducing corporate uncertainty (Knickerbocker, 1973). Firms imitate others in order to maintain their relative positions or to counteract hostile competitor behaviour. When firms' rivals have large cash holdings, Chen and Chang (2012) discover that they also have large cash reserves. When firms with equivalent resource endowments and market positioning exist, a firm copying to lower rivalry in its major actions is most sensible in terms of market competition.

Peer mimicking processes are most relevant in environments with higher uncertainty and when only a few corporate decisions have consequences that are fully estimated. Decision-makers take actions, the outcome of which is determined by the future state of the environment (Aslan and Kumar, 2016). Decision-makers, therefore, actively and regularly mimic the behaviour and actions of peers' to eliminate information related imperfection and guard and improve decision-makers' reputations. They may also argue

that imitation is critical in settling rivalry and reducing risk to their businesses. Chen and Chang (2012), for example, indicate that the average cash holdings of peers in the industry have a considerable impact on the cash-to-total-assets ratio. They conclude that corporations imitate peers in order to establish their relative position or diffuse competing enterprises' aggressive strategies by reserving capital. Similarly, Chen and Lu (2013) found that when a company makes or devises its own merger and acquisition strategy to improve its M&A performance, it considers and evaluates rivals' tactics.

In the aforesaid economic views, I hypothesize two hypotheses to examine the effect of peer influence on the propensity to activism.

$H_{3.2.1}$: Peer firm characteristics affect hedge fund activism

$H_{3.2.2}$: Peer firm characteristics affect the propensity that passive hedge funds activists turn activists differently than their counterparts that are direct activists

3.2.4. Competition and Propensity to Activism

According to theories, when there is more competition, the degree of utility of private information generated by informed traders is lower for a given level of asymmetric information (e.g., Holden and Subrahmanyam 1994; Foster and Viswanathan 1996). This occurs as a result of competition, which causes private information to be reflected in prices more quickly. To put it in another way, prices grow more revealing about basic worth as time goes on. This phenomenon could have two implications for information asymmetry pricing.

The first argument is that competition lessens the need for market makers to price protect since asymmetric information is used less frequently. Second, because aware investors' collective trading results in more information being reflected in the equilibrium price, competition minimises the risk of asymmetric information to uninformed investors (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). When combined, competitive drive mitigates the detrimental effects of asymmetric information, at least in part.

Hedge Fund activists could specialise as informed investors lowering the information asymmetry. To this end, HFA and industry competition serve the same purpose of lowering information asymmetry facing a target firm.

Alternatively, in a monopolistic market, firms possess market power to the extent of coercing prices and output (Elia, 2018). To this end, the value of activism may not translate into eliminating underperformance and undervaluation. Therefore, I hypothesize that Hedge fund activists target firms in a more competitive industry as the effectiveness of activism to influence corporate decisions made largely ineffective in a monopolistic environment to enjoy coercive market power.

$H_{3.3.1}$: Hedge fund activists target firms in an industry with lower competition

$H_{3.3.2}$: Passive hedge fund turned activists target firms in an industry with lower competition

3.2.5. Antecedents of Activism post Dodd-Frank Act

Hedge fund activism is associated with information production to lower the adverse selection cost of existing shareholders (Gillan and Starks, 2007; Brav, Jiang and Kim, 2015). The most common Hedge fund activism on the target firms includes changing and challenging management policies or board decisions; pursuing a board seat for varied purposes related to input or control of information; bringing about changes in corporate governance in the target firm to affect how the firm is governed and monitored; forcing a sale or buyout of a unit; and altering cash distributions to shareholders in the form of dividends or share buyback (Brav, Jiang and Kim, 2015). While the hedge funds use some of the same strategies as those employed by the traditional institutional activists—including shareholder proposals, direct negotiations, and use of the media—they also adopt other strategies like an outright takeover, proxy contests or litigation, among others (Gillan and Starks, 2007). It is optimal for hedge fund activists to invest in the search for information, thereby creating better monitoring and governance for the managers and existing board. The strategies adopted by hedge fund activism could lower the conflict of interest between minority shareholders and the activists as activists engage in information production in their process of activism.

The information environment that Hedge Fund Activism now faces as a result of the Dodd-Frank Act could be thought of as a structural shift (Cumming et al., 2020). Prior to the Dodd-Frank Act, many hedge fund advisers relied on Section 203(b) (3) private

adviser exemption to avoid registration obligations. This exception was repealed by the Dodd-Frank Act.

Title 4 of the Dodd-Frank Act mandates a number of more stringent recordkeeping and reporting requirements for particularly sensitive and proprietary data. Advisers must report information on their advisory activities, such as the types of investments they manage, security or pricing ratings, net asset values, risk measures, credit exposure, and counterparties, adopted investment strategies, products used by the investment adviser and its funds, performance and performance changes, information on financing, positions and forms held, debt and equity positions, and the algorithms they use (SEC Form 2012). In addition, funds must provide information on the adviser's clients and employees, including the types and amounts of investors. In business practises, there is a duty to disclose conflicts of interest. This conflict of interest disclosure covers associated brokers' use, soft dollar arrangements, client referral payments, advisors' related persons' information, and information on non-advisory financial activity. Furthermore, there is a duty to reveal information about service providers (i.e. main brokers, custodians, administrators, auditors, marketers etc.). Dodd-Frank also mandates that the fair value of fund assets and illiquid assets be reported.

The Dodd-Frank Act also added a number of new criteria that are specific to different types of hedge funds. Swaps, for example, were not regulated before Dodd-Frank, but Dodd-Frank now mandates swap transaction recordkeeping and reporting, as well as capital and margin requirements for swap participants. Furthermore, the Volcker Rule forbids funds connected with investment banks from engaging in proprietary trading.

Furthermore, counsellors who have already engaged in specific types of inappropriate behaviour will be excluded (Cumming et al., 2020).

The Dodd-Frank Act's impact could result in a fundamental split in the determinants of hedge fund activism, making prior antecedents less useful. As a result, in the aforementioned, I state the following hypothesis.

$H_{3.4.1:}$ The firm antecedents have become less informative in explaining the propensity to hedge fund activism post-Dodd Frank Act

$H_{3.4.2:}$ The firm antecedents have become less informative in explaining the propensity to passive investor turns activists post-Dodd Frank Act

3.2.6. Market reaction on activism.

The disciplining effect of hedge fund activism suggests that the activism would attract a positive market reaction. Brav et al. (2015) suggest that it is optimal for hedge funds to initiate activism to correct firm under-pricing and underperformance.

I, therefore, state my final set of testable hypotheses as follows:

$H_{3.5.1}$: The filing of Hedge fund activists produces a positive market reaction

$H_{3.5.2}$: The filing of Passive hedge fund turned activists produces a positive market reaction

3.3 Data

For the purpose of this study, I source the 13D/13G filing data with the US Securities Exchange Commission (SEC). The data ranges from 1994 to 2018 for all public listed

companies in the USA. The firm- and industry-level data of related firms are procured from the *WRDS (Capital-IQ)* database. The data from both sources are integrated by matching firms in SEC Filing with CIQ, using the International Securities Identification Number (ISIN). For firms on SDC with no ISIN, a fuzzy matching technique is used, employing 90% similarity scores. I further undertake a manual audit on these fuzzy matched firms to make sure to eliminate any wrong matches. Based on these matching techniques and integration, our data points consist of public firms 117,911 observations for the entire sample period from 1994 to 2018. A further restriction to map industry using SIC four-digit code reduces the final sample to 12,804s with 110888 observation.

A caveat in the data is the nature of the database, which may affect the inference of the empirical chapter. Specifically, Ince and Porter (2006) find data employed from WRDS to have errors, including typos, incorrect dates and anomalies in observations which lead to extreme daily returns, while they also find shortcomings when trades are suspended. To control for the effect of extreme outliers affecting my result, I winsorize returns and financials data at the top and bottom 1%.

3.3.1 Dependent variables

I have two main dependent variables. The first is a categorical variable that takes the value of one if a firm is targeted by an activist hedge fund and zero otherwise. This variable gauges the likelihood (propensity) of hedge fund activism. My second variable is a categorical dummy which takes the value of one if a firm targeted by a passive hedge fund which later turns into an activist and zero otherwise. This second variable gauges the

likelihood or propensity that passive hedge fund turns activist. This information is captured from the SEC filing data of 13G and 13D. While Funds file 13G to indicate their regular shareholding in the firm, they file 13D to indicate that they own more than 20% of the stock or turn activist. I use this change in the filing type from 13G to 13D to identify that the hedge funds have turned activist.

13D vs 13G Schedule filings

In the United States, investors with a beneficial ownership interest in publicly-traded companies must either file 13D or 13G detailing their holdings. Investors with an interest in influencing control of the company are considered activist investors and must file Schedule 13D with the Securities and Exchange Board within ten days of acquiring beneficial ownership of at least 5% in a publicly-traded company. The intent of influencing the target company's business decisions is often reflected in purpose statements included along with Schedule 13D filings.

Schedule 13G filing, on the other hand, is triggered when the beneficial ownership in a publicly-traded company is between 5-10% and when the investor's intent is passive or has no intention of changing or influencing the control of the company. The regulations require the initial 13G filing within ten days of acquiring ownership interest. When the beneficial ownership interest exceeds 20%, investors must furnish SEC with a long-form 13D instead of a short-form 13G within ten days. Failure to file appropriate forms with the SEC may lead to charges and financial penalties.

Relative to 13D, 13G is less restrictive and shorter with fewer reporting requirements. Importantly, it does not include purpose and intent disclosures. This has sometimes led to misuses of schedule 13G filings by truly activist investors who want to hide their intentions to avoid increased regulatory scrutiny (Giglia, 2016). Studies point to evidence that investors may be tempted to misuse schedule 13G due to various benefits available under this filing schedule. Hedge fund activists may initially remain passive, planning a surprise attack in the future in order to obtain a larger ownership interest (Giglia 2016; Briggs 2007). An activist who hides its intentions may wait until prices are low enough to increase its ownership interest. Had an activist properly filed its true intentions of acquiring a greater ownership benefit, markets would have reacted to this information immediately, and this information would have reflected in the company's stock prices in the marketplace. These kinds of filing of the improper 13G when it is required to file 13D occur presumably a lot more frequently than it is known because it is brought to the attention when the company decides either to litigate the hedge fund activists of abuse or when the SEC brings charges against violators of federal filing requirements. In February 2017, the SEC announced charges against a group of investors for failure to file to switch from 13G to 13D between 2012 and 2014.[22]

The cost to inventors for improperly filing the 13D versus 13G schedule can carry financial penalties. More recently, on September 10, 2014, the SEC accused a group of 34 individuals, investment firms and publicly traded companies of failing to promptly report about their holdings of company stocks, which led 33 out of 34 investors to settle and pay

[22] Bureau of National Affairs (June 2, 2017). "Section 13 and Section 16 Enforcement Actions — A Guide for Staying in Compliance." For more information, see https://www.bna.com/section-13-section-n73014451906/.

financial penalties totalling $2.6 million.[23] The financial penalties can be substantial, but these seem to occur fairly infrequently. If the probability of getting caught is small, then the benefits of improperly filing schedule 13G may outweigh the costs for certain investors. The associated non-reporting of appropriate filing types could incur a significant cost for the activists to file their positions to the SEC.

Taken together, 13D and 13G filing allows a rich and relatively cleaner distinction for us to trace the target firms to explore the determinants of hedge fund activism on a potential target.

3.4 Empirical Results

I examine the determinants of hedge fund activism, and I resort to a probit analysis as my empirical estimation method.

A probit model is a type of regression in statistics when the dependent variable can only have two values, such as married or not married. The word is a portmanteau made up of the words probability and unit. The model's goal is to forecast the likelihood that observations with given features would fall into one of the categories; also, classifying observations based on their anticipated probabilities is a sort of binary classification model. When compared to the linear probability estimation model, the advantage of employing a probit model is that the latter does not constrain the probability to be in the range of 0 to 1, making the coefficient of the linear probability estimation model difficult

[23] US Securities and Exchange Commission Press Release (September 10, 2014). “SEC Announces Charges Against Corporate Insiders for Violating Laws Requiring Prompt Reporting of Transactions and Holdings.” For details, see https://www.sec.gov/news/press-release/2014-190.

to comprehend.[24]

In line with my three levels of study, I set my estimation model at three levels. For each level of empirical enquiry, I have two sets of dependent variables: The first is the propensity to hedge fund activism, and the second is the propensity for passive hedge fund turns activist.

3.4.1 Firm antecedents and Hedge Fund Activism

At the firm level, I run the probit model as depicted by equation (1) to assess the determinants of hedge fund activism.

$$E(Y|X_{i,t-1}) = P\left(Y = 1\middle|X_{i,t-1}\right) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n) \quad (1)$$

where n=number of covariates, $\Phi(z)=P(Z\leq z)$, $Z\sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n X_n$. The dependent variable y_{it} is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if the firm has been targeted by an activist hedge fund in a given year and 0 otherwise. It is important to highlight here that my empirical investigation uses two versions of dependent variables on hedge fund related activism.

The first dependent variable is a binary variable taking the value of one if a firm has been the target of activism in a given year and zero otherwise. This variable gauges the propensity of a firm to be targeted by activist hedge funds.

[24] For example, it is entirely possible in a linear probability model to get a probability of over 1 which does not make meaningful sense. Probit (and logit) model eliminates this limitation of linear probability model.

The second dependent variable takes the value of one if the target has a hedge fund that has been passive and now turns active in a given year and zero otherwise. This variable gauges the propensity that a passive hedge fund turns into an activist.

$\boldsymbol{X'_{it-1}}$ in equation one is a vector of firm-level determinants that theory suggests should have an influence on predicting propensity to activism. I use Size, MB, Operating performance, Cash-holding, z-score, capital expenditure (capex), leverage and dividend to total equity as possible firm-level antecedents.

The important thing here to note is that the firm-level antecedents are taken in one year lag to lower the chances of reverse causality. Reverse causality is a situation where contrary to our assertion that explanatory variable set **X** would cause y (the dependent variable), it is y that causes X. By taking lagged variables $\boldsymbol{X}$**,** I lower this possibility as it is less likely that the value of y this year would affect $\boldsymbol{X}$ of the previous year. In keeping with literature that industry characteristics and general conditions of the economy could affect activism, I employ industry fixed effect, ϑ_j and year fixed effect γ_t in all my estimation models.

Regression output tables 3.3a and 3.3b present the firm antecedents of activism. At the same time, table 3.3a reports firm antecedents to hedge fund activism and 3b analyses firm antecedents of passive hedge fund turning activists.

As reported in table 3.3a, firm size is an important antecedent of hedge fund activism. All else equal, the smaller the firm, the higher the likelihood of being acquired. In terms of economic magnitude, the coefficient is negative and significant (at 1%

significance). In terms of risk-taking behaviour, a larger size may lower the risk of failure. Wide-ranging financial assets, larger manufacturing infrastructures, and a huge workforce allow firms to endure continued episodes of weaker financial performance with a lower threat of failure (Audia and Greve, 2006; Voss, Sirdeshmukh and Voss, 2008). This buffering effect of a huge inventory of resources lowers the performance level at which the organization's survival is in question. On the contrary, smaller endowments of resources raise the degree of a firm's point of survival. Therefore, size could proxy for lower survival risk. Alternatively, the firm size also proxies the firm's ability to sustain a competitive advantage when scale economies, scope economies, or learning benefits exist (Roberts and Dowling, 2002).

In model [2] of table 3.3a, I examine the effect of MB on its power to explain hedge fund activism. The finding documents that hedge fund activism is negatively related to MB. Hedge fund activism is linked in the literature to influence corporate information towards creating value relevant shift. Information search and active monitoring create search costs. The associated search cost and free-rider problem make it prohibitively costly for the minority shareholders to actively search for information to monitor a company. Similarly, the agency-related view asserts that the stake held funds hold and the expertise they bring to discipline managers from deriving private utility makes their activism more aligned with the shareholders' interest. The larger the cost of adverse selection and agency related conflict, the greater is the downward push to the valuation of an asset, and therefore larger is the effect of hedge fund activism on correcting this undervaluation. Given the size of the stake and expertise of hedge funds, it is optimal for

them to initiate activism to improve firm under-pricing and underperformance (Brav et al., 2015). To this end, the findings documented in the model [2] of table 3.3a are in line with the economic prediction that hedge fund activism target undervalued asset and create value by correcting this undervaluation.

Examining the effect of cash-holding on hedge fund activism, the empirical model [4] of table 3.3 shows lower corporate cash holding would attract propensity to activism.

Literature maintains motives of corporate cash-holding include precautionary, speculative, transaction and agency motives, among others. Keynes (1936) proposes that one of the major reasons for storing cash is to hedge against the risk of cash flow shortages, which can happen in many cases, including the possibility of finding an attractive opportunity when other sources of funding are costly or unavailable or when the company is financially distressed (Brisker, Çolak, and Peterson 2013). Additionally, agency problem (Jensen and Meckling 1976) and information asymmetry (Myers and Majluf 1984) could also play a role in raising the cost of external funding compared to internal funds. Consequently, holding cash could reduce this risk. As Hedge fund activism is associated with higher risk-taking, the prediction based on this argument would be a positive relationship between cash holding and the propensity of activism. However, empirical findings in this chapter refute the existence of this mechanism. Contrarily, cash is argued in the literature to be a negative debt. To this end, hedge fund activism is positively related to debt employment, an enquiry I test later in the model [7].

Operating performance as an explanatory variable for propensity to activism is examined in the model [3] of table 3.3a. According to studies, hedge fund activism is

linked to a target company's underperformance. Boyson, Gantchev, and Shivdasani (2017) analyse the channel of value creation of hedge fund activism using 159 switches. They argue that once the transfer is made, the portfolio business will be more likely to receive a takeover proposal. They conclude that "beyond stock selecting abilities, the hedge fund's activist engagement has an incremental influence in stimulating takeovers." Finally, Brav, Jiang, Ma, and Tian (2018) find 79 activist initiatives that arise from a changeover. They discover that after the hedge fund switches from a passive to an active position, the target firm increases innovation as measured by the number of new patents and citations. My findings in the model [3] corroborate with this previously documented prediction of a firm antecedent. The weaker the firm operating profit, the higher the propensity to target, all else being equal. In terms of explanatory power, operating performance explains 4.17% of the variation of activism, the second-highest among all firm antecedents after size.

In model [5], I examine the effect of firm financial soundness, gauged by the z-score. The empirical finding suggests that the weaker the financial health of a firm as proxied by a lower z score, the higher the propensity that activist hedge funds would target a firm. HFA increases the propensity for underperforming incumbent managers to be replaced and acts as a credible managerial disciplining tool that lowers managerial slack or tendency to enjoy a quiet life (Bertrand and Mullainathan, 2003). Additionally, the threat of replacement and being challenged could motivate directors to be more careful as corporate monitors, as these directors face the risk of being dismissed by the acquiring team when a firm becomes a target as a result of poor performance (Hirshleifer and

Thakor, 1998; Lel and Miller, 2015). The empirical evidence is in support of this economic view.

The prediction of corporate investment as an antecedent of hedge fund activism is mixed and seemingly opposing. On the one hand is the view that positive relation between HFA and corporate risk-taking because the managerial discipline that HFA brings to the firm could align managers' interests with the shareholders' interests (John, Litov and Yeung, 2008; Koirala et al., 2020). Therefore, this could discourage managerial slack or consumption of private benefits, thereby increasing the risk-taking appetite (Lel and Miller, 2015; Bena et al., 2017).

There is an alternative view of short-termistic risk-taking. This view which is popular in sociology as *temporal traps*, argues that facing managers as an unintended consequence of increased activism stipulated risk-taking does not reflect into real investment (Hayes and Abernathy, 2007; Ladika and Sautner, 2020). My results in the model [6] fail to document either of the two opposing arguments. It could be indicative of the fact that I have to run a horse race to see the margin effect (as employed in model [9] to have a direction impact. Alternatively, it could also be interpreted as a firm investing policy is not of material importance to trigger hedge fund activism.

The enquiry of the effect of leverage on hedge fund activism is examined in model [7]. The results document the positive association between debt employability. In literature, two economic views of predictions are equally dominant.

Higher leverage could imply higher risk-taking, as employing higher debt would increase the financial distress (Bargeron et al., 2010; Faccio et al., 2016). Consistent with this argument of risk-taking, Faccio et al. (2016) argue that when a firm faces a (negative) shock related to underlying business conditions, the higher the leverage, the greater the (negative) impact of the shock on the firm's profitability and the higher is the probability of default. Along with survival likelihood and earnings volatility, Faccio et al. (2016) use leverage in their empirical study to measure risk-taking. To the extent HFA aim to increase risk-taking appetite, they would target firms with lower debt employability.

There is another view on leverage as the proxy of financial access (Rao et al., 2020). Higher leverage is associated with higher access to debt capital. To the extent HFA aim to bring better financial access, they would target firms with lower debt employability.

Both of the economic views, while the mechanism operational are different, predict a negative relationship with debt employability. However, my results in the model [7] show that hedge fund activism is positively associated with leverage. The results, while presenting a counter-intuitive prediction, could be interpreted as Hedge fund activism does not bring improvement in financial access to a firm. Rather it would target a firm that has better access to debt finance.

As a final set of my firm antecedent, I examine the effect of dividend policy on the propensity of activists to target a firm in model [8] of table 3.3a. Model [8] reports that hedge fund activism targets firms that pay a lower dividend. The finding is consistent with the outcome argument of La Porta et al. (2000).

By undertaking an aggressive (higher) payout policy, insiders return corporate profits to outside insiders and hence are no longer capable of using this free cash flow for their private consumption. Consistent with the bird in the hand argument, dividends are more valued than earnings retained in the business as retained profit might fly away through private consumption and, therefore, may not translate as future dividends (John et al., 2015). Besides, by paying dividends, firms commit themselves towards the need to come to the capital markets scrutiny to raise additional capital (La Porta et al., 2000). Therefore higher corporate discipline is associated with a higher payout policy. This is an outcome argument postulated by (La Porta et al., 2000).

To the extent hedge fund is associated with corporate discipline, the result of my model [8] maintains that hedge fund activist target firms with lower dividend payout policy.

To assess the relative contribution of all the antecedents, I finally run a horse race of all antecedents employed in a single model in model [9]. In the horse race, the antecedents that explain the propensity to be targeted by hedge fund activism are size, cash holding, risk-taking, capital investment, leverage and payout policy. It is interesting to note that underinvestment in capital investment (as proxied by Capex), which is a standalone antecedent, fails to explain the propensity to attract hedge fund activism, now in a horse race, explain the activism, other things being the same.

Similarly, higher leverage attracts activism in the horserace. The result is consistent with the theory that underinvestment predicts a positive relation between HFA

and corporate risk-taking because the managerial discipline that HFA brings to the firm could align managers' interests with the shareholders' interests (John, Litov and Yeung, 2008; Koirala et al., 2020). Finally, a lower payout policy consistently explains the propensity to target a firm by activist hedge funds.

The results taken together are largely in agreement with hedge fund activism toward improving the information environment facing target firms, correcting undervaluation and shunning corporate conservatism and underperformance. This finding corroborates with earlier studies in the US that examine the productivity improvement associated with hedge fund activism. Specifically, in a related study, Brav, Jiang, and Kim (2015) used US data to study the impact of hedge fund activism on firm productivity and find that it leads to productivity improvement at target firms. They focus on firm productivity gains after three years of activist intervention and document that productivity at production plants, which comprises one-third of targeted firms, increases approximately by 7-10% of the standard deviation from the initial intervention year to three years later. The authors maintain these improvements in firm productivity primarily occur due to the reallocation of capital and improved efficiency of assets. Other studies, including Brav et al. (2018), corroborate this argument. Therefore, a firm’s information environment, undervaluation and underperformance all explain the higher propensity of hedge fund activism.

3.4.2 Firm antecedents and the propensity of passive hedge fund turning activist

As the next level of empirical enquiry, as reported in table 3.3b, I examine the effect of firm antecedents that explain the propensity of passive hedge funds to switch to becoming an activist.

In theory, activist hedge funds have the ability to affect corporate decisions through influencing managerial discipline and affecting the information environment facing a firm. In addition to having traits like any other activist hedge fund, a passive hedge fund turning activist has a unique advantage. The passive hedge fund has the advantage of the time to learn about a firm before turning activists. Therefore, the antecedents I discuss in section may or may not necessarily work in the same direction or intensity to affect the propensity to switch to activism. The difference in the learning window may provide passive investors with extra stimulus to revise their priori or information set may make the antecedents differently affecting the passive hedge funds turning activists (Elia, 2018). Table 3.3b reports that, while most of the firm-level antecedents of passive hedge funds turning activists are similar to the general activist hedge funds, there are few stark differences.

On one hand, the findings are in line with the mechanism of information and agency theory explaining hedge fund activism in general. For instance, higher adverse selection cost as proxied by smaller size (as in model [1]), undervaluation as gauged by lower MB (as in model [2]), and higher risk-taking appetite (model [5]) explain a passive hedge fund turn activist. This result could be interpreted as though there could be two broader sets of strategies to target a firm, both giving a similar outcome. First, a hedge fund may gather inside information about a potential target and enter as an activist. Alternatively, when not

sure about the reliability of the information gathered or the inability to do so, a hedge fund may enter as a passive investor, gather information about it and turn activist. However, in terms of predictability, both of the strategies may result in the same outcome. The result that both types of activism are associated with undervaluation and higher adverse selection costs is a piece of evidence that my research contributes to, in this debate on the antecedents.

On the contrary, the propensity of passive turning activist is positively associated with operating performance (model 9 of 3b). The results are insightful to the minority investors as the propensity of passive hedge funds to turn activist is explained by chasing a potential target that is generating positive operating cash flow. In essence, it could be optimal for some hedge funds with a lower aptitude to identify and correct the underperformance of the target to enter as a passive investor and switch to activist once the potential to perform becomes clearer, thereby correcting the undervaluation of the performing targets. The results taken together may highlight, at least in part, the merit of time hedge fund buys to learn about target firms in the form of their passive ownership before turning activists.

3.4.3 Influence from peer firms and Hedge Fund Activism

In this empirical enquiry, I assess the influence of target peers that explains the propensity to hedge fund activism. I do this empirical test by running the following regression equation 2.

$$E(Y|X_{i,t-1}, \boldsymbol{Q_{i,t-1}}) = P\left(Y = 1 \middle| \boldsymbol{X_{i,t-1}}, \boldsymbol{Q_{i,t-1}}\right) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n) \quad (2)$$

where n=number of covariates, $\Phi(z)=P(Z \leq z)$, $Z \sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n X_n$. The dependent variable y_{it} is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if the firm has been targeted by activists hedge fund in a given year and 0 otherwise. $X_{\boldsymbol{i,t-1}}$ is a vector of firm antecedents while $\boldsymbol{Q_{i,t-1}}$ is a vector of peer factors as gauged by the industry median of antecedents. It is important to highlight here that my empirical investigation uses two versions of dependent variables on hedge fund related activism.

The first dependent variable is a binary variable taking the value of one if a firm has been the target of activism in a given year and zero otherwise. This variable gauges the propensity that a firm

The results are presented in tables 3.4a and 3.4b. Table 3.4 shows that the larger median size of peer firms increases the likelihood of hedge fund activism.

An information-related argument of peer influence explains the outcome. It is costly for activists to forecast the implications of a particular activism decision in a frictional environment with limited and ambiguous information since it increases the possibility of unwanted events and the danger of losses and failure. As a result, activists learn not just from corporate antecedents but also from firm peers in the market with incomplete knowledge. As a result, making the decision to become an activist or to start activism is more likely to learn from the experiences of peer enterprises in order to lower the risk of failure (Foucault and Fresard, 2014; Gantchev, Gredil, and Jotikasthira, 2019).

The finding that shows that a larger median size of peer firms increases the likelihood of hedge fund activists is insightful, in line with the theoretical argument of information theory of peer influence and of policy relevance as activism is negatively associated with firm size. The two seemingly opposing directions of prediction imply while hedge fund activism aims to correct the adverse selection problem of a firm and target a smaller firm, they derive information on the prospects regarding the firms from their peers. Thus hedge fund activism is positively associated with a larger size of peers. Similarly, the underperformance of peers and lower cash-holding by peers triggers hedge fund activism (model 9 of table 3.4a).

Similarly, in table 3.4b, I present the analysis of peer influence on the passive hedge funds turning activists. The finding from the table suggests that undervaluation (model [2]), lower cash holding (model [4]), and better operating performance (model [3]) of peer firms triggers passive hedge fund to turn activist. The findings taken together suggest passive hedge fund turning activists may be affected by peers in a different way. Depending on different information sets available to the activists' hedge funds and passive hedge fund turning activist, their response to peers is in line with the rivalry view on decision making.

The impact of peer pressure is well documented in the corporate finance literature, mostly in capital structure decisions. Specific to hedge fund activism, Aslan and Kumar (2016) explore the impact of post-HFA on the industry rivals of the target firm. Specifically, they find that hedge fund activism has negative real and stockholder wealth but significantly positive spillover effects on the target firm's industry rivals in terms of

improved firm productivity, cost and capital allocation efficiency and product differentiation. They argue that these performance impacts are commensurate with the improvements in the target firm's performance after the hedge fund activism. In a related study, Gantchev et al. (2019) show that there is a positive spillover effect of activism that extend beyond the targets, to affect peers firms to improve as they perceive the threat of being a target of hedge fund activism. Peers firms that are exposed to a higher likelihood of activism improve their return on assets and asset turnover, consequently improving their valuations. To this strand of literature, my empirical findings suggest that it is not only the spill-over effect stemming from rival firms, as documented by Aslan and Kumar (2016). On the contrary, as hypothesised based on the peer pressure argument in 3.2.3, my empirical investigation document the spill-back effect where the propensity that a firm is targeted by hedge fund activism depends on the firm's industry peer characteristics.

3.4.4 Competitive force and Hedge Fund Activism

In this section, I examine the effect of competition on the propensity to hedge fund activism. According to theories, when there is more competition, the degree of utility of private information generated by informed traders is lower for a given level of asymmetric information (e.g., Holden and Subrahmanyam 1994; Foster and Viswanathan 1996). This occurs as a result of competition, which causes private information to be reflected in prices more quickly.

Because asymmetric information is used less frequently, competition lessens the need for market makers to price protect. In the same way, competition minimises the risk

of asymmetric information to uninformed investors because informed investors' collective trading results in more information being reflected in the equilibrium price (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012). Taken together, the competitive force could substitute, at least in part, the negative effect of asymmetric information. Hedge Fund activists specialise as informed investors lowering the information asymmetry. To this end, HFA and industry competition serve the same purpose of lowering information asymmetry facing a target firm.

Alternative, in a monopolistic market, firms possess market power to the extent of coercing prices and output (Elia, 2018). To this end, the value of activism may not translate into eliminating underperformance and undervaluation. I examine this effect of competition and report the findings in table 3.5. I gauge competition by the Herfindahl–Hirschman Index (HHI, henceforth). The ratio is computed by squaring the market share of each firm competing within an industry defined as a Fama French 48 industry classification and then summing the resulting numbers. HHI is a measure of market concentration. The HHI increases both as the number of firms in an industry decreases and as the disparity in size between those firms increases, meaning a higher HHI score indicates a less competitive market. Results of model [1] show that hedge fund activism is positively (negative) associated with market concentration (competition), supporting the substitutive argument. The result suggests competitive force could substitute, at least in part, the negative effect of asymmetric information and lower the need for hedge fund activism. On the other hand, concentrated sectors attracted more activism due to the value

of the private information generation role played by the activists (Akins, Ng and Verdi, 2012; Lambert, Leuz and Verrecchia, 2012).

3.4.5 Information environment, hedge fund activism and post Dodd-Frank Act

The information environment is one of the important motives for hedge fund activism. It could be argued that it is optimal for hedge fund activists to invest in the search for information, thereby creating better monitoring and governance for the managers and existing board. The strategies adopted by hedge fund activism could lower the conflict of interest between minority shareholders and the activists as activists engage in information production in their process of activism. Alternatively, hedge fund regulation, like Dodd-Frank Act which, through its disclosure and compliance requirement, could lower this information requirement, the need for active information generation redundant and therefore less relevant. This could lead to the antecedents being unnecessary in the new regime post-Dodd-Frank Act.

In line with the aforesaid argument, in this section, I examine the effect of DFA on Hedge fund activism as shown in equation (3).

$$E(Y|X_{i,t-1}, [(\boldsymbol{X_{it-1}}).DFA_t]) = P\left(Y = 1\middle|\boldsymbol{X_{i,t-1}}, [(\boldsymbol{X_{it-1}}).DFA_t]\right) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n) \quad (3)$$

where n=number of covariates, $\Phi(z)=P(Z\leq z)$, $Z\sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n X_n$. The dependent variable y_{it} is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if the firm has been targeted by activists hedge fund in a given year and 0 otherwise. $X_{i,t-1}$ is a vector of firm antecedents. DFA_t takes the value of one in the

post-Dodd-Frank period and zero otherwise. All other symbols are as described in equation (1).

Table 3.6a presents the results of the propensity of hedge fund activism, while table 3.6b depicts the antecedents of propensity that passive hedge fund turns activist before and after the Dodd-Frank Act.

There are important revelations from tables 3.6a and 3.6b. Table 3.6a reveals that while most of the firm antecedents are similar in direction pre and post Dodd-Frank Act, the relationship between cash-holding and leverage flips in the post Dodd-Frank Act to explain the propensity to hedge fund activism. The results could be interpreted as in the post-Dodd-Frank Act; the activist has targeted firms with lower leverage and higher cash-holding. In essence, the regime change in the information environment created by Dodd-Frank Act has enabled activist hedge funds to target firms that are more conservative (hold more cash) or are financially constrained. Therefore Dodd-Frank Act could be considered to complement and support an information environment for hedge funds to assess about a target, rather than substitute information creation. The evidence is in favour of regulations like the Dodd-Frank Act to improve the information environment. However, such an effect does not exist for the passive turned active hedge funds.

3.4.6 Market response to activism filing

In this final set of enquiries, I examine the market reaction to hedge fund activism.[25] To do so, I employ three ways to compute cumulative abnormal returns. The CAR (cumulative abnormal return) for firm *i* is the sum of the abnormal returns over an n1+n2+1 window period (*t – n1* to *t + n2*) surrounding the activism announcement day, *t = 0*, as in equation (4) as follows.[26] The results are reported in table 3.8.

$$\mathrm{CAR}_i = \sum_{t-n1}^{t+n2} \mathrm{AR}_{it}\,, \tag{4}$$

To calculate CAR, I adopt three methods. First, I compute a CAR of hedge fund filing around a fixed window using simple market-adjusted returns. This is in keeping with the literature where I follow Fuller et al. (2002) and Brown and Warner (1985) and employ the market-adjusted model.[27]

As shown in equation (4a), the first abnormal return is a simple market-adjusted model that defines daily abnormal returns as the difference between the firm's return and the market return.

[25] This study faces the standard limitations that relate to studies employing market reactions. Ideally, the announcement effect is meaningful when we capture the announcement date of the activism. However, due to unavailability of announcement data, I employ filing date to capture market reaction of activism news. I aimed to lower the impact of this on the abnormal return computation by examining the sensitivity of CAR with different windows and results are fairly stable. However, the issues with the late reporting which may dilute the announcement effect, in principle, remains.

[26] As an illustration, window of n1=2 and n2=2 days is 5 (2*2+1=5) day CAR around the filing of activism.

[27] Since prior same events (i.e. earlier filings in our sample) may pollute the estimation window, some empirical studies refrain from using the market model. Moreover, for short-window event studies, Brown and Warner (1985) show that weighting the market return by the firm's beta does not significantly improve the estimation.

$$AR_{it} = R_{it} - R_{mt} \quad (4a)$$

where, AR_{it} is the abnormal return of firm *i* on day *t*, R_{it} is the realised return of firm *i* on day *t* and R_{mt} is the value-weighted market return on day *t*.

The second abnormal return is based on the market model following equation.

$$AR_{it} = R_{it} - (\alpha + \beta_i R_{mt}) \quad (4b)$$

where β_i is computed using return data from -252 days to -2 days.

A third and final abnormal return based on Fama-French 3 factor models.[28]

The results are presented in Table 3.8. As presented in Table 3.8, the filing of activist hedge funds generates a positive market reaction in the form of positive CAR and is consistent for a different window period of 5 days, 11 days, 21 days etc. The results suggest that the market value the information content of activist filing. This is in line with the information and agency related improvement hedge fund activism creates. Hedge fund activism literature is crowded with the stock market reaction (Brav et al., 2010; Coffee, 2015, DesJardine and Durand, 2019, among others). The economic arguments put forward are mainly based on the ability and incentive that hedge fund activists have to lower information and agency related frictions facing a firm (Brav et al., 2010; Coffee, 2015). The positive market reactions measured by all three methods, including simple market

[28] One limitation applying to Cumulative Abnormal return (CAR) computation comes from models used to estimate CAR (Brown and Warner, 1985). For instance, Brown and Warner (1985) argue that for short-window event studies, show that weighting the market return by the firm's beta does not significantly improve the estimation. While I aim to reduce the model dependency of CAR by employing three different models including simple market adjusted, market model and FF-3 factors, and the results are fairly stable for the employed models, the results could still be sensitive to other benchmark models.

adjustment, market model and Fama-french 3 factor model, suggest that market value hedge fund activism in its ability to correct firm-specific underperformance, undervaluation and corporate conservatism stemming from managerial slack or utility to enjoy quiet life (John et al., 2008).

3.5. Conclusion

Activism is a costly business; however, it is also a common phenomenon in the corporate world. In this chapter, I, therefore, explore the motivations of an activist hedge fund to target a firm and provide important insights. I employ an extensive set of hedge fund filing data and trace target firms associated with the activist hedge fund filing for the US firms and extend the current literature in activism by investigating firm antecedents, industry peer characteristics and competitive forces as drivers of hedge fund activism.

Firstly, my empirical investigations of the firm antecedents of hedge fund activism have important revelations. Results of my empirical investigations document provide evidence that agency and information-related problems facing a firm and which could be prompted by unobservable actions, limited ability of contracting, and asymmetric information largely result in second-best outcomes in which corporate ownership distribution is realized only at substantial cost. While shareholders (principal), in theory, can lower the impact of sub-optimal decision making by the managers (agents), the free-rider problem associated with costly information search and lower proportion of stock holding can make monitoring sub-optimal for general shareholders. However, an activist

hedge fund could act as an informed investor as it is optimal for them to chase costlier information on the target firm they target, a firm that is potentially exposed to higher adverse selection costs and information asymmetry driven frictions and aims to correct misevaluation of target firms. On a related economic mechanism, agency driven conflict of interest could provide an incentive for a manager to underinvest in value relevant projects or underperform to enjoy managerial slack. To this end, hedge fund activism would target firms with higher agency problem of underperformance. Taken together, this chapter explores and document information asymmetry and agency related situation facing a firm and explain whether a firm could be targeted by an activist hedge fund where hedge fund activism is driven by correcting undervaluation, underperformance and corporate conservatism.

On my enquiry of the potential impact of corporate risk-taking of target firms on the propensity to hedge fund activism, the results provide important insights. First, the propensity to hedge fund activism is positively related to corporate conservatism. On the other hand, conservatism related to cash-holding and debt employability seem to discourage hedge fund activism. As higher debt employment relates to firm access to external capital, the results provide an interesting insight into the hedge fund activism literature in the sense that while hedge funds normally have a higher appetite for higher debt employability, they do not tend to improve financial access rather would target firms which already have better access to the debt market.

The enquiry of passive hedge fund turning activists reveals that a hedge fund may gather inside information of a potential target and enter as an activist. Alternatively, when

not certain about the reliability of the information gathered or inability to do so, a hedge fund may enter as a passive investor, gather information about it and turn activist. However, both of the strategies may be optimal and result in the same efficacy in addressing adverse selection and agency related problems of a target firm. Similarly, I document that it could be optimal for some hedge funds with a lower aptitude to identify and correct the underperformance of the target to enter as a passive investor and switch to activist once the potential to perform becomes clearer, thereby correcting the undervaluation of the performing targets. The findings underscore the merit of time as some hedge funds may find it beneficial to buy to learn about target firms in the form of their passive ownership before turning activists.

Similarly, peer influence on the passive hedge funds turning activist suggests that undervaluation, lower cash holding and better operating performance of peer firms trigger passive hedge funds to turn activist. The findings taken together suggest passive hedge fund turning activists may be affected by peers in a different way. Depending on different information sets available to the activists' hedge funds and passive hedge fund turning activist, their response to peers is in line with the rivalry view on decision making.

In my third set of enquiries, I examine the role of competition on the propensity to hedge fund activism and find hedge fund activism and industry competition serve the same purpose of lowering information asymmetry facing a target firm.

In my fourth set of enquiries, I examine the role of explanatory power and direction firm antecedents on the propensity to hedge fund activism in the changing information environment before and after Dodd-Franc Act and find evidence that hedge fund

regulations would complement and support in information environment for a hedge fund to assess about a target, and does not play a substitutive role in information creation. The evidence informs policymaking on regulations like Dodd-Frank Act to improve the information environment. In my final set of enquiries, I investigate the market reaction of activists filing and find a positive market response to activists filing. The result suggests that the market value the information content of activist filing and that the market values the potential that hedge fund activism can correct information and agency related imperfection facing a target firm. Taken together, the antecedents of my chapter provide important insights to practitioners, policymakers and the academic world.

3.6 Tables and Figures

Table 3.1. Summary Statistics

Variables	Count	Mean	SD	P50	P25	P75
Propensity to activism	110888	0.1591	0.3658	0.0000	0.0000	0.0000
Propensity to switch to activist	110888	0.0585	0.2347	0.0000	0.0000	0.0000
Size	110888	5.9576	2.1152	5.9305	4.5733	7.3671
MB	96481	2.6460	5.4368	1.7562	1.0100	3.1923
Cash holding	110862	0.2109	0.2414	0.1079	0.0294	0.3142
Operating performance	107420	0.0031	0.3303	0.0826	0.0057	0.1453
Z score	84393	3.6252	10.4884	2.9084	1.2763	5.2867
Capex	107552	0.0518	0.0655	0.0308	0.0117	0.0642
Leverage	90661	0.2198	0.2481	0.1490	0.0033	0.3471
Div/TE	110403	0.0174	0.0428	0.0000	0.0000	0.0154
Market share	110457	0.0163	0.0447	0.0018	0.0004	0.0092
HHI (Market share)	110888	0.1169	0.0740	0.1031	0.0735	0.1440

Table 3.2. Industry Distribution of Activists Filing

Industry (FF48)	Total Filings Count	Activist Filings		Switchers Filings	
		Count	Proportion	Count	Proportion
Agriculture	308	54	0.1753	10	0.0325
Aircraft	512	49	0.0957	15	0.0293
Apparel	1488	206	0.1384	44	0.0296
Automobiles and Trucks	1421	190	0.1337	38	0.0267
Banking	7746	1473	0.1902	430	0.0555
Beer & Liquor	297	56	0.1886	17	0.0572
Business Services	14857	2462	0.1657	923	0.0621
Business Supplies	1128	163	0.1445	60	0.0532
Candy & Soda	141	33	0.2340	12	0.0851
Chemicals	1999	262	0.1311	84	0.0420
Coal	212	51	0.2406	17	0.0802
Communication	3729	898	0.2408	258	0.0692
Computers	4210	690	0.1639	242	0.0575
Construction	1361	212	0.1558	65	0.0478
Construction Materials	1771	249	0.1406	64	0.0361
Consumer Goods	1455	264	0.1814	104	0.0715
Defense	113	9	0.0796	2	0.0177
Electrical Equipment	1340	254	0.1896	102	0.0761
Electronic Equipment	7414	991	0.1337	374	0.0504
Entertainment	1544	384	0.2487	110	0.0712
Fabricated Products	320	54	0.1688	8	0.0250
Food Products	1448	268	0.1851	127	0.0877
Healthcare	1800	360	0.2000	155	0.0861
Insurance	3251	433	0.1332	149	0.0458
Machinery	3601	482	0.1339	153	0.0425

Measuring and Control Equipment	2266	332	0.1465	120	0.0530
Medical Equipment	3952	585	0.1480	240	0.0607
Non-Metallic and Industrial Metal Mining	741	133	0.1795	26	0.0351
Others	2302	637	0.2767	156	0.0678
Personal Services	1497	255	0.1703	126	0.0842
Petroleum and Natural Gas	4501	910	0.2022	200	0.0444
Pharmaceutical Products	8669	1357	0.1565	654	0.0754
Precious Metals	946	140	0.1480	47	0.0497
Printing and Publishing	890	206	0.2315	78	0.0876
Real Estate	677	242	0.3575	75	0.1108
Recreation	962	199	0.2069	77	0.0800
Restaurants, Hotels, Motels	2109	492	0.2333	173	0.0820
Retail	6047	887	0.1467	365	0.0604
Rubber and Plastic Products	880	182	0.2068	90	0.1023
Shipbuilding, Railroad Equipment	199	19	0.0955	4	0.0201
Shipping Containers	309	43	0.1392	5	0.0162
Steel Works etc.	1482	184	0.1242	39	0.0263
Textiles	509	75	0.1473	30	0.0589
Tobacco Products	36	2	0.0556	2	0.0556
Trading	7599	1272	0.1674	691	0.0909
Transportation	2742	417	0.1521	166	0.0605
Utilities	1792	172	0.0960	49	0.0273
Wholesale	3338	532	0.1594	127	0.0380
Total	110888	17699	0.1591	6505	0.0585

Note: Table 3.2 presents distribution of sample (in frequency and proportion) across 48 industries as classified by Fama-French industry classification.

Table 3.3a. Probability to activism

Dependent variable: Propensity to activism	[Model 1]	[Model 2]	[Model 3]	[Model 4]	[Model 5]	[Model 6]	[Model 7]	[Model 8]	[Model 9]
Size	-0.1750*** (-64.24)								-0.1931*** (-48.56)
MB		-0.0048*** (-4.65)							0.0009 (0.94)
Operating performance			-0.5083*** (-37.73)						-0.0183 (-0.90)
Cash holding				-0.0501** (-2.03)					-0.3465*** (-11.20)
Z-score					-0.0121*** (-20.89)				-0.0012* (-1.91)
Capex						-0.0325 (-0.38)			-0.3275*** (-3.27)
Leverage							0.2034*** (9.07)		0.2973*** (11.66)
Div/TE								-2.0194*** (-13.16)	-0.4352** (-2.53)
R^2 (Pseudo)	0.07898	0.02404	0.04173	0.02743	0.03195	0.02674	0.02375	0.03010	0.08779
N	110830	96580	107349	110803	84431	107484	90740	110342	78249
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents the output of probit estimation models as represented by the equation:
$E(Y|X_{i,t-1}) = P(Y=1|X_{i,t-1}) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n)$ where n=number of covariates, $\Phi(z)=P(Z \leq z)$, $Z \sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n X_n$. Y is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if the firm has been targeted by activists hedge fund in a given year and 0 otherwise. X'_{it-1} are potential firm antecedents, as explained in the text. All models use firm and industry fixed effects. While models [1]-[8] present the impact of each explanatory factor as explained in the text, model [9] presents a horse race impact of each factor, when all factors are employed together in the estimation model on the propensity to activism. ***,** and * denotes significance at 1%, 5% and 10% respectively.

Table 3.3b. Probability of passive hedge funds turning activists

	[Model 1]	[Model 2]	[Model 3]	[Model 4]	[Model 5]	[Model 6]	[Model 7]	[Model 8]	[Model 9]
Size	-0.0934***								-0.1169***
	(-28.25)								(-24.26)
MB		-0.0037***							-0.0001
		(-2.83)							(-0.11)
Operating performance			-0.2213***						0.1317***
			(-13.79)						(5.08)
Cash holding				0.0672**					-0.0904**
				(2.17)					(-2.37)
Z-score					-0.0075***				-0.0042***
					(-11.42)				(-5.12)
Capex						0.1643			-0.0271
						(1.44)			(-0.21)
Leverage							0.0510*		0.1038***
							(1.75)		(3.28)
Div/TE								-1.4135***	-0.2611
								(-7.09)	(-1.18)
R^2 (Pseudo)	0.03125	0.01508	0.01749	0.01465	0.01902	0.01510	0.01434	0.01605	0.03846
N	110830	96550	107349	110803	84401	107484	90709	110342	78219
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents the output of probit estimation models as represented by the equation:
$E(Y|X_{i,t-1}) = P(Y = 1|X_{i,t-1}) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n)$ where n=number of covariates, $\Phi(z)=P(Z \leq z)$, $Z \sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n X_n$. Y is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if a firm has been targeted by a passive hedge fund which has turned activist in a given year and 0 otherwise. $\boldsymbol{X'_{it-1}}$are potential firm antecedents, as explained in the text. All models use firm and industry fixed effects. While models [1]-[8] present the impact of each explanatory factor as explained in the text, model [9] presents a horse race impact of each factor, when all factors are employed together in the estimation model on the propensity to activism. ***,** and * denotes significance at 1%, 5% and 10% respectively.

Table 3.4a. Probability to activism: Peer influence

	[Model 1]	[Model 2]	[Model 3]	[Model 4]	[Model 5]	[Model 6]	[Model 7]	[Model 8]	[Model 9]
Industry- Size	0.0275*								0.0360*
	(1.65)								(1.89)
Industry- MB		0.0099							0.0179
		(0.92)							(1.55)
Industry- Operating performance			-0.0521						-0.7645***
			(-0.26)						(-2.84)
Industry- Cash holding				-0.4758***					-0.6931***
				(-2.94)					(-3.36)
Industry- Z-score					-0.0055				-0.0012
					(-0.72)				(-0.15)
Industry- Capex						1.0032			0.9789
						(1.55)			(1.50)
Industry- Leverage							0.3621**		0.1745
							(2.45)		(1.09)
Industry- Div/TE								-0.0862	-0.4775
								(-0.07)	(-0.37)
Size	-0.1912***	-0.1905***	-0.1905***	-0.1905***	-0.1905***	-0.1905***	-0.1907***	-0.1905***	-0.1912***
	(-47.93)	(-47.99)	(-48.00)	(-47.99)	(-48.00)	(-47.98)	(-48.02)	(-47.98)	(-47.96)
MB	-0.0019*	-0.0019*	-0.0019*	-0.0019*	-0.0018*	-0.0019*	-0.0019*	-0.0019*	-0.0020**
	(-1.85)	(-1.92)	(-1.87)	(-1.86)	(-1.84)	(-1.89)	(-1.89)	(-1.86)	(-1.98)
Operating performance	-0.0364*	-0.0364*	-0.0381*	-0.0359*	-0.0363*	-0.0365*	-0.0369*	-0.0363*	-0.0336
	(-1.78)	(-1.78)	(-1.87)	(-1.76)	(-1.78)	(-1.79)	(-1.81)	(-1.78)	(-1.64)
Cash holding	-0.3588***	-0.3597***	-0.3508***	-0.3601***	-0.3601***	-0.3598***	-0.3587***	-0.3597***	-0.3510***

	(-11.54)	(-11.57)	(-11.21)	(-11.57)	(-11.58)	(-11.58)	(-11.54)	(-11.57)	(-11.21)
Z-score	-0.0007	-0.0007	-0.0007	-0.0007	-0.0006	-0.0007	-0.0006	-0.0007	-0.0007
	(-1.02)	(-1.03)	(-1.03)	(-1.02)	(-0.97)	(-1.03)	(-1.00)	(-1.02)	(-1.06)
Capex	-0.2300**	-0.2341**	-0.2303**	-0.2338**	-0.2339**	-0.2521**	-0.2361**	-0.2334**	-0.2505**
	(-2.30)	(-2.34)	(-2.31)	(-2.34)	(-2.34)	(-2.51)	(-2.36)	(-2.34)	(-2.50)
Leverage	0.3121***	0.3115***	0.3116***	0.3118***	0.3116***	0.3112***	0.3063***	0.3118***	0.3076***
	(12.22)	(12.20)	(12.20)	(12.21)	(12.20)	(12.18)	(11.95)	(12.21)	(12.00)
Div/TE	-0.3063*	-0.3048*	-0.3094*	-0.2999*	-0.2991*	-0.2998*	-0.3007*	-0.3001*	-0.3057*
	(-1.79)	(-1.78)	(-1.81)	(-1.75)	(-1.75)	(-1.75)	(-1.76)	(-1.75)	(-1.78)
R^2 (Pseudo)	0.08695	0.08691	0.08690	0.08703	0.08691	0.08694	0.08700	0.08690	0.08726
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	78181	78181	78181	78181	78181	78181	78181	78181	78181

Note: This table presents the output of probit estimation models as represented by the equation:
$E(Y|X_{i,t-1}, \boldsymbol{Q_{i,t-1}}) = P(Y = 1|\boldsymbol{X_{i,t-1}}, \boldsymbol{Q_{i,t-1}}) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n)$ where n=number of covariates, $\Phi(z)=P(Z \leq z)$, $Z \sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n$. $\boldsymbol{X_n}$ is a vector of firm antecedents while $\boldsymbol{Q_{i,t-1}}$ is a vector of peer factors as gauged by industry median of antecedents.
Y is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if the firm has been targeted by activists hedge fund in a given year and 0 otherwise. All models use firm and industry fixed effects. While models [1]-[8] present the impact of each explanatory factor as explained in the text, model [9] presents a horse race impact of each factor, when all factors are employed together in the estimation model on the propensity to activism. ***,** and * denotes significance at 1%, 5% and 10% respectively.

Table 3.4b. Probability to switch: Peer influence

	[Model 1]	[Model 2]	[Model 3]	[Model 4]	[Model 5]	[Model 6]	[Model 7]	[Model 8]	[Model 9]
Industry- Size	0.0250								0.0042
	(1.18)								(0.17)
Industry- MB		-0.0294*							-0.0283
		(-1.84)							(-1.61)
Industry- Operating Performance			0.5859**						0.1610
			(2.42)						(0.48)
Industry- Cash holding				-0.6980***					-0.7105***
				(-3.56)					(-2.73)
Industry- Z-score					-0.0037				-0.0071
					(-0.53)				(-0.95)
Industry- Capex						-0.1487			-0.2081
						(-0.20)			(-0.27)
Industry- Leverage							-0.1586		-0.3903*
							(-0.86)		(-1.94)
Industry- Div/TE								1.6417	1.7410
								(1.01)	(1.02)
Size	-0.1131***	-0.1126***	-0.1125***	-0.1127***	-0.1124***	-0.1124***	-0.1124***	-0.1126***	-0.1128***
	(-23.56)	(-23.55)	(-23.55)	(-23.57)	(-23.53)	(-23.52)	(-23.51)	(-23.53)	(-23.49)
MB	-0.0000	0.0001	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	0.0002
	(-0.01)	(0.10)	(-0.02)	(-0.02)	(-0.01)	(-0.02)	(-0.01)	(-0.03)	(0.13)
Operating performance	0.1199***	0.1200***	0.1176***	0.1160***	0.1199***	0.1199***	0.1201***	0.1200***	0.1173***
	(4.56)	(4.56)	(4.47)	(4.40)	(4.56)	(4.56)	(4.57)	(4.56)	(4.45)
Cash holding	-0.0771**	-0.0776**	-0.0648*	-0.0737*	-0.0779**	-0.0777**	-0.0782**	-0.0775**	-0.0642*

	(-2.02)	(-2.03)	(-1.69)	(-1.93)	(-2.04)	(-2.04)	(-2.05)	(-2.03)	(-1.67)
Z-score	-0.0041***	-0.0041***	-0.0041***	-0.0041***	-0.0041***	-0.0041***	-0.0041***	-0.0041***	-0.0041***
	(-4.93)	(-4.90)	(-4.95)	(-4.92)	(-4.90)	(-4.93)	(-4.94)	(-4.93)	(-4.87)
Capex	0.1424	0.1414	0.1454	0.1438	0.1398	0.1427	0.1414	0.1410	0.1555
	(1.12)	(1.11)	(1.15)	(1.13)	(1.10)	(1.12)	(1.11)	(1.11)	(1.22)
Leverage	0.1405***	0.1412***	0.1399***	0.1404***	0.1403***	0.1404***	0.1427***	0.1407***	0.1466***
	(4.44)	(4.46)	(4.43)	(4.44)	(4.43)	(4.44)	(4.50)	(4.45)	(4.63)
Div/TE	-0.3853*	-0.3729*	-0.3929*	-0.3910*	-0.3784*	-0.3796*	-0.3783*	-0.3950*	-0.4024*
	(-1.73)	(-1.68)	(-1.77)	(-1.75)	(-1.70)	(-1.71)	(-1.70)	(-1.77)	(-1.80)
R^2 (Pseudo)	0.03855	0.03858	0.03884	0.03866	0.03851	0.03851	0.03853	0.03854	0.03905
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	78151	78151	78151	78151	78151	78151	78151	78151	78151

Note: This table presents the output of probit estimation models as represented by the equation:
$E(Y|X_{i,t-1}, \boldsymbol{Q_{i,t-1}}) = P(Y = 1|\boldsymbol{X_{i,t-1}}, \boldsymbol{Q_{i,t-1}}) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n)$ where n=number of covariates, $\Phi(z)=P(Z \leq z)$, $Z \sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n . X_{\boldsymbol{n}}$ is a vector of firm antecedents while $\boldsymbol{Q_{i,t-1}}$ is a vector of peer factors as gauged by industry median of antecedents.
Y is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if a firm has been targeted by a passive hedge fund which has turned activist in a given year and 0 otherwise. All models use firm and industry fixed effects. While models [1]-[8] present the impact of each explanatory factor as explained in the text, model [9] presents a horse race impact of each factor, when all factors are employed together in the estimation model on the propensity to activism. ***,** and * denotes significance at 1%, 5% and 10% respectively.

Table 3.5. Propensity to activism. The effect of Competition

Dependent Variable:	Propensity to Activism	Propensity of passive hedge fund turning activists
	[Model 1]	[Model 2]
HHI (Market share)	0.2688*	0.0451
	(1.96)	(0.25)
Size	-0.1930***	-0.1137***
	(-48.45)	(-23.71)
MB	-0.0012	-0.0019
	(-1.17)	(-1.51)
Operating performance	-0.0460**	0.1345***
	(-2.25)	(5.09)
Cash holding	-0.3431***	-0.0953**
	(-11.09)	(-2.49)
Z-score	0.0005	-0.0042***
	(0.73)	(-4.96)
Capex	-0.2680***	0.3101**
	(-2.68)	(2.45)
Leverage	0.3536***	0.1015***
	(13.91)	(3.20)
Div/TE	-0.0752	-0.5015**
	(-0.45)	(-2.21)
R^2 (Pseudo)	0.08743	0.03937
Year	Yes	Yes
Industry	Yes	Yes
N	78238	78209

Note: This table presents the output of probit estimation models as represented by the equation: $E(Y|X_{i,t-1}) = P(Y = 1|\boldsymbol{X_{i,t-1}}) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n)$ where n=number of covariates, $\Phi(z)=P(Z \leq z)$, $Z \sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n$. $\boldsymbol{X_n}$ is a vector of firm and competition antecedents. Y is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if a firm has been targeted by activists hedge fund in a given year (in model 1) or if a firm has been targeted by a passive hedge fund which has turned activist in a given year (model 2), and 0 otherwise. All models use firm and industry fixed effects. While models [1]-[8] present the impact of each explanatory factor as explained in the text, model [9] presents a horse race impact of each factor, when all factors are employed together in the estimation model on the propensity to activism. ***,** and * denotes significance at 1%, 5% and 10% respectively.

Table 3.6a. Probability to activism pre and post Dodd-Franck Act

	[Model 1]	[Model 2]	[Model 3]	[Model 4]	[Model 5]	[Model 6]	[Model 7]	[Model 8]	[Model 9]
Size	-0.1690*** (-53.50)								-0.1863*** (-38.89)
Size × DFA_t	-0.0146*** (-2.75)								-0.0114 (-1.37)
MB		-0.0058*** (-4.50)							0.0003 (0.20)
MB × DFA_t		-0.0040* (-1.81)							-0.0063*** (-3.01)
Operating performance			-0.5153*** (-32.26)						-0.0829*** (-3.32)
Operating performance × DFA_t			0.0015 (0.06)						0.1282*** (3.01)
Cash holding				-0.1708*** (-6.12)					-0.4246*** (-11.56)
Cash holding × DFA_t				0.3202*** (7.73)					0.1849*** (3.20)
Z-score					-0.0132*** (-18.38)				-0.0003 (-0.42)
Z-score × DFA_t					0.0019 (1.56)				-0.0011 (-0.81)
Capex						0.0551 (0.58)			-0.1390 (-1.20)

Capex × DFA_t						-0.2081			-0.3338*
						(-1.29)			(-1.78)
Leverage							0.2864***		0.3680***
							(11.00)		(12.02)
Leverage × DFA_t							-0.2319***		-0.1750***
							(-5.10)		(-3.31)
Div/TE								-1.8314***	-0.3067
								(-10.13)	(-1.38)
Div/TE × DFA_t								-0.4107	0.0196
								(-1.36)	(0.06)
R^2 (Pseudo)	0.07798	0.02441	0.02817	0.04229	0.03306	0.02696	0.02420	0.03012	0.08772
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	110848	96449	110819	107362	84317	107511	90604	110345	78181

Note: This table presents the output of probit estimation models as represented by the equation:
$E(Y|X_{i,t-1}, [(\boldsymbol{X_{it-1}}).DFA_t]) = P\left(Y = 1\middle|\boldsymbol{X_{i,t-1}}, [(\boldsymbol{X_{it-1}}).DFA_t]\right) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n)$ where n=number of covariates, Φ(z)=P(Z≤z), Z~N(0,1) and $z=\beta_o + \sum_{n=1}^{N} \beta_n$. $X_{i,t-1}$ is a vector of firm antecedents. DFA_t takes the value of one in the post-Dodd-Frank period and zero otherwise. Y is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if the firm has been targeted by activists hedge fund in a given year and 0 otherwise. All models use industry and year fixed effects. While models [1]-[8] present the impact of each explanatory factor as explained in the text, model [9] presents a horse race impact of each factor, when all factors are employed together in the estimation model on the propensity to activism. ***,** and * denotes significance at 1%, 5% and 10% respectively.

Table 3.6b. Propensity of passive hedge fund turning activist pre and post Dodd-Franck Act

	[Model 1]	[Model 2]	[Model 3]	[Model 4]	[Model 5]	[Model 6]	[Model 7]	[Model 8]	[Model 9]
Size	-0.0814*** (-21.20)								-0.0963*** (-16.80)
Size × DFA_t	-0.0361*** (-5.57)								-0.0457*** (-4.61)
MB		-0.0034** (-2.20)							0.0007 (0.43)
MB × DFA_t		0.0032 (1.22)							0.0029 (1.12)
Operating performance			-0.2288*** (-11.94)						0.0332 (1.04)
Operating performance × DFA_t			-0.0257 (-0.82)						0.1916*** (3.54)
Cash holding				0.0644* (1.83)					-0.0757* (-1.65)
Cash holding × DFA_t				0.0245 (0.48)					-0.0585 (-0.84)
Z-score					-0.0067*** (-7.67)				-0.0027** (-2.54)
Z-score × DFA_t					-0.0024* (-1.72)				-0.0029* (-1.70)
Capex						-0.0571 (-0.44)			-0.2268 (-1.49)

Capex × DFA_t						0.6457***			0.5203**
						(3.17)			(2.20)
Leverage							0.0350		0.0787**
							(1.01)		(2.02)
Leverage × DFA_t							0.0444		0.1151*
							(0.77)		(1.78)
Div/TE								-1.5257***	-0.7061**
								(-6.36)	(-2.39)
Div/TE × DFA_t								-1.1556***	-0.7372
								(-2.64)	(-1.50)
R^2 (Pseudo)	0.03199	0.01404	0.01825	0.01491	0.01838	0.01564	0.01410	0.01751	0.03967
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	110882	96503	107391	110849	84317	107537	90664	110395	78177

Note: This table presents the output of probit estimation models as represented by the equation:
$E(Y|X_{i,t-1}, [(\boldsymbol{X_{it-1}}).DFA_t]) = P\left(Y = 1\middle|\boldsymbol{X_{i,t-1}}, [(\boldsymbol{X_{it-1}}).DFA_t]\right) = \Phi(\beta_o + \sum_{n=1}^{N} \beta_n X_n)$ where n=number of covariates, $\Phi(z)=P(Z \leq z)$, $Z \sim N(0,1)$ and $z=\beta_o + \sum_{n=1}^{N} \beta_n$. $X_{i,t-1}$ is a vector of firm antecedents. DFA_t takes the value of one in the post-Dodd-Frank period and zero otherwise. Y is a binary response variable for the firm *i* and the time *t*, which takes the value of 1 if a firm has been targeted by a passive hedge fund which has turned activist in a given year and 0 otherwise. $\boldsymbol{X'_{it-1}}$are potential firm antecedents, as explained in the text. DFA_t takes the value of one in the post Dodd-Frank period and zero otherwise. All models use industry and year fixed effects. While models [1]-[8] present the impact of each explanatory factor as explained in the text, model [9] presents a horse race impact of each factor, when all factors are employed together in the estimation model on the propensity to activism. ***,** and * denotes significance at 1%, 5% and 10% respectively.

Table 3.7. Distribution of Events over time

Passive Hedge Fund Turned Activists		13 D Activism	
Year	Freq.	Year	Freq.
1994	3		
1995	3		
1996	2		
1997	17	1997	1
1998	43	1998	31
1999	37	1999	68
2000	35	2000	95
2001	39	2001	98
2002	37	2002	106
2003	31	2003	98
2004	27	2004	88
2005	42	2005	121
2006	36	2006	129
2007	44	2007	159
2008	46	2008	189
2009	32	2009	115
2010	35	2010	112
2011	32	2011	131
2012	22	2012	132
2013	33	2013	109
2014	33	2014	124
2015	40	2015	89
2016	45	2016	84
2017	42	2017	117
2018	27	2018	118
Total	783		2314

Note: This table presents the distribution of filings of activist hedge funds, and passive hedge funds turned activists over the sample period of 1994- 2018.

Table 3.8: CAR analysis by different groups

Panel A. CAR estimation of the filing of activist hedge funds (13D)

Estimation Method	Window Period (13D-filing)				
	(1)	(2)	(3)	(4)	(5)
	[-2,+2]	[-5,+5]	[-10,+10]	[-10,+21]	[-10,+51]
Market Adjusted	0.0512***	0.137***	0.252***	0.378***	0.712***
	(8.55)	(13.40)	(15.19)	(15.69)	(15.15)
Market Model	-0.309***	-0.596***	-1.217***	-1.990***	-3.931***
	(-12.71)	(-12.51)	(-13.19)	(-13.62)	(-14.25)
Fama French 3-Factor Model	-0.229***	-0.454***	-0.905***	-1.472***	-3.229***
	(-12.29)	(-12.18)	(-12.81)	(-13.34)	(-14.02)
No. of Events.	2308	2308	2308	2308	2308

Panel B. CAR estimation of the non-activist turned activists (the switchers)

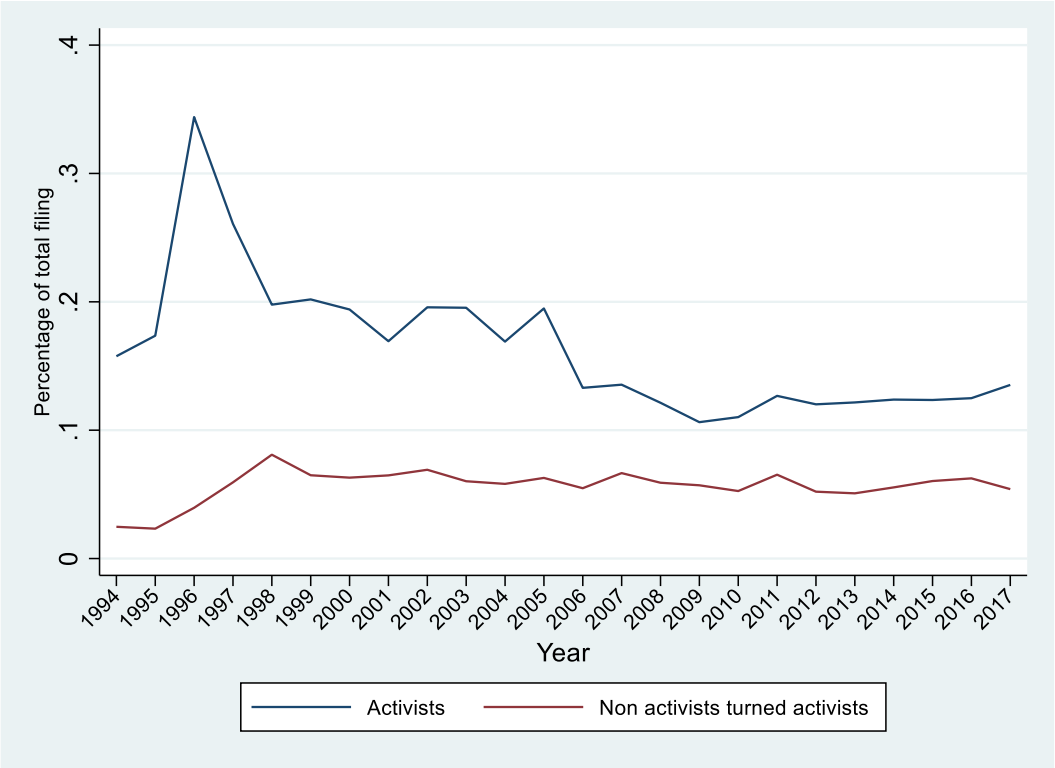
Estimation Method	Window Period (Switchers)				
	(1)	(2)	(3)	(4)	(5)
	[-2,+2]	[-5,+5]	[-10,+10]	[-10,+21]	[-10,+51]
Market Adjusted	0.0142***	0.0383***	0.0480***	0.0615***	0.103***
	(3.52)	(5.26)	(5.03)	(5.68)	(6.03)
Market Model	0.0117**	0.0275***	0.0314**	0.0323**	0.0457**
	(2.74)	(4.00)	(3.25)	(2.71)	(2.63)
Fama French 3-Factor Model	0.0114**	0.0254***	0.0257**	0.0256*	0.0443**
	(2.67)	(3.71)	(2.70)	(2.12)	(2.59)
No. of Events.	783	783	783	783	783

Note: This table presents the Cumulative abnormal return of activist hedge fund filings in Panel 1 and filings of passive activists turned activists in Panel B. I compute abnormal return using: simple market adjusted return, market model and fama-french 3 factor models. Cumulative abnormal return (CAR) is computed using the following formula:

$$\mathrm{CAR}_i = \sum_{t-n1}^{t+n2} \mathrm{AR}_{it},$$

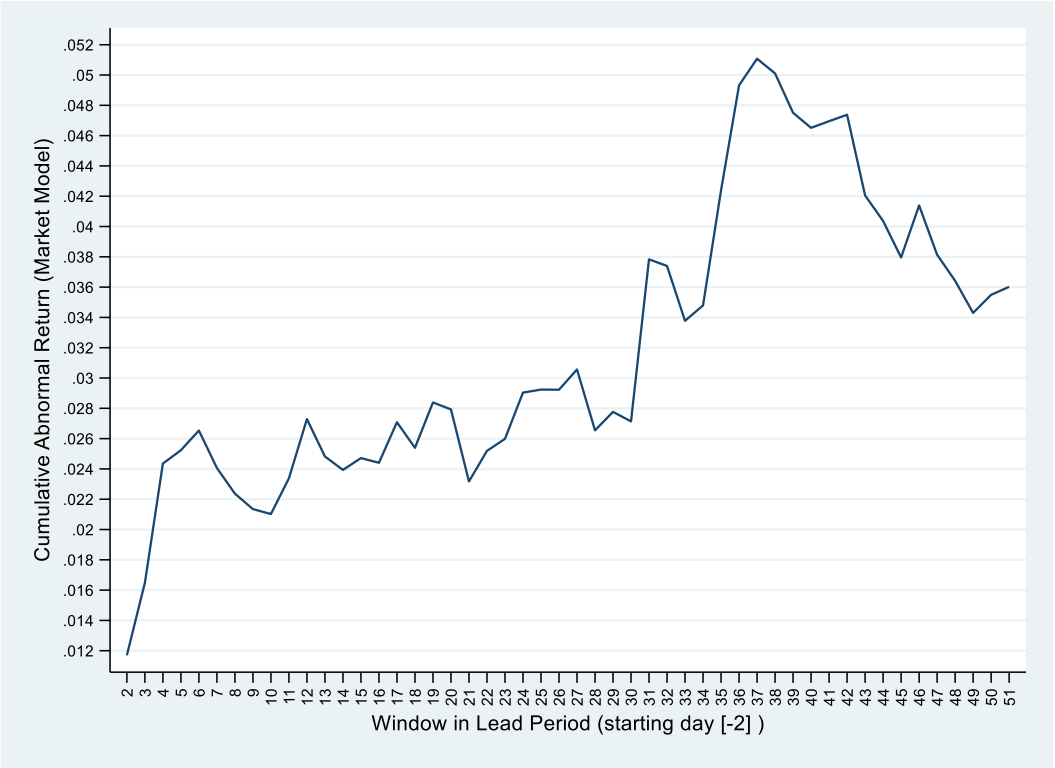
where n1 and n2 denote different periods before and after filing to for n1+n2+1 window period. I employ window period of [-2,+2], [-5,+5], [-10,+10], [-10,+21] and [-10,+51]. Sample period ranges from 1994- 2018.

Figure 3.1. Activists and non-activists turned activists as a proportion of total filling



Note: The figure plots the annual activists' filings (Blue solid line) and filings of non-activists turned activists (red solid line) as a proportion of total SEC filings for a period of 1994-2017.

Figure 3.2. CAR plot over different windows



The figure plots the CAR of 783 events based on the filing of non-activists turned activists. The starting day of the event is 2 days before the filing date. The starting CAR corresponds to a 5-day window [-2,+2] as the window period increases by one day from left to right. The final window in the plot is for 54 days [-2,+51].

3.7 Appendix

Appendix A3.1. Definition of variables

This table shows the construction of the variables. Explanations are provided in the description of the variables in the text.

Variables	Calculation	Source
Dependent Variables		
$Activism_{it}$	Categorical variable that takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise.	SEC filing
$Switcher_{it}$	Categorical variable that takes the value of 1 if passive hedge fund of a target firm i turns activist in year t and zero otherwise.	SEC filing
CAR	$\sum_{t-n1}^{t+n2} \mathrm{AR}_{it}$, where AR_{it} is the abnormal return of firm *i* on day t estimated by market adjusted return, market model and Fama French 3 factor models respectively	Compustat NA
Antecedents		
Size	ln (Book-value of Total Assets)	Compustat NA
MB	Total market capitalization to book value of equity	Compustat NA
Operating performance	EBITDA/Total Assets	Compustat NA
Cash holding	Total Cash holding/Total Assets	Compustat NA
Z-score	1.2A + 1.4B + 3.3C + 0.6D + 1.0E where: A = working capital / total assets, B = retained earnings / total assets, C = earnings before interest and tax / total assets, D = market value of equity / total liabilities and E = sales / total assets	Compustat NA
Capex	Capital Expenditure/Total Assets	Compustat NA
Leverage	Total debt/Total Assets	Compustat NA
Div/TE	Total dividend/Total shareholder equity	Compustat NA
HHI	Herfindahl–Hirschman Index, calculated by squaring the market share of each firm competing in the market and then summing the resulting numbers	Compustat NA

Appendix A3.2. Sampling technique

Items	Observations
Initial Sample of Filing for SEC	117911
Missing data with SIC information	7023
Final SEC filing observations	110888
Unique Target- firms	12804

Note: the table presents the sampling technique used in this study to arrive at the final sample size used in this study.

Chapter 4. HEDGE FUND ACTIVISM AND CORPORATE RISK-TAKING

4.1 Introduction

The last three decades have witnessed the emergence of a new breed of shareholder activists - the hedge fund activists (Karpoff, 2001; Gillan and Starks, 2007; Brav, Wei Jiang and Kim, 2009; Coffee and Darius Palia, 2016). These new breeds have been argued to be equipped with more suitable financial incentives and structures for undertaking activism agendas when compared to the earlier generation peers of institutional activists like mutual funds and pension funds. Not surprisingly, hedge fund activism has occupied an important place in the academic and practitioners' debate on corporate governance (Karpoff, 2001; Gillan and Starks, 2007; Brav, Wei Jiang and Kim, 2009; Coffee and Darius Palia, 2016). This empirical chapter examines the effect of hedge fund activism on corporate risk-taking.

The motivation behind this possible nexus between hedge fund activism and corporate risk-taking is driven by the fact that risk-taking is an important driver of corporate growth and innovation (John, Litov and Yeung, 2008; Faccio, Marchica and Mura, 2011). Prior studies have shown that firm's willingness to undertake risks toward profitable ventures is an essential foundation of long-term economic growth (DeLong and Summers 1991; Acemoglu and Zilibotti 1997; Baumol, Robert, and Schramm 2007; John, Litov, and Yeung 2008). Sustained economic growth, in essence, leads to economic development. Thus, understanding the antecedents of corporate risk-taking would be important to policymakers. On the other hand, the ability of hedge fund activism to challenge managerial actions to the extent of forceful

replacement of incumbent decision-makers makes hedge fund activism a powerful mechanism of corporate discipline, thus affecting a firm's decision making. The nexus of hedge fund activism and corporate risk-taking, therefore, is a policy-relevant question.

Hedge fund activism constitutes one of the important corporate governance tools (Brav et al., 2008; Brav et al., 2018). Literature highlights three stylized features, among other characteristics, that distinguish hedge funds from other institutional investors in their ability to influence the corporate governance of target firms.

Firstly, asset managers of hedge funds have more solid incentives to generate returns. A previous study by Brav et al. (2009) documents that, on average, hedge fund managers receive a higher proportion to the extent of up to 20% or higher of the excess returns generated by the fund as performance fees. These performance fees are in addition to the fixed management fees these asset managers receive for managing the assets. The higher performance fees are complemented by the personal stake these managers undertake in the assets they invest. They invest a considerable amount of their personal wealth into the invested assets. This strongly incentivises fund managers for better performance. This is in stark contrast with other institutional investors like a mutual fund or pension fund, where managers are not allowed to capture a substantial share of excess returns.

Second, because hedge funds are only available to skilled investors, such as institutional investors and high-net-worth people, they are subject to fewer regulatory interventions and oversights than mutual funds or pension funds. As a result, hedge funds have more freedom to intervene in target companies. Hedge funds, for example,

can take concentrated shares in investment corporations with ease because the rule does not require them to have diverse portfolios like other institutional investors. Add to it the fact that they have no restrictions on the use of derivatives or margin trading on their investment. These are important advantages for activist shareholders to have an unconstrained impact on the target firms' decisions (DesJardine and Durand, 2020).

Finally, most hedge funds have lock-up measures in place that prevent investors from withdrawing their money. Given that hedge fund activists typically invest for more than a year in target companies to implement their strategies, this feature allows managers to focus on intermediate- and long-term activist goals.

The aforesaid three stylized features, taken together, imply that hedge fund activism forms an important corporate governance tool. From a policy-input viewpoint, while there is an agreement in the literature on corporate finance that risk-taking is an important growth driver, however, the studies also highlight the unintended consequence of hedge fund activism on corporate and social outcomes by pointing out the potential short-sightedness of hedge fund activism to the extent of shunning value relevant long term risk-taking while promoting short-termism in risk-taking.

There has been a steady increase in the number of activist hedge fund campaigns in the last 20 years, implying the effect of hedge funds (DesJardine and Durand, 2020). Similarly, another empirical study by Lazard (2018) estimates that the activist had launched almost one campaign against a new target company every single day during 2018. This has attracted enormous interest among researchers in

policymaking, industry and academia to assess the (un)intended short term and long term consequences of hedge fund activism.

The empirical evidence so far is largely in agreement with the immediate positive effect of hedge fund activism in the form of stock price reactions (Brav, Jiang, Partnoy, & Thomas, 2008; Clifford, 2008), given their ability to remove immediate managerial slack or lower conflict of interest and ability to pump-up stock market in the short-run by engaging in share buybacks or forcing managers to pursue high payout policy. Recent research questioned the long-term consequence of hedge fund activism (DesJardine and Durand, 2020). With the activism by hedge funds constituting a normal corporate phenomenon in business, determining the long-term consequences of hedge fund activism becomes important. In the foregoing, the chapter aims to answer how hedge fund activism impacts corporate risk-taking.

The effect of HFA on corporate risk-taking is guided by the popular economic view that HFA could arguably be an important tool of corporate discipline (Brav et al., 2015; Brav et al., 2018). This view suggests HFA could lead to positive consequences because hedge fund activism improves the managerial discipline. Previous studies argue that corporate discipline aligns managers' interests with the shareholders' interests (John, Litov and Yeung, 2008; Koirala et al., 2020). The threat of losing their jobs and reputational capital in the event of an activist attempt to replace management could form a credible source of corporate discipline.

Corporate discipline is one of the crucial drivers of corporate risk-taking. The economic theory maintains risk-taking as a utility function of an insider who derives utility from the wealth effect of investments and utility from private benefits of the

resources of a firm or the utility derived from enjoying quiet life or managerial slack (Bertrand and Mullainathan, 2003; John et al., 2008). A higher level of wealth effect from an investment is positively related to insiders' appetite for value-enhancing long term risk-taking behaviour. In contrast, a higher utility from private benefit or managerial slack is negatively associated with insiders' appetite for value-enhancing risk-taking behaviour (John et al., 2008). Hedge fund activism, as a corporate discipline tool, could affect corporate risk-taking. Therefore, this could discourage managerial slack or consumption of private benefits, thereby increasing the long-term value-enhancing risk-taking (Lel and Miller, 2015; Bena et al., 2017). In line with the positive outcome, Brav et al. (2018) found that firms targeted by activists enhanced their innovation efficiency over a five-year period following hedge fund involvement in their empirical study of how hedge fund activism affects corporate innovation. Their analysis also shows that hedge fund activism is linked to a decrease in R&D spending; target firms would boost innovation outputs, as measured by patent numbers and citations, especially for targets with diverse innovation portfolios. They argue that allocative efficiency in inventive resources, redeployment of human capital, and a shift to board-level specialisation explain innovation efficiency in the post-HFA period (5 years post-HFA).

On the other hand, there is a material concern over the short-termism of hedge fund activism. DesJardine and Durand (2020), for example, found a clear trade-off linked with hedge fund activism in their recent study on how hedge fund activism affects organisations' financial and social performance. They document that while there are short-term benefits to the shareholders reflected in the form of market price reactions and immediate profitability, this short-lived performance does not persist and

is associated with a medium to long-term cost to stakeholders, in the form of decreased operating cash flow, investment spending, and social performance. Lower capital formation (capital investment) could have a negative impact on economic growth while deteriorating social performance could undermine the pursuit of an equitable society. Similar concerns have been raised in popular press and media, where authors have expressed their scepticism on the ability of these hedge funds, which are money managers with limited strategic vision or operational know-how. This has raised concerns of regulators and policymakers with mandates to work towards improving economic growth and social performance metrics.

The mixed empirical evidence of the effect of HFA on corporate consequences motivates this study to examine the effect of HFA on corporate risk-taking from the framework of short-term and long-term debate. Given the seemingly opposing views, I examine the effect of HFA on corporate risk-taking using the framework of managerial myopia resulting from performance pressure employing a comprehensive sample of US firms targeted by hedge funds from 1995 - 2017.

Policymakers and investors equally are concerned whether the abundantly documented positive market response associated with hedge fund activism could deliver the expectations of the market. My third chapter aims to contribute to this direction. While in my second empirical chapter, I show the positive market response associated with hedge find activism announcement, in this chapter, I extend that to trace how hedge fund activism shapes corporate risk-taking appetite.

Specifically, this empirical study examines four specific questions. First, gauging the argument of hedge fund activism as a corporate governance tool, this study

examines whether hedge fund activism affects corporate risk-taking. I do so by focusing on the risk-taking consequence of hedge fund activism within the framework of long-termism vs short-termism. Economic prediction of a positive association between corporate disciplines is widely held (John et al., 2008). However, this corporate discipline brought about by hedge fund activism could lead to performance pressure forcing managers to pursue a short-termistic approach to the extent of shunning long-term risk-taking (DesJardine and Durand, 2020). To this end, the impact of hedge fund activism remains an interesting open question. To the best of my knowledge, there is no study studying explicitly the impact of hedge fund activism on corporate risk-taking.

Second, literature on corporate risk-taking mostly links risk-taking as an essential antecedent of corporate and economic growth (John et al., 2008). However, not all forms of risk-taking would be valuable for the economy or firm. Some risk-taking increases corporate short-termism (Strine, 2016; DesJardine & Durand, 2020). I, therefore, examine important corporate decisions associated with hedge fund activism to explain whether the risk-taking appetite of target firms due to hedge fund activism promotes long term risk-taking or short term risk-taking.

In the third research question, I examine the stock liquidity consequence of target firms due to hedge fund activism. Liquidity is an important factor in determining value relevant long term risk-taking.

The final research question of this study is to examine whether a hedge fund, which first enters a target firm as a passive investor and subsequently turns into an activist, could impact the risk-taking of target firms differently. Literature in

organisational theory maintains the advantage for insiders in an organizational setting to initiate change (Gioia et al., 2010). An investor may learn about firm internal dynamics to be better able to influence corporate decisions (Eggers, 2012; Chen and Feldman, 2018). I borrow from this literature on investor learning to examine if the passive hedge funds, which later turn activists (switchers, henceforth), affect the corporate risk-taking appetite of the target firms differently.

My empirical study, which employs comprehensive US data on hedge fund activism from 1995 - 2017 on the effect of HFA, has the following important revelations. First, HFA is associated with an increase in return volatility when gauged by both book measures of risk-taking and market-based measures of risk-taking, eliminating the concern that empirical studies employ one or the other method. Both measures have their own advantage. The book based measure is credible as it is annually audited; however, it is sensitive to accounting treatment and is often accused as a backwards-looking measure (Bargeron et al., 2010). Market-based measure, on the other hand, is a forward-looking measure, therefore could capture risk in a better way. However, the market-based measure is often driven by events outside corporate influence and may capture market conditions than measure firm appetite towards risk. To this end, employing both book and market-based measure of risk-taking widely accepted in literature, I document a positive association between hedge fund activism and corporate risk-taking. The managerial discipline induced by hedge fund activism seems to have expanded the risk-taking appetite in line with previous literature on corporate discipline (John et al., 2008; Koirala et al., 2018)

Not all forms of risk-taking, however, are valuable to a firm. Some forms of risk-taking encourage short-termism, while other forms of risk-taking might encourage

long-term growth and sustainability. To examine whether risk-taking associated with hedge fund activism is long-termistic in nature, I examine the effect of hedge fund activism on six important corporate decisions: i.e. Leverage, Cash holding, Capital Expenditure, R&D Expenditure, Dividend payout, and share buyback. My investigation reveals that while hedge fund activism is associated with a decrease in capital expenditure, R&D and cash holding, on one hand, while an increase in leverage and dividend payouts. Therefore, it can be argued the risk-taking effects of HFA is two-fold. While firms pursue higher financial risk (more use of debt) and liquidity risk (lower cash holding), they undertake lower investment risk (lower investments and R&D). These findings are in line with the short-termism argument of HFA (Strine, 2016; DesJardine & Durand, 2020). I further examine the payout policy of activist targeted firms. The empirical investigation reveals that higher risk-taking is also associated with a higher payout policy to possibly avoid resistance from other shareholders. Taken together, the HFA is associated with lower real and innovative investments while pursuing higher financial and liquidity risk exposing firms to higher insolvency risk. HFA do, however, align the interest of other shareholders by maintaining higher dividends.

I further examined whether a decrease in investment and increase in corporate borrowing is explained by a gain in investment efficiency widely discussed in the literature on investment (Khurana et al., 2019). There could be a possibility that decreasing value-destroying investments, borrowing optimally higher and paying dividends improve investment efficiency. However, my robustness test on investment efficiency refutes this possibility as the reduction in capital expenditure is not associated with the improvement in investment efficiency. The results are consistent

with the short-termism argument in the literature (Strine, 2016; DesJardine & Durand, 2020). Similary, Chen, Meyer-Doyle and Shi (2020), in their investigation of the effect of hedge fund activism on the human capital of the target firms, reveal that firms, when targeted by activists fund, witness a higher departure of valuable employees; they also further find that this removal adversely affects target firm's performance. Chen, Meyer-Doyle and Shi (2020) argue that valuable human resources decide to opt out of firms attacked by hedge fund activists to lower the uncertainty and potential adversity for their careers. I extend this argument by showing corporate risk-taking increases in the aftermath of increased corporate discipline; however, this increase in risk-taking is driven by firms engaging in short-termism. In fact, hedge fund activism is associated with deterring long term risk-taking and increased leverage.

Third, I examined the liquidity consequence of hedge fund activism and found that hedge fund activism causes stock illiquidity, a concern raised by regulators (Berkel, 2007; Cumming et al., 2017). With eroding illiquidity in the market coupled with gearing up the target firms, hedge fund activism could undermine corporate stability giving one good reason for regulators to regulate this specialized investor class. To this end, my research is relevant to policymaking.

The results of my empirical study on the HFA show that the learning window (time between a hedge fund entering as a non-activist in a firm and turning into an activist) supplies decision power that a non-activist turned activist enjoys when compared to other activists peers in that, this activist can pursue higher risk-taking without compensating by higher payouts as the otherwise activists would do. The resultant, however, may further make firms more short-termistic as this evolution of HFA makes operating earnings more volatile and balance-sheet more levered without

simultaneous compensating balance by additional real and innovative investments (Strine, 2016; DesJardine & Durand, 2020).

My study makes two important contributions to the literature on hedge fund activism and corporate consequence (Klein & Zur, 2011; Gantchev, 2013; Brav, Jiang, & Kim, 2015; Strine, 2016; Chen & Feldman, 2018; DesJardine & Durand, 2020). First, I contribute to the ongoing open question of long-termism vs short-termism consequence of hedge fund activism by looking at the effect of hedge fund activism on corporate risk-taking. Our empirical investigation suggests that hedge fund targeted firms would pursue investment conservatism, however aggressive debt policy, thereby directing firms toward short-termism, consistent with the argument of DesJardine & Durand (2020). However, this contrasts with the implication of Brav et al., 2018. My study implies that the policy discussion should take into account risk-taking consequences that would have long term costs of hedge fund activism.

Second, my study contributes to the strand of literature on the evolution of Hedge fund activism on the corporate consequence. Coffee and Palia (2010) show that target firms bleed of short-termism with the strike of the wolf (HFA) in terms of the negative effect of hedge fund activism on labour market consequences. To this strand of literature, empirical results of the study imply that the non-activist turned activist heightens short-term oriented risk-taking by exposing the firm to higher earnings volatility and more levered balance sheet while shunning investment and dividends (Strine, 2016; DesJardine & Durand, 2020).

The rest of the chapter is structured as follows. 4.2 explores the institutional context of Hedge Fund Activism in Corporate America. Section 4.3 reviews literature related

to my research question. Section 4.4 discusses hypothesis development, 4.5 explains the research method employed in this chapter, and 4.6 discusses empirical analysis and results. Finally, section 4.9 concludes the chapter.

4.2 Hedge Fund Activism and corporate governance

The evolution of investor activism traces back to the activist blockholders of the 1980s. In their study, Bethel, Liebeskind, and Opler (1998) classify blockholders as activists, financial organisations and strategic investors and document that companies that perform poorly are targeted by the activist blockholders. They found activism led to an improvement in shareholder value and profitability by employing share repurchases and higher asset divestitures.

In response to these shareholder activism forms during the 1980s, firms were found to have implemented an array of takeover defences, many of which were endorsed by courts. The result was a decline in the hostile takeover deals as well as a drop in the role of control-driven shareholder activists.

Shareholder activism has been attempted by sophisticated institutional investors, labour associations, and other groups over the previous three decades, with varying outcomes. Rule 14a8, which empowers shareholders to propose recommendations on a number of themes, has been used by public pension funds and other activist investors to engage in shareholder activism. To influence business management, mutual funds and larger public pension funds have used a variety of additional control mechanisms (Wahal, 1996; Del Guercio and Hawkins, 1999; Gillan and Starks, 2000). Previous literature review shows the performance of these

institutions has been underwhelming. Studies show that activism by these institutional investors is able to affect only minor changes to firms' corporate governance structures and does not materially impact stock prices or earnings (Karpoff, 2001; Del Guercio, Woidtke, and Wallis, 2006; Barber, 2006; and Gillan and Starks, 2007). In related work in the context of the UK, Becht et al. (2006) collected data on public and non-public activism by a leading UK pension fund, Hermes and found that public notification of Hermes' stake did not garner a positive reaction from the market, while governance outcomes of activism by Hermes attracted a 3% market reaction, which was significant.

Institutional investors' monitoring generally has resulted in underwhelming monitoring outcomes due to regulations related barriers and structure-related frictions. This includes collective action concerns that result in a free-rider problem on others' efforts (Kahan and Rock, 2006), conflicts of interest, such as those that mutual funds face when considering activism at future clients (Black, 1990); regulatory constraints, such as diversification rations and insider trading laws (Black, 1990); political constraints, such as managers being constrained from engaging in activism by local and state politics (Romano, 1993); and weak persuasion skills.[29] Due to these limitations, as Admati and Pfleiderer point out in their study in 2005, the "Wall Street Rule" often becomes the default form of institutional shareholder activism.

Tax restrictions, for example, prevent mutual funds from acquiring concentrated stakes in a single company or group of companies. The Securities and Exchange Commission [SEC] also limits the types of fees that Investment Company

[29] Free rider problem in capital market emerges when costly monitoring by one class of investors allow disperse shareholders to benefit without their effort to monitor managerial actions. The free-rider problem creates dead-weight cost and disincentivise active monitoring of managerial actions (Fluck and Khanna, 2007).

Act of 1940-regulated companies can charge. Similarly, regulated funds are barred from engaging in activities like shorting, borrowing, and investing in illiquid securities.

There is no universally accepted definition of a hedge fund. In a roundtable discussion on hedge funds, the Securities and Exchange Commission (SEC) discusses 14 alternative potential definitions—hedge funds are typically recognised by four stylized features: These are pooled, privately organised investment vehicles that are managed by professional investment advisors who have a large stake in the company and are compensated based on performance. These funds are not readily available to the general public. These funds operate outside of the realm of securities regulation and registration (Partnoy and Thomas, 2006). Though there have been significant regulatory developments in the hedge fund industry, they remain unregulated in comparison to other institutional investors.

The traditional hedge fund is a partnership led by a general partner, with investors acting as limited partners having little or no say in the hedge fund's operations. Because their remuneration is based mostly on the success of their fund, hedge fund managers are compelled to provide positive returns. Hedge funds have traditionally charged a 2% (fixed) annual fee on their asset value and a 20% annual fee (return based performance fee). Although managers of other institutions may receive bonus income based on performance, their incentives are often less important because they collect a significantly smaller amount of returns due to the Investment Company Act of 1940's performance fee cap.

Unlike many institutional investors, such as pension funds, hedge funds are not bound by strict fiduciary obligations. Large institutions and high net worth individuals are expected to be the bulk of hedge fund investors. Hedge funds often raise money through private placements, which are exempt from extensive disclosure requirements and other regulatory laws.

Hedge funds aren't like other investment vehicles. Because hedge fund managers are not obligated by law to have diverse portfolios, they can take larger positions than other institutions. Hedge funds, unlike mutual funds, may have a substantial percentage block holding in the businesses they target and may demand investors to agree to "lock up" their assets for a period of two years or more. Mutual funds, on the other hand, are required by law to maintain diversified portfolios and sell securities within one day of an investor's redemption. Furthermore, because hedge funds are exempt from the Investment Company Act, they are allowed to trade on margin and engage in derivatives trading, which are not open to other institutions like mutual funds and pension funds. As a result, hedge funds have more trading flexibility than other financial institutions.

Furthermore, hedge fund managers are less likely to have conflicts of interest than other fund managers. Unlike mutual funds connected with huge financial institutions, hedge funds, for example, do not offer products to the companies whose stock they own. Hedge funds, unlike pension funds, are not subject to considerable governmental or local political influence or oversight.

Hedge fund managers have a vested interest in making a profit. Although many private equity and venture capital funds have similar traits, their focus on private

capital markets distinguishes them from hedge funds. Hedge fund activists are more likely to target private enterprises or going private transactions, while private equity investors are more likely to acquire a significant share of ownership. However, the lines between these investors are not always clear, and there is some overlap, especially between some private equity companies and activist hedge funds. Furthermore, hedge funds (and private equity firms) frequently follow various strategies, with some hedge funds focusing solely on activist investing (Brav et al., 2010).

The characteristics mentioned above of hedge funds have created hedge fund activism as one of the essential corporate governance strategies (Brav et al., 208). Specifically, three stylistic qualities, as stated above, distinguish hedge funds from other institutional investors in their potential to influence the corporate governance of target firms, and I summarise them as follows:

1. Hedge fund asset managers are more motivated to make profits. These performance fees are on top of the fixed management fees that these asset managers are paid to manage the assets. Furthermore, they invest a significant portion of their personal money in the invested assets. This provides a tremendous incentive for fund managers to improve their performance. This is in sharp contrast to other institutional investors, such as mutual funds and pension funds, whose managers are not permitted to keep a significant portion of excess returns.
2. Because hedge funds are exclusively open to skilled investors, such as institutional investors and HNIs, they are subject to fewer regulatory

interventions and oversights than mutual funds or pension funds. As a result, hedge funds have more freedom to intervene in target companies.

3. Finally, most hedge funds contain lock-up rules that prevent investors from withdrawing their initial investment. Given that hedge fund activists typically invest in target companies for more than a year to implement their strategies, this feature allows managers to focus on intermediate- and long-term activist goals.

In summary, the stylized features of hedge fund stake in firms imply that hedge fund activism forms an important corporate governance tool.

4.3 Related Literature

Hedge fund activism could be considered an important corporate discipline tool (Brav et al., 2018). Corporate discipline is a complex set of restraints that checks quasi-rents generated by firms (Zingales, 1998). It can also be viewed as an instrument with which providers of funds for firms assure themselves of receiving a return on their investment (Shleifer and Vishny, 1997). Largely agreed as a set of mechanisms, laws, principles, or interactions of these elements, corporate discipline is targeted to lower managerial opportunism and or slack and in essence, forms the foundation of corporate governance (Gillan, 2006). Specifically, from the corporate governance viewpoint, Gillan (2006) divides corporate discipline into two broad categories.

The first type of corporate discipline forms internal governance and is comprised of the role, structure and incentives of the board of directors, managerial incentives

and compensation; corporate capital structure; bylaw and charter provisions (or antitakeover measures) and systems of internal control.

Similarly, the external governance categories of Gillan (2006) comprise law and regulation, specifically federal law, self-regulatory organisations, and state law; markets focusing on accounting, financial and legal services from parties external to the firm (including auditing, directors' and officers' liability insurance, and investment banking advice); capital markets, the market for corporate control, labour markets, and product markets); providers of capital market information such as that provided by credit, equity, and governance analysts; and private sources of external oversight, particularly the media and external lawsuits.

In the aforesaid classification of internal and external corporate discipline, HFA falls into internal corporate discipline tools. Primarily, hedge fund acquires a big stake in the target firm and becomes insiders to affect the board and corporate decision. However, literature also documents the effect of this internal governance to improve external market-based governance by increasing capital market scrutiny and the market of corporate control by improving the target firms' efficiency in M&A activities. Wu and Chung (2021) show that activist hedge funds improve target firms' M&A performance by adopting different value-relevant strategies like reducing diversification-driven M&A, poor M&A, and deals between firms with multiple business segments. Taken together, hedge fund activism as a governance tool has been documented to influence their governance practices through internal and external corporate discipline.

The effect of hedge fund activism as a disciplining tool on corporate risk-taking could be understood by categorizing risk-taking into long-termistic risk-taking and short-termistic risk-taking. The following section discusses the prediction of the risk-taking consequence of Hedge fund Activism on corporate risk-taking from a framework of long-termism vis-à-vis short-termism.

4.3.1 HFA and long-term risk-taking

The corporate discipline view of HFA suggests the HFA lowers managerial opportunism, thereby encouraging long term risk-taking (Lel and Miller, 2015; Bena *et al.*, 2017). This economic view maintains that the effect of HFA on firm risk-taking is related to the value that corporate discipline brings to the firms (John, Litov and Yeung, 2008). The HFA can be an effective governance mechanism of corporate discipline to reduce agency problems (Fama and Jensen, 1983; Jensen and Ruback, 1983). This improved corporate monitoring could lower the magnitude and importance of the private benefits of insiders.

Alternatively, an HFA increases the propensity for underperforming incumbent managers to be replaced and acts as a credible managerial disciplining tool that lowers managerial slack or tendency to enjoy a quiet life (Bertrand and Mullainathan, 2003). Additionally, the replacement threat motivates directors to be more careful as corporate monitors, as these directors face the risk of being dismissed by the acquiring team when a firm becomes a target as a result of poor performance (Wu and Chung, 2021).

From a theoretical standpoint, corporate risk-taking depends on the manager's utility from a corporate decision. A rational decision-maker would maximize his utility

from corporate decisions (John et al., 2008; Glendening, 2016, among others). Utility comes from three important sources: utility derived from value-enhancing decisions, utility gained from private benefits and utility from slack (or quiet-life). Utility derived from value improving decisions align with the interest of insider decision-makers and other shareholders. On the other hand, the utility derived from private benefit or managerial slack encourage them to make a corporate decision that may be sub-optimal to the shareholders (Bertrand and Mullainathan, 2003; Vig, 2013).[30] As such, an insider decision maker faces a tradeoff of the utility maximization given the utility function of a value-enhancing decision and the utility function of private benefits or quiet-life that would encourage a decision-maker to make a decision that has an opposite consequence. Corporate discipline should shrink insiders' opportunism and slack. Therefore, corporate discipline works in aligning the interest of inside decision-makers and outside investors and encourages insiders to undertake risky but value-enhancing projects (John et al., 2008; Glendening et al., 2016).

Taken together, corporate discipline predicts a potential positive relation between HFA and corporate risk-taking as a managerial discipline could discourage managerial slack or consumption of private benefit, thereby increasing risk-taking. Therefore, the HFA should discourage investment short-termism and encourage long-term risk-taking through managerial discipline (Weisbach, 1988; Khanna and Palepu, 2000; Fauver *et al.*, 2017; Lu and Wang, 2018; Wu and Chung, 2021)). Monitoring

[30] Bertrand and Mullainathan (2003) using plant-level data find that when managers are insulated from takeovers, worker compensation rise, the destruction of old plants falls, but the creation of new plants also falls. They also find that overall productivity and profitability decline in response to these anti-takeover laws. Their results suggest that active empire building may not be the only drive of entrenchment and that managers may have preference to derive utility from enjoying the quiet life.

provided by HFA could also reduce managerial slack, which would otherwise encourage them to pursue a quiet life (Bertrand, Mehta and Mullainathan, 2002).

4.3.2 HFA and short-termism

Economic *short-termism* that results in firm biases against pursuing a long-run risk-taking may be due to formal planning tools and regimes for organisational control (Hayes and Abernathy, 2007), managerial incentives to boost short-term earnings and stock prices (Ladika and Sautner, 2020), and economy-wide high cost of capital (Jacobs, 1991). The basic argument here is that *short-termism* leads firms to undertake risks that will have immediate payoffs (Laverty, 1996). Theory predicts that executives evaluate both the cost and benefits of engaging in short-termism (Stein, 1988). Supporting this view, a survey by Graham et al. (2005) revealed that 78% of the responding managers admitted to lowering or deterring long-term value-driving investments to smooth earnings in support of short-term performance targets. To this end, the intertemporal choice of corporate risk-taking favours *short-termism* over *long-termism* (Ladika and Sautner, 2020).

There are at least two major economic reasons connecting HFA and short-termism. First, if stockholders are less than perfectly informed, transitory lower earnings may result in downward price pressure, and the stocks would be undervalued, increasing the likelihood of an HFA at an unfavourable price. This could encourage managerial short-termism and force managers to focus on current earnings to the extent that they sacrifice long-term value-enhancing investments. The implication is that HFA in the form of disciplining threats can be damaging because it leads to managerial short-termism and could deter the appetite of managers to undertake longer-term value-generating risk-taking (Stein, 1988).

Second, for growing and innovative firms, greater external monitoring may be expensive (Coles, Daniel and Naveen, 2008). As the HFA provides excessive board monitoring, this increased cost of external monitoring could dampen the managers' appetite for long term risk-taking (Coles, Daniel and Naveen, 2008; Cohen, Dey and Lys, 2013). This encourages managerial short-termism, wherein managers focus on current earnings and disincentivise long-term value-enhancing risky projects (Stein, 1988; John, Litov and Yeung, 2008). This means firms will adopt *short-termism,* i.e., increase short-term operating and financial risks at the expense of long-term innovative investment risks.

4.4 Hypotheses Development.

4.4.1 Hedge fund Activism and corporate risk-taking

The first research question examines hedge fund activism's impact on corporate risk-taking. I investigate whether hedge fund activism influences corporate risk-taking based on the premise that hedge funds can be used as corporate governance tools. I do this by focusing on the risk-taking implications of hedge fund activism in the context of long-termism vs short-termism. To my knowledge, no research has looked into the influence of hedge fund activism on business risk-taking. A generally believed economic belief is that there is a positive relationship between corporate disciplines (John et al., 2008). On the other hand, Hedge fund activism may impose performance pressure on managers, driving them to take a short-termistic attitude to the point of avoiding long-term risk-taking (DesJardine and Durand, 2020). To this end, the impact

of hedge fund activism remains an interesting open question. To answer this question, I state my first hypothesis as follows:

$H_{4.1}$: Hedge fund activism increases corporate risk-taking

4.4.2 Hedge fund Activism and corporate decisions

The second question this empirical chapter aims to answer is the impact of hedge fund activism on corporate decisions that are related to risk-taking in the finance discipline. Literature on corporate risk-taking mostly links risk-taking as an essential antecedent of corporate and economic growth (John et al., 2008). However, not all forms of risk-taking would be valuable for the economy or firm. Some risk-taking increases corporate short-termism (Strine, 2016; DesJardine & Durand, 2020). Therefore, I examine important corporate decisions associated with hedge fund activism to explain whether the risk-taking appetite of target firms due to hedge fund activism promotes long-term or short-term risk-taking.

$H_{4.2}$: Hedge fund activism increases corporate risk-taking that promotes corporate short-termism

To test whether hedge fund activism increases corporate short-termism, I use the following four decision variables in corporate finance, viz. corporate borrowing, cash-holding, investments and payout decisions.

4.4.2.1 Hedge fund Activism and Corporate borrowing decisions

Corporate borrowing is related to corporate risk-taking through its impact on investment and financial risk. There are a few important economic theories guiding

corporate borrowing. In Appendix A4.3, I highlight important mechanisms that explain corporate financing decisions.

The prediction of the hedge fund activism on corporate financing decisions is explained by demand and supply factors. The demand side argument is that hedge funds are associated with a higher appetite for debt and risk-taking. To this end, hedge funds as activist investors should borrow more, all else remaining constant. However, previous studies also highlight value-destroying corporate conservatism due to creditors' influence on the firm decision. Specifically, Acharya et al. (2011) highlight that increased creditors' influence on firm decisions encourages value-destroying corporate conservatism. To this end, activists who prefer to enjoy their influence on corporate decisions would borrow less so as to minimize creditors' influence in the corporate decisions.

4.4.2.2 Hedge fund Activism and Corporate cash holding decisions

The problem of corporate cash holding motive has been examined in academics for a long time. Keynes proposed the cash holding motive theory in 1936, and it drew a lot of attention right away. Cash holding is consistently one of the most widely explored topics in academia and practice. Keynes proposed three different reasons for holding currency, including transactional, precautionary, and speculative purposes. The transactional motivation refers to a company's cash requirements for day-to-day operations and transactions. The precautionary motive refers to the cash requirement that a company must meet in order to deal with uncertainty and assure operational safety. While cash is hoarded when lower-risk investing possibilities are available, this

is referred to as the speculative motive. Cash holding motives are discussed in Appendix A.

Corporate discipline and cash holding

The link between corporate discipline and cash management is skewed. In a study of corporations with M&A targets from 1985 to 1994, Pinkowitz et al. (2001) discovered that the organisations that are considerably more likely to be purchased keep less cash, hinting that corporate cash holding could be utilised as a defensive measure against a potential takeover. They also claim that in a country where shareholders' rights are poorly protected, information asymmetry and investment opportunities have no impact on company cash hoarding behaviour. The fundamental reason is that because shareholders are in a weak position and their rights aren't sufficiently safeguarded, they can't effectively monitor managers in allocating excess cash to them.

Harford et al. (2008) looked at the cash holdings of American corporations between 2000 and 2004 and discovered that they are positively connected to corporate governance. Zhang and Liu (2005), on the other hand, used three variables as a substitute for shareholder protection, including the largest shareholder's absolute shareholding ratio, relative shareholding ratio, and ownership type, to investigate the impact of internal corporate governance on cash-holdings and observed a significant negative correlation between shareholder protection and corporate cash holdings.

4.4.2.3 Investment decisions

Corporate investment is an important corporate decision variable used to assess the corporate risk-taking appetite of a firm (John et al., 2008; Bergaron et al., 2010;

Koirala et al., 2020). Corporate investments represent the real risk-taking of a company as the payoff of these investments is not known ex-ante and therefore exposes using Capex and R&D, along with other risk-taking proxies. Bergaron et al. (2010) investigate whether risk-taking by publicly traded US corporations decreased significantly after the passage of the Sarbanes-Oxley Act of 2002 (SOX) and find that numerous risk-taking metrics decreased significantly for the US versus non-US enterprises after SOX. They contend that their findings support the claim that SOX discourages public corporations from taking risks. Koirala et al. (2020) explore the relationship between corporate governance reform and risk-taking in an emerging market environment marked by weaker market forces of corporate scrutiny and higher insider ownership, which pushes firms to choose investment conservatism. Contrary to Bergaron et al. (2010)'s findings, they find that stricter CGR leads to increased corporate risk-taking and that risk-taking is an essential avenue via which CGR boosts company value. In keeping with the literature, the study uses Capital Expenditure (Capex) and Research and Development Expenditure (R&D) to gauge real and innovative investment to assess the impact of hedge fund activism on a firm's investment decisions.

To the extent increased risk-taking of the firm following hedge fund activism is related to its long-term orientation, the risk-taking should be associated with a simultaneous increase in corporate investments (Capital expenditure and R&Ds). On the contrary, risk-taking that fosters short-termism is not (or negatively) associated with real investments. Hypothesis $H_{4.2}$ tests this postulation.

4.4.2.4 Hedge fund Activism and Payout decisions

Conceptually, managerial discipline mechanisms can be used to mitigate managerial agency issues and guarantee that shareholders get compensation for their investment (Shleifer and Vishny, 1997). Alternatively, pre-commitment to cash distributions through dividend distribution could address agency problems

Managerial discipline through corporate governance instruments like boards monitoring and the markets for corporate control can be an expensive strategy. The lack of adequate supervision and monitoring in the absence of such monitoring instruments can intensify conflicts of interest between managers and shareholders. The choice of dividend payments policy entails a pre-commitment to future cash distributions. By limiting managerial discretion, dividend payout can lower managerial agency conflicts.

In terms of payout policy and risk-taking, all else remaining the same, a risky-payout policy is the one when a firm adopts a higher dividend payout to allow additional capital market scrutiny for future capital raising (La Porta et al., 2002). Alternatively, a higher payout policy could be aimed at signalling better future investment prospects. As dividends are sticky in nature and dividend cuts are associated with negative market reactions, managers would pursue higher dividend payout only if they are confident that the future prospects of the business are sound. On the contrary, a higher payout could also imply that a firm does not have attractive investment projects at hand. This prediction contrasts with the signalling argument of a higher payout policy. Dividend policy, therefore, should be assessed in conjunction

with investment policy. A higher payout without a commensurate increase in investment could imply the short-termistic strategy adopted by the managers.

4.4.3 Hedge fund Activism and liquidity consequence

The third important implication of hedge fund activism, held mostly by the regulators, is its potential effect on a firm's market liquidity. Stock liquidity in the market has an important impact on firm decisions. Liquidity is factored in the required rate of return. An unattractive investment project to an illiquid stock could be attractive in terms of positive net present value to a liquid stock due to a lower required rate of return (cost of equity capital) (Amihud and Mendelson, 2000; Easley and O'Hara, 2004). To the degree that HFA is linked to long-termism, the increased utility received from the investment-related wealth benefit may be due to decreased capital costs as a result of corporate monitoring and reduced information asymmetry (Stulz, 1999; Bekaert and Harvey, 2000; Errunza and Miller, 2000; Khanna and Palepu, 2000; Healy and Palepu, 2001; Chen et al., 2009). By lowering information asymmetry among traders, corporate discipline promotes stock liquidity in the market (Chung et al., 2010). Improved liquidity following CGR could help lower the cost of capital, as liquidity is considered in the cost of capital estimation (Amihud and Mendelson, 2000; Easley and O'Hara, 2004). However, to the extent HFA is associated with short-termism, their investment is associated with increased adverse selection costs increasing stock illiquidity. Besides, hedge fund activism is associated with bloc-trading; increased adverse selection costs could raise the market-making cost of inventory holding cost of the order flow. This can create liquidity dry-ups, a situation

that could trigger capital erosion, therefore, concern to regulators. My third question is whether hedge fund activism is associated with improved or deterioration of stock liquidity of target firms. I postulate my third hypothesis to answer this question.

$H_{4.3:}$ Hedge fund activism lower stock market liquidity

4.4.4 Hedge fund Activism when passive hedge funds turn activists

The final research question of this study is to examine whether a hedge fund, which first enters a target firm as a passive investor and subsequently turns into an activist, could impact the risk-taking of target firms differently. Literature in organizational theory maintains the advantage for insiders in an organizational setting to initiate change (Gioia et al., 2010). Resistance to change could be one important challenge for entering activists to initiate strategic intervention. With higher resistance, there is a higher chance of failure of intended changes to benefit an organization (Eggers, 2012). This is where the advantage of turning from passive to active lies. An investor may learn about firm internal dynamics to be better able to influence corporate decisions (Eggers, 2012; Chen and Feldman, 2018). The inside perspective could provide them with greater cooperation from the incumbent decision-makers and employees when negotiating for interventions. I borrow from this literature on inside learning, which could help a hedge fund first enter a potential target as a passive investor. After acquiring sufficient inside knowledge of people, structure and culture, this passive hedge fund could strategically switch to activist (Gioia et al., 2010). Therefore as a final set of enquiry, this empirical study examines if passive hedge funds, which later turn into activists (switchers, henceforth), affect the corporate risk-taking appetite of the target firms differently.

4.5 Research Method

This section discusses data and sampling strategies followed by sampling using causal empirical design. The causal design follows univariate and multivariate analysis as my research method.

4.5.1 The role of hedge fund activism on corporate risk taking

Is it true that activist-backed targeted firms are more or less prone to earnings volatility? In my empirical testing, I utilise earnings volatility as my primary variable to reflect business risk-taking, as suggested by the literature (John et al., 2008; Faccio et al., 2011; Boubakri et al., 2013).

Earnings volatility reflects the degree of risk-taking in a firm's operations based on the volatility of operating earnings, which should be higher for riskier initiatives (John et al., 2008; Boubakri et al., 2013). Earnings volatility is calculated as the five-year and three-year rolling standard deviation of earnings, where earnings are expressed as a percentage of total assets using earnings before interest, taxes, depreciation, and amortisation (EBITDA). Because EBITDA is frequently used as a proxy for operating cash flow or cash from operations, EBITDA volatility is also known as cash-flow volatility in the literature (Boubakri et al., 2013). Operating earnings volatility reflects corporations' efforts to increase real investment (John et al., 2008; Faccio et al., 2011; Boubakri et al., 2013).

To empirically answer research question 1, this part of the analysis employs the following estimation model.

$$Risk_{i,t} = \alpha + \beta.Activism_{i,t} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}, \quad (1)$$

where $Risk_{i,t}$ is book-based (RoA Volatility) and market-based (stock return volatility and idiosyncratic return volatility) as defined in Appendix A1. $Activism$ is a categorical variable to account for the presence of HFA in a given firm in a given year. $\boldsymbol{X_{i,t-1}}$ is a vector of firm characteristics like firm size, profitability, tangibility and valuation. $\boldsymbol{FE}$ allows for industry-specific shocks to evolve over a different time period. Similarly, $\boldsymbol{FE}$ also controls for the general macroeconomic factors in the economy that would impact all firms in a similar way through the year FE. The differential risk-taking attitude of hedge fund activism is captured by β, the coefficient of the variable of interest $Activism$.

4.5.2 The role of activism in corporate decisions

In this part of the analysis, I focus on the following estimation model.

$$Decisions_{i,t} = \alpha + \beta.Activism_{i,t} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}, \quad (2)$$

where $Decisions_{i,t}$ one of the six corporate decision variables as computed in Appendix table A4.1. These include Leverage, Cash Holding, Capex, R&D, Dividend and Buyback $Activism$ is a categorical variable to account for the presence of HFA in a given firm in a given year. $\boldsymbol{X_{i,t-1}}$ is a vector of firm characteristics changing over time. $\boldsymbol{FE}$ allows for industry-specific shocks to evolve over a different time period. The differential risk-taking attitude of activism is captured by β, the coefficient of the variable of interest $Activism$.

4.5.3 Liquidity consequence of hedge fund activism

To examine research question 3, I examine the liquidity consequence of hedge fund activism. To do so, this part of the analysis employs the following estimation model.

$$Liquidity_{i,t} = \alpha + \beta.Activism_{i,t} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}, \qquad (3)$$

I employ three widely used measures of liquidity.

The first measure is average daily turnover. This ratio measures the average number of shares traded within a day in a given stock as a fraction of total shares outstanding. A higher value indicates the stocks are more liquid. Assets with lower turnover imply having to have fewer buyers and sellers and, therefore, are illiquid.

The second measure is the Amihud Illiquidity Measure. The Amihud measure is a low-frequency measure that calculates the order flow's daily price impact (Amihud, Y. 2002). Brennan and Subrahmanyam (1996) investigated this metric and found that it is highly and positively related to illiquidity estimations based on microstructure.

It is computed as

$$Amihud_{i,t} = \frac{1}{iT}\sum_{i=1}^{T} \frac{|Daily\ return_i|}{Daily\ trading\ Volume_i}$$

where T is a trading day in a year t.

The final measure is the implied bid-ask spread based on Corwin and Schultz (2012). The spread measures the transaction cost of round trip, and therefore higher spread implies illiquid stock.

4.5.4 The Switching of passive hedge funds into active and corporate risk-taking

To examine research question 2, I examine the evolution of hedge fund activism when a passive hedge fund in a target firm turns activist. To do so, this part of the analysis employs the following estimation model.

$$Risk_{i,t} = \alpha + \ +\beta.Activism_{i,t} + \omega.Switcher_{i,t}\ \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + \ e_{i,t}, \qquad (4)$$

,

where $Risk_{i,t}$ is one of three sets of dependent variables gauging risk-taking (book and market measures), corporate decisions (Leverage, Cash holding, Capex, R&D, Dividend and Buyback) and liquidity consequence as defined in Appendix A1.

4.5.5 Control variables

Literature has identified many firm industry and time-specific factors that may confound results. This section discusses important control variables controlled in my empirical estimations. In the empirical estimate models (1) and (2), I utilise a variety of control variables that may contest my variable of interest HFA in explaining differences in corporate risk-taking, in line with the current research.

4.5.5.1 Size

I control for firm size (Size) by using the natural logarithm of the book value of total assets, where assets are stated in millions of dollars, as recommended by Whited and Wu (2006). The expected relationship between corporate risk-taking (return volatility) and leverage is multi-facet. The impact can be appraised under

entrepreneur-driven and supplier-driven factors. To the extent that leverage is associated with higher access to capital

Due to the higher asymmetric information and agency risks, small firms' risk-taking appetites could be different compared to large firms. For instance, large firms may face lower financial constraints and therefore have higher access to obtain debt is lower when compared to their larger counterparts (Ben-Nasr et al., 2015). In the same line of argument, the visibility factor could provide greater flexibility to expand a firm's investment. I expect *the size* to be positively related to the amount borrowed to the extent that it represents a firm's reputation for facilitating greater access to external financing (Fombrun and Shanley, 1990; Shane and Cable, 2002; Williams and Barrett, 2000).

4.5.5.2 Profitability

I further consider that firm-level operating performance *(Operating Profitability)* could affect corporate risk-taking. Profitable firms could have a higher appetite for pursuing risky investments (Almeida et al., 2007). Similarly, creditors are willing to lend more to profitable firms, implying that these firms are less financially constrained by the supply of funds (Rao et al., 2020). I measure Operating performance by earnings before interest, taxes, depreciation, and amortisation (EBITDA) scaled by total assets (John et al., 2008; Koirala et al., 2018). I expect Operating Profitability to be favourably connected to corporate risk-taking, as evidenced by the existing literature (Vig, 2013).

4.5.5.3 Tangibility

I also use the property, plant, and equipment (PPE) as a percentage of total assets to control for asset tangibility (Tangibility) (Rajan and Zingales, 1995). The tangibility of assets represents the firms' collateral capacity to borrow more (Gan, 2007). High tangibility could imply higher lower capital constraints to finance growth and investment in risky assets.

4.5.5.4 Growth Opportunity and Valuation

The firm's growth potential/valuation, as proxied by the market-to-book (MB) value of the stock, is also included in the list of control variables. Because a higher MB is connected with a firm's reputation, particularly in emerging markets (Pinkowitz et al., 2006), and because reputable enterprises have greater access to finance, MB is projected to be positively associated with firm financing.

4.5.5.5 Industry and Economy-wide factors

I also use firm fixed effects in the regression models to account for the firm's time-invariant idiosyncrasies. Finally, industry-level shocks, such as investment opportunities occurring in several industries (sectors) at different periods, could throw my calculations off (Koirala et al., 2018). I use the combination of industry and year fixed effects to reduce this probability.

4.6 Empirical Analysis

In this section, I first discuss descriptive statistics of variables used in this study. This is then followed by the results from my univariate and multivariate estimation models.

4.6.1 Sampling strategy

I collected data on hedge fund activism from SEC filings starting from 1995 to 2017. The initial SEC filling observation comprises 117911 filing observations of 11325 unique firms. This comprises 19,820 activist filings and 98,091 non-activist filings. This was then mapped target firms' financials using Compustat Capital IQ. This resulted in the final observation to be 57235 firm-year observations of 5258 unique firms with 49,145 non-activists and 8,090 activists' filings. Of this, 3,492 filings comprised passive hedge funds turning activists.

4.6.1.1 Descriptive Statistics

I start my analysis with descriptive statistics of the variables employed in this study. I present a total number of observations, mean, standard deviation, median, 25th and 75th percentile distribution of variables. I study in this empirical chapter.

The empirical study uses the sample period of 1995 - 2017. Table 4.1 presents descriptive statistics of variables I used in this study. During this period, 14.13% of the listed sample firms in the USA were targeted by hedge fund activism, while 6.10% of the entire sample were targeted by non-activist hedge funds, which turned out to be activists. This account for over a third of activist sample observation (40.63%) during my study period. The average (median) RoA-volatility-3y of the sample firms during the period remains around 4.67% (1.79%) of the total assets. Similarly, average (median) Capex, Leverage and Cash-Holding are 5.22% (3.11), 17.53% (9.34%) and 23.19% (12.76%) respectively. Average operating profitability remains marginally negative (-0.055%) while that of median firms remains at 7.8%. For this period, size (natural log) and tangibility remain at 5.82% and 46.96%, on average.

4.6.1.2. Univariate Analysis

To assess how risk-taking variables differ across activist-targeted and non-activist firms, I start with the univariate t-tests of the key variables. Tables 4.2a and 4.2b report the univariate t-test results of the mean difference of the key variables of interest.

Results of Panel A of Table 4.2a reveal a statistically significant and economically material high level of risk-taking by the activist targeted firms when compared to their non-activist targeted firms when measured by both book and market measures of risk-taking. Economically, the RoA volatility-5yr (-3yr) is 2.19 (1.64) % higher than the peer firms in the non-activist category. Similar results are found when risk-taking is gauged using market measures—specifically, total stock return. Volatility (idiosyncratic volatility) by activist targeted firms is 6.28 (5.13%) higher among activist targeted firms when compared to non-activist targeted firms.

The finding is in line with the argument that increased corporate monitoring induced by hedge fund activism increases corporate risk-taking. Figures 4.1 and 4.2 plot the time-series of book and market measures of risk-taking of activist targeted and non-activist targeted firms during my study period from 1995 - 2017. The plots show that risk-taking of activist targeted firms (blue line) has been consistently higher than non-activist targeted firms. This is in line with hypothesis 4.1, which suggests a positive association between hedge fund activism and corporate risk-taking.

To investigate the corporate decisions' impact on hedge fund activism to answer my second research question, panel B of table 4.2a report the simple t-tests comparison

of corporate decision proxies like Leverage, Cash holding, Capital expenditure, Dividend payout and Buyback ratio.

Panel B of Table 4.2a reveal that while leverage (corporate borrowing) has increased (1.75%), corporate cash holding decreased (-2.12%) significantly. The finding is in line with hypothesis 4.1, which suggests corporate risk-taking of firms increases with hedge fund activism. Taken together, these could indicate the risk-taking of activists targeted firms are higher than the non-activist targeted firms.

However, in order to take into consideration the firm characteristics to see if this difference is attributed to key firm characteristics, it needs to control for the effect of differences in firm characteristics like size, profitability, tangibility and MB in the multivariate analysis in the following section.

Panel C of Table 4.2a, I examine the t-test of differences in liquidity consequences associated with hedge fund activism. As reported in panel C, target firms associated with hedge fund activists have lower average daily turnover, higher Amihud Illiquidity and higher implied bid-ask spread. Taken together, there is a negative liquidity consequence of hedge fund activism as hedge fund activism is associated with liquidity dry-ups of stocks in the capital market.

In table 4.2b, I show the univariate of differences in corporate risk-taking, corporate decisions and liquidity consequences associated with activism when a passive hedge fund turns activists (referred to in the table as *Switchers*). The comparison group is firms targeted by activist hedge funds (without passive hedge funds turning activists). As shown in table 4.2b, the firm's RoA volatility of firms with Switchers is higher (9.03% vs 7.43% (7.05% vs 5.77% with 3 year time frame)) than

peer firms targeted by activists but with no passive hedge fund turning activists. However, stock return volatility and idiosyncratic return volatility are lower for firms targeted by switchers when compared to firms targeted by non-switching activist hedge funds. The results highlight the significance of hedge funds entering a target firm initially as passive investors and later turning into activists. One advantage for activist hedge funds with this strategy is increased corporate risk-taking without having market volatility consequences. The findings are consistent with the advantage of the learning window that the switchers enjoy.

4.7 Multivariate Analysis

The univariate has certain limitations in a causal investigation. Differences in firm characteristics may confound the results. To alleviate this concern, this section employs multivariate estimation models for f multivariate regression are presented in tables 4.3-4.8. In Table 4.3a, I present the effect of activism on a firm's earnings volatility while I examine the effects on Leverage and Cash-holding in Tables 4.4 and 4.5; the effect on real investment is presented in Table 4.6a.

4.7.1. Risk-taking and activism

Table 4.3a presents the multivariate regression to gauge the marginal effect of HFA on earnings volatility. I present the effect of HFA on both 3yr and 5yr RoA volatility. Model 1 of Table 4.3a shows that, after accounting for the time-varying industry effect, the 5yr RoA volatility of activist target firms is higher compared to the non-activist firms. Economically, the 5yr RoA volatility increases by 2.78% and is statistically significant at a 1% significance level. Therefore, the higher earnings volatility of activist targeted firms in the univariate analysis is associated with HFA.

Similarly, Earnings 3yr RoA volatility (column 7) in the model shows a similar effect with an economic magnitude of 1.98%. Similarly, the effect is stable with additional firm characteristics like size, profitability, tangibility and Market-to-Book. In terms of economic magnitude, with all firm, year and industry controls (in models 6 and 12), the effect of hedge fund activism is associated with an increase in 0.39% (0.18%) of 5 yr-RoA (3-yr) volatility which translates into 6.57% (3.85%) of average RoA volatility 5.93 (4.67) % of our sample firms.[31]

4.7.2. Hedge fund activism, leverage and cash holding

Tables 4.4 and 4.5 present the effect of HFA on corporate leverage and corporate cash-holding. As shown in the estimation model [6], after controlling for firm attributes and industry shocks, target firms' leverage increases by 3.59% of total assets due to HFA, and the coefficient is highly significant (at 1%). In terms of economic magnitude, with an average leverage ratio of 18% in our sample period, the marginal effect of 3.59% attributed to HFA translates into a 19.94% increase in long term debt employability. Similarly, in the model [6] of Table 4.5, I estimate the effect of HFA on corporate cash holding. Cash act as a buffer to any future demand and supply shock and serves as a precautionary motive for managers. The result in the model [6] implies the activist targeted firm's cash holding was reduced by 18.12% (4.03% / 22.24% (which is the average cash-holding of sample firms)). Taken together,

[31] Risk taking is a forward-looking approach (John et al., 2008; Koirala et al., 2020). Koirala et al. (2021) argue that forward rolling eliminates the problem with conventional estimation models, dominant in the finance literature, that backward rolling may capture risk as a back-ward looking and not forward-looking approach. One problem with the employment of forward rolling in the diff-in-diff approach is the possibility that some of the pre-activism risk-taking measures may capture the post activism effect. To assuage that my result is not driven by this, I also use the backward rolling as an alternative measure of risk-taking. The results are robust to this alternative definition of risk-taking.

HFA increases the financial risk of firms by increasing the size of the debt and lowering cash holding.

4.7.3. Activism - Capital Expenditure and Investment Efficiency

Table 4.6a and Table 4.6b present multivariate analysis to estimate the economic effect of HFA on Capex and Investment Efficiency. As presented in estimation models [6] of Table 4.6a, HFA lowers corporate investments in the form of Capex. In terms of economic magnitude, HFA lowered Corporate Capex by 10.54%. However, as shown in Table 4.6b, it does not translate to an improvement in investment efficiency. These findings are consistent with the reduction in operating risk gauged by earnings volatility. As investment risk translates into more volatile operating earnings, taken together with the finding of 4.3a, implies the HFA lowers operational and investment risk-taking; however, it increases financial risk-taking.

4.7.4. Activism and Payout Policy

In addition to the examination of the five variables (earnings volatility, leverage, cash-holding, Capex and Investment Efficiency), in this subsection, I examine the effect of HFA on corporate payout policy. For this, I use two proxies of payout, Dividend/Total equity and Sharebuyback/Total Equity. The results are presented in Tables 4.7a and 4.7b. As presented in table 4.7a, HFA is associated with a higher payout. In terms of economic magnitude, the activism increases the payout policy of target firms by 27 basis points and is statistically significant. However, my data in Table 4.7b shows no material change in corporate buybacks attributed to HFA. The results imply that HFA is associated with a higher payout policy in favour of shareholders.

4.7.5. Risk-taking when a passive hedge fund turns activist

The risk-taking appetite of HFA targeted firms could stem from the difference in the nature of activists. While I discuss in sections 4.7.1 – 4.7.4 the effect of HFA on corporate risk-taking, in this section, I discuss if these risk-taking strategies evolve among firms targeted by non-activists Hedge Funds turned activists. The results are reported in Tables 4.3c, 4.3d, 4.4,4.5, 4.6a, 4.6b, 4.7a, 4.7b and 4.8, where the *Switcher* in the second row in these tables capture the effect if any. Here *Switcher* is a categorical dummy that takes the value of one if the firm is targeted by non-activists turned activists and zero otherwise.

4.7.5.1 Earnings volatility when passive hedge funds turn activists

Table 4.3c reports the effects of HFA on earnings volatility, allowing for the evolution of earnings volatility for firms targeted by non-activist turned activists. The *Switcher* in Columns 6 and 12 of table 4.3c show that the effect of non-activists turn activists on earnings volatility is positive and significant when I consider either 5yr and 3yr windows for rolling. The implication of the results is that *learning as an insider* of these future activists allows them to learn adequately in the *learning window* (time between a non-activist entering the target and turning into an activist) to pursue risk-taking in the post activism period that other direct activists would not pursue. These findings highlight the Switchers increase risk-taking of target firms. However, whether this makes them long-termistic remains, which I attempt to answer in my empirical analysis in the subsections 4.7.5.2 - 4.7.5.4.

4.7.5.2 Switchers, Leverage and Cash Holding

The effect of non-activist turned activists on the leverage and cash-holding is reported in tables 4.4 and 4.5. Estimations specifications [7-12] of Tables 4.4 and 4.5 reveal that the firm targeted by non-activists turned activists further increased the proportion of debt financing, exposing the firm to higher financial risk, while there is no significant change in cash holding. Linking this to the results of univariate before and after analysis in table 4.2 b, we see that there is an increase in cash-holding in the post HFA of firms targeted by non-activists turn activists implying some evidence of increased financial risk-taking associated with higher cash holdings as a precautionary motive especially when these non-activists turned activists increase earnings volatility post activism (Han and Qiu, 2007). However, allowing for firm characteristics and industry shocks to vary over time, the economic magnitude of the effect on cash-holding is not statistically distinguishable from zero. Taken together, HFA instigated the non-activists turned activists increased financial risk. To examine whether this increased financial risk reflects the firms' strategy to pursue higher real investments and investment efficiency, I examine the effect of the HFA evolution on Capex and investment efficiency in the following sub-section 4.7.5.3.

4.7.5.3 Switchers, Real Investments and Investment efficiency

Table 4.6.a shows that while HFA is in general associated with lower Capex, this strategy does not change between non-switchers and non-activists turn activists. Similarly, no difference is revealed in terms of the investment efficiency of firms targeted by switchers, as shown in Table 4.6b. The findings are consistent with the

argument that increased risk-taking of HFA targeted firms engaging in short-termism, increasing operating risk and financial risk with no commensurate investments in real investments and innovative expenditure. The *learning window* of non-activists turned activists only makes firms riskier in terms of operational and financial risks.

4.7.5.4 Switchers and Payout Policy

To assess how the learning window affects the evolution of payout policy, I examine the effect of non-activist turned activists on dividend payout (Table 4.7a) and buybacks (Table 4.7b). It is revealed that while activism is associated with higher dividend payout than the peer firms, the effect of Switchers is indistinguishable. In the analysis of buybacks, we document the positive effect of activism on buybacks, while Switchers have a lower tendency to engage in buybacks when compared to non-switcher activists. The result highlights the importance of a learning window allowing firms to engage in higher operational risk and financial risk while at the same time paying lower dividend payouts.

4.8 Discussion

HFA's biggest concern is whether it achieves its declared goal of increasing shareholder value. According to studies, the market responds favourably to HFA (Brav et al., 2010). For example, Brav et al. (2010) use both short- and long-run event windows around the announcement of activism events and find a run-up of about 2.6 % from 10 days to 1 day prior to filing, an increase of 1.0 and 1.2 % on the filing day and the following day, and an abnormal return of 6.0 % in 20 days. Klein and Zur (2009) report a 7.2 % abnormal return for the [30, +30] window around the

announcement day, while Clifford (2008) and Boyson and Mooradian (2007) report significantly positive average abnormal announcement-day returns ranging from 3.4 to 8.1 % for different event windows. While the overall evidence from the stock market reaction is encouraging for value creation, whether this HFA transfers to corporate decision making to create value remains an unanswered topic. To that end, my empirical research examines the influence of hedge fund activism on long-term risk-taking, adding to the debate over short-term vs long-term risk-taking.

My empirical findings on the effect of HFA have the following important revelations. First, HFA is associated with an increase in return volatility, implying increased risk-taking. However, this increased risk-taking is rather a short-termistic in nature as this increase in return volatility is coupled with decreased capital expenditure, R&D and cash holding on the one hand while increasing leverage and dividend payouts. Therefore, it can be argued the risk-taking effects of HFA is two-fold. While firms pursue higher financial risk (more use of debt) and liquidity risk (lower cash holding), they undertake lower investment risk (lower investments and R&D). This findings is in in line with the short-termism argument of HFA (Strine, 2016; DesJardine & Durand, 2020). My further examination shows that this decrease in investment is not explained by improvement in investment efficiency, supplying further evidence that hedge fund activism triggered corporate discipline, resulting in the short-termstic risk-taking, which shuns value relevant corporate investments.

Not surprisingly, the HFA is also associated with a higher payout policy to possibly avoid resistance from other shareholders. Taken together, the HFA is associated with lower real and innovative investments while pursuing higher financial

and liquidity risk exposing firms to higher insolvency risk. HFA do, however, align the interest of other shareholders by maintaining higher dividends.

Similarly, the results of my empirical study on the evolution show that the *learning window* supplies decision power that a non-activist turned activist enjoys when compared to other activist peers in that this activist can pursue higher risk-taking without compensating by higher payouts as the otherwise activists would do. However, it may further make firms more short-termistic as this evolution of HFA makes operating earnings more volatile and balance-sheet more levered without simultaneous compensating balance by additional real and innovative investments. In the debate of wolf at the door, Coffee and Palia (2010) show that target firms bleed of short-termism with the strike of the wolf (HFA). To this end, I show that the non-activist turned activist further heightens this risk-taking by exposing the firm to higher earnings volatility and levered balance sheet while shunning investment and dividends.

Hedge fund activism's contagion effect on financial stability is a primary regulatory concern. The main concern about hedge funds' systemic impact is that the failure of just one of them might have far-reaching consequences for the whole financial system. Leverage, opacity, fraudulent behaviour, herding, the usage of complicated financial instruments, and the use of market liquidity are all factors that could threaten financial stability (Brav et al., 2008).

One means through which hedge funds might achieve amplification of their gains is through the use of leverage. The risk of high leverage stems from the fact that, unlike regulated financial institutions, hedge funds have no maximum limit on the amount of leverage they can use. Hedge fund defaults are more likely and more severe

as a result of this. Due to the high magnitude of hedge fund investments, liquidation may trigger significant swings in market pricing and affect the positions of hedge fund counterparties and other market participants. This could cause a "domino effect" or market spillover, which would raise regulatory concerns. The combination of leverage and other risks could create more dangerous scenarios, where hedge fund defaults could have major systemic effects.

Several vulnerabilities to the financial system have been identified as a result of increased leverage use, according to the literature. First, as a result of the leveraged positions, the hedge fund's risk exposure will increase. Furthermore, unwinding leveraged holdings may have an impact on creditors' solvency. Similarly, because there is less capital available to absorb losses, leveraged institutions are more vulnerable to losses. Finally, unwinding large bets quickly can have a negative impact on market pricing and volatility. As a result, prices in other markets may be altered, thereby affecting the fund's and its counterparties' positions (Berkel, 2008). To this regulatory concern, my empirical study has lent an additional dimension of leverage contagion of these highly leveraged sophisticated investors. The implication of my empirical study could be an input to regulators in assessing the risk-factor hedge fund activism can bring to the corporate world through disruption in the target firms in the form of high risk-taking and high leverage not explained by investment efficiency or long-termistic strategies.

4.9. Conclusion

The mixed empirical evidence of the effect of HFA on corporate consequences motivates this study to examine the effect of HFA on corporate risk-taking from the framework of short-term and long-term debate. Given the seemingly opposing views, I examine the effect of HFA on corporate risk-taking.

Tracking a large set of US-listed firms by activists and non-activists for a study period from SEC filings, my empirical study investigates the risk-taking consequence of hedge fund activism. Employing different proxies of risk-taking to capture different types of risk stemming from different corporate decisions, my empirical findings on the effect of HFA have two important revelations.

First, while firms pursue higher financial risk (more use of debt) and liquidity risk (lower cash holding), they undertake lower investment risk (lower investments and R&D). I further document that higher risk-taking is associated with a higher payout and is also associated with a higher payout policy to avoid resistance from other shareholders. Maintaining stable earnings, they, on the one hand, avoid possible capital market scrutiny stemming from suppliers of debt while aligning the interest of shareholders by paying a higher dividend on the other hand. Taken together, the HFA is associated with lower real and innovative investments while pursuing higher financial and liquidity risk exposing firms to higher insolvency risk. HFA do, however, align the interest of other shareholders by maintaining higher dividends. Second, the results of my empirical study show that the learning window supplies decision power that a non-activist turned activist enjoys when compared to other activist peers in that

this activist can pursue higher risk-taking without compensating by higher payouts as the otherwise activists would do.

In the debate on short-termism vis-à-vis long-termism, there is a fundamental concern about the consequences of hedge fund activism. Hedge fund activism constitutes an important corporate governance tool, but, like any other corporate governance instrument, the (un)intended consequences are not obvious. To the extent that stakeholders either protect their stakes by contractual arrangements or are sheltered from negative outcomes by regulatory provisions (Pacces 2012; DesJardine and Durand (2020), efficient corporate governance should lead to Pareto optimality. In the informationally efficient capital market, the difference between short-term and long-term optimisation would not exist in equilibrium as any asymmetry would be arbitraged away. The reality of the capital market is far from efficient, and its time and gain outweigh the short-term performance when compared to its long-term sustainable performance. To this end, my chapter highlights how Hedge fund activism shuns corporate risk-taking that is beneficial to the long term sustainability of a firm (Pacces 2012; DesJardine and Durand 2020).

4.10 Tables and Figures

Table 4.1. Descriptive Statistics

	Count	Mean	SD	Median	25th pct.	75th pct.
RoA volatility 3yr (Rolling)	57235	0.0467	0.0899	0.0179	0.0041	0.0471
RoA volatility 5yr (Rolling)	57235	0.0593	0.1052	0.0263	0.0084	0.0627
Capex	55634	0.0522	0.0653	0.0311	0.0133	0.0634
Leverage	57053	0.1753	0.2170	0.0934	0.0001	0.2823
Cash Holding	57233	0.2319	0.2518	0.1276	0.0344	0.3574
Size	57233	5.8243	1.9978	5.8074	4.5202	7.1156
Operating performance	57144	-0.0055	0.3247	0.0780	-0.0118	0.1405
Tangibility	53702	0.4696	0.4042	0.3439	0.1544	0.7021
MB	57235	2.7201	5.4697	1.7807	1.0200	3.2839
Activism	57235	0.1413	0.3484	0.0000	0.0000	0.0000
Non activist-turn Activist	57235	0.0610	0.2394	0.0000	0.0000	0.0000

Note: The table presents summary statistics of the distribution of the variables used in this empirical chapter. The summary statistics include the total number of observations of each variable along with their respective mean values, standard deviations (SD), median values and 25th and 75th percentiles. Sample period 1997-2017.

Table 4.2a. Univariate Analysis

Panel A

	Non Activists	Activists	Diff	t-stat	p-value
RoA Volatility (5yr)	0.0436	0.0600	-0.0164***	-15.4749	0.0000
RoA Volatility (3yr)	0.0552	0.0771	-0.0219***	-17.6765	0.0000
Total stock volatility	0.1715	0.2343	-0.0628***	-42.7152	0.0000
Idiosyncratic Volatility	0.1653	0.2166	-0.0513***	-37.0188	0.0000

Panel B

	Non Activists	Activists	Diff	t-stat	p-value
Leverage	0.1713	0.1888	-0.0175***	-6.8062	0.0000
Cash Holding	0.2318	0.2106	0.0212***	7.1140	0.0000
Capex	0.0512	0.0534	-0.0021***	-2.6788	0.0074
DIV/Equity	0.0229	0.0225	0.0004	0.2719	0.7857
Buyback/ Equity	0.0491	0.0422	0.0068*	1.9377	0.0527

Panel C

	Non Activists	Activists	Diff	t-stat	p-value
Av daily turnover	0.0093	0.0063	0.0031***	26.5299	0.0000
Amihud	0.0385	0.2184	-0.1799***	-38.2491	0.0000
Spread	0.0132	0.0236	-0.0104***	-54.0213	0.0000

Note: The table presents mean figures of dependent variables along with the differences in means of firms targeted by non-activists and those by activist hedge funds. Panel A presents univariate statistics of risk-taking variables, while Panel B and Panel C present Corporate decision variables and liquidity measures, respectively. *,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.2b. Univariate Analysis

Panel A

	Non Switchers	Switchers	Diff	t-stat	p-value
RoA Volatility (5yr)	0.0743	0.0903	-0.0160***	-3.8964	0.0001
RoA Volatility (3yr)	0.0577	0.0705	-0.0128***	-3.6962	0.0002
Total stock volatility	0.1653	0.2166	-0.0513***	-37.0188	0.0000
Idiosyncratic Volatility	0.2371	0.2216	0.0155***	3.3936	0.0007

Panel B

	Non Switchers	Switchers	Diff	t-stat	p-value
Leverage	0.1866	0.1989	-0.0123*	-1.7650	0.0776
Cash Holding	0.2046	0.2380	-0.0334***	-4.6675	0.0000
Capex	0.0540	0.0504	0.0036*	1.6850	0.0920
DIV/Equity	0.0231	0.0202	0.002	0.7660	0.4438
Buyback/ Equity	0.0444	0.0344	0.0100	0.5860	0.5580

Panel C

	Non Switchers	Switchers	Diff	t-stat	p-value
Av daily turnover	0.0062	0.0064	-0.0002	-0.7479	0.4546
Amihud	0.2394	0.1217	0.1178***	5.3743	0.0000
Spread	0.0244	0.0198	0.0046***	5.2626	0.0000

Note: The table presents mean figures of dependent variables along with the differences in means of firms targeted by activist hedge funds and passive hedge funds turned activists. Panel A presents univariate statistics of risk-taking variables, while Panel B and Panel C present Corporate decision variables and liquidity measures, respectively. *,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.3a. Multivariate Analysis. Hedge fund activism and risk-taking - Earnings Volatility

	RoA-Volatility-5yr						RoA-Volatility-3yr					
	1	2	3	4	5	6	7	8	9	10	11	12
Activism	0.0278***	0.0041**	0.0272***	0.0275***	0.0277***	0.0039**	0.0198***	0.0017	0.0196***	0.0197***	0.0198***	0.0018
	(0.0000)	(0.0107)	(0.0000)	(0.0000)	(0.0000)	(0.0161)	(0.0000)	(0.2176)	(0.0000)	(0.0000)	(0.0000)	(0.2030)
Size		-0.0185***				-0.0185***		-0.0145***				-0.0145***
		(0.0000)				(0.0000)		(0.0000)				(0.0000)
Return on equity			-0.0003***			-0.0003***			-0.0001**			-0.0001
			(0.0006)			(0.0011)			(0.0249)			(0.1709)
Tangibility				0.0231***		0.0238***				0.0209***		0.0218***
				(0.0000)		(0.0000)				(0.0000)		(0.0000)
Market-to-Book					-0.0002	0.0001					-0.0001	0.0002
					(0.2339)	(0.5258)					(0.7230)	(0.1944)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.13	0.22	0.13	0.13	0.13	0.23	0.12	0.19	0.12	0.12	0.12	0.20
N	49,898.00	49,894.00	49,894.00	48,594.00	49,898.00	48,594.00	48,815.00	48,813.00	48,813.00	47,584.00	48,815.00	47,584.00

Note: The table presents the following multivariate estimation:

$$Risk_{i,t} = \alpha + \beta . Activism_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t},$$

where $Risk_{i,t}$ gauges earnings volatility-5yr (in model 1-6) and -3yr (in model 7-12). $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t. $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. $\boldsymbol{FE}$ allows of time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard errors are reported in the parenthesis.*,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.3b. Multivariate Analysis. Hedge fund activism and risk-taking - Market-based measures of corporate risk-taking

	Stock return volatility						Idiosyncratic Volatility					
	1	2	3	4	5	6	7	8	9	10	11	12
Activism	0.0494***	0.0238***	0.0491***	0.0490***	0.0491***	0.0234***	0.0598***	0.0288***	0.0595***	0.0594***	0.0593***	0.0283***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Size		-0.0200***				-0.0199***		-0.0242***				-0.0242***
		(0.0000)				(0.0000)		(0.0000)				(0.0000)
Return on equity			-0.0002***			-0.0001***			-0.0002***			-0.0001***
			(0.0000)			(0.0002)			(0.0000)			(0.0017)
Tangibility				0.0041**		0.0045***				0.0096***		0.0098***
				(0.0280)		(0.0087)				(0.0000)		(0.0000)
Market-to-Book					-0.0006***	-0.0003***					-0.0009***	-0.0005***
					(0.0000)	(0.0091)					(0.0000)	(0.0000)
Adj. R^2	0.27	0.35	0.27	0.27	0.27	0.35	0.25	0.36	0.25	0.25	0.25	0.36
N	50,291.00	50,287.00	50,287.00	48,643.00	50,291.00	48,643.00	50,290.00	50,286.00	50,286.00	48,642.00	50,290.00	48,642.00

Note: The table presents the following multivariate estimation:

$$Risk_{i,t} = \alpha + \beta.Activism_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t} ,$$

Where $Risk_{i,t}$ gauges Stock return volatility (in columns 1-6) and Idiosyncratic Volatility (in columns 7-12). $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. **FE** allows of time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard errors are reported in the parenthesis.*,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.3c. Multivariate Analysis. Passive hedge fund turned activists and corporate risk-taking

	RoA-Volatility-5yr						RoA-Volatility-3yr					
	1	2	3	4	5	6	7	8	9	10	11	12
Activism	0.0254***	0.0030*	0.0247***	0.0253***	0.0253***	0.0030*	0.0030*	0.0006	0.0174***	0.0177***	0.0176***	0.0009
	(0.0000)	(0.0657)	(0.0000)	(0.0000)	(0.0000)	(0.0723)	(0.0723)	(0.6520)	(0.0000)	(0.0000)	(0.0000)	(0.5396)
Switcher	0.0179***	0.0086***	0.0182***	0.0163***	0.0179***	0.0072***	0.0072***	0.0085***	0.0159***	0.0143***	0.0158***	0.0071***
	(0.0000)	(0.0003)	(0.0000)	(0.0000)	(0.0000)	(0.0024)	(0.0024)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0008)
Size		-0.0185***				-0.0185***	-0.0185***	-0.0144***				-0.0145***
		(0.0000)				(0.0000)	(0.0000)	(0.0000)				(0.0000)
Return on equity			-0.0003***			-0.0003***	-0.0003***		-0.0001**			-0.0001
			(0.0006)			(0.0011)	(0.0011)		(0.0232)			(0.1663)
Tangibility				0.0227***		0.0236***	0.0236***			0.0205***		0.0216***
				(0.0000)		(0.0000)	(0.0000)			(0.0000)		(0.0000)
Market-to-Book					-0.0002	0.0001	0.0001				-0.0000	0.0002
					(0.2528)	(0.5154)	(0.5154)				(0.7576)	(0.1887)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.13	0.22	0.13	0.13	0.13	0.23	0.23	0.19	0.12	0.12	0.12	0.20
N	49,898.00	49,894.00	49,894.00	48,594.00	49,898.00	48,594.00	48,594.00	48,813.00	48,813.00	47,584.00	48,815.00	47,584.00

Note: The table presents the following multivariate estimation:

$$Risk_{i,t} = \alpha + \beta Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t},$$

where $Risk_{i,t}$ gauges earnings volatility-5yr (in models 1-6) and -3yr (in models 7-12). $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. While β gauges the effect of hedge fund activism on risk-taking, π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{FE}$ allows time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard errors are reported in the parenthesis. *,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.3d. Passive turned Active Hedge Funds: Market measures of risk-taking.

	Average monthly stock Volatility						Idiosyncratic Volatility					
	1	2	3	4	5	6	7	8	9	10	11	12
Activism	0.0477***	0.0235***	0.0474***	0.0471***	0.0473***	0.0230***	0.0577***	0.0284***	0.0574***	0.0572***	0.0572***	0.0278***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Switcher	0.0129***	0.0026	0.0130***	0.0134***	0.0128***	0.0035	0.0157***	0.0033	0.0159***	0.0159***	0.0155***	0.0038
	(0.0000)	(0.2191)	(0.0000)	(0.0000)	(0.0000)	(0.1067)	(0.0000)	(0.1515)	(0.0000)	(0.0000)	(0.0000)	(0.1008)
Size		-0.0199***				-0.0199***		-0.0242***				-0.0241***
		(0.0000)				(0.0000)		(0.0000)				(0.0000)
Return on equity			-0.0002***			-0.0001***			-0.0002***			-0.0001***
			(0.0000)			(0.0002)			(0.0000)			(0.0016)
Tangibility				0.0037**		0.0044**				0.0091***		0.0097***
				(0.0452)		(0.0103)				(0.0000)		(0.0000)
Market-to-Book					-0.0006***	-0.0003***					-0.0009***	-0.0005***
					(0.0000)	(0.0094)					(0.0000)	(0.0000)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.27	0.35	0.27	0.27	0.27	0.35	0.25	0.36	0.25	0.25	0.25	0.36
N	50,291.00	50,287.00	50,287.00	48,643.00	50,291.00	48,643.00	50,290.00	50,286.00	50,286.00	48,642.00	50,290.00	48,642.00

Note: The table presents the following multivariate estimation:

$$Risk_{i,t} = \alpha + \beta Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t},$$

where $Risk_{i,t}$ gauges total stock volatility of monthly return (Models [1-6]) and Idiosyncratic Volatility of monthly return based on market model (Models [7-12]). $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. $\boldsymbol{FE}$ allows of time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard errors are reported in the parenthesis. *,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.4. Hedge fund Activism and Corporate risk-taking - The debt employment

Dependent Variable: Leverage	1	2	3	4	5	6	7	8	9	10	11	12
Activism	0.0076**	0.0389***	0.0076***	0.0054*	0.0058**	0.0359***	0.0063**	0.0362***	0.0064**	0.0048	0.0046	0.0338***
	(0.0100)	(0.0000)	(0.0096)	(0.0675)	(0.0480)	(0.0000)	(0.0350)	(0.0000)	(0.0337)	(0.1117)	(0.1207)	(0.0000)
Switcher							0.0092**	0.0218***	0.0092**	0.0044	0.0085*	0.0165***
							(0.0369)	(0.0000)	(0.0372)	(0.3147)	(0.0530)	(0.0002)
Size		0.0246***				0.0254***		0.0248***				0.0256***
		(0.0000)				(0.0000)		(0.0000)				(0.0000)
Return on equity			0.0000			0.0000			0.0000			0.0000
			(0.1835)			(0.9292)			(0.1926)			(0.9583)
Tangibility				0.1074***		0.1034***				0.1073***		0.1029***
				(0.0000)		(0.0000)				(0.0000)		(0.0000)
Market-to-Book					-0.0029***	-0.0028***					-0.0029***	-0.0028***
					(0.0000)	(0.0000)					(0.0000)	(0.0000)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.18	0.22	0.18	0.20	0.18	0.24	0.18	0.22	0.18	0.20	0.18	0.24
N	49,738.00	49,738.00	49,738.00	48,438.00	49,738.00	48,438.00	49,738.00	49,738.00	49,738.00	48,438.00	49,738.00	48,438.00

Note: The table presents the following multivariate estimations:

$$Debt_{i,t} = \alpha + \beta Activism + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t} \text{ in columns (1-6) and}$$

$$Debt_{i,t} = \alpha + \beta Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t} \text{ in columns (7-12),}$$

where $Debt_{i,t}$ gauges Leverage is defined by the book value of total debt to total asset ratio. $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. $\boldsymbol{FE}$ allows of time varying industry shocks. Variables are defined in appendix A4.1. Robust Standard clustered at firm levels are reported in the parenthesis.*,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.5. Hedge fund Activism and Corporate risk-taking - The Cash-holding

Dependent Variable: Cash Holding	1	2	3	4	5	6	7	8	9	10	11	12
Activism	-0.0085***	-0.0454***	-0.0086***	-0.0055**	-0.0058**	-0.0403***	-0.0089***	-0.0440***	-0.0091***	-0.0072***	-0.0064**	-0.0402***
	(0.0020)	(0.0000)	(0.0017)	(0.0416)	(0.0327)	(0.0000)	(0.0014)	(0.0000)	(0.0012)	(0.0090)	(0.0213)	(0.0000)
Switcher							0.0033	-0.0116***	0.0034	0.0123***	0.0043	-0.0014
							(0.4047)	(0.0035)	(0.3984)	(0.0017)	(0.2745)	(0.7145)
Size		-0.0290***				-0.0294***		-0.0291***				-0.0294***
		(0.0000)				(0.0000)		(0.0000)				(0.0000)
Return on equity			-0.0001			-0.0001			-0.0001			-0.0001
			(0.5960)			(0.5353)			(0.5951)			(0.5360)
Tangibility				-0.1708***		-0.1652***				-0.1711***		-0.1652***
				(0.0000)		(0.0000)				(0.0000)		(0.0000)
Market-to-Book					0.0044***	0.0041***					0.0044***	0.0041***
					(0.0000)	(0.0000)					(0.0000)	(0.0000)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.35	0.39	0.35	0.39	0.36	0.44	0.35	0.39	0.35	0.39	0.36	0.44
N	49,894.00	49,894.00	49,894.00	48,594.00	49,894.00	48,594.00	49,894.00	49,894.00	49,894.00	48,594.00	49,894.00	48,594.00

Note: The table presents the following two multivariate estimations:

$$Cash_{i,t} = \alpha + \beta Activism_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (1-6) and

$$Cash_{i,t} = \alpha + \beta Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (7-12),

where $Cash_{i,t}$ gauges Cash-holding computed as total cash and cash equivalent scaled by total assets. $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. $\boldsymbol{FE}$ allows of time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard clustered at firm levels are reported in the parenthesis.*,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.6a. Hedge fund Activism and Corporate risk-taking - The Capital Expenditure

Dependent Variable: Capital Expenditure	1	2	3	4	5	6	7	8	9	10	11	12
Activism	-0.0038***	-0.0041***	-0.0038***	-0.0052***	-0.0036***	-0.0055***	-0.0041***	-0.0044***	-0.0041***	-0.0051***	-0.0040***	-0.0054***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Switcher							0.0025**	0.0024*	0.0025**	-0.0008	0.0025**	-0.0009
							(0.0401)	(0.0526)	(0.0393)	(0.5016)	(0.0358)	(0.4532)
Size		-0.0003*				-0.0004**		-0.0003				-0.0004**
		(0.0984)				(0.0142)		(0.1291)				(0.0126)
Return on equity			-0.0000			-0.0000			-0.0000			-0.0000
			(0.3063)			(0.5761)			(0.3018)			(0.5822)
Tangibility				0.0649***		0.0654***				0.0649***		0.0655***
				(0.0000)		(0.0000)				(0.0000)		(0.0000)
Market-to-Book					0.0002***	0.0005***					0.0002***	0.0005***
					(0.0000)	(0.0000)					(0.0000)	(0.0000)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.36	0.36	0.36	0.45	0.37	0.45	0.36	0.36	0.36	0.45	0.37	0.45
N	49,640.00	49,640.00	49,640.00	48,366.00	49,640.00	48,366.00	49,640.00	49,640.00	49,640.00	48,366.00	49,640.00	48,366.00

Note: The table presents the following two multivariate estimations:

$$Capex_{i,t} = \alpha + \beta.Activism + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (1-6) and

$$Capex_{i,t} = \alpha + \beta.Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (7-12),

where $Capex_{i,t}$ gauges Capital expenditure scaled by total assets. $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. FE allows for time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard clustered at firm levels are reported in the parenthesis. *,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.6b. Hedge fund Activism and Corporate risk-taking – Investment Efficiency

	1	2
Activism	-0.9379	-0.9892
	(0.2405)	(0.2173)
Switcher		0.3727
		(0.6692)
Size	1.7599***	1.7637***
	(0.0000)	(0.0000)
Return on equity	27.1246***	27.1281***
	(0.0000)	(0.0000)
Tangibility	1.2778	1.2675
	(0.2714)	(0.2737)
Market-to-Book	-0.0113	-0.0112
	(0.8944)	(0.8949)
Industry FE*Year FE	Yes	Yes
Adj. R^2	0.26	0.26
N	39,417.00	39,417.00

Note: The table presents the following two multivariate estimations:

$$Invest\ Eff_{i,t,\widehat{t+3}} = \alpha + \beta.Activism + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in column (1) and

$$Invest\ Eff_{i,t,\widehat{t+3}} = \alpha + \beta.Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t},$$ in column (2),

where $Invest\ Eff_{i,t,\widehat{t+3}}$gauges average operating earnings generated in 3 lead periods per dollar invested today. $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{FE}$ allows of time varying industry shocks. Other variables are defined in Appendix A4.1. Robust Standard clustered at firm levels are reported in the parenthesis.*,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.7a. Hedge fund Activism and Corporate risk-taking - Dividend Payout

Dependent Variable: Dividend Payout	1	2	3	4	5	6	7	8	9	10	11	12
Activism	-0.0031**	0.0012	-0.0031*	-0.0034**	-0.0006	0.0027*	-0.0025	0.0013	-0.0025	-0.0027*	-0.0001	0.0029*
	(0.0497)	(0.4426)	(0.0500)	(0.0372)	(0.6806)	(0.0889)	(0.1161)	(0.4067)	(0.1168)	(0.0999)	(0.9545)	(0.0730)
Switcher							-0.0031	-0.0007	-0.0031	-0.0036*	-0.0030	-0.0012
							(0.1343)	(0.7220)	(0.1340)	(0.0959)	(0.1380)	(0.5719)
Size		0.0031***				0.0030***		0.0031***				0.0029***
		(0.0000)				(0.0000)		(0.0000)				(0.0000)
Return on equity			0.0000			-0.0000			0.0000			-0.0000
			(0.7451)			(0.4992)			(0.7124)			(0.5182)
Tangibility				0.0076***		0.0112***				0.0077***		0.0112***
				(0.0000)		(0.0000)				(0.0000)		(0.0000)
Market-to-Book					0.0028***	0.0029***					0.0028***	0.0029***
					(0.0000)	(0.0000)					(0.0000)	(0.0000)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.21	0.21	0.21	0.16	0.24	0.20	0.21	0.21	0.21	0.16	0.24	0.20
N	23,982	23,981	23,981	23,013	23,982	23,013	23,982	23,981	23,981	23,013	23,982	23,013

Note: The table presents the following two multivariate estimations:

$$Dividend_{i,t} = \alpha + \beta.Activism + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t} \text{ in columns (1-6) and}$$

$$Dividend_{i,t} = \alpha + \beta.Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}, \text{ in columns (7-12),}$$

where $Dividend_{i,t}$ gauges Total dividend scaled by total equity. $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{FE}$ allows of time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard clustered at firm levels are reported in the parenthesis. *,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.7b. Hedge fund Activism and Corporate risk-taking - Share buy-buybacks

Dependent Variable: Buybacks	1	2	3	4	5	6	7	8	9	10	11	12
Activism	-0.0155***	-0.0012	-0.0155***	-0.0153***	-0.0104***	0.0033	-0.0128***	-0.0000	-0.0128***	-0.0124***	-0.0077***	0.0046*
	(0.0000)	(0.6400)	(0.0000)	(0.0000)	(0.0000)	(0.2303)	(0.0000)	(0.9917)	(0.0000)	(0.0000)	(0.0021)	(0.0955)
Switcher							-0.0150***	-0.0073**	-0.0150***	-0.0158***	-0.0149***	-0.0076**
							(0.0000)	(0.0305)	(0.0000)	(0.0000)	(0.0000)	(0.0246)
Size		0.0102*** (0.0000)				0.0106*** (0.0000)		0.0101*** (0.0000)				0.0105*** (0.0000)
Return on equity			-0.0000 (0.4832)			-0.0000*** (0.0006)			-0.0000 (0.5250)			-0.0000*** (0.0008)
Tangibility				-0.0153*** (0.0000)		-0.0084*** (0.0002)				-0.0149*** (0.0000)		-0.0082*** (0.0003)
Market-to-Book					0.0059*** (0.0000)	0.0057*** (0.0000)					0.0059*** (0.0000)	0.0057*** (0.0000)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.46	0.47	0.46	0.47	0.49	0.51	0.46	0.47	0.46	0.47	0.49	0.51
N	23,991.00	23,990.00	23,990.00	23,022.00	23,991.00	23,022.00	23,991.00	23,990.00	23,990.00	23,022.00	23,991.00	23,022.00

Note: The table presents the following two multivariate estimations:

$$Buyback_{i,t} = \alpha + \beta Activism + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (1-6) and

$$Buyback_{i,t} = \alpha + \beta Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (7-12),

where $Buyback_{i,t}$ gauges Share buybacks scaled by total equity. $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{FE}$ allows of time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard clustered at firm levels are reported in the parenthesis. *,**,*** indicates significance at 10%,5% and 1% respectively. Sample period: 1995-2017.

Table 4.8. Hedge fund Activism and Corporate risk-taking - Liquidity Consequence

Dependent Variable	1	2	3	4	5	6
	Average Daily Turnover	Amihud	Bid-ask Spread	Average Daily Turnover	Amihud	Bid-ask Spread
Activism	-0.0012***	0.1244***	0.0060***	-0.0011***	0.1271***	0.0061***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Switcher				-0.0009***	-0.0213*	-0.0013***
				(0.0000)	(0.0542)	(0.0002)
Size	0.0011***	-0.0573***	-0.0038***	0.0011***	-0.0575***	-0.0038***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Return on equity	0.0000	0.0001	-0.0000	0.0000	0.0001	-0.0000
	(0.6121)	(0.5328)	(0.1693)	(0.5831)	(0.5236)	(0.1772)
Tangibility	-0.0018***	0.0574***	0.0011***	-0.0018***	0.0580***	0.0011***
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0001)
Market-to-Book	0.0001***	-0.0029***	-0.0001***	0.0001***	-0.0029***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Industry FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.21	0.14	0.30	0.21	0.14	0.30
N	48,549.00	48,680.00	48,713.00	48,549.00	48,680.00	48,713.00

Note: The table presents the following two multivariate estimations:

$$Liquidity_{i,t} = \alpha + \beta Activism_{i,t} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (1-3) and

$$Liquidity_{i,t} = \alpha + \beta Activism_{i,t} + \pi Switcher_{it} + \boldsymbol{\lambda_k X_{i,t-1}} + \boldsymbol{FE} + e_{i,t}$$ in columns (4-6),

where $\text{Liquidity}_{i,t}$ is gauged by Average Daily turnover (column 1 and column 4), Amihud Illiquidity (column 2 and column 5) and Bid-ask Spread (column 3 and column 6). $Activism_{it}$ takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise. $Switcher_{it}$ takes the value of 1 if the passive hedge fund of a target firm i turns activist in year t and zero otherwise. $\boldsymbol{X_{i,t-1}}$ controls firm characteristics. While β gauges the effect of hedge fund activism on risk-taking π estimates the effect of passive hedge funds that turn activists (switchers). $\boldsymbol{FE}$ allows of time varying industry shocks. Variables are defined in Appendix A4.1. Robust Standard clustered at firm levels are reported in the parenthesis. *,**,*** indicates significance at 10%, 5% and 1% respectively. Sample period: 1995-2017.

Figure 4.1: Time series plot of RoA-volatility of activists and non-activist hedge funds

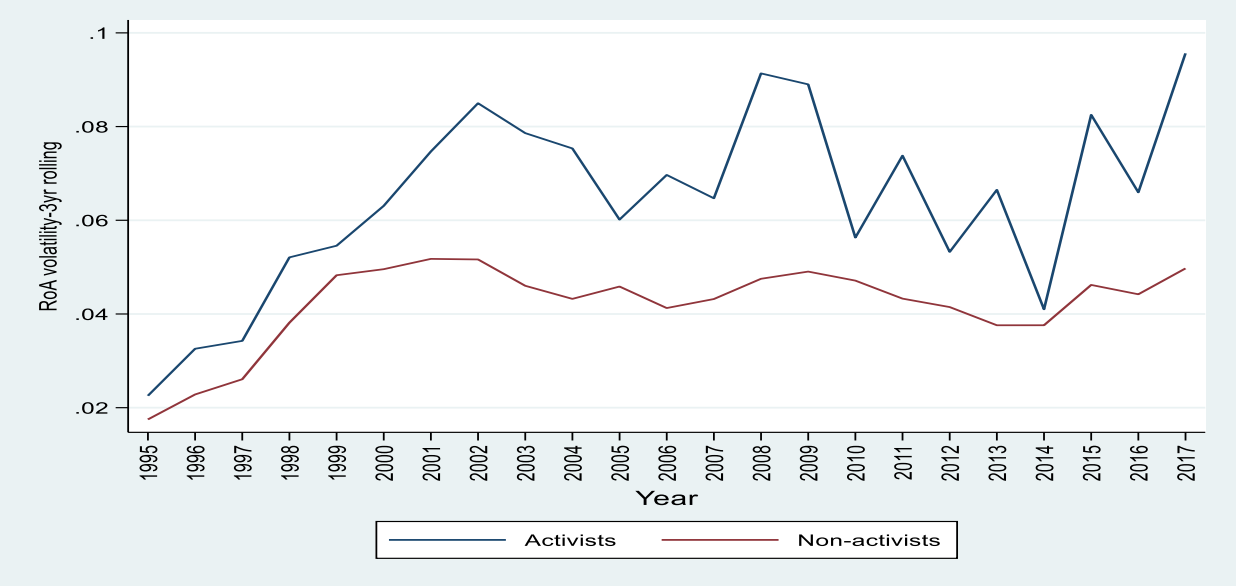


Figure 4.1a: Time series plot of RoA volatility gauged by 3-year rolling standard deviation of (operating profit) EBITDA as a proportion of total assets of activists and non-activist hedge funds.

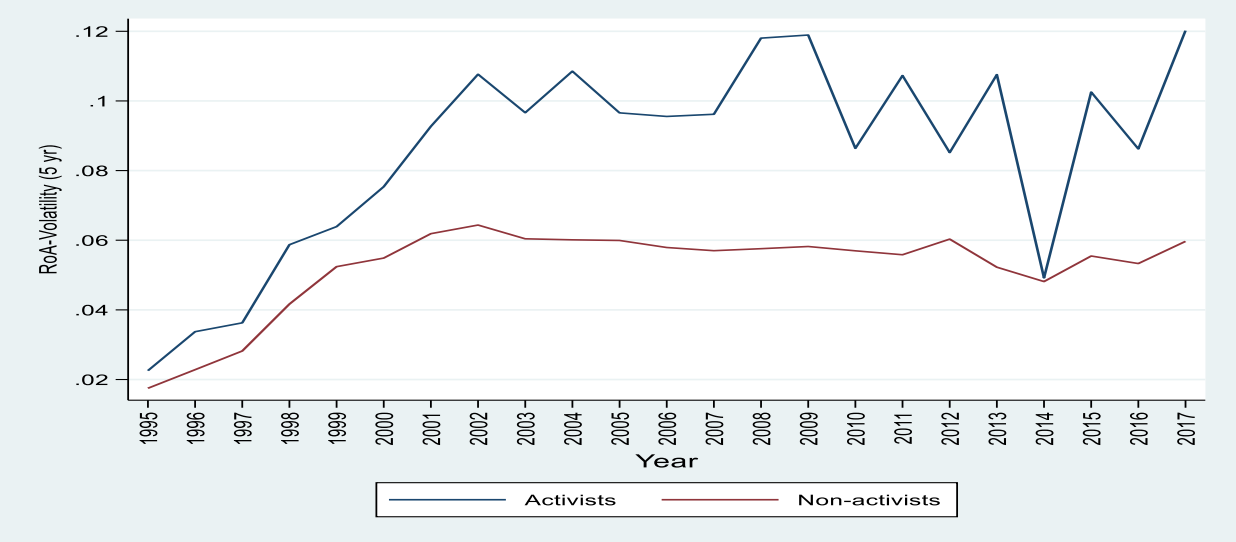


Figure 4.1b: This figure plots the time series of RoA volatility gauged by 5-year rolling standard deviation of (operating profit) EBITDA as a proportion of total assets of activists and non-activist hedge funds.

Figure 4.2: Time series plot of stock return-volatility of activists and non-activist hedge funds

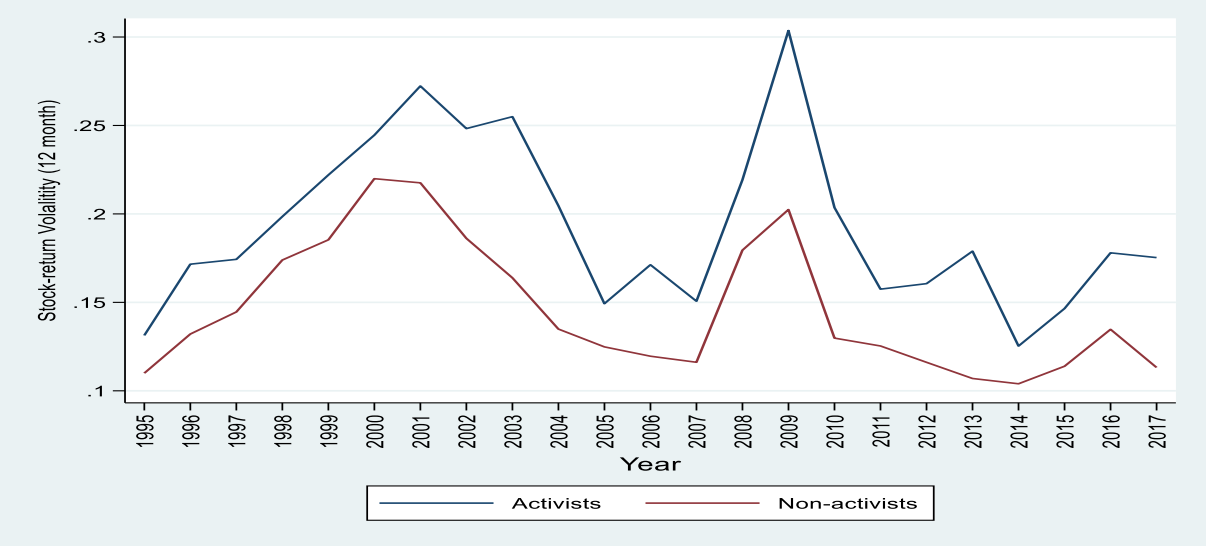


Figure 4.2a: This figure plots the time series of rolling standard deviation of the 12-month forward stock return of activists and non-activist hedge funds.

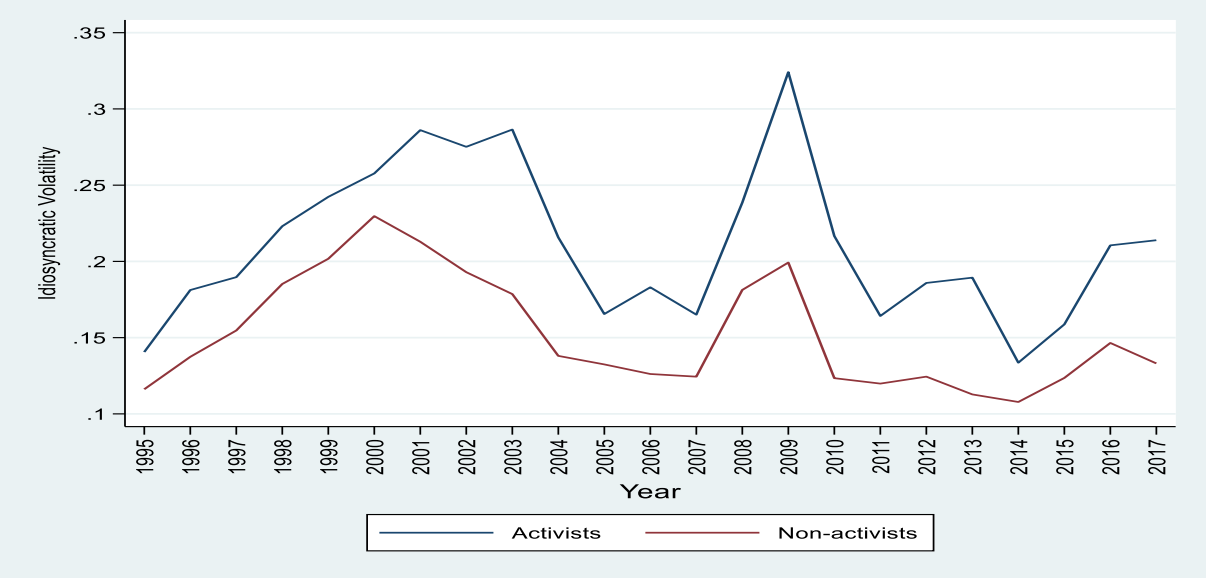


Figure 4.2b: This figure plots the time series of 12 months forward rolling idiosyncratic –volatility of activists and non-activist hedge funds.

4.11 Appendix

Appendix A4.1. Definition of variables

This table shows the construction of the variables. Explanations are provided in the description of the variables in the text.

Variables	Calculation	Source
Dependent Variables		
σ(RoA)-forward 5yr	5 yr − rolling forward σ(RoA) where RoA=EBITDA/Total Assets	Compustat NA
σ(RoA)-forward 3yr	3 yr − rolling forward σ(RoA)	Compustat NA
Stock return volatility	12 month forward rolling standard deviation of monthly stock return	Compustat NA
Idiosyncratic volatility	12 month forward rolling standard deviation of residual of return predicted by market-model.	Compustat NA
Debt/ TA	Total Debt /Total Assets ()	Compustat NA
Capex/TA	Capital Expenditure /Total Assets	Compustat NA
Cash-holding	Total Cash holding/Total Assets	Compustat NA
Other variables		
$Dividend_{i,t}$	Total dividend scaled by total equity	Compustat NA
$Buyback_{i,t}$	Total Share buybacks scaled by total equity	Compustat NA
Liquidity Variables		
Average daily turnover	Average number of shares traded within a day in a given stock as a fraction of total shares outstanding.	
$Amihud_{i,t}$	$\frac{1}{iT}\sum_{i=1}^{T}\frac{\lvert Daily\ return_i\rvert}{Daily\ trading\ Volume_i}$	Compustat NA
Bid-ask spread	Implied bid-ask spread is based on Corwin and Schultz (2012). The spread measures the transaction cost of round trip, and therefore higher spread implies illiquid stock.	Compustat NA
Independent Variables		
$Activism_{it}$	Categorical variable that takes the value of 1 if a firm i is targeted by hedge fund activism in year t, and zero otherwise.	SEC filing
$Switcher_{it}$	Categorical variable that takes the value of 1 if passive hedge fund of a target firm i turns activist in year t and zero otherwise.	SEC filing
Control Variables		
Firm Control		
Firm Size	ln (Book-value of Total Assets)	Compustat NA
Tangibility	Property, Plant and Equipment / Total Assets	Compustat NA
Return on equity	Net income/Total Shareholder equity	Compustat NA
Tangibility	Total PPE/Total Asset	Compustat NA
Market to book	Total market capitalization to book value of equity	Compustat NA
Industry	65 unique industries based on SIC-2 digits non-financial firms	Compustat NA

Appendix A4.2. Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) RoA Volatility (3yr)	1.00																
(2) RoA Volatility (5yr)	0.89*	1.00															
(3) Leverage	-0.02*	-0.02*	1.00														
(4) Cash	0.24*	0.26*	-0.30*	1.00													
(5) Capex	0.03*	0.02*	0.11*	-0.14*	1.00												
(6) R&D	0.45*	0.46*	-0.12*	0.49*	-0.03*	1.00											
(7) Dividend	-0.03*	-0.04*	0.08*	-0.08*	-0.02*	-0.09*	1.00										
(8) Buybacks	-0.05*	-0.05*	0.00	-0.02*	-0.02*	-0.09*	0.20*	1.00									
(9) Average daily turnover	0.09*	0.09*	0.01	0.18*	0.07*	0.03*	-0.06*	0.05*	1.00								
(10) Amihud	0.13*	0.16*	0.02*	-0.01	-0.02*	0.09*	-0.03*	-0.04*	-0.09*	1.00							
(11) Spread	0.20*	0.22*	-0.03*	0.09*	0.01	0.22*	-0.08*	-0.09*	-0.03*	0.46*	1.00						
(12) Size	-0.31*	-0.34*	0.22*	-0.35*	-0.05*	-0.45*	0.10*	0.10*	0.14*	-0.23*	-0.44*	1.00					
(13) Profitability	-0.45*	-0.47*	-0.02*	-0.22*	-0.04*	-0.63*	0.07*	0.11*	-0.02*	-0.21*	-0.33*	0.43*	1.00				
(14) Tangibility	0.05*	0.03*	0.22*	-0.35*	0.53*	-0.08*	0.02*	-0.04*	-0.05*	0.05*	0.03*	0.07*	-0.02*	1.00			
(15) MB	0.03*	0.02*	-0.08*	0.17*	0.02*	0.02*	0.18*	0.19*	0.09*	-0.07*	-0.06*	-0.02*	0.06*	-0.09*	1.00		
(16) Activist	0.06*	0.07*	0.02*	-0.03*	0.01*	0.06*	0.00	-0.02*	-0.11*	0.15*	0.22*	-0.24*	-0.14*	0.03*	-0.04*	1.00	
(17) Switchers	0.06*	0.06*	0.01*	0.02*	0.01*	0.06*	-0.02*	-0.03*	-0.06*	0.03*	0.04*	-0.11*	-0.06*	0.02*	-0.01*	0.18*	1.00

Note: The table shows the pairwise correlation of the variables used in the study. Variables are defined in the text and in Appendix A4.1.
*,**,*** indicates significance at 10%, 5% and 1% respectively. Sample period is 1995-2017.

Appendix A4.3 Economic arguments explaining a firm's borrowing decisions

Tradeoff theory

The theory posits that capital structure is optimal for the cost and benefit of debt arising in different ways. Firms may trade off the tax benefits of debt for bankruptcy costs. Alternatively, debt controls agents (i.e. managers) and mitigates agency problems of free cash flow (Jensen and Meckling (1976) and Jensen (1986)). On the other side, an increase in debt increases the agency conflict between equity holders and debt holders. Similarly, in product market interaction, a capital structure can be thought of as a trade-off between the benefits of debt and liquidation costs rather than the costs of bankruptcy (Parsons and Titman (2008)). A dynamic variant of tradeoff theory is that capital structure is time-varying optimal with partial adjustments (Chang and Dasgupta, 2009), and there exists a target leverage zone (DeAngelo and Roll, 2014). Hackbarth, Hennesy and Leland (2007) empirically inferred that the Tradeoff theory explains many stylized facts regarding corporate debt structure variations.

Pecking order theory

Financing choices are affected by the costs related to asymmetrical information between management and outside investors, which results in an adverse selection problem. Consequently, the firm prefers a hierarchy of funds with a preference for the financing choices with the lowest adverse selection cost. Wherever possible, retained earnings are used. Debt financing will be used if retained earnings are insufficient, and equity will be used only as a last resort (Myers, (1984), Myers and Majluf (1984)). As per the pecking order, the optimal leverage ratio is non-existent. Although the theory

has been initially propounded accounting for asymmetric information, pecking order can be the result of tax, agency or behavioural factors (Frank and Goyal, 2009).

Market timing theory

The fundamental notion of market timing theory is that the manager assesses current market conditions of debt and equity for a firm's financing decision and uses them based on their relative favorability. If neither market looks favourable, financing may be deferred, and if the current condition is highly favourable, a firm may raise funds even if currently not needed. Baker and Wurgler (2002) posit that capital structure is the cumulative effect of past attempts to time the market.

Other Explanations of Capital Structure

Recent studies in corporate finance have started exploring the contribution of financing contracts, their types and features, including covenants, maturity, and renegotiation in firms financing decisions (Graham and Leary, 2011). In another study, Berk et al. (2010) documented that capital structure is affected by employees' stake in the firm. Leverage increases the risk for employees, as they are exposed to unemployment risk in the event of bankruptcy, which is ultimately borne by the company in the form of higher wages which pressurizes the lower use of debt. Similarly, corporate borrowing is documented to be affected by managerial traits CEO experience, ownership and tenure (Hackbarth (2008), Strebulaev and Yang (2013)).

Appendix A4.4 Motives of Corporate Cash Holdings

Transactional Motive

For the day-to-day functioning of a business, money plays an important medium of exchange. In the day-to-day production and operation processes, firms would engage in the procurement of raw materials, plant and machinery or pay wages and salaries, which need cash. Baumol (1952) argued that cash reserves may be utilised as an intermediary for the corporation to operate as a medium of transaction, and he developed an inventory model to show that transactional money demand is indeed affected to some extent by interest rates. However, the assumption of this approach is that business cash flow is stable and there is no funding crisis. According to Miller and Orr (1966), the company's actual cash demand fluctuates a lot and is impossible to estimate effectively. As a result, when designing the optimal cash holding model, the cash flow factor is included. Similarly, Himmelberg (2003) developed a cash holding transactional demand model and discovered that production factors like raw material inputs, labour, and inventory prices all have an impact on the firm's cash holdings.

Precautionary Motive

Firms hold cash not only to meet the daily transactional demands but also to avoid various uncertain risks. Morris (1982) investigates the issue of firms' cash holding and shows that the lower level of cash holding by firms could lead to higher cash management costs. The reason follows when firms hold less cash, that leads to an increase in the idiosyncratic risks caused by uncertainty.

Bates et al. (2009) document that the average corporate cash holding as a percentage of total assets of industrial firms in the US from 1980 to 2006 grew by more

than two folds. They attribute this growth to the continued increase in cash flow risks during this period.

Speculative Motive

Cash is the most liquid form of asset, allowing the company to take advantage of any favourable opportunities. As a result, some businesses keep cash on hand in order to take advantage of market opportunities whenever they emerge, which is known as the speculative motive proposed by Keynes. In the presence of information asymmetry, Myers and Majluf (1984) proposed the value relevance of currency. If the company does not have enough cash on hand, it may be unable to take advantage of attractive prospects. As a result, shareholders value holding a dollar of cash more than a dollar in such a situation.

Agency Motive

Jensen (1986) propounded the free cash flow argument, which put forward the idea that the self-interested managers might want to hold more cash for private consumption, abuse of funds, and satisfying their personal needs and network building like club membership at the expense of shareholders' value. Firstly, in order to protect their own personal interests and fulfil their personal goal, agent-managers are more likely to pile up cash. Secondly, cash stock can prevent capital market scrutiny faced by managers in the event they need to raise additional funds for investments. Wu et al. (2007) say that the motives for holding high cash holdings of the Chinese listed firms are not due to external financing constraints but rather the manager's self-interest.

Chapter 5. CONCLUSION

My thesis sheds light on the role of regulatory intervention on hedge fund return and risk. The question of whether to regulate hedge funds occupies a central concern of regulatory economics. However, empirical evidence in this regard is divided and inconclusive. On one side of the argument are the advocates of no regulation who maintain that regulation protecting consumer protection might not be convincing due to the specialised investment class offered by hedge funds favouring opacity of these funds and that they are only accessible to a limited set of investors. This view posits that existing regulatory methods focusing on more disclosure regimes and restricted works may not necessarily bring the intended positive outcome. These proponents maintain that regulation destroys the very essence of hedge funds and may translate these into other regulated asset classes like mutual funds and pension funds.

Supporters of hedge fund regulation, on the other hand, are on the other side of the debate. The main issue about hedge funds' systemic repercussions is that the failure of just one of them might have far-reaching consequences for the whole financial system. Hedge fund investment techniques can have more opacity, herding, the usage of complicated financial instruments, and market liquidity risk, all of which can jeopardise financial stability. One of the ways hedge funds can increase their returns is through the use of leverage. The risk of high leverage stems from the fact that, unlike regulated financial institutions, hedge funds have no maximum limit on the amount of leverage they can use. Hedge fund defaults are more likely and more severe as a result of this. Due to the high magnitude of hedge fund investments, liquidation may trigger major swings in market pricing and affect the positions of hedge fund counterparties

and other market participants. This could cause a market reaction, raising regulatory issues. The combination of leverage and other risks could create more dangerous circumstances, where hedge fund defaults could swiftly spiral out of control, causing catastrophic systemic effects.

When combined with the leverage, their limited high opacity is a worrying concern for financial stability. Hedge fund holdings are difficult to value accurately due to the usage of highly sophisticated financial instruments. As a result, investors must rely on the fund's public information. Because a manager may have the incentive and power to alter the portfolio's worth, the genuine value may not be displayed. This could lead to erroneous fees and appraisals. Because credit is typically delivered through securities lending and derivative contracts, effective supervision of contracts between banks and hedge funds is extremely difficult. It becomes difficult for supervisors to determine how assets are utilised as collateral for various transactions and how this translates into risk.

In addition to the concerns about financial stability and high leverage, there is also concern about hedge funds' propensity to cause market liquidity to dry up. Because hedge funds typically make substantial investments, their actions could have a significant price impact, making it harder for other investors to unwind their positions. When hedge funds provide liquidity and stability when other investors try to sell their positions in down markets, this behaviour could have a reverse impact. Finally, the availability of hedge fund products to individual investors and the broader public via pension funds has presented additional regulatory challenges.

To the concern mentioned above, my research sheds important light on the impact of the hedge fund regulation on fund performance and volatility. Motivated by the theoretical tension for and against regulating Hedge funds, this thesis employs a large sample of European and US hedge fund for the study period of 2004 to 2017 and examine the effect of hedge fund regulation on fund performance and volatility and a differential effect of regulation on performance based on fund heterogeneity.

The study has two important revelations. First, the overall hedge fund industry experienced a decline in performance, similar to what has been documented in previous studies. However, when used a different set of the control group (funds that are not affected by HFR), the reduction of performance is equally pronounced among unaffected funds opening the possible interpretation that the changing market factors post-financial crisis 2008-09 could have led to the fall of fund performance due to increased scrutiny the funds have faced by regulators and investors.

Second, hedge fund regulation has a distributional effect on the return based on fund heterogeneity. In line with the distributive effect of regulation towards smaller firms, this thesis shows that hedge fund regulation positively affects the performance of smaller funds as the new information regime facing funds in the post-regulation should lower information friction and adverse selection cost in Europe. In the US context, however, no such distributional effect is documented. Next, this thesis finds the substitution of law to incentive package lowering adverse selection costs. I further find some evidence that in a regime switch following hedge fund regulation, the transparency and disclosure requirement should lower the information asymmetry cost, thereby making the lock-up period less relevant in the post HFR period in the US.

The findings of this thesis add to broader literature the merit of regulation in bringing positive market outcomes when facing constraints or friction. Similarly, this thesis adds to the regulatory economics debate on the distributive effect of regulation. The implication of the study is in line with the view that by eliminating market frictions and improving the information environment, regulation could help otherwise constrained players enjoy positive market outcomes. This thesis underscores the importance of regulation in lowering destabilising ability of hedge funds by reducing volatility. The findings imply that regulation could be Pareto-efficient in lowering volatility in the HF markets and, therefore, desirable from a market stability viewpoint and could be an important policy input to the regulators.

The second important question this thesis explores is the drivers of hedge fund activism.

In doing so, I employ an extensive set of hedge fund filing data and trace target firms associated with the activist hedge fund filing for the US firms and extend the current literature in activism by investigating firm antecedents, industry peer characteristics and competitive forces as drivers of hedge fund activism.

While shareholders (principal), in theory, can lower the impact of sub-optimal decision making by the managers (agents), the free-rider problem associated with costly information search and lower proportion of stock holding can make monitoring sub-optimal for general shareholders. However, an activist hedge fund could act as an informed investor as it is optimal for them to chase costlier information on the target firm they target, a firm that is potentially exposed to higher adverse selection costs and information asymmetry driven frictions and aims to correct misevaluation of target firms. On a related economic mechanism, agency driven conflict of interest could

incentivise a manager to underinvest in value relevant projects or underperform to enjoy managerial slack. To this end, hedge fund activism would target firms with higher agency problems of underperformance. Taken together, this chapter explores and document information asymmetry and agency related situation facing a firm and explain whether a firm could be targeted by an activist hedge fund where hedge fund activism is driven by mis-valuation, underperformance and corporate conservatism.

In the investigation of the potential impact of corporate risk-taking of target firms on the propensity to hedge fund activism, the results provide important insights. First, the propensity to hedge fund activism is positively related to corporate conservatism. On the other hand, conservatism related to cash-holding and debt employability seem to discourage hedge fund activism. As higher debt employment relates to firm access to external capital, the results provide an interesting insight into the hedge fund activism literature in the sense that while hedge funds normally have a higher appetite for higher debt employability, they do not tend to improve financial access rather would target firms which already have better access to the debt market.

The exploration of passive hedge funds turning activists reveals that a hedge fund may gather inside information about a potential target and enter as an activist. Alternatively, when uncertain about the reliability of the information gathered or inability to do so, a hedge fund may enter as a passive investor, gather information about it and turn activist. However, both of the strategies may be optimal and result in the same efficacy in addressing adverse selection and agency related problems of a target firm. Similarly, I document that it could be optimal for some hedge funds with a lower aptitude to identify and correct the underperformance of the target to enter as a passive investor and switch to activist once the potential to perform becomes clearer,

thereby correcting the mis-valuation of the performing targets. The findings underscore the merit of time, and some hedge funds may find it beneficial to buy to learn about target firms in the form of their passive ownership before turning activists.

Similarly, peer influence on the passive hedge funds turning activist suggests that undervaluation, lower cash holding, and better operating performance of peer firms triggers passive hedge fund to turn activist. The findings, taken together, suggest passive hedge fund turning activists may be affected by peers differently. Depending on different information sets available to the activists' hedge funds and passive hedge fund turning activist, their response to peers is in line with the rivalry view on decision making.

This thesis also investigates the role of explanatory power and direction firm antecedents on the propensity to hedge fund activism in the changing information environment before and after Dodd-Franc Act and finds evidence that hedge fund regulations would complement and support in information environment for a hedge fund to assess about a target, and does not play a substitutive role in information creation. The evidence informs policymaking on regulations like Dodd-Frank Act to improve the information environment. In my final set of enquiries, I investigate the market reaction of activists filing and find a positive market response to activists filing. The result suggests that the market value the information content of activist filing and that the market values the potential that hedge fund activism can correct information and agency related imperfection facing a target firm. Taken together, the antecedents of my chapter provide important insights to practitioners, policymakers and the academic world.

Finally, my thesis explores the corporate risk-taking consequence of hedge fund activism. The important concern for hedge fund activism is whether it realises the stated goal of creating value for shareholders. Studies document that the market reacts positively to hedge fund activism. While the overall evidence from the stock market reaction is positive for value creation, it is still an open question whether this hedge fund activism translates to corporate decision making to create value. To this end, my empirical study contributes to the debate on short-term vs long term by examining the impact of hedge fund activism on long term risk-taking.

The empirical findings on the effect of hedge fund activism have the following important findings. First, hedge fund activism is associated with an increase in return volatility, implying increased risk-taking. However, this increased risk-taking is rather a short-termistic in nature as this increase in return volatility is coupled with decreased capital expenditure, R&D and cash holding on the one hand while increasing leverage and dividend payouts. Therefore, it can be argued the risk-taking effects of hedge fund activism is two-fold. While firms pursue higher financial risk (more use of debt) and liquidity risk (lower cash holding), they undertake lower investment risk (lower investments and R&D). This finding is in line with the short-termism argument of hedge fund activism. My further examination shows that this decrease in investment is not explained by improvement in investment efficiency, supplying further evidence that hedge fund activism triggered corporate discipline, resulting in short-termistic risk-taking, which shuns value relevant corporate investments. Hedge fund activism is also associated with a higher payout policy to avoid resistance from other shareholders possibly. Taken together, hedge fund activism is associated with lower real and innovative investments while pursuing higher financial and liquidity risk exposing

firms to higher insolvency risk. Hedge fund activism does, however, align the interest of other shareholders by maintaining higher dividends.

The findings of my empirical study on the passive hedge funds turned activists show that the *learning window* supplies decision power that a non-activist turned activist enjoys when compared to other activist peers in that these activists can pursue higher risk-taking without compensating by higher payouts as the otherwise activists would normally do. However, it may further make firms more short-termistic as this evolution of HFA makes operating earnings more volatile and balance-sheet more levered without simultaneous compensating balance by additional real and innovative investments. The implication of my empirical study could be an input to regulators in assessing the risk-factor hedge fund activism can bring to the corporate world through disruption in the target firms in the form of high risk-taking and high leverage not explained by investment efficiency or long-termistic strategies. My thesis highlights how hedge fund activism shuns corporate risk-taking that is beneficial to the long-term sustainability of a firm.

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