HEC MONTRÉAL
École affiliée à l'Université de Montréal

Three essays in governance and financial reporting

par
Luc Desrousseaux

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Présentée par :

Luc Desrousseaux

a été évaluée par un jury composé des personnes suivantes :

Sophie Marmousez
HEC Montréal
Président(e)-rapporteur(se)

Claude Francoeur
HEC Montréal
Directeur de recherche

Denis Cormier
UQAM
Membre du jury

Thomas Jeanjean
ESSEC Business School
Examinateur externe

Jorge Humberto Mejia Morelos
HEC Montréal
Représentant du directeur de HEC Montréal

Résumé

Cette thèse analyse deux thèmes importants en gouvernance et en comptabilité financière : les fonds de couverture activistes et les biais comportementaux des gestionnaires.

Le rôle des fonds de couverture activistes est actuellement au centre d'un débat acharné. Ces investisseurs professionnels se comportent-ils comme des vautours dans leurs firmes investies ou contribuent-ils à de meilleures pratiques de gouvernance et une meilleure qualité du résultat financier ? Dans le premier essai, j'étudie la relation entre la présence des fonds de couverture activistes et les pratiques de gouvernance des Conseils d'Administration (CA). Basés sur des données uniques de fonds de couverture activistes, les résultats empiriques révèlent une relation positive entre les pratiques de gouvernance des CA et la présence des fonds de couverture activistes. Ces derniers sont associés à un moindre enracinement des membres du CA et à des PDG moins puissants. De plus, l'initiation d'une campagne d'activisme publique pour faire part de leurs griefs à l'égard du CA renforce l'influence des fonds de couverture activistes sur les pratiques de gouvernance.

Dans le deuxième essai, j'analyse s'il existe des effets collatéraux de la surveillance intensive de ces fonds de couverture activistes sur les pratiques d'affaires des firmes. L'étude porte sur la relation entre la qualité du résultat comptable et la présence des fonds de couverture activistes. Plus précisément, j'observe une relation positive entre l'usage des techniques de gestion réelle du résultat comptable dans les firmes et la présence des fonds de couverture activistes. Cela semble le cas en particulier pour les firmes avec un haut degré d'asymétrie d'information et celles qui sont le plus susceptibles d'avoir géré leur résultat comptable. Par ailleurs, plus la présence des fonds de couverture activistes est élevée dans une firme, moins le contenu informationnel du résultat comptable de cette firme est jugé crédible par les investisseurs. Ces résultats empiriques suggèrent que les fonds de couverture activistes sont associés à plus d'aléa moral dans les firmes investies.

Dans le troisième essai, j'analyse comment les investisseurs jugent la crédibilité des annonces de résultat par des gestionnaires manifestant un excès de confiance. Dans la littérature académique, l'excès de confiance des gestionnaires est associé à une moindre qualité du rapport financier, en raison notamment d'erreurs et omissions. J'observe que les investisseurs appliquent une décote aux résultats inattendus des firmes dirigées par un PDG manifestant un excès de confiance. Par ailleurs, ce résultat n'est pas modéré par un niveau élevé de qualité de gouvernance dans ces firmes. Ainsi, les investisseurs semblent prendre en compte ce biais comportemental du dirigeant dans leurs valorisations, sans égard pour les mécanismes de gouvernance d'entreprise en place.

Mots clés : qualité du résultat comptable, gouvernance d'entreprise, activisme actionnarial, fonds de couverture, gestion du résultat, comportement du dirigeant

Méthodes de recherche : recherche quantitative, recherche longitudinale, analyse multivariée

Abstract

This dissertation investigates two important current issues in governance and financial reporting: the role of activist hedge funds and the behavioural biases of corporate managers.

The role of activist hedge funds is currently at the center of a heated debate. Do these sophisticated investors merely behave as vultures in their investees, or do they contribute to better governance or transparency? In the first paper, I study the relation between the presence of activist hedge funds and governance practices at the board level. Relying on a unique shareholder activist database, empirical results reveal that board governance practices are positively related to the presence of activist hedge funds. The latter are associated with lower director entrenchment, lower CEO power, and higher board ratings. Further, the initiation of a public activist campaign to voice concerns over boards of directors reinforces the influence of activist hedge funds on governance practices.

In the second paper, I investigate whether there are side effects of intensive monitoring performed by activist hedge funds. To this end, I study the relation between the presence of activist hedge funds and earnings quality in their investee firms. Consistent with the perverse effect of "over monitoring" discussed in Tirole (2010), I document a negative relation between earnings quality and aggregate activist hedge fund ownership. Specifically, I provide evidence of a positive association between the use of real-based earnings management and the presence of activist hedge funds, particularly in firms exhibiting a high degree of information asymmetry, and for firms that are more suspected of managing their earnings. Further, the earnings response coefficient, a proxy for the perceived credibility of earnings surprises, is decreasing in the level of aggregate hedge fund ownership. This provides evidence that activist hedge funds are related to higher moral hazard.

In the third paper, I analyse how market participants perceive the credibility of earnings announcements for firms run by overconfident managers. In the academic literature, managerial overconfidence is associated with lower financial reporting quality, including

misreporting. I document that market participants apply a discount to earnings surprises announced by overconfident managers, as suggested by a lower earnings response coefficient for those firms. Further, strong governance mechanisms do not moderate this finding. As such, market participants seem to incorporate this behavioural bias of corporate managers into their market valuations, without regard for the strength of governance.

Keywords: earnings quality, corporate governance, shareholder activism, hedge funds, earnings management, managerial behavior

Research methods: quantitative research, longitudinal research, multivariate analysis

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List of acronyms

CAR	Compounded Abnormal Returns
ERC	Earnings Response Coefficient
HF	Hedge Funds
HHI	Herfindhal-Hirschman Index
IFRS	International Financial Reporting Standards
SEC	Securities and Exchange Commission
US GAAP	United States Generally Accepted Accounting Principles

To my wife Mohélie

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Preface

This thesis focuses on two current major issues in governance and financial reporting. Indeed, the benefits of activist hedge funds for stakeholders is currently the center of a heated debate amongst the academic, regulatory and business communities. Further, the study of the implications of managerial cognitive and emotional biases is increasingly popular in the academic literature.

The first two essays shed light on the benefits for corporate governance and financial reporting quality of activist hedge funds, a group of sophisticated investors that I had the chance to meet and trade with during my industry experience. The first essay is co-authored with my supervisor Claude Francoeur.

The third essay focuses on behavioural characteristics of managers as a means to depart from the traditional rational agent postulate, and thus come closer to the reality of agents and business situations.

There is no doubt that these crucial and timely issues are exciting research avenues.

Introduction

Financial statements are a major vehicle of communication to stakeholders of the firm. As defined by the accounting standard setters, the qualitative characteristics of financial statements are relevance and reliability. Of course, the production of financial statements by the managers of the firm is undertaken in accordance with Generally Accepted Accounting Principles (GAAP), including US GAAP. Yet, there is leeway as regards to the interpretation of accounting standards requirements, guidance and best practices. To produce financial statements, the manager disposes of a pool of accounting choices and tools from which he chooses those that not only closely represent the reality of its business... but also fulfill its own incentives. This is the essence of positive accounting theory developed by Watts & Zimmerman (1979,1980).

To counter the tendency of managers to serve their own interests instead of those of the stakeholders, it has been argued that efficient governance mechanisms should act as counterweights. Monitoring can be internal such as the board of directors, or external such as the auditor or institutional owners. Within the institutional ownership arena, there is a wide range of investment strategies and horizons, as well as a range of involvement in governance and financial reporting matters. Indeed, some institutional investors do care about governance matters and value the benefits of sound governance; other types of institutional investors merely base their investments on statistical modeling and trading algorithms, do not meet with the executives of their investees nor vote at shareholder meetings. Those who are actively involved in firms' business and governance are said to choose the "voice" route (Hirschman 1970). In this vein, Gillan and Starks (2007) document that activist Hedge Funds (HF hereafter), a group of sophisticated investors who often work in "wolf packs", have been taking the lion's share of shareholder activism over the last decade in the US. Yet, their benefits are still the center of a long debate. Are they beneficial to stakeholders, or are they merely vultures? Alternatively, as The Economist (2015) describes them, are activist HF "sometimes ill-mannered…" yet "unlikely heroes"?

To shed more light on this debate, the first paper focuses on the benefits of activist HF for governance practices at their investees.

Sound governance may also materialize into better financial reporting quality, which leads to more useful and reliable accounting information to financial statement users. This is the focus of the second paper, allowing to assess in a different way the presupposed short-term stance of HF activism: does the presence of activist HF relate to higher reporting aggressiveness in their investee firms?

The analysis of strong governance benefits is further extended to its ability to constrain managers behavioural biases. In this vein, managerial overconfidence has been found to negatively influence the quality of financial reporting. Do market participants incorporate this behavioural trait of firm managers into their valuations? Further, in front of an unexpected earnings announcement made by an overconfident manager, does the market assessment change in presence of strong governance mechanisms?

These three research questions are timely and relevant for today's business challenges in governance and financial reporting; empirical evidence of these essays contribute to the growing body of knowledge in these topics.

The first article, written with Claude Francoeur, is entitled "Hedge fund activism and corporate governance. Evidence from private and public interventions". The second article is entitled "Reporting aggressiveness in presence of activist hedge funds." Finally, the third article is entitled "Can overconfident managers trick the market? Evidence from earnings announcements".

Chapter 1
Hedge fund activism and corporate governance: evidence from private and public interventions

Abstract

Activist hedge funds are a group of sophisticated professional investors that operate in so-called "wolf packs" to influence changes in their target firms. These institutional investors argue that they contribute to improving the governance of the firms they target. But do they actually deliver what they claim? We take a closer look at this question by analysing the influence of activist hedge funds on a set of corporate governance practices adopted by a sample of US-listed firms. Contrary to previous work, we investigate both private and public channels of hedge fund activism. We find nuanced evidence that activist hedge funds play a significant role in the corporate governance landscape. Overall, their influence on governance practices adopted at the board level is significant. More specifically, we find that director entrenchment and CEO power are negatively related to activist hedge fund ownership, over and above the monitoring performed by other institutional investors. This provides evidence of the effectiveness of hedge fund activism. In addition, and consistent with the idea of the "name and shame" behavior where activist concerns about corporate boards are publicly voiced, the public shareholder activism channel incrementally influences their impact on governance practices. Taken together, these results suggest that activist hedge funds play an important role in fostering governance practices.

1.1. Introduction

Recent press articles (e.g. The Economist 2014, 2015) relate the tremendous importance of corporate activist campaigns initiated by hedge funds (HF hereafter). In recent years, HF activism has been growing rapidly as an alternative investment strategy, both in the number of funds and the level of assets under management. Preqin (2014) reports that activist HF manage an estimated $100 billion of assets worldwide. Anecdotal evidence of activist HF coordination - the so-called "wolf pack activism"- has gained much attention in the media and business community . Due to its growing importance, shareholder activism is at the center of heated debates amongst academics, regulators and practitioners. Proponents of activist HF claim that these actors target companies that fail in one or several aspects of their governance, and once they hold a significant block of shares, they intervene in the media and try to federate enough investors to get changes made at their investees. In this sense, activist HF would contribute to better corporate governance by identifying failures and trying to improve them. Yet, based on the fact that the average duration of an activist HF public campaign is 22 months (Brav, Jiang, Partnoy, & Thomas 2008), critics of activist HF blame them for giving too much importance to short-term profits and not creating any real improvements to the corporate governance structure of their target firms (Taub 2013). It is therefore relevant to further analyse whether HF activism results in better corporate governance, or if in the negative case, activist HF are merely "barbarians".

Besides financially driven motivations, one of the motives of intervention of activist HF is corporate governance performance (Gifford 2010). In the area of corporate governance, these sophisticated investors are primarily concerned with the C-suite and the board. (Anson et al. 2012). HF frequently criticize the performance of the board of directors and the governance provisions they adopt to entrench themselves. A recent research by Activist Insight (2015) on activist HF

motives shows that governance issues are an important motive of shareholder activism. Their agenda primarily concerns the competence, effectiveness and compensation of the directors and the composition of the board. Prior research on the effects of hedge fund activism on governance matters has focused on a subset of specific practices such as CEO/board turnover and compensation. An important issue at stake (e.g. Taub 2013) is whether activist HF are successful at improving corporate governance practices.

Our methodological approach is inspired by recent calls for new empirical evidence about private and public interventions (Goranova & Ryan 2014; Rehbein, Logsdon, & Iii, 2012; McNulty & Nordberg (2015). We view shareholder activism first and foremost as a bargaining process nurtured by a dialogue between the activists and the management of the target firm. This approach encompasses both public and private interventions, and as such includes a more comprehensive set of activist engagement than what can be achieved through public reports and proxy voting information. Our measure of wolf-pack activism draws on the concept of wolf-pack activism by Brav, Dasgupta, & Mathews (2015). We built a uniquely designed proprietary shareholder activist database to perform this study.

We find that the intensity of HF activism increases board independence, expertise and effectiveness, reduces board entrenchment and CEO power. We also find that initiating a public campaign reinforces the positive relationship between activist HF and board governance practices. In this respect, this study sheds light on the operational setting of shareholder activism (McNulty & Nordberg, 2015) by showing that HF activists tend to improve their targets' governance practices.

The rest of the paper is structured as follows. Section 1.2 reviews previous relevant literature. Section 1.3 discusses the theoretical background. Section 1.4 provides the set of hypotheses. Section 1.5 describes the methodology and the data. Section 1.6 presents and discusses the empirical results. Section 1.7 introduces alternative and robustness tests. We conclude in section 1.8.

1.2. Literature review

1.2.1. The benefits of good governance practices

There is a large literature on the benefits of sound corporate governance practices for stakeholders (see e.g. Larcker & Tayan, 2015 for a review). Efficient internal governance mechanisms help align managers and shareholders' interests. Firms with strong governance mechanisms have been documented to exhibit higher firm valuation (e.g. Gompers, Ishii, & Metrick, 2003), lower cost of debt (Bhojraj & Sengupta, 2003), higher levels of accounting conservatism (Ahmed & Duellman, 2007), lower levels of accrual-based earnings management (e.g. Klein, 2002), lower likelihood of earnings restatements (Abbott, Parker, & Peters, 2004) and litigation (Dechow, Sloan, & Sweeney, 1996).

1.2.2. Governance practices that matter

Central to corporate governance is the board of directors. The board performs both monitoring and advisory functions (e.g. Baldenius, Melumad & Meng 2014). Board size, independence, expertise, composition, member networks, are common attributes analysed in corporate governance studies (Larcker and Tayan 2015). Governance is a multifaceted construct and it has become clear that it is the combination of best governance practices that matter. A noticeable paper in this regard is

Gompers *et al.* (2003) who design an index of governance practices, the G-Index, and document a positive association between high governance quality (low G-Index) and equity prices. Bebchuk, Cohen, & Ferrell (2009) revisit the G-Index provisions and validates board entrenchment as an aggregate measure to detect poor governance. Indeed, when restrictive shareholder rights have been implemented, boards may then become entrenched and serve managerial interests (Bebchuk et al. 2009). In their setting, board entrenchment is negatively related to firm valuation.

Given their function and central role in corporate strategic decisions, CEOs interact with board members on a regular basis. The CEO ability to control board activities, also known as CEO power (Baldenius, Melumad & Meng (2014), partly determines corporate governance practices. In activist Carl Icahn's own words (Business Week Online, 11/18/2005), "members of the boards are cronies appointed by the very CEOs they're supposed to be watching." Jensen (1993) argues that CEOs may find smaller boards easier to control. In Hermalin and Weisbach (1998), a CEO that also serves as the chairman of the Board - a commonly used proxy for CEO power- may influence the board monitoring function.

Board members are less efficient at monitoring powerful CEOs. The latter may more likely oppose board recommendations (Haynes and Hillman 2010). In the banking industry, Llewellyn & Muller-Kahle (2012) find that bank risk taking is positively related to CEO power. Further, a powerful CEO may likely provide information of lower quantity or quality to the different board committees, thereby detrimentally influencing their monitoring functions (Adams and Ferreira 2007; Harris and Raviv 2008). Beasley et al. (2009) document that the audit committee has less control over its agenda in the presence of a powerful CEO, which lowers audit committee effectiveness. In addition, prior research finds that firms with powerful CEOs exhibit higher likelihood of financial restatements and internal control weaknesses (Lisic et al. 2015).

Activist HF can be particularly vociferous against the perceived lack of competence of board members, the detrimental influence of CEOs on the board decisions, and resulting suboptimal business decisions (Brav et al. 2008). In some cases (see e.g. Fortune 2014) a public activist campaign results in firing the CEO or some members (if not all) of the board of directors . Thus, given the documented consequences of CEO power for board effectiveness, as well as shareholder activist agendas, it seems relevant to study how CEO power accommodates from the presence of activist HF.

1.2.3.Hedge funds as institutional investors

A wealth of research has documented the overall monitoring role of institutional investors (Gillan & Starks, 2000). But, as reported by Gillan & Starks (2007), institutional investors can differ significantly in their trading strategies, information-gathering capabilities, fiduciary duties as well as the legal/regulatory environments they operate in (Gillan & Starks, 2007). Monitoring institutions differ in their capacity, incentives and degree of influence on the firm business conduct and managerial behavior (Chen, Harford, & Li, 2007). Their degree of independence *vis-a-vis* the management of their investee companies also varies significantly (Brickley, Lease, & Smith, 1988; Porter, 1992). For instance, insurance companies or pension funds may feel prevented from voting against top management because of close business relationships with their investees (Brickley et al. 1988). As a sub-group of institutional investors, HF differ in a variety of ways (Brav, Jiang, & Kim, 2009), mainly due to regulatory, trading and compensation structures. First, they are independent investors, not tied to a financial services entity. Further, they are relatively lightly regulated and adopt a more flexible investment approach with more illiquid holdings and extensive use of financial derivatives. The investment manager personal wealth is usually solidly tied to the investment vehicle performance, and a significant part of fees earned stems from performance fees

with the so-called “high water mark” (HWM) and hurdle rate systems. The HWM is the highest net asset value (NAV) of the fund on which an incentive fee has been paid. This mechanism ensures that no fee is paid on recouped losses. The HWM mechanism can be paired with a hurdle rate, a specified minimum return that must be earned by the investor before the incentive fee is applied to profits. For instance, with a typical 2% management fee and a 4% annual hurdle rate, the manager would earn an incentive fee only when the NAV before fees exceeds that of the HWM by at least 6%. These mechanisms are attempts to provide optimal contracting as the HF fee structure is said to provide a better alignment of interests between the investment manager and the hedge fund investor (Anson et al. 2012).

1.2.4.Shareholder activists

A way to classify investors activities and interactions with the firms is to observe if they behave as shareholder activists, e.g. making noise in the media and being involved in (non)-routine shareholder voting; in a nutshell being an “itching powder”. A stream of research focusing on the determinants and consequences of shareholder activism is gaining traction in the media and academic research.

Gillan *et al.* (2007) mention six tactics of institutional activism, which can be classified by the degree of hostility towards top management. Activists may initially announce in the media their opposition to management on concerns about shareholder undervaluation and/or on a specific matter related to governance inefficiency. Activists may alternatively announce direct negotiation with management. If the first two tactics prove unsuccessful, activists may turn into shareholder proposals to reach their purpose. The three most extreme shareholder tactics are to initiate proxy contests (Ikenberry & Lakonishok, 1993; Van Nuys, 1993) to sue the company, or to undertake an outright takeover. According to Gillan et al.(2007) ,the most extreme cases are frequently initiated

by activist HF. Goranova & Ryan (2013) and Greenwood & Schor (2009) mention that the number of shareholder resolutions initiated by HF has dramatically increased since the late 1990s.

Yet, there are also cases where a mutual agreement can be reached without resorting to the tactics outlined below. The mere threat to initiate a public campaign may also act as a powerful catalyst to reach an undisclosed agreement between the board/CEO and the activist HF that is mutually beneficial.

1.2.5.Activist hedge funds

Prior research documents the characteristics of firms targeted by HF activists (Brav et al. 2008). Based on public disclosures, HF activists intervene in small, value-oriented (i.e. low market-to-book) companies, with sound operating cash flows, low sales, low dividend payouts, and low leverage. These studies are mainly focused on the financial consequences and governance benefits of HF activism. For instance, it has been found that activist HF interventions lead to higher ROA (Clifford, 2008) and positive abnormal stock returns (Brav et al. 2008). Aktas, Croci, & Simsir (2015) document that activist investors exert strong influence on boards regarding M&A activities. There is also evidence of short and long-term expropriation of bondholder wealth to the benefit of shareholders (Klein & Zur, 2011), thereby exacerbating the bondholder-shareholder conflict (Jensen & Meckling, 1976). HF activists also contribute to initiate important changes in the C-suite and the board of directors, as well as to the executive compensation packages. Brav et al. (2008) document a higher CEO turnover following activist interventions, while Gow, Shin, & Srinivasan (2014) provide evidence of higher director turnover in the target firm. Bebchuk, Brav, & Jiang (2015) document lower CEO total compensation in the same context.

1.3. Theoretical background

1.3.1. Institutional investors as external monitors of the firm

The separation of ownership and control exhibited by the modern firm gives rise to a misalignment of interests between the manager (the principal) and the shareholders (the agent), and therefore engenders agency costs (Jensen *et al.* 1976). As a remedy, academics and regulators have suggested that the board of directors serves the purpose of monitoring manager activities and operates independently from the management (e.g. Fama & Jensen, 1983). However, Von Thadden (1995) argues that corporate boards must also be monitored by independent external counterweights (Von Thadden, 1995). Jensen *et al.* (1976) suggest that specific stakeholders have a comparative advantage in monitoring activities. To minimize the cost of information collection and monitoring, it seems therefore rational to assign delegate these tasks collection of information and monitoring to a small number of "financial intermediaries" (Diamond, 1984). Some of these monitors are institutional investors; one component of their fiduciary responsibility vis-a-vis their own principals is the effective monitoring of the firm's activities. In this study, we consider board ineffectiveness as a case of moral hazard, that can be mitigated by intensive monitoring (Holmstrom & Tirole, 1997).

1.3.2. Investor classification

Cornett, Marcus, & Tehranian (2008, p.359) argue that long-term investors are well equipped and trained to efficiently perform monitor managers, and intervene if necessary. Porter (1992) differentiates between short-term and long-term investor and finds that only long-term-oriented shareholders are efficient monitors. Indeed, short-term investors have few incentives to create long-term value (Tirole 2010). In contrast, long-term shareholders focus more extensively on the underlying firm profitability. Long-run improvements can be operationalized through active

interventions in the governance of the firm (Renneboog & Szilagyi, 2011) such as deterring collusion between the board of directors and managers, intervening in the appointment of top managers, or discussing appropriate strategic decisions.

1.3.3. Activism and the notion of "exit" or "voice"

Hirschman (1970) introduces the concept of "exit" vs "voice" in the behaviours of organization members. Members, when displeased, either vote "with their feet" and go away, or stay and try to resolve issues. These two forms of involvement are said to be "active". Applied to institutional investors (McNulty *et al.* 2015), the choice between exit or voice is the result of a cost/benefit analysis, as monitoring is costly. In the exit case, activists signal their disagreements by selling their stakes and explain their rationales publicly. When shareholders choose the voice approach, they are likely to exert intensive monitoring and reduce private benefits that can be extracted by managers through shirking.

1.3.4. Real control and wolf-pack activism

To reduce the extent of moral hazard, active monitoring is required (Tirole 2010). Aghion & Tirole (1995) discuss formal and real control as two forms of shareholder engagement. Formal control refers to large block holders who directly influence firm's decisions. Real control refers to minority shareholders' building coalitions with other investors to exert pressure on the firm. Activist HF usually fall into the category of "real control" as they intervene with a relatively small stake (Brav *et al.* 2008) in collaboration with other HF to engage with the firms they target. Brav *et al.* (2015) introduce the concept of wolf-pack HF activism. They set up a model of collusive behaviour around the "lead" HF activist, and theoretically show that over the days surrounding the intervention of an activist leader, several other large investors become active and collude with the

lead activist. This facilitates the success of the activist leader's campaign, as it may be both time-consuming and expensive to acquire a significant stake to exert influence on the target firm.

1.4. Hypothesis development

Given their incentives and *raison d'être*, activist HF are deemed to influence corporate governance practices in their investee firms, through their board of directors. Anecdotal evidence shows that hedge funds often denounce and sometimes are successful in altering shareholder-unfriendly mechanisms such as poison pills and classified boards during a shareholder activist campaign. Given the negative associations between bad board practices and firm valuation put forward by Bebchuk *et al.* (2009), as well as the ultimate pecuniary goal pursued by activist HF, it is likely that activist HF will exert their influence on their target firms. While prior research provides evidence of a link between HF activism and CEO and board turnover, there is no documented evidence of a relation between wolf-pack activism and board effectiveness. In light of the above, we develop the following hypothesis, stated in alternative form:

H1: Firms with higher levels of activist hedge fund ownership are associated with better corporate governance practices

1.5. Methodology and data

1.5.1. Model

Our baseline model takes the following form:

$$BOARD\_RATING = \beta_1 * ACTIVIST\_HF\% + \beta_2 * INSTIT\_OTHER\% + \beta_3 * SIZE + \beta_4 * Q + \beta_5 * GROWTH + \beta_6 * ROA + \beta_7 * CASH + \beta_8 * FIN\_NEEDS + \beta_9 * \#ANALYST + \beta_{10} * INSTIT\_HHI + \beta_{11} * LEVERAGE + \beta_{12} * INDUSTRY + \beta_{13} * YEAR + \varepsilon$$

Where *BOARD_RATING* is our measure of board governance rating, *ACTIVIST_HF%* is the aggregate % equity holding of activist HF in the firm; *INSTIT_OTHER%* is the aggregate % equity holding of all institutional investors excluding activist hedge funds in the firm; *SIZE* is a measure of firm size; *Q* is the Tobin's Q; *ROA* is return on assets; G*rowth* is the firm sales growth; *Cash* is a measure of available cash; *#ANALYST* is a proxy for analyst coverage; *FIN_NEEDS* is a measure of external financing needs; *INSTIT _HHI* is a proxy for ownership concentration; *LEVERAGE* is a measure of firm leverage; *INDUSTRY* and Year are industry and year dummies, respectively. A detailed definition of these variables can be found in section 5.6 and all variables used throughout the study are also listed in table 1.1 of the appendix. All regressors are lagged by one year, so that we analyse the influence of activist HF and other determinants on future governance quality. Using lagged firm and ownership characteristics mitigates the impact of potential simultaneity, since past firm characteristics and board governance quality are not determined in the same period.

1.5.2. Sample universe

We collect information on US-listed firms from the Compustat database over the 2010-2014 fiscal years. The initial sample is then merged with the MSCI ESG database that provides governance

metrics from 2009 to 2014 -as discussed further below-, and the Thomson Reuters institutional ownership database[1] that provides details on institutional ownership composition.

1.5.3. Governance measures

Corporate governance is a multifaceted construct and empiricists have identified which governance settings and provisions have important implications, in other words "what matters in corporate governance" (Bebchuk *et al.* 2009). Our main measure of board practices (*BOARDRATING)* is collected from the MSCI[2] ESG database. This comprehensive score includes 38 metrics that cover overall board independence, the independence of key committees, the structure of board leadership and the individual director qualifications and experience, including their industry and financial expertise.

1.5.4. Activist hedge fund ownership

Activist HF are first and foremost institutional investors that have strong monitoring capabilities and strive to influence firms *per* their own agenda. In this paper, we assume that HF activism can be operationalized by both observable and unobservable involvement in governance matters through discussions and bargaining with the board and management of the target firms. Such influence may be reinforced by public activist campaigns when discussions fall through, but it is fair to say that public campaigns are not the only channel of influence, as informal discussions and bargaining process may push the management towards the activist agenda. Shareholder activism involvement may be made without the need to initiate a formal activist campaign, either because

[1] Formerly known as CDA/Spectrum S34

[2] MSCI is a provider of asset indices (e.g. MSCI World Equity index) and portfolio analytics solutions for institutional investors

matters are discussed and settled without the need to engage in costly campaigns, or because no single activist has crossed the 5% equity stake threshold that would require the activist to file a SC13D report to the SEC.

In this paper, we measure the presence and the intensity of activist HF in the firm equity, rather than the mere occurrence of a public activist campaign. Brav *et al.* (2015) mention that a number of activist HF fail to report adequately wolf-pack activism in SEC filings. In this study, we do not rely on firms who had been subject to an official 13D campaign over our sample period. Instead, we take a broader view and analyze the effects of the presence and level of activist HF ownership. We measure HF activism by analyzing the institutional ownership composition in each of our sample firms.

Our approach has two advantages over prior research. First, a deep analysis of institutional ownership composition allows to detect wolf-pack activism more reliably than solely relying on SEC filings. Second, we adopt a more general framework that permits to analyse the effect of *both* observable (i.e. public) and unobservable (non-public) occurrence of wolf-pack activism[3]. Two reasons support the logic of the second justification. Because activists may also get involved "behind the doors", i.e. intervene non-publicly, relying on SC13D reports to study the effects of activism encompasses only a subset of shareholder activism involvement. Initiating a public campaign is costly. To avoid unnecessary efforts and expense shareholder activists beforehand discuss their grievances non-publicly with the management. Some demands do not become public. It is only when discussions prove unsuccessful that a public activist campaign is initiated and becomes publicly available. In parallel, capturing cases of activism unreported by the SEC (e.g.

[3] In this case, "unobservable" means activist involvement which could not observable under a SC13D if no single activist has crossed the 5% threshold required to file a SC13D report.

Icahn on Apple in 2015) involves cases where the filing activist holds less than the 5% threshold required for filing with the SEC, yet gets involved in board matters. These low stakes often involve larger target firms. Previous studies have been criticized for having a bias towards smaller target companies.[4].

We rely on the Thomson Reuters Institutional Ownership database to collect the institutional holdings of each sample firm. To analyze the institutional ownership composition and identify shareholder activists, we rely on the methodology employed in Brav *et al.* (2008). First, we analyse the institutional ownership composition to quantify the presence of hedge funds in the equity of the firm. To identify investment vehicles as HF, we use the Lipper TASS HF database, a major provider of HF data. The data is supplemented with information collected from Bloomberg the firm's website. This approach avoids survivorship bias (the fact that poorly performing and liquidated investment companies stop reporting to the HF database vendors). The analyses were performed at the management company level, as it is the appropriate level of decision-making (Jiang, Li, & Wang, 2012). The remaining cases were validated by a professional alternative investment manager.

There is no comprehensive list of shareholder activists, therefore we compile existing information from four sources. The first source is the TASS hedge fund database that flags activist hedge funds as a strategy. The second source is the Audit Analytics shareholder activist databases that collects information on activist campaigns from 2000 onwards. Finally, we rely on 2 pre-existing shareholder activist listings produced over the period of our study, namely those by Thomson One

[4] For example, it is more feasible for an activist to build a 1% or 2% position in Apple than having to go up to 5%.

and The Conference Board. As such, we believe that our approach allows to reliably identify shareholder activists.[5]

1.5.5.Control variables

We follow prior literature (Aggarwal, Erel, Ferreira, & Matos, 2011; Durnev & Kim, 2005) to identify relevant control variables. Size, investment opportunities, firm performance, the need for external funding, analysts following and concentration of ownership are the primary determinants of corporate governance practices. To proxy for firm size, we include the firm stock market capitalization (*SIZE*). Firm growth is measured as the 2-year average of sales growth (*GROWTH*). Tobin's Q (*Q*), a proxy for growth opportunity, is defined as the market value of assets divided by the book value of assets. The latter is computed following Ramalingegowda *et al.* (2012) as the sum of book value of assets and the market value of equity, less the sum of the book value of equity and balance sheet deferred taxes. Our measure for external financial needs is the ratio of capital expenditures minus cash holdings over capital expenditures (*FIN_NEEDS)*[6]. With this measure, we avoid introducing endogeneity related to an outcome-based measure such as equity /debt issuance. Analysts following (#*ANALYST*) is proxied by the natural logarithm of the number of Earnings Per Share (EPS) analyst estimates. We also control for institutional ownership concentration by designing a Herfindhal-Hirschman (HHI) index (*Instit_HHI*). Leverage is computed as the ratio of total debt (long-term debt plus short-term portion of long-term debt) over

[5] A tabulated summary of the methodology employed is provided in Appendix 1.b

[6] As an alternative proxy for financial needs, and following follow Durnev and Kim (2005), external funding needs is computed as the difference between the required investment rate minus the internally available capital. The required investment rate is measured as the two-year average of annual growth rate of total assets. The internally available capital is computed as (*ROE*/(1-*ROE*)), where *ROE* is the ratio of net income over market value of equity. The use of this alternative proxy yields very similar results and does not change the inference.

total assets (*LEVERAGE*) Finally, we take care in controlling for firm past performance as theoretical works (e.g. Harris and Raviv 2008) show that firm performance influences the firm information environment, profit potential, and the opportunity cost of independent directors, which in turn affect firm governance structure. In this vein, we also include return on assets (*ROA*), the sum of cash and short-term cash equivalents over total assets *Cash*, and the ratio of operating cash flows over total assets (*CFO*). Size, Market-to-book, growth, external financial needs are calculated based on Compustat data. Institutional ownership concentration is collected from Thomson Reuters S34 database, whereas analysts following is collected from I/B/E/S. The data covers the 2009-2014 fiscal years and is matched with our governance and activist HF ownership measures. We deliberately use the 2010-2014 period to avoid any unobserved confounding factors that would heighten scrutiny over governance matters during the financial crisis of 2008. We also include industry and year dummies to account for industry-wide factors and time trend in governance practices over the sample period.

1.6. Descriptive statistics and results

1.6.1. Descriptive statistics

Table 1.3 provides an overview of the sample firms across industries and years. The sample is made of 1,820 unique firms and 6,342 firm-year observations over the 2010-2014 period.[7] Consistent with prior research on activist HF (e.g. Brav *et al.* 2008, Gow *et al.* 2014), firms are mostly operating in the consumer discretionary sector (2-digit SIC code #3).

[insert table 1.3 here]

[7] All results presented in this study are qualitatively similar when using a balanced panel, and do not change the inference.

Table 1.4 provides descriptive statistics. The mean (median) sample firm exhibits a market capitalization (variable *SIZE*) of $2 billion ($1.8 billion), a Tobin's Q of 1.89 (1.44), leverage (*LEVERAGE*) of 0.21 (0.18), sales growth (*GROWTH*) of 8% (5%), return on assets (*ROA*) of 4% (4%), positive operating cash flows (*CFO*); further, cash (*CASH*) comprises 16% (10%) of the mean (median) firm total assets and R&D expenses (*R&D*) are 11% (0%) of total assets. On average, total institutional ownership (*INSTIT_TOTAL%)* is 77%, consistent with prior research data in a US setting. Of this institutional ownership base, activist HF (*ACTIVIST_HF%)* hold 10% of total ownership on average. Looking at their trading behavior and patterns, these activist HF are equity owners predominantly over more than 24 months, and are classified as non-transient when using the Bushee classification. In the latter case, the largest 5% equity holdings of "transient" activist HF collectively own about 10%. Regarding ownership concentration , the average (median) institutional ownership Herfindahl-Hirschman index (*HHI*) is 0.36 (0.30), suggesting a lower-end ownership concentration consistent with prior research on the US investor base. Further, the mean (median) sample firm is followed by 2 (2) analysts (*#ANALYST*). Average (median) board score (*BOARD_RATING*) is 48.51 (48), which seems representative of the average US-listed firm as benchmarked by MSCI. Compared to the median Compustat firm over the same period (unreported), the median sample firm is relatively larger and exhibits similar cash levels, sales growth, leverage and profitability. Our sample does not seem to suffer from a selection bias towards smaller firms, a characteristic trait of prior research in HF activism due to their approach based exclusively on SC13D filings. Activist HF are also invested in large firms, therefore it is ex-ante relevant to investigate their influence on governance practices in larger firms.

[insert table 1.4 here]

The Pearson correlation matrix can be found in table 1.5. Noticeably, the (lagged) presence of HF activists (ACTIVIST_HF%) is positively correlated with current period board rating and negatively correlated with CEO duality and board entrenchment, which suggests that the presence of activist HF positively influences board practices.

[insert table 1.5 here]

1.6.2.Regression results

Table 1.6 presents the first two models where BOARDRATING, the main dependent variable, is regressed on institutional ownership and control variables. In all models, continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers[8]. All regressors are lagged by 1 year and p-values are reported with standard errors clustered at the firm-level (Petersen 2009).

In model 1, the base model, total institutional ownership is positively related to board quality (p-value < 0.0001). This is consistent with the idea that institutional investors, as external monitors, perform their monitoring role effectively. However, not all institutional investors are alike. Tirole (2006) argue that only some external monitors have incentives to closely monitor the board to improve the quality of governance. By their very nature, shareholder activists decide to exert their influence with their shares rather than with their feet, to take the terminology of Hirschman (1970).

[8] In unreported analysis, we employ two alternative regression techniques to test the sensitivity of our main result to influential observation points. The first model uses the interquartile range (IQR) method, and the second model uses a quantile-based regression. Both models yield very similar results of the same magnitude, sign and statistical significance than in our main models, and hence leaves the inference unchanged. This gives us some comfort that our findings accommodate well with alternative outlier treatments methods.

This assertion is tested in model 2. Consistent with activist HF demanding better governance, and controlling for other institutional investors of the firms and control variables, the coefficient for Activist_HF% is significantly positive (p-value = 0.008). The presence of activist HF is positively associated with board quality, which provides support for our main hypothesis. Our results therefore suggest a positive relation between activist HF ownership and governance at the board level. This is supportive of the claim that activist HF contribute to better governance.

[insert table 1.6 here]

1.7. Additional tests

We run additional tests to deal with endogeneity (section 1.7.1), non-linearity (section 1.7.2), the influence of a publicly reported activist campaign (section 1.7.3), alternative governance measures (section 1.7.4), and outlier management (section 1.7.5).

1.7.1. Endogeneity

1.7.1.1. Endogeneity of the main regressor

A legitimate concern may stem from endogeneity issues that could induce spurious correlations. Beyond using a series of lagged control variables, we tackle this issue following the literature dealing with institutional ownership (e.g. Schleifer and Vishny 1986, Ramalingegowda and Yu 2012). The method aims at using an "unexpected" activist hedge fund ownership instead of the one used in our main tests. The unexpected ownership is meant to be purged from factors that may be also be correlated with the dependent variable. It is computed as the residual from a Fama-McBeth regression, using variables known to influence the presence of activist hedge funds. The variables are size (*SIZE*), and bid-ask spread *(BIDASK*), buy and hold return over 9 months

(*BHR_9M*), the dividend yield (*DIV_YLD*), idiosyncratic volatility computed as the residual from a Fama-French Carhardt model (*IDIOVOLAT*), R&D expenses (*R&D*), Operating Cash flows (*CFO*), stock turnover (*TURNOVER*), cash levels (*CASH*), leverage (*LEVERAGE*), "other" institutional ownership (*IO_OTHER%),* and a dummy for firm inclusion in the SP500 (*SP500*). This residual or "unexpected" component of activist hedge fund ownership is used to create a variable we named *RACTIVIST_HF% (*the "R" stands for "residual"*)*.

Details on the Fama-McBeth regression are provided in table 1.7. Consistent with prior research findings, the aggregate activist ownership variable is negatively to firm size, bid-ask spread, buy-and-hold stock return, dividend yield, operating cash flows, and positively related to cash levels and stock volatility. The mean adjusted R-squared of 16% is consistent with those found in prior research, suggesting that the model exhibits reasonable explanatory power.

[insert table 1.7 here]

Result from the regression using the unexpected ownership variable can be found in table 1.8 and yields statistically significant coefficients of the same sign as in our main tests (p-value =0.01). This suggests that our main result does not change when we control for the endogeneity of our main regressor.

[insert table 1.8 here]

1.7.1.2. Causality

Causality is another source of endogeneity and concern. In this vein, a reverse causality or simultaneity explanation could be hypothesized and hence would alter the inference. To test these alternatives, we use the following models:

$BOARD\_RATING = f(ACTIVIST\_HF\%_T, CONTROLS)$

$ACTIVIST\_HF\% = f(BOARDRATING_{T-1}, CONTROLS)$

A positive coefficient for *ACTIVIST_HF%* in the first model would be indicative of simultaneity, while a positive coefficient for *BOARD_RATING* in the second model may provide support for the reverse causality explanation.

Results are reported on table 1.9. The coefficients in both models 5 and 6 are not significant (p-value of 0.2 and 0.5, respectively), providing neither support for the simultaneity nor the reverse causality relations. Therefore, we have additional evidence that activist HF tend to foster better governance, ruling out alternative explanations.

[insert table 1.9 here]

1.7.2.Individual governance variables

In order to analyse more finely the relation between HF activism and governance quality, we then focus on four individual governance metrics that are commonly used in previous studies, namely CEO duality, board entrenchment, CEO and Board tenure. Of these four individual measures, CEO tenure and duality are related to CEO power. A significant part of HF activist campaigns is aimed at changing the board composition or the top executive team when the target's financial performance is unsatisfactory. If activist HF positively influence governance practices in their

investee firms, one should expect to observe lower CEO and Board tenure, lower board entrenchment and a lower likelihood of CEO/Chair duality in firms where activist HF equity ownership is higher.

Based on the above, the second governance metric we use is a measure of board entrenchment provided by MSCI (ENTRENCHMENT) (Bebchuk et al. 2005, 2009, 2010). Consistent with Berger et al. (1997), lengthy tenure is a characteristic of entrenchment. We use this proxy as an alternative measure to antitakeover provisions, as the latter approach has been criticized as too narrow.

We also use proxies for CEO power based on dimensions of organizational power by Finkelstein (1992). This concept has been used in prior management (e.g. Haynes et al. 2010), finance (e.g. Pathan, 2009) and accounting research (e.g. Abernethy, Kuang, & Qin, 2014; Lisic et al. 2015). We use two individual proxies for CEO power, collected from the Boardex database individual CEO attributes: CEO duality (when the CEO is also the chairman of the Board) and CEO tenure. Following Finkelstein (192), structural power refers to the idea that the higher the manager is positioned in the hierarchy, the more influence he can exert. We use a dummy variable CEO/Chairman coded as 1 if the CEO is also Chairman of the Board (CEO duality), and 0 otherwise. Finally, expertise power relates to the idea that a CEO with greater knowledge and experience of the business and the firm is more capable of providing sound strategic decisions, is sought after and therefore is more influential. The CEO's number of service years at the same firm is a direct measure of CEO involvement with the firm and a further proxy for CEO power (e.g. Adams et al. 2005). We use CEO tenure as a proxy for the expertise dimension.

Table 1.10 shows the regression results on the relationship between the presence of activist HF and the subset of individual governance metrics described above. Results from model 7 suggest

that a higher presence of HF activists is associated to a higher likelihood to separate the function of CEO and Chairman of the Board (p-value = 0.003). In model 8, the presence of aggregate activist HF is negatively associated with the likelihood of entrenched boards (p-value =0.001). Finally, CEO tenure (model 9) and board tenure (model 10) are negatively related to activist HF ownership (p-value =0.025 and 0.001, respectively). Interestingly, other institutional investors are not significantly related to CEO duality, board entrenchment and CEO/Board tenure.

[insert table 1.10 here]

The effects of wolf-pack hedge fund activism on board and CEO tenure is consistent with Gow *et al.* (2014). Further, the negative relation between activist HF and board entrenchment corroborate findings in Ertimur, Ferri & Muslu (2010), yet our results are not conditioned on the occurrence of a shareholder public voting proposals. The results on CEO duality are new evidence that do have an influence on corporate governance practices. In addition, these findings suggest that CEO power is negatively linked to activist HF. Taken together, these results are additional evidence that activist HF improve some stakeholder-friendly governance provisions and settings.

1.7.3. Influence of a publicly reported activist campaign

Our research design aims at encompassing both the observable (public) and unobservable (private) influence of activist HF on board practices. A natural extension of our findings is to introduce an observable measure of shareholder activism undertaken by HF (*i.e* the "public" channel of activism). Under the assumption that greater public scrutiny may lead to additional pressure for governance improvements, we introduce a public activist campaign dummy as a moderating factor in our regression.

To this end, we extract from Audit Analytics the list of activist campaigns initiated by HF over the period. We perform a search on the main concerns raised by the activist filer, identify those that explicitly mention board concerns, and design a binary variable *CAMPAIGN* taking the value of 1 if a publicly reported campaign explicitly voices concerns about board effectiveness, and 0 otherwise. Over the period, we identify 100 firm observations where concerns about board effectiveness are raised by the activist HF[9]. Results can be found on table 11. The coefficient for *CAMPAIGN* is significant and positive (p-value=0.03) in model 11, suggesting that board governance is positively related to the presence of a public activist campaign. In model 12, *ACTIVIST_HF%* and *CAMPAIGN* are the regressors of interest; both are positively and significantly related to board rating, with a p-value of 0.01 and 0.05, respectively. In model 13, the interaction term *CAMPAIGN#ACTIVIST_HF%* is strongly positive (p-value=0.006), suggesting that the relation between board governance and the presence of activist HF is incrementally stronger when those activist HF initiate a public campaign. Taken together, these results add some support regarding the relation between governance practices and activist hedge fund ownership. Consistent with the differing shareholder engagement practices advocated by Goranova, Abouk, Nystrom & Soofi (2016) and McNulty & Nordberg (2015), this result suggests that their influence is not conditioned on a publicly reported campaign, yet the latter does reinforce their influence.

[insert table 1.11 here]

[9] On average, and compared to firms who do not face a public activist campaign, firms in this sub-sample are (statistically) slightly smaller with a market capitalization of $1.3billion, and also exhibit a higher activist HF presence in the year of the campaign.

1.8. Conclusion

The results of this study show that activist HF are shaking the boardrooms of their target firms in a positive way. We extend previous findings that focused on CEO/director turnover and compensation structure/levels, by providing evidence that HF activism influences overall corporate governance practices. Specifically, our results show that the presence of HF activism is associated with better board practices, lower CEO power, and lower board entrenchment. Moreover, HF activists reinforce their influence when they initiate public campaigns to voice their concerns. Our evidence is therefore consistent with the idea that HF activists have superior monitoring capabilities that allow them to induce improvements in corporate governance practices of the firms they target.

This study responds to a recent call from Goranova & Ryan (2014) regarding the benefits of private vs public activist interventions, as well as the robustness of empirical evidence on shareholder activism and sheds new light on HF activism in three ways. First, we document that HF activists do not merely behave as vultures extracting resources from their targets for their own benefits. Rather, they exert a strong influence to adopt sound corporate governance practices. By showing a significant relationship between board quality and the level of HF activism, we document that as a group, HF activists are better positioned to exert strong and effective monitoring. Besides the publicized (and sometimes aggressive campaigns) that make the headlines, there is also room for corporate board improvements through negotiation and advice in a nurtured dialogue. Second, contrary to recent research that observes HF activists targeting relatively small firms, thereby limiting generalization, we also provide evidence that wolf-pack activism enables HF to leverage their influence on governance practices in a larger set of firms.

Third, we provide evidence that initiating a publicly reported activist campaign is not a necessary condition for those investors to have a positive influence on firm governance practices, although initiating such a campaign reinforces their influence.

Overall, we provide evidence of a positive relation between activist HF and governance. Future studies could investigate the conditions under which their ability to federate other shareholders in specific corporate events is the most prevalent. In addition, a deeper analysis of the pool of activist HF, including their distinctive incentives and characteristics, merit further investigation.

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Table 1.1.- Variable description

Variable name	Definition
SIZE	Market capitalization, computed as the fiscal year-end closing price times the number of shares outstanding
Q	Ratio of market value of assets over book value of assets, where the market value of assets is computed as the book value of assets plus the market value of equity less the sum of the book value of equity and balance sheet deferred taxes.
LEVERAGE	Asset leverage, defined as total debt/total assets
GROWTH	Sales growth computed as the 2-year average growth of total revenue
ROA	Ratio of net income over total assets
CFO	Operating cash flows deflated by total assets
CASH	Ratio of cash and marketable securities over total assets
FIN_NEEDS	External financing needs, defined as the ratio of capital expenditures minus cash over capital expenditures
R&D	R&D expenses deflated by total assets
INSTIT_TOTAL%	Aggregate total % of equity institutional holdings in the firm
ACTIVIST_HF%	Aggregate % of equity holdings of activist hedge funds in the firm
INSTIT_OTHER%	Aggregate % of equity holdings of institutional investors (excl. non-activist hedge funds) in the firm
INSTIT_HHI	Herfindahl-Hirschman concentration index of institutional ownership
#ANALYST	Analyst following, computed as the natural logarithm of the number of EPS estimates for a given firm-year observation
ENTRENCHMENT	Board entrenchment dummy developed by MSCI, equal to 1 in the following cases: 1.) More than 35% of the board has tenure greater than 15 years; 2.) More than 22% of the board has tenure greater than 15 years and more than 15% of the directors are over 70; 3.) ; more than 4 directors whose tenure is greater than 15 years; or 4.) if there are more than 4 directors who are over 70.

Variable name	Definition
CEO_DUALITY	Dummy variable equal to 1 if the CEO of the firm is also chairing the board of directors, and 0 otherwise
BOARD_TENURE	Average tenure of the board of directors
CEO_TENURE	CEO tenure
BOARDRATING	MSCI Board rating
BIDASK	Annual average of daily Bid-ask spread computed as (ask-bid)/((ask+bid)/2)
BHR_9m	Buy and hold return calculated over 9 months
BHR_90d	Buy and hold return calculated over 3 months
DIV_YIELD	Ratio of common dividends over book value of common equity
IDIOVOLAT	Idiosyncratic volatility computed as the residual of a Fama-French regression
TURNOVER	Ratio of monthly trading volume over shares outstanding measured 3 months prior to fiscal year end
FIRMAGE	Number of years the firm is listed as per CRSP

Table 1.2.- Investor classification methodology

(adapted from Brav, Jiang, Partnoy & Thomas 2008)

Step #1	**Identification of Hedge Funds**	**(1)**
	Lipper TASS HF database	
	Firm website	
	Bloomberg terminal	
	Validation with an alternative investment expert	
Step #2	**Identification of Shareholder Activists**	**(2)**
	Conference board list	
	Thomson list	
	SC13D filings	
Step #3	**Focus on Activist Hedge Funds**	**(1) x (2)**

Table 1.3.- Sample description by industry and year

SIC/YEAR	2010	2011	2012	2013	2014	Total
1	63	67	71	105	111	417
2	137	141	158	271	290	997
3	244	251	272	394	410	1,571
4	105	108	112	172	176	673
5	101	108	118	168	179	674
6	129	136	157	279	288	989
7	105	110	129	208	224	776
8	37	39	42	63	64	245
Total	921	960	1,059	1,660	1,742	6,342

Table 1.4.- Descriptive statistics

Variable / Stats	N	Mean	SD	p25	Median	p75
SIZE (log)	6342	7.62	1.47	6.53	7.49	8.54
Q	6342	1.89	1.30	1.08	1.44	2.14
LEVERAGE	6342	0.21	0.19	0.05	0.18	0.32
GROWTH	6342	0.08	0.20	-0.02	0.05	0.14
ROA	6342	0.04	0.10	0.01	0.04	0.08
CFO	6342	0.09	0.12	0.05	0.09	0.14
CASH	6342	0.16	0.18	0.04	0.10	0.23
FIN_NEEDS	6342	-20.78	66.95	-13.12	-3.07	-0.10
R&D	6342	0.11	0.83	0.00	0.00	0.03
INSTIT_TOTAL%	6342	0.77	0.19	0.67	0.82	0.92
ACTIVIST_HF%	6342	0.10	0.07	0.04	0.08	0.14
INSTIT_OTHER%	6342	0.67	0.18	0.57	0.71	0.81
INSTIT_HHI	6342	0.36	0.20	0.21	0.30	0.44
#ANALYST	6342	2.05	0.84	1.61	2.14	2.71
BOARD_RATING	6342	48.81	28.66	24.00	48.00	73.00
Entrenched	6337	0.22	0.41	0.00	0.00	0.00
CEO_DUALITY	6337	0.46	0.50	0.00	0.00	1.00
CEO_TENURE	5786	5.86	5.61	1.90	4.30	7.90
BOARD_TENURE	5922	9.02	4.05	6.32	8.61	11.22
BIDASK	6297	0.00	0.00	0.00	0.00	0.00
BHR_3m	6165	0.12	0.36	-0.08	0.09	0.27
BHR_90d	6165	0.08	0.18	-0.01	0.08	0.18
DIV_YIELD	6341	0.01	0.02	0.00	0.01	0.02
IDIOVOLAT	6298	0.02	0.01	0.01	0.02	0.02
TURNOVER (log)	6165	11.62	1.49	10.59	11.59	12.67

Table 1.5.- Pearson correlation matrix

The lower triangle shows Pearson coefficient. Significant coefficient at the 5% level or better appear in bold.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
BOARD RATING	1																								
Entrenched	2	**-0.46**																							
CEO_DUALITY	3	**-0.10**	0.01																						
CEO_TENURE	4	**-0.12**	**0.28**	**0.20**																					
BOARD_TENURE	5	**-0.34**	**0.65**	**0.07**	**0.44**																				
ACTIVIST_HF%	6	**0.05**	-0.02	**-0.07**	0.00	**-0.05**																			
INSTIT_OTHER%	7	**0.07**	**-0.06**	-0.02	**-0.05**	**-0.08**	**-0.12**																		
INSTIT_TOTAL%	8	**0.08**	**-0.07**	**-0.06**	**-0.04**	**-0.10**	**0.36**	**0.88**																	
SIZE (log)	9	**-0.14**	**-0.11**	**0.13**	**-0.13**	**-0.11**	**-0.28**	**0.08**	**-0.05**																
GROWTH	10	**-0.04**	-0.02	**-0.06**	**0.04**	**-0.04**	0.02	**0.03**	**0.04**	**0.03**															
Q	11	0.00	**-0.04**	-0.02	**0.08**	**0.03**	-0.03	**0.10**	**0.08**	**0.17**	**0.23**														
CASH	12	**0.03**	**-0.03**	**-0.04**	**0.07**	-0.01	**0.10**	**0.08**	**0.12**	**-0.11**	**0.11**	**0.41**													
ROA	13	-0.03	0.01	**0.05**	**0.04**	**0.05**	**-0.09**	**0.06**	0.01	**0.25**	**0.23**	**0.48**	**0.13**												
LEVERAGE	14	**-0.03**	**-0.09**	0.01	**-0.08**	**-0.12**	**-0.03**	0.01	0.00	**0.14**	**-0.05**	**-0.14**	**-0.31**	**-0.19**											
FIN_NEEDS	15	-0.02	**-0.04**	0.03	-0.02	**-0.03**	**0.04**	0.01	0.03	**0.08**	**0.05**	0.02	**-0.22**	**0.11**	0.01										
ANALYST	16	**-0.09**	**-0.10**	**0.10**	**-0.09**	**-0.10**	**-0.16**	**0.21**	**0.12**	**0.66**	**0.09**	**0.17**	-0.02	**0.15**	**0.07**	**0.05**									
INSTIT_HHI	17	0.01	**0.13**	-0.02	**0.12**	**0.17**	**0.03**	**-0.20**	**-0.16**	**-0.41**	**-0.05**	**-0.08**	0.00	**-0.12**	**-0.10**	**-0.05**	**-0.35**								
BIDASK	18	**0.06**	**0.04**	**-0.07**	**0.06**	0.02	**0.08**	**-0.21**	**-0.16**	**-0.54**	**-0.14**	**-0.13**	**0.08**	**-0.29**	**-0.05**	**-0.12**	**-0.44**	**0.30**							
BHR_3m	19	**-0.04**	0.00	-0.01	0.00	-0.02	0.02	**-0.04**	**-0.03**	**-0.05**	**0.07**	-0.01	0.01	-0.02	**0.05**	0.00	-0.01	0.00	**0.07**						
BHR_90d	20	0.03	0.02	0.00	0.02	0.00	-0.01	0.01	0.00	**-0.08**	**-0.10**	**-0.05**	0.00	**-0.07**	**-0.03**	**-0.04**	**-0.08**	0.02	**0.10**	**-0.14**					
DIV_YIELD	21	**-0.04**	0.02	**0.06**	**-0.04**	**0.03**	**-0.25**	**-0.17**	**-0.28**	**0.20**	**-0.13**	**-0.06**	**-0.16**	**0.10**	**0.11**	-0.01	0.02	**0.03**	**-0.14**	0.02	-0.02				
IDIOVOLAT	22	**0.05**	-0.02	**-0.08**	0.01	**-0.08**	**0.16**	**0.04**	**0.12**	**-0.44**	-0.02	**-0.03**	**0.19**	**-0.28**	0.02	**-0.11**	**-0.23**	**0.11**	**0.61**	**0.08**	**0.08**	**-0.29**			
R&D	23	0.00	-0.02	**-0.05**	0.02	-0.01	**0.08**	0.01	**0.05**	-0.02	-0.01	**0.12**	**0.27**	**-0.21**	-0.02	**-0.16**	0.01	0.01	**0.07**	**0.05**	-0.02	**-0.08**	**0.09**		
CFO	24	-0.01	**-0.04**	0.02	0.02	0.01	**-0.04**	**0.13**	**0.10**	**0.15**	**0.11**	**0.51**	**0.19**	**0.63**	**-0.10**	**0.17**	**0.16**	**-0.13**	**-0.13**	0.00	**-0.07**	**0.05**	-0.02	**-0.12**	
TURNOVER (log)	25	**-0.09**	**-0.14**	**0.04**	**-0.17**	**-0.21**	**-0.21**	**0.11**	0.00	**0.75**	-0.02	0.02	**-0.03**	-0.01	**0.24**	**-0.04**	**0.64**	**-0.40**	**-0.30**	-0.02	**-0.03**	**0.10**	**-0.07**	**0.03**	**0.03**

Table 1.6.- Panel regressions of MSCI board on activist hedge fund ownership.

	(1) BOARD_RATING	(2) BOARD_RATING
INSTIT_TOTAL%	14.2734 (0.000)***	
ACTIVIST_HF%		16.3681 (0.008)***
INSTIT_OTHER%		14.4681 (0.000)***
SIZE	-3.4304 (0.000)***	-3.4022 (0.000)***
GROWTH	0.7539 (0.663)	0.7646 (0.659)
Q	1.0915 (0.005)***	1.0931 (0.005)***
CASH	3.6675 (0.264)	3.6487 (0.268)
ROA	-1.9020 (0.602)	-1.8886 (0.606)
LEVERAGE	-6.1847 (0.026)**	-6.1524 (0.027)**
FIN_NEEDS	-0.0001 (0.983)	-0.0001 (0.988)
#ANALYST	1.1382 (0.123)	1.1045 (0.136)
INSTIT_HHI	-2.9180 (0.142)	-2.7603 (0.167)
Constant	61.1025 (0.000)***	60.5157 (0.000)***
N	6342.000***	6342.000***
Chi2	831.571	834.795
R-sq	.08	.08
N_clust	1,820	1,820

p-values in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$)

Table 1.7.- Handling endogeneity of activist hedge fund ownership.
Fama-Mcbeth (1973) regression of ACTIVIST_HF% on its determinants.

	(3) ACTIVIST_HF%
SIZE	-0.008***
	(0.00)
VOLAT	-0.34***
	(0.001)
TURNOVER	0.003***
	(0.00)
AGE	-9.03E-04*
	(0.08)
BIDASK	-0.99***
	(0.00)
BHR_9M	-0.0026
	(0.26)
DIV_YIELD	-0.45***
	(0.00)
CFO	0
	(0.67)
CASH	0.023***
	(0.00)
LEV	0.005
	(0.10)
IO_OTHER	0.06***
	(0.00)
R&D	0
	(0.32)
SP500	-0.016***
	(0.00)
Constant	yes
F	616.59***
Mean. Adj. R^2	0.16

Table 1.8.- Endogeneity test -panel regressions of board rating on residual activist ownership.

P-values are indicated in parentheses a follows: * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(4) BOARD_RATING
RACTIVISTHF_%	11.6193 (0.011)**
INSTIT_OTHER%	19.1842 (0.000)***
SIZE	-3.6582 (0.000)***
GROWTH	0.9212 (0.694)
Q	1.0118 (0.023)**
CASH	2.4650 (0.542)
ROA	-1.3662 (0.777)
LEVERAGE	-7.5557 (0.016)**
FIN_NEEDS	-0.0062 (0.367)
#ANALYST	1.0942 (0.198)
INSTIT_HHI	-4.2674 (0.071)*
Constant	60.7508 (0.000)***
N	4,665
Chi2	828.16***
R-sq	0.11
#firms	1,687

Table 1.9.- Causality test

Panel regressions of board rating, Board entrenchment and CEO power on activist ownership. P-values in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(5) BOARD_RATING	(6) ACTIVIST_HF%
ACTIVIST_HF%$_t$	8.0430	
	(0.208)	
BOARDRATING$_{t-1}$		-0.0000
		(0.500)
INSTIT_OTHER%	13.2986	-0.0075
	(0.000)***	(0.338)
SIZE	-3.4131	-0.0064
	(0.000)***	(0.000)***
GROWTH	1.0820	0.0044
	(0.533)	(0.343)
Q	1.0792	-0.0015
	(0.006)***	(0.164)
CASH	3.6770	0.0234
	(0.265)	(0.020)**
ROA	-2.5406	-0.0150
	(0.483)	(0.220)
LEVERAGE	-5.9079	0.0071
	(0.034)**	(0.409)
FIN_NEEDS	0.0007	-0.0000
	(0.898)	(0.222)
#ANALYST	1.2756	-0.0028
	(0.088)*	(0.181)
INSTIT_HHI	-2.9687	-0.0163
	(0.139)	(0.001)***
Constant	62.5227	0.1762
	(0.000)***	(0.000)***
N	6,165	5,244
F	837.21***	178.53***
R-sq	0.09	0.003
#firms	1,811	1,801

Table 1.10.- Tests on selected individual governance metrics
Panel regressions of CEO duality board entrenchment on activist ownership. P-values in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(7) CEO duality	(8) Board entrenchment	(9) CEO tenure	(10) Board tenure
ACTIVIST_HF%	-4.6290 (0.003)***	-4.1502 (0.001)***	-2.3496 (0.025)**	-2.2876 (0.001)***
INSTIT_OTHER%	-0.0510 (0.943)	-0.5660 (0.286)	-0.1001 (0.843)	-0.0115 (0.969)
SIZE	0.2604 (0.046)**	-0.1522 (0.102)	-0.1100 (0.231)	0.1452 (0.021)**
GROWTH	-1.0973 (0.024)**	-1.4763 (0.001)***	-0.4852 (0.063)*	-0.5767 (0.000)***
Q	-0.1248 (0.307)	0.0319 (0.699)	0.2069 (0.005)***	-0.0135 (0.729)
CASH	-1.3248 (0.176)	-3.0582 (0.000)***	-1.4017 (0.017)**	-1.2689 (0.001)***
ROA	1.0666 (0.385)	3.6695 (0.000)***	1.4753 (0.037)**	1.6225 (0.000)***
LEVERAGE	-0.0363 (0.963)	-1.4501 (0.013)**	-0.2779 (0.582)	0.0882 (0.798)
FIN_NEEDS	-0.0004 (0.799)	-0.0004 (0.720)	-0.0000 (0.994)	0.0008 (0.055)*
#ANALYST	0.1917 (0.303)	-0.2946 (0.046)**	-0.3307 (0.017)**	-0.1117 (0.127)
INSTIT_HHI	0.3380 (0.441)	1.2564 (0.003)***	0.4862 (0.135)	0.4821 (0.003)***
Constant	-6.2328 (0.000)***	-0.9548 (0.299)	7.9678 (0.000)***	9.1055 (0.000)***
N	6,337	6,337	5,786	5,922
F	83.59***	114.19***	73.05***	231.87***
R-sq	-	-	0.006	0.06
#firms	1,819	1,819	1,771	1,795

Table 1.11.- Influence of a public activist campaign

Panel regressions of board rating on activist ownership and publicly reported campaign. P-values in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

	(11) BOARD_RATING	(12) BOARD_RATING	(13) BOARD_RATING
CAMPAIGN	5.6909	5.1862	
	(0.033)**	(0.052)*	
ACTIVIST_HF%		15.6445	14.2741
		(0.012)**	(0.022)**
CAMPAIGN			-6.5520
			(0.184)
CAMPAIGN # ACTIVIST_HF%			71.2756
			(0.006)***
INSTIT_OTHER%	13.4873	14.4571	14.6406
	(0.000)***	(0.000)***	(0.000)***
SIZE	-3.5089	-3.4032	-3.4502
	(0.000)***	(0.000)***	(0.000)***
GROWTH	0.7773	0.7888	0.9287
	(0.654)	(0.649)	(0.592)
Q	1.0875	1.1186	1.1221
	(0.005)***	(0.004)***	(0.004)***
CASH	3.9238	3.6447	3.5694
	(0.233)	(0.269)	(0.280)
ROA	-1.9783	-1.6946	-1.4231
	(0.590)	(0.643)	(0.698)
LEVERAGE	-5.9849	-6.1257	-6.1440
	(0.031)**	(0.027)**	(0.027)**
FIN_NEEDS	-0.0003	-0.0001	-0.0002
	(0.955)	(0.991)	(0.965)
#ANALYST	1.1483	1.1148	1.1539
	(0.121)	(0.131)	(0.119)
INSTIT_HHI	-3.4432	-2.7555	-2.7354
	(0.081)*	(0.168)	(0.170)
Constant	63.9926	60.4907	60.7478
	(0.000)***	(0.000)***	(0.000)***
N	6,342	6,342	6,342
Chi2	820.88***	838.08***	847.57***
R-sq	0.09	0.09	0.09
#firms	1,820	1,820	1,820

Chapter 2
Reporting aggressiveness in presence of activist hedge funds

Abstract

This paper revisits prior research documenting the relation between external monitoring and financial reporting quality. We examine the specific case of activist hedge funds, a group of sophisticated investors that exert intensive influence on the management and the board of their target firms. Their influence on firm practices and management behaviour is currently the subject of a heated debate amongst the academic community and practitioners. Using a unique proprietary shareholder activist database and several proxies for accounting earnings quality on a sample of US-listed firms over the 2006-2014 period, this paper sheds light on this debate and analyses the influence of activist hedge funds on earnings quality.

Our results provide evidence of pervasive earnings management in presence of activist hedge funds. This evidence corroborates public perceptions about their short-term stance. Specifically, we provide evidence that activist hedge funds are positively related to earnings management practices in their investee firms. In additional analysis, a study of the earnings response coefficient reveals that earnings participants perceive earnings surprises in presence of a higher level of activist hedge fund ownership as less credible, consistent with the idea that such earnings are less informative.

Overall, we provide evidence of a positive relation between activist hedge funds and reporting aggressiveness.

2.1. Introduction

Does the presence of Activist Hedge Funds influence their target firms towards more aggressive reporting choices? Activist Hedge Funds ("HF" thereafter) are sophisticated investors that are currently on the spotlights of the press, political field and academic research. In this vein, research focusing on the determinants and consequences of HF activism is gaining traction. Whether activist HF influence their target firms for the better or the worse is an empirical matter. In this paper, we focus on the influence of activist HF on financial reporting quality, measured through several earnings quality proxies. This paper connects two streams in the literature: the effects of institutional ownership on financial reporting quality (e.g. Bushee 1998, Ramalingegowda & Yu, 2012) and recent research focused on activist hedge funds (Brav, Jiang, Partnoy, & Thomas, 2008; Bebchuk, Brav, & Jiang, 2015).

Several factors have been found to influence the level of earnings quality, including institutional ownership composition. Yet, with the emergence of new forms of institutional ownership and involvement (Gillan & Starks, 2007), which institution matters for governance is still an ongoing debate. A way to classify investor's activities and interactions with the firms is to observe if they behave as shareholder activists such as intervening in governance matters; in a nutshell, being an "itching powder".

Recent academic research (e.g. Brav *et al.* 2008, 2009) generally documents short-term and long-term benefits of HF activism for other shareholders, as measured by abnormal price performance. However, there is also evidence that HF activism leads to bondholder

wealth expropriation, thereby exacerbating the bondholder-shareholder conflict (Klein and Zur 2011).

Our paper takes a new stance on hedge fund activism and complements prior accounting research on the benefits of institutional monitoring in their target firms. We rely on a unique proprietary shareholder activist database to identify and measure accurately the level of equity held by activist hedge funds in each of our sample firms. This allows us to analyse the influence of so-called "wolf-pack" activism under both formal and informal (i.e. less directly observable) settings. We use accounting earnings quality measures that have solid theoretical and empirical validity, as well as important implications both for the bondholder-shareholder and the principal-agent conflicts: evidence of earnings management, and the earnings response coefficient (ERC).

Our results, by research design, are based on a sample that is more representative of the US stock population, is not conditioned on the occurrence of a publicly reported activist hedge fund campaign, and therefore should suffer less from selection bias. Our results echo those documented in Klein and Zur (2011) on the negative consequences of hedge fund activism for the bondholder-shareholder conflict. We find that the same activist HF are positively related to earnings management practices, as well as lower earnings informativeness. Additional tests support our main results. Overall, this paper provides evidence that activist HF are positively related to reporting aggressiveness in their investee firms.

The paper is structured as follows. Section 2.2 reviews the literature on earnings quality and the influence of institutional investors. Section 2.3 develops our hypotheses. Section 2.4 shows the methodology adopted and section 2.5 discusses the data and descriptive

statistics. Section 2.6 discusses the empirical results. Section 2.7 provides additional analysis and section 2.8 concludes.

2.2. Literature review

We review the existing literature on the determinants, consequences and proxies for earnings quality in section 2.2.1, and the investor classification in section 2.2.2.

2.2.1. Earnings quality

There has been abundant research on earnings management, mostly relying on discretionary accrual models, such as the Jones (1991) model and its subsequent improvements (Dechow *et al.* 1995, Kothari *et al.* 2005). Yet, accrual-based earnings management is only one component of the toolbox available to managers to achieve various objectives. Other forms of earnings management exist, such as classification shifting (e.g. McVay 2006[10]), or "real activities" -also named "transaction-based"- manipulations. Two examples of Real Earnings Management (hereafter "REM") are opportunistic sale of fixed assets and marketable securities (e.g. Bartov 1993, Hermann 2003) or abnormal reduction of R&D expenditures (e.g. Bushee 1998).

This form of moral hazard may likely have negative consequences for investors as it blurs the "true" (i.e. underlying) performance of both the firm and the manager and therefore sends misleading signals. In the academic literature, Graham, Harvey & Rajgopal (2005) find that REM practices are widespread and actually the dominant source of earnings management. Prior research documents that when managers are constrained from using

[10] Earnings management by classification shifting, although instructive in itself, has not gained as much interest from academics and practitioners as real earnings management.

accrual-based earnings management, they turn instead to real earnings management. For instance, Cohen, Dey & Lys (2008) provide empirical support for the model of Ewert and Wagenhofer (2005), suggesting that SOX imposed greater regulatory scrutiny on firms and potentially reduced their accounting flexibility via the use of accruals, but exacerbated the use of real earnings management techniques.

Rooted in positive accounting theory, prior research has identified various reasons for manipulating earnings such as contracting factors (e.g. Defond and Jiambalvo 1994 in the case of debt covenants, Healy 1985 and Beneish 1999 in the case of executive compensation, Teoh and Wong 1998 in the case of IPO, Cohen and Zarowin 2010 in the case of seasoned equity offerings), political purposes (e.g. Jones 1991), and target beating (e.g. Degeorge *et al.* 1999, Matsumoto 2002).

Roychowdhury (2006) studies REM of sales, production and discretionary expenses; he finds that managers avoid reporting accounting losses with the help of REM. Specifically, managers use sales manipulation and overproduction to decrease reported COGS and avoid reporting losses. Gunny (2010) focuses on REM based on operating activities (R&D, SG&A and overproduction) and investment activities (sale of fixed assets) and show that managers of firms that just meet zero earnings and last year's net income use more of these techniques to inflate earnings. Several studies report that managers may cut discretionary expenses in order to meet earnings targets. For instance, relying on a survey of US CFOs, Graham *et al.* (2005) and Dichev, Graham, Harvey, & Rajgopal (2016) document that managers frequently employ REM in order to meet earnings forecasts. Herrmann *et al.* (2003) find that earnings are managed closer to management's forecasts of operating income with the help of the sale of fixed assets and marketable

securities. Bartov (1993) documents a positive correlation between income from asset sales and debt-equity ratios as a proxy for accounting-based constraints (debt–equity hypothesis). In the same paper, Bartov (1993) documents a negative correlation between income from asset sales and earnings (excluding effect of asset sales) changes (earnings smoothing hypothesis). Bens *et al.* (2002) show that following stock option exercise, managers cut R&D and capital expenditures to accommodate for earnings per share dilution. Further, Bens *et al.* (2003) show that increasing stock repurchases is used to offset dilutive effects of Employee Stock Options. Finally, Gunny (2010) finds evidence that managers employ simultaneously several methods not in an opportunistic way, but rather to enhance or signal future performance.

Factors limiting the use of accrual-based earnings management include auditors, financial analysts, internal governance and controls and institutional investors. The former three are briefly discussed below, and an emphasis is made on the latter.

Caramanis and Lennox (2008) show that abnormal increasing accruals are negatively related to the audit engagement hours. Bradshaw *et al.* (2001) find that financial analysts do not seem to incorporate into their forecast the predictable decline in earnings associated with high accruals, suggesting that they expect accruals to persist about as strongly as cash flows, when in fact accruals are significantly less persistent. In contrast, Yu (2008) documents that firms followed by more analysts exhibit lower levels of abnormal accruals, suggesting that analysts deter the use of opportunistic manipulation of accruals. Dechow *et al.* (1996) document that firms subject to SEC enforcement actions are more likely to exhibit poor governance characteristics. The efficiency of internal control also affects the quality of accruals (Ashbaugh-Skaife *et al.* 2008, p247), as it reduces "both

intentional and unintentional misstatements in measuring, recording and processing financial statements", all steps leading to more reliable reporting.

Regarding the influence of institutional investors, Chung *et al.* (2002) document that the presence of institutional investors deters managers to use opportunistic accrual-based earnings management for smoothing purpose, an incentive identified analytically in Fudenberg and Tirole (1995). Similar results are found in Roychowdhury (2006) who provides evidence that higher levels of institutional ownership deter manipulations of operating activities. These previous studies focus on the aggregate level of institutional ownership and do not make the distinction between short-term and long-term-oriented investors. Given the theoretical findings provided in the previous section, it is likely that the impact of such investors on managerial opportunistic behaviours differs along with the type of institutional investors. An improvement in this regard is Bushee (1998) who documents the relation between the presence of institutional investors in the capital of the firm and earnings management through the reduction of R&D expenses. He shows that different composition of institutional ownership affects management real decisions. In particular, the higher presence of "transient" investors, exhibiting high portfolio turnover and a short-term investment horizon, increases the likelihood of a cut in R&D expenses undertaken by the manager to reach last year earnings levels. While documenting a pressuring role of transient investors is an important contribution per se, the paper is silent on the role of other types of investors: indeed the results in Bushee (1998) indicate that they do not play any role. Therefore, looking at these results, we may conclude that institutional investors do play a pressuring role on earnings management activities. At least three interpretations are possible. First, the two other types of investors actually do

not play any role in the business activities of their investees. Second, the research design omits certain types of investors such as hedge funds or shareholder activists who may more likely play a role in the firm's activities. Third, the classification technique employed in Bushee (1998) is incomplete as it relies solely on funds past portfolio behaviour, and omits other aspects of a fund's activities such as its involvement in the governance of investees. Given these comments and the theoretical arguments, we aim at improving our understanding of the consequences of involvement of institutional investor in the firm's governance and decisions. In particular, our paper revisits this question by focusing on a particular group of investors that exert strong influence in the corporate governance area.

2.2.2.Institutional investor classification

Brickley, Lease, & Smith (1988) classifies institutional ownership based on their potential business relations with their investees. In their setting, "pressure-sensitive investors include banks and insurances, whereas "pressure-resistant" include independent advisors and public pension funds. Subsequent research has refined the classification scheme to reflect other dimensions of institutional investing. In this regard, Bushee (1998, 2000) adopts a classification based on investors' past trading behaviour, including portfolio liquidity, turnover, concentration and sensitivity to past, current and changes in earnings. The influence of institutional ownership is predicted to differ along these portfolio characteristics. Further, he defines "transient" investors as short-term oriented investors, "quasi-indexers" as long-term investors without governance motivations, and "dedicated" as medium to long-term investors who are involved in the monitoring of their investees. He predicts and finds that transient investors, characterized by high portfolio turnover, influences negatively the level of earnings management as a proxy for the quality of

financial reporting, whereas dedicated and quasi-indexers investors do not play any role. This classification has been used in subsequent research dealing with the effects of institutional ownership on earnings management practices, noticeably in real earnings management studies (e.g. Roychowdhury 2006).

Another stream of research focuses on the engagement of the shareholder in governance matters. Based on the concept of Hirschman (1970) of "exit" vs "voice", investors get actively involved in their investee firms. According to Tirole (2006), executive compensation schemes change not only the manager's effort, but also other behaviours. Therefore, contracting must be complemented by a direct control of these side effects. This is where institutional investors can intervene as active monitors. Quoting Tirole (2006, p. 36): "active monitors intervene in such matters as the *firm's strategic decisions, investments, and asset sales, managerial compensation*, design of takeover defenses, and board size and composition..." (emphasize added).

Gillan & Starks (2007) argue that within the shareholder activist arena, activist HF take the lion's share. This group of sophisticated investors has been the focus of a number of finance studies (see Brav, Jiang, & Kim, 2010 for a review). This research generally documents positive benefits for other shareholders, as evidenced by abnormal stork price performance following an activist HF intervention. Such welcomed improvements may be the consequence of actual "real" business improvements, artificial inflated earnings, or a combination of both. As such, whether activist HF contribute to improving or worsening financial reporting quality is an empirical question that is worth investigating. In addition, there is also evidence of bondholder wealth expropriation, as documented in Klein & Zur (2011).

In this paper we focus on activist HF, as they exhibit differing characteristics compared to other institutional investors (Brav et al., 2010), mainly due to regulatory, trading and compensation structures. First, they are independent investors, not tied to a financial services entity. Further, they are lightly regulated and adopt a flexible investment approach with a greater proportion of illiquid holdings and extensive use of financial derivatives relative to mutual funds. The investment manager personal wealth is usually solidly tied to the investment vehicle performance, and a significant part of fees earned stems from performance fees with the so-called "high water mark" (HWM) and hurdle rate systems. The HWM is the highest net asset value (NAV) of the fund on which an incentive fee has been paid. This mechanism ensures that no fee be paid on recouped losses. The HWM mechanism can be paired with a hurdle rate, a specified minimum return that must be earned by the investor before the incentive fee is applied to profits. These mechanisms are attempts to provide optimal contracting, as the fee structure should provide better alignment of interests between the investment manager and the hedge fund investor (Anson, Black, Kazemi, & Chambers, 2012).

We draw on Gillan & Starks (2007) and depart from prior investor classification (e.g. Bushee 1998) in an important way. Basing the investor classification on portfolio characteristics may not accurately depict the monitoring activity of these sophisticated investors operating in wolf packs (Brav, Dasgupta, & Mathews, 2015). In this paper, we adopt a simple yet powerful way to classify investors, according to the likelihood of their interventions to get things changed in their target firms. Compared to non-activists, shareholder activists are more likely to exert a strong monitoring function (including the financial reporting process) on their investees. Our approach sheds new light on the extent

to which a well-identified group of independent investors with strong monitoring capabilities and incentives can influence financial reporting quality.

2.3. Hypotheses Development

There are two competing views on the benefits of institutional ownership. First, the presence of hedge funds activists is expected to increase the level of earnings quality because of an increase in the level of monitoring relatively to other investors. Given their expertise, they are likely to exert tougher monitoring (Tirole, 2006). If earnings quality provides some benefits (see section 2.2.1), and if shareholder activists, as strong independent monitors, value such benefits, then the presence of shareholder activists should demand and enhance earnings quality.

However, Von Thadden (1995) shows a side effect to increased monitoring of the managerial behaviour. Conceptually, monitoring may solve one type of moral hazard but gives rise to a new one. Feeling pressured to achieve higher objectives, and overly focused on short-term decisions that will determine both her/his tenure and her/his compensation level, the manager is enticed to boost short-term profits, at the detriment of potentially larger long-term losses. Such behaviour may materialize into aggressive use of earnings management.

Thus, under the assumptions that activist hedge funds are one form of intensive monitoring, and given the conflicting arguments presented above, we state the following first hypothesis (in the alternative form):

H1 Earnings quality is related to aggregate activist hedge fund ownership

A further test of their monitoring benefits is to focus on cross-sectional analysis based on the degree of information asymmetry of the sample firms. Extant research documents that earnings management activities are greatest in firms with high information asymmetry, a proxy for the degree of information environment and information production. In this vein, theoretical and empirical contributions show that moral hazard is higher in firms exhibiting a higher degree of information asymmetry. If we detect a positive relation between earnings quality and aggregate activist hedge fund ownership for the sample of firms exhibiting a high level of information asymmetry, one would have further evidence that these institutional investors perform their monitoring role well. Adversely, a negative relation between earnings quality and aggregate activist hedge fund ownership for the sample of firms exhibiting a high degree of information asymmetry would provide support for the myopic stance of activist hedge funds. Therefore, we state the second hypothesis as follows:

H2 Earnings quality is related to aggregate activist hedge fund ownership in firms exhibiting a high level of information asymmetry

2.4. Research design and methodology

We present in this section the measure employed to test the influence of activist hedge funds on earnings management (section 2.4.1). The methodology of investor classification is presented in section 2.4.2. The sample construction and descriptive statistics are presented in section 2.4.3.

2.4.1.Earnings management measures

2.4.1.1. Real-based earnings management models

We focus on real earnings management for two reasons. First, it's likely that activist hedge funds have more direct influence over real-based than over accrual-based earnings management. Extreme accruals are more easily spotted by investors and auditors because they eventually reverse. In contrast, detecting real earnings management is not the prerogative of auditors; real earnings management may be used as part of the normal course of business decisions, and as such is less likely to be detected by the board of directors (Carcello, Hollingsworth, Klein & Neil 2006). Extant research shows that real-based earnings management increased following the enactment of SOX (Cohen, Dey & Lys 2008) and is the predominant form of earnings management (Graham & al. 2005). Second, resorting to real earnings management to boost short-term earnings has direct consequences for long-term performance. Prior research indeed documents that firms using real-based earnings management including cutting R&D expenditures lose ground in the product market competition and exhibit lower future performance (Cohen & Zarowin 2010; Cheng, Lee & Shevlin 2016). The long-term implications of these earnings management techniques are therefore a direct test to assess the long-term stance (or lack thereof) of activist hedge funds.

We perform our analysis based on real-based earnings management (REM hereafter), as they are the predominant form of earnings manipulation (Graham *et al.* 2005). We employ abnormal R&D expenses, abnormal SG&A expenses, abnormal production costs and

abnormal gains on asset sales as our 4 measures for REM following Cohen & Zarowin (2010) and Gunny (2010). The regressions of normal levels of R&D expenses, SG&A, production costs and asset sales are run cross-sectionally at the industry (2-digit SIC)-year level.

The regression models are as follows:

Normal levels of production costs are expressed as a linear combination of sales, lagged and current change in sales, firm size and Q.

$$\frac{PROD_{it}}{AT_{i,t-1}} = cst + k_1 \frac{1}{AT_{i,t-1}} + k_2 \frac{\Delta SALES_{it}}{AT_{i,t-1}} + k_3 \frac{\Delta SALES_{it-1}}{AT_{i,t-1}} + k_4 \frac{SALES_{it}}{AT_{i,t-1}} +$$

$$k_5 SIZE_{it} + k_6 Q_{it} + \varepsilon_{it} \quad (1)$$

Expected levels of SGA&A are expressed as a linear combination of lagged sales, and R&D expenses as a linear combination of lagged sales and R&D expenses, size, capital expenditures and internal funding levels :

$$\frac{SGA\&A_{it}}{AT_{i,t-1}} = cst + k_1 \frac{1}{AT_{i,t-1}} + k_2 \frac{SALES_{it-1}}{AT_{i,t-1}} + \varepsilon_{it} \quad (2)$$

$$\frac{R\&D_{it}}{AT_{i,t-1}} = cst + k_1 \frac{1}{AT_{i,t-1}} + k_2 \frac{SALES_{it-1}}{AT_{i,t-1}} + k_3 \frac{R\&D_{it-1}}{AT_{i,t-2}} + k_4 SIZE_{it} +$$

$$k_5 CAPEX_{it} + k_6 INTFUND_{it} + \varepsilon_{it} \quad (3)$$

Where SG&A is the sum of SG&A expenses and advertising expenses; R&D is Research & Development expenses; SALES is total sales; SIZE is firm size as proxied by market

capitalization; CAPEX is capital expenditures; INTFUND is internal funding levels, computed as net income before extraordinary items + depreciation and amortization + R&D expenses.

The fourth REM model is based on abnormal gains generated from the sale of assets following on Bartov (1993), Hermann (2003) and Gunny (2010). The normal level of gains on asset sales is modeled as:

$$\frac{GAIN}{AT_{i,t-1}} = cst + m_1 \frac{1}{AT_{i,t-1}} + m_2 \frac{ASSETSALE_{it}}{AT_{i,t-1}} +$$

$$m_3 \frac{INVTSALE_{it}}{AT_{i,t-1}} + m_4 SIZE_{it} + m_5 INTFUND_{it} + m_6 Q_{it} + m\varepsilon_{it} \qquad (4)$$

Where *GAIN* is gain from asset and investment sale; *ASSETSALE* is long-lived asset sales, *INVTSALE* is long-lived investment sales, *INTFUND* is internal funding computed as net income before extraordinary items + depreciation and amortization + R&D expenses, and all other variables defined as above.

The equations are estimated cross-sectionally for each industry-year with at least 9 observations. We then define 4 firm-level real earnings management proxies: *REM_PROD*, *REM_RD*, *REM_SGA* and *REM_ASSET* as the residuals from the firm-level regressions using actual firm data and the coefficients obtained from the models shown above. Finally, *REM_RD* and *REM_SGA* are multiplied by one for the ease of interpretation, so that higher levels earnings management indicate higher earnings management levels.

2.4.1.2. Aggregate real earnings management measures

In addition to the prior earnings management measures, we design one aggregate measure of earnings management through discretionary expenses *REM_DIXP*, and one aggregate real earnings management measures *REM_AGG* as the sum of *REM_PROD* and *REM_DIXP*[11].

2.4.1.3. Earnings management regressions

The baseline regression used to test H1 and H2 is the following:

$$EM = ACTIVIST\_HF\%_{it-1} + IO\_OTHER\%_{it-1} + \#ANALYST_{it} + MTR_{it} + FIRMAGE_{it} + BTM_{it} + LEV_{it} + ROA_{it} + SIZE_{it} + IND_{it} + YEAR_{it} + \varepsilon_{it} \quad (5)$$

Where:

EM, the earnings management measure, stands for either *REM_PROD, REM_RD, REM_SGA, REM_ASSET, REM_DIXP, or REM_AGG*;

ACTIVIST_HF% is our measure for aggregate activist hedge fund ownership;

IO_OTHER% is the measure of "other" institutional ownership;

#ANALYST is the number of analysts following;

[11] REM_AGG provides a summary measure of the earnings management commonly used in the literature and covers the full sample. In unreported analysis, we also design a summary measure REM_AGG2, the "total" real earnings management activities, including the gain from asset sale, a decision where activist hedge funds are known to have an influence (Clifford 2008). REM_AGG and REM_AGG2 are very highly correlated (rho=0.99), therefore seems redundant to be included in the analysis. Further, using REM_AGG2 comes at the price of a much lower sample size. Results are very similar when using RM2 as our summary measure. We base the discussion of our results on REM_AGG.

MTR is the firm marginal tax rate collected from Prof. Graham's website;

FIRMAGE is the age of the firm (the time from the initial listing year);

BTM is the firm book-to-market, defined as the ratio of the book value of equity over the market value of equity and a proxy for growth opportunities;

LEV is firm leverage, defined as the ratio of the sum long-term liabilities and current portion of long-term debt over total assets;

ROA is Return on Assets and a proxy for firm performance

SIZE is the log of firm total assets and a proxy for the firm size

IND and *YEAR* are controls for industry and year, respectively.

To mitigate endogeneity concerns, the variables *ACTIVIST_HF%* and *IO_OTHER%* are introduced with one-year lags in all regressions. Other variables are introduced at their contemporaneous level values. Variables definition and construction can be found on table 2.1.

[insert table 2.1 here]

In addition, we identify within the full sample a subsample of firms that are more likely to manage earnings; we call them the "suspect firms". We focus on firms reporting a small profit as a major earnings management incentive identified and used in prior research (Degeorge 1999; Kasznik & McNichols, 2002; Graham,Harvey & Rajgopal 2005; Dichev, Graham, Harvey & Rajgopal 2013;2016).

The model to explain the firm overall decision to manage earnings is the following:

$$P(MANAGE) = ACTIVIST\_HF_{it\text{-}1} + IO\_OTHER\%_{it\text{-}1} + LEV_{it} + GROWTH_{it} + CFO_{it} + FIN\_NEEDS_{it} + SIZE_{it} + YEAR_{it} + \varepsilon_{it} \quad (6)$$

Where:

MANAGE is a dummy variable taking the value of 1 in the "Small profits" case and 0 otherwise. Consistent with prior research, firms are posting small profits when their earnings lie in in the [0-1%] bracket. We include the log of total assets (*SIZE*), leverage (*LEV*) operating performance (*CFO*) and two-year average sales growth (*GROWTH*) to control for size, capital structure and performance that may affect the decision to report a small profit (Healy & Wahlen 1999, Dechow *et al.* 2010). We also control for financing needs as there are capital market incentives. We use a measure of external financing needs to this end. This measure is defined as the ratio of capital expenditures minus cash holdings over capital expenditures (*FIN_NEEDS)*. With this measure, we avoid introducing endogeneity related to an outcome-based measure such as equity /debt issuance.

Regression results can be found on tables 2.7 to 2.10.

2.4.2.Methodology of activist HF measurement

In this paper, we measure the presence and the intensity of activist HF in the firm equity, rather than the mere occurrence of a public activist campaign. Brav *et al.* (2015) mention that a number of activist HF fail to report adequately wolf-pack activism in SEC filings.

In this study, we do not rely on firms who had been subject to an official 13D campaign over our sample period. Instead, we take a broader view and analyse the effects of the presence and level of activist HF ownership. We measure HF activism by analysing the institutional ownership composition in each of our sample firms and design a firm-level measure of aggregate activist HF ownership.

Our approach has two advantages over settings used in prior research. First, drawing on the observation noted above a deep analysis of institutional ownership composition allows to detect wolf-pack activism more reliably than solely relying on SEC filings. Second, we adopt a more general framework that permits to analyse the effect of *both* observable (i.e. public) and unobservable (non-public) occurrence of wolf-pack activism[12]. Two reasons support the logic of the second justification. Because activists may also get involved "behind the doors", i.e. intervene non-publicly, relying on SC13D reports to study the effects of activism encompasses only a subset of shareholder activism involvement. Initiating a public campaign is costly. To avoid unnecessary efforts and expense shareholder activists beforehand discuss their grievances non-publicly with the management. Some demands do not become public. It is only when discussions prove unsuccessful that a public activist campaign is initiated and becomes publicly available. In parallel, capturing cases of activism unreported by the SEC (e.g. Icahn on Apple in 2015) involves cases where the filing activist holds less than the 5% threshold required

12 In this case, "unobservable" means activist involvement which could not observable under a SC13D if no single activist has crossed the 5% threshold required to file a SC13D report.

for filing with the SEC, yet gets involved in governance matters. These low stakes often involve larger target firms.

We use the Thomson Reuters (formerly CDA/Spectrum S34) institutional ownership database as our main source to collect detailed institutional holdings[13]. In order to analyze the institutional ownership composition and identify activist hedge funds, we rely and extend the methodology employed in Brav *et al.* (2008) as follows: first, we collect from the CDA/Spectrum S34 ownership database and analyse the institutional ownership composition to quantify the presence of hedge funds in the equity of the firm. To identify investment vehicles as a hedge fund, we use the Lipper TASS Hedge Fund database, a major provider of hedge fund data, supplemented by information collected on a Bloomberg terminal and self-reported investment strategy on the investment company website. This methodology avoids survivorship bias (the fact that poorly performing and liquidated investment companies stop reporting to the hedge fund database vendors) encountered with relying solely on hedge fund databases. The analysis is performed at the management company level, as it is the appropriate level of decision-making (Jiang, Li, & Wang, 2012). Remaining cases are validated with a professional alternative investment manager.

13 Consistent with prior research, we first review the CDA/Spectrum management type codes as these are not updated since 1998 and many institutions are misclassified as type5 (others) whereas they should be classified in other types (including banks (typecode1) and insurance companies (typecode2). This initial step ensures that we do not misclassify hedge funds as banks or insurance companies.

There is no comprehensive list of shareholder activists, therefore we compile existing information from three main sources. The first source is the TASS hedge fund database that flags activist hedge funds as a separate strategy. The second source is the Audit Analytics shareholder activist databases that collects information on activist campaigns from 2000 onwards. Finally, we rely on 2 pre-existing shareholder activist listings produced over the period of our study, namely those by Thomson One and The Conference Board. We believe that our approach allows to identify the majority of shareholder activists with a high degree of accuracy. A summarized methodology is tabulated in Table 2.2.

Our purpose is to measure the influence of activist hedge funds on earnings quality. To this end, we design a variable *ACTIVIST_HF%* measuring the aggregate equity holding % of activist HF in the firm.

2.5. Data and descriptive statistics

2.5.1. Descriptive statistics

Our sample includes all US-listed firms with the required financial data from Compustat, institutional ownership from Thomson Reuters Ownership, stock data from CRSP and analyst data from I/B/E/S. The final sample used for our main regression test includes 11,117 firm-year observations and covers the 2006-2014 fiscal years. Table 2.3 summarizes the sample breakdown by industry.

[insert table 2.3 here]

Table 2.4 reports descriptive statistics. Over the period, the average (median) sample firm exhibits total assets of about $900 ($820) million, positive sales growth of 11% (7%) and is profitable as evidenced by a median ROA of 5%. Sample firms also exhibit an average (median) leverage of 0.21 (0.17), a book-to-market ratio of 0.59 (0.49), are followed by 7 (7) analysts, and invest in R&D at the level of 10% of total assets on average. Further, they exhibit a median total institutional ownership base of 77% consistent with the literature, and an aggregate activist hedge fund ownership of 8%. Compared to the median Compustat firm over the same period (unreported), the sample firm exhibits similar size, similar sales growth, leverage, cash levels, market-to-book ratio, performance, dividend payout levels, and analysts following. Therefore, our sample seems to match reasonably well the characteristics of a typical US-listed firm over the same period. Therefore, while prior research on focuses on the benefits of activist HF for a relatively small set of firms, our analysis may provide evidence that the presence of activist hedge funds may also be related to accounting earnings attributes for a larger set of firms.

[insert table 2.4 here]

The Pearson correlation table is shown in table 2.5. Significant coefficients at the 5% level or better appear in bold. Noticeably, the aggregate percentage of activist HF equity holdings (variable *ACTIVIST_HF%)* is positively correlated with most of our earnings management measures. Further, *ACTIVIST_HF%* is negatively correlated with firm size and leverage, consistent with the idea of activist HF tend to invest in smaller firms and firms exhibiting lower leverage.

[insert table 2.5 here]

2.5.2. Measures of the dependent variables

Regression results on the earnings management tests can be found in table 2.6 to 2.8. Table 2.6 presents the regression results of the estimation of the "normal" levels of our earnings management measures. The equations are estimated cross-sectionally for each industry year with at least 9 observations. There are at least 458 industry-years pairs available during the sample period for each estimation model. On average, each industry-year regression contains more than 56 observations. The mean coefficients are comparable to those reported in Roychowdhury (2006). Consistent with Gunny (2010) and Cohen and Zarowin (2010), the mean adjusted R-squared is 87 percent for the normal production cost level (model 1), 59 percent for the normal level of SG&A expenditure (model 2), 68 percent for the R&D expense level (model 3), and 30 percent for the normal level of gain on asset sales (model 4). Overall, such levels suggest that these models have reasonable to high explanatory power.

[insert table 2.6 here]

2.6. Results

We present regression results for the main tests in tables 2.7 to 2.10. Outliers are removed with the Cooks' D statistic. Two-tailed p-values are reported using standard errors clustered by firm and year (Petersen, 2009).

2.6.1. Full sample

Tables 2.7 & 2.8 present the result of the regression of individual earnings management measures on activist hedge fund ownership and control variables. We present regressions results separately for each earnings management measure, and also the aggregate measures as defined in section 2.4.1.3.

The coefficient for the marginal tax rate (*MTR*) is significantly negative in most regressions, consistent with the idea that employing real-based earnings management is costly and is decreasing in the level of its fiscal impact (Zhang 2012). Consistent with Yu (2008), the variable *#ANALYST* is generally negative, suggesting that analysts deter the use of earnings management of the firms they cover.

Turning to our main predictor, we find a statistically significant and positive relation between our measures of earnings management and aggregate activist hedge fund ownership. The relation seems mostly prevalent in models dealing with discretionary expenses (*REM_RD & REM_SGA,* respectively models 6 & 7. This positive association is also significant in economic terms: a one-standard deviation of activist hedge fund ownership (7%) is related to a change in *REM_DIXP* of about 4.4% of total assets.

[insert table 2.7 here]

Table 2.8 presents the regression results of abnormal gains on asset sale and our summary measure of earnings management on activist hedge fund ownership and control variables. While we do not find any significant relation in the asset sale model (model 9) and ACTIVIST_HF%, we do find a positive association in our summary earnings

management measure REM_AGG (model 10). These association also have economic significance: a one-standard deviation of activist hedge fund ownership (7%) is related to a positive change in *REM_AGG* of about 4.6% of total assets (model 11). Thus, this provides support for H1. In addition, these results suggest that activist hedge funds are positively related to reporting aggressiveness.

[insert table 2.8 here]

2.6.2.Suspect firm sample

Table 2.9 focuses on the "suspect firms" sample and presents the results of the logistic regression of the likelihood to report a small profit. We find that the likelihood to report a small profit (model 11) is a positive function of the level of activist hedge fund ownership (p-value =0.014). H2 therefore finds support. A look at the odds ratios reveals insightful results: in economic terms, the odds of reporting a small profit are 6.22 larger for a one-unit increase in the level of activist hedge fund ownership. These results suggest that this group of sophisticated entices their investee firms to manage earnings.

[insert table 2.9 here]

Overall, in this section, our results provide evidence that activist HF exacerbate the use of opportunistic earnings management techniques. In other words, moral hazard seems positively related to their presence in the firm equity.

2.6.3.Sample partitioning based on information asymmetry

To test H2, we perform additional analysis by dividing the sample into two groups based on the degree of information asymmetry. We use the firm bid-ask spread to proxy for information asymmetry; this measure has solid theoretical grounds and is commonly accepted in the literature. A high bid-ask spread indicates a high degree of information asymmetry. Therefore, we form a "high" group of firms exhibiting a bid-ask spread above the sample-year median.

Results are presented in table 2.10. We find significant and positive associations between earnings management and activist hedge fund ownership across all our models. These results are also economically significant; a one-standard deviation of our main predictor is associated with positive change in REM_AGG, representing about 6% of total assets (model 12).

[insert table 2.10 here]

2.7. Additional analysis

We perform additional tests to control for the endogeneity of our main predictor (section 2.7.1), non-linearity (section 2.7.2), and an analysis of earnings informativeness (section 2.7.3).

2.7.1.Endogeneity of the main predictor

To control for the potential endogeneity of our main predictor, we rely on an alternative measure of aggregate activist hedge fund ownership (Gompers & Metrick, 2001;

Ramalingegowda & Yu, 2012). To this end, a Fama-McBeth regression is run with activist hedge fund ownership determinants documented in prior literature, and the coefficients obtained from this regression are used to extract the unexpected activist hedge fund ownership and design our variable *RACTIVIST_HF%*. We use this variable *RACTIVIST_HF%* as a robustness check. The predictors used are firm size (*SIZE*), firm bid-ask spread (*BIDASK*), volatility (*VOLAT*), share turnover (*TURNOVER*), firm age (*FIRMAGE*), 9-month buy-and-hold firm stock return (BHR_9m), dividend yield (*DIV_YLD*), operating cash flows (*CFO*), cash levels (*CASH*), leverage (*LEV*), R&D intensity (R&D), the proportion of "other" institutional holdings (*IO_OTHER%*), and a dummy variable indicating whether the firm is included in the SP500 index (*SP500*). These variables are signed and significant as per extant research. Further, the model explains a reasonable level of the main dependent variable, with an average adjusted R-squared of 16%. Details on the Fama-McBeth regression (model 13) can be found on table 2.11.

[insert table 2.11 here]

Results of the regressions run with the variable *RACTIVIST_HF%* can be found in table 2.12 and show, albeit now significant at only 5%, the magnitude and sign of the coefficients for *RACTIVIST_HF%* are similar than in the model using the "normal" aggregate activist hedge fund ownership. Corroborating our first results, this suggests that our inference until now accommodates well for endogeneity concerns. Untabulated analysis of the remaining regressions run with *RACTIVIST_HF%* yield similar results, and does not alter the inference.

[insert table 2.12 here]

2.7.2.Non-linearity

We test for the non-linear relationship between our measures of earnings management and activist hedge fund ownership. To this end, we include in the regressions the squared of the main predictor *ACTIVIST_HF%SQ*.

Results are presented on table 2.13 and show that while the coefficient for the main (unsquared) variable is still significant, the coefficient for the squared variable is not significant; therefore, this provides no evidence for a non-linear relationship between earnings quality and aggregate activist hedge fund ownership.

[insert table 2.13 here]

2.7.3.Return-earnings regression (ERC test)

We analyse how market participants assess the level of credibility of financial reporting in presence of activist hedge funds. We use the earnings response coefficient linking market reaction to earnings surprise announcement as our measure of earnings informativeness.

There is a rich literature on the investor response to earnings that follows the Ball and Brown (1968) paper. Liu and Thomas (2000) explicitly mention the ERC as a proxy for

earnings quality, and link high ERC with a high correlation between forecast revisions and earning surprise, the latter being defined as the difference between actual accounting earnings and the analysts' consensus forecast. Factors that have been documented to influence earnings informativeness include the firm systematic risk, auditor quality (e.g. Teo and Wong 1993), family ownership (Wang 2006), firm fundamentals and performance (e.g. Hayn 1995). Yet, to the best of our knowledge, a study of additional governance mechanisms including institutional ownership, as potential factors influencing earnings informativeness, is missing.

We employ the return-earnings regression in this section. The dependent variable is the cumulative abnormal return (*CAR*) and the "earnings" variable is the earnings surprise of the difference between actual accounting earnings and analyst consensus. A Fama-French-Carhart four-factor market model is used to compute normal (expected) returns. Daily Fama-French-Carhart factors are retrieved from WRDS. The firm-level coefficients for market risk premium, size, book-to-market and momentum are obtained from a regression over a 120-day period, with at least 70 consecutive observations. Further, we impose that 20 trading days separate the end of the coefficient estimation window from the beginning of the event window, to mitigate the likelihood that the factor model estimates are affected by the event-window return variance. To mitigate measurement errors (Bartov *et al.* 2001), we compute cumulative abnormal returns (*CAR*) over the period separating the latest consensus forecast from the announcement date for each firm/earnings announcement. Unexpected Earnings (*UE*) is defined as the difference between the latest median consensus earnings forecast taken from I/B/E/S and the actual earnings. Control variables include the beta used in the market model regressions, Tobin's

Q (*Q*) as a proxy for growth opportunity, *BIG4* as a proxy for auditor quality, sales growth (*GROWTH*) as a proxy for firm performance, a dummy variable *LOSS* if the earnings is negative and 0 otherwise, asset leverage (*LEV*) and the log of total assets as a proxy for firm size (SIZE).

We regress *CAR* against the variables presented above as follows (firm subscript is omitted to ease reading):

$$CAR = UE_t + ACTIVIST\_HF\%_{t-1} + UE_t * ACTIVIST\_HF\%_{t-1} + IO\_OTHER\%_{t-1} + U_tE * IO\_OTHER\%_{t-1} + BETAt + UE_t * BETAt + LOSSt + UE_t * LOSSt + SIZEt + UE_t * SIZE_t + BIG4_t + UE * BIG4_t + GROWTHt + UE * GROWTHt + \varepsilon_{it} \quad (7)$$

Regression results on the ERC test can be found in table 2.14. Model 20 presents the regression of cumulative abnormal returns (*CAR*) on activist HF ownership and control variables. Consistent with prior research (Dechow *et al.* 2010), the earnings surprise (UE) and other control variable coefficients are significant and signed as expected. The interaction term *UE*BETA* is significant and positive, whereas the interaction term *UE*LOSS* is significantly negative. Of note, the interaction term *UE*INSTIT_OTHER%* is significantly positive, suggesting that earnings surprises are perceived to be more credible in presence of a higher institutional ownership base, where sophisticated investors may perform their monitoring and act as counterweights to managerial opportunism. In sharp contrast, the interaction coefficient between earnings surprise (*UE*) and *ACTIVIST_HF%* is significantly negative (p-value=0.006), suggesting that earnings are less informative when activist hedge fund ownership is higher.

[insert table 2.14 here]

2.8. Conclusion

This paper sheds new light on the relation between institutional ownership and earnings quality. Based on prior investor classification, it is not clear a priori whether the presence of activist hedge funds operating in "wolf packs" should lead to better earnings quality.

In this paper, we provide new evidence on the benefits (or lack thereof) of activist hedge funds for transparency and monitoring. We investigate their influence on earnings quality of their investee firms. To this end, we use key accounting earnings quality proxies commonly accepted in the literature that have important implications for other stakeholders 'investment and business decisions. We provide evidence that as a group, these sophisticated investors influence their investee firms towards *more* reporting aggressiveness. Their influence on reporting aggressiveness seems noticeable in firms exhibiting high information asymmetry, and firms that report a small profit. In subsequent analysis, earnings informativeness, as measured via the earnings response coefficient, is negatively related to the presence of activist hedge funds. This is consistent with the idea that market participants perceive earnings surprises of firms subject to higher activist hedge fund monitoring as less credible.

Overall, based on these findings, we document empirical evidence of the side effects of intensive monitoring (Tirole 2010). In this vein, we document that activist hedge funds contribute to higher moral hazard in their investees. Our findings therefore fail to provide any support regarding activist hedge funds' claim of being efficient and useful monitors.

An extension of this paper is to introduce the influence of public activist campaigns on our models and results, and analyse whether and how the initiation of a publicly reported activist campaigns reinforces or dampens our results. Furthermore, a natural extension of

this paper is to study the heterogeneity of activist hedge fund group composition and analyse the differing nature of their influence on reporting practices. This is left for future research.

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Appendix

Table 2.1.- Variable description

Variable codes contained in the definitions (second column), where indicated, are Compustat codes.

Variable name	Definition
#ANALYST	Log number of analyst following (I/B/E/S)
ACTIVIST_HF%	Holdings % of Activist HF
ASSETSALE	Sale of long-term assets ()
BETA	Beta obtained from the Fama-French Carhardt pricing model
BHR_9m	Firm's buy-and-hold return computed over the 9-month period ending 3 months prior to fiscal year-end
BIDASK	Annual average of daily Bid-ask spread computed as (ask-bid)/((ask+bid)/2)
BIG4	Dummy variable that take the value of 1 if the firm is audited by a Big 4 auditor, and 0 otherwise
CAR	Cumulative Abnormal Returns, computed from a Fama-French Carhardt four factor model
CEQ	Book value of common stock
CSHO	Common shares outstanding
DIV_PAYOUT	dvc/ni
DIV_YIELD	dvc/ceq
REM_ASSET	Abnormal gain on asset sale
REM_DIXP	Sum of REM_RD and REM_SGA
REM_PROD	Abnormal level of production costs
REM_RD	Abnormal levels of R&D expenses
REM_SGA	Abnormal levels of SGA and advertising expenses
FIN_NEEDS	External financing needs, defined as the ratio of capital expenditures minus cash over capital expenditures
FIRMAGE	Log number of years the firm is listed as per CRSP
IDIOVOLAT	Idiosyncratic volatility computed as the residual of a Fama-French regression (CRSP)
INVTSALE	Sale of investments ()
IO_OTHER%	Aggregate institutional shareholding excl. Activist HF
IO_TOTAL%	Aggregate total institutional shareholding
LEV	Leverage (DLC+DLTT)/AT
LIT	Litigious industries- defined as SIC codes 2833 to 2836 and 8731 to 8734 (Biotechnology), 3570 to 3577 and 7370 to 7374 (Computers), 3600 to 3674 (Electronics), 5200 to 5961 (Retailing).

LOSS	Dummy variable equal to 1 if RET is negative, otherwise
MANAGE	Dummy variable that take the value of 1 if the firm reports a small profit, and 0 otherwise
MARKETSHARE	Market share of the firm, computed at the 3-digit SIC level
MTB	Market-to-book ratio MV/CEQ
MTR	Marginal tax rate taken from John Graham's website at https://faculty.fuqua.duke.edu/~jgraham/taxform.html
MV	Market value of equity (CSHO* PRCC_F)
NI	Net income before extraordinary items(IB)
NOA	Net operating accruals, computed as
PRICE	Stock price close as at fiscal year-end (PRCC_F)
R&D	R&D expenses from Compustat (XRD)
RACTIVIST_HF%	Residual aggregate holdings of Activist HF
RET	Buy and hold stock return over the fiscal year
REM_AGG	Sum of REM_PROD and REM_DIXP
ROA	Returns on Assets (NI/AT)
SIZE	Log of firm total assets
TURNOVER	Ratio of monthly trading volume over shares outstanding measured 3 months prior to fiscal year end
UE	Unexpected Earnings or earning surprise, the difference between actual earnings and analysts' latest earnings consensus forecast, take from I/B/E/S
VOLAT	Standard deviation of daily stock returns (CRSP)

Table 2.2.- Investor classification methodology inspired by Brav et al. (2008)

Step #1	**Identification of Hedge Funds** Lipper TASS HF database Firm website Bloomberg terminal Validation with an alternative investment expert	**(1)**
Step #2	**Identification of Shareholder Activists** Conference board list Thomson list SC13D filings	**(2)**
Step #3	**Focus on Activist Hedge Funds**	**(1) x (2)**

Table 2.3.- Sample description by industry

Industry (SIC code) / Year	2,006	2,007	2,008	2,009	2,010	2,011	2,012	2,013	2,014	Total
Agriculture & mining (0-1)	75	71	83	111	111	113	110	114	110	**898**
Manufacturing (2-3)	562	592	572	713	698	730	767	735	618	**5,987**
Transportation (4)	60	70	73	88	94	86	95	95	85	**746**
Wholesale & retail Trade (5)	107	110	152	168	172	171	141	142	113	**1,276**
Services (7-8)	201	240	219	260	269	254	267	271	229	**2,210**
Total	**1,005**	**1,083**	**1,099**	**1,340**	**1,344**	**1,354**	**1,380**	**1,357**	**1,155**	**11,117**

Table 2.4.- Sample variable descriptive statistics

Variable	Mean	SD	P25	Median	P75
REM_PROD	-0.04	0.38	-0.15	-0.02	0.09
REM_RD	0.01	0.06	0	0	0
REM_SGA	0.23	1.88	-0.06	0.1	0.46
REM_DIXP	0.25	1.89	-0.06	0.1	0.47
REM_ASSET	0	0.03	0	0	0
REM_AGG	0.21	1.92	-0.16	0.11	0.56
IO_TOTAL%	0.72	0.24	0.58	0.77	0.91
ACTIVIST_HF%	0.1	0.07	0.04	0.08	0.14
RACTIVIST_HF%	0.01	0.07	-0.04	-0.01	0.05
IO_OTHER%	0.62	0.24	0.47	0.67	0.8
#ANALYST	1.95	0.77	1.39	1.95	2.56
BIG4	0.82	0.39	1	1	1
SIZE	6.8	1.77	5.57	6.71	7.95
FIRMAGE	2.75	0.79	2.2	2.77	3.3
ROA	0.02	0.18	0	0.05	0.08
SALESGROWTH	0.11	0.39	-0.02	0.07	0.18
DIV_YLD	0.01	0.02	0	0	0.01
CASH	0.19	0.19	0.04	0.12	0.28
R&D	0.1	0.66	0	0	0.06
CFO	0.09	0.14	0.05	0.1	0.14
BIDASK	0	0.01	0	0	0
BHR9m	0.14	0.64	-0.14	0.07	0.3
IDIOVOLAT	0.02	0.01	0.02	0.02	0.03
TURNOVER	11.14	1.67	10.05	11.12	12.25
FIN_NEEDS	0.05	0.8	-0.12	-0.01	0.11
BTM	0.59	0.56	0.29	0.49	0.76
LEVERAGE	0.21	0.21	0.01	0.17	0.32
MTR	0.15	0.15	0.02	0.04	0.35
CAR	0	0.14	-0.06	0	0.07
UE	0.01	0.15	-0.02	0.01	0.05
BETA	1.01	0.52	0.73	1.01	1.3

Table 2.5.- Pearson correlation matrix

The table shows Pearson coefficient. Significant coefficient at the 5% level or better appear in bold.

var#	var	1	2	3	4	5	6	8	9	10	11	12	13	14
1	REM_PROD													
2	REM_RD	**-0.19**												
3	REM_SGA	-0.01	**0.09**											
4	REM_DIXP	-0.02	**0.12**	**1.00**										
5	REM_ASSET	**-0.04**	**-0.03**	0.00	0.00									
6	REM_AGG	**0.18**	**0.08**	**0.98**	**0.98**	0.00								
8	IO_TOTAL%	**0.04**	-0.01	**-0.03**	**-0.03**	-0.02	-0.02							
9	ACTIVIST_HF_%	-0.01	**0.05**	**0.03**	**0.03**	-0.01	**0.03**	**0.35**						
10	RACTIVIST_HF%	0.00	**0.05**	**0.02**	**0.02**	-0.01	**0.02**	**0.18**	**0.95**					
11	IO_OTHER%	**0.05**	**-0.04**	-0.02	-0.02	-0.01	-0.01	**0.85**	**0.07**	**-0.11**				
12	#ANALYST	0.01	-0.01	-0.01	-0.01	0.01	-0.01	**0.49**	0.02	**-0.03**	**0.53**			
13	BIG4	**0.03**	-0.01	-0.01	-0.01	-0.02	0.00	**0.35**	**0.08**	**0.03**	**0.37**	**0.34**		
14	SIZE	**0.15**	**-0.06**	-0.01	-0.01	-0.01	0.02	**0.45**	-0.02	-0.01	**0.52**	**0.68**	**0.43**	
15	FIRMAGE	**0.08**	**0.04**	-0.01	-0.01	**-0.04**	0.01	**0.06**	**-0.04**	-0.01	**0.12**	0.02	**0.03**	**0.29**
16	ROA	-0.01	**-0.11**	-0.01	-0.01	-0.03	-0.01	**0.21**	**-0.03**	-0.01	**0.20**	**0.17**	**0.08**	**0.28**
17	SALESGROWTH	**-0.09**	**0.06**	0.02	0.02	0.00	0.00	**-0.03**	-0.01	-0.01	**-0.05**	**0.03**	**-0.04**	**-0.06**
18	DIV_YLD	**0.06**	**-0.05**	0.01	0.01	0.01	0.02	**-0.12**	**-0.09**	0.01	**-0.08**	-0.02	**0.05**	**0.16**
19	CASH	**-0.18**	**0.14**	**0.03**	**0.03**	0.00	0.00	**-0.03**	**0.05**	**-0.02**	**-0.05**	0.00	**-0.06**	**-0.33**
20	R&D	**-0.07**	**0.15**	**0.04**	**0.04**	0.00	**0.03**	**-0.06**	**0.04**	**0.03**	**-0.08**	-0.01	**-0.03**	**-0.13**
21	CFO	**0.03**	**-0.14**	-0.02	**-0.03**	0.00	-0.02	**0.23**	**-0.03**	**-0.03**	**0.25**	**0.21**	**0.10**	**0.27**
22	BIDASK	**-0.05**	**0.03**	-0.02	-0.02	0.01	**-0.03**	**-0.49**	**-0.12**	-0.01	**-0.51**	**-0.44**	**-0.33**	**-0.48**
23	BHR9m	-0.02	**0.03**	-0.01	-0.01	-0.01	-0.01	0.00	-0.02	0.00	**-0.10**	**-0.03**	-0.01	-0.02
24	IDIOVOLAT	**-0.07**	**0.06**	**-0.04**	**-0.03**	**0.03**	**-0.05**	-0.34	**-0.08**	**-0.04**	**-0.38**	**-0.35**	**-0.24**	**-0.49**
25	TURNOVER	0.02	0.02	**-0.03**	**-0.03**	0.00	-0.02	**0.43**	**-0.03**	**-0.07**	**0.47**	**0.71**	**0.34**	**0.71**
26	FIN_NEEDS	**-0.05**	**0.06**	0.01	0.01	0.00	0.00	**-0.04**	0.02	0.01	**-0.06**	-0.02	**-0.05**	**-0.08**
27	BTM	**0.10**	**-0.08**	**-0.04**	**-0.04**	0.00	**-0.02**	**-0.09**	**0.02**	0.01	**-0.04**	**-0.23**	**-0.07**	-0.02
28	LEVERAGE	**0.05**	-0.02	0.02	0.02	**0.03**	**0.03**	0.01	-0.02	0.01	**0.04**	**0.11**	**0.11**	**0.33**
29	MTR	0.00	**-0.02**	**-0.04**	**-0.04**	-0.01	**-0.04**	**0.07**	-0.02	0.00	**0.06**	**0.05**	-0.01	**0.08**
30	CAR	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	**0.02**	0.02	**0.04**	**0.03**
31	UE	-0.01	0.02	0.00	0.00	0.00	0.00	**0.07**	0.00	0.00	**0.08**	**0.08**	**0.05**	**0.10**
32	BETA	**0.09**	-0.02	**-0.03**	**-0.03**	-0.01	-0.01	**0.24**	0.01	**-0.04**	**0.25**	**0.20**	**0.15**	**0.25**

Table 2.5.- Pearson correlation matrix (ctd)

The table shows Pearson coefficient. Significant coefficient at the 5% level or better appear in bold.

var#	var	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
15	FIRMAGE																	
16	ROA	**0.14**																
17	SALESGROWTH	**-0.11**	**-0.08**															
18	DIV_YLD	**0.13**	**0.10**	**-0.08**														
19	CASH	**-0.20**	**-0.20**	**0.16**	**-0.17**													
20	R&D	**-0.07**	**-0.37**	**0.55**	**-0.06**	**0.29**												
21	CFO	**0.07**	**0.60**	**-0.25**	**0.11**	**-0.18**	**-0.37**											
22	BIDASK	**-0.08**	**-0.17**	**0.03**	**-0.05**	**0.03**	**0.06**	**-0.23**										
23	BHR9m	-0.02	**0.08**	**0.05**	**0.04**	-0.01	**0.03**	**-0.05**	**0.17**									
24	IDIOVOLAT	**-0.27**	**-0.32**	**0.08**	**-0.15**	**0.17**	**0.17**	**-0.29**	**0.54**	**0.24**								
25	TURNOVER	**0.12**	**0.07**	**0.05**	-0.02	0.02	**0.03**	**0.10**	**-0.44**	**0.04**	**-0.20**							
26	FIN_NEEDS	**-0.11**	**-0.19**	**0.21**	**-0.10**	**0.09**	**0.15**	**-0.18**	**0.05**	0.00	**0.14**	0.02						
27	BTM	0.02	**-0.07**	**-0.12**	-0.02	**-0.21**	**-0.09**	**-0.04**	**0.08**	**-0.20**	**0.08**	**-0.16**	**-0.03**					
28	LEVERAGE	-0.02	**-0.12**	0.01	**0.14**	**-0.36**	**-0.03**	**-0.05**	**-0.05**	0.00	**-0.03**	**0.17**	**0.10**	**-0.04**				
29	MTR	**0.09**	**0.28**	-0.02	**0.13**	**-0.12**	**-0.10**	**0.24**	**-0.07**	0.01	**-0.17**	**-0.03**	**-0.11**	**-0.05**	**-0.06**			
30	CAR	0.01	0.02	-0.02	0.00	**-0.03**	0.00	0.01	-0.01	-0.02	-0.01	0.01	**-0.03**	**0.05**	0.00	0.01		
31	UE	**0.03**	**0.11**	**0.04**	-0.02	0.01	0.01	**0.05**	**-0.05**	**0.04**	**-0.04**	**0.07**	**-0.04**	**-0.04**	**-0.03**	**0.04**	**0.16**	
32	BETA	**0.03**	**0.06**	**0.04**	**-0.04**	**-0.05**	-0.01	**0.08**	**-0.29**	0.00	**-0.06**	**0.30**	0.02	0.01	**0.07**	0.00	0.03	**0.03**

Table 2.6.- Estimation of the normal level of production costs, R&D expenses, SG&A expenses, and gains on asset sales

The following are ordinary least square regressions estimated cross-sectionally at the 2-digit SIC-year level, from 2006 to 2014, with at least 9 observations. Similar to Gunny (2010), the reported coefficients are the mean coefficient values across the industry-years. All variables except for the constant, the scale factor, SIZE and Q are deflated by lagged total assets. Two-tailed p-values are computed using the standard error of the mean coefficients across the industry-years. The adjusted R-squared and the number of observations per regression are averaged across the industry-years.

	(1) PROD	(2) SG&A	(3) R&D	(4) ASSET
Constant	0.202	0.134	0.0029	-0.0013
$1/AT_{t-1}$	9.16	3***	-0.0012	-0.59
SALEt	0.603***			
$SALE_{t-1}$		0.189	0.0011	
ΔSALE	0.66			
$\Delta SALE_{t-1}$	0.412			
$CAPEX_t$			-0.0176	
$INTFUND_t$			-0.012	-0.006*
$R\&D_{t-1}$			0.71**	
$ASSETSALE_t$				-0.375***
$INVTSALE_t$				0.1883
$SIZE_t$	-0.0327		0.00034	0.0002
Q_t	-0.044***			0.001
Mean Adj. R-squared	0.87	0.59	0.68	0.3
Mean # obs.	86	94	69	56
# industry year	459	458	459	458

p-values in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.7.- Regression of earnings management variables on activist hedge fund ownership and control variables

	(5) REM_ PROD	(6) REM_ R&D	(7) REM_ SG&A	(8) REM_ DISXP
ACTIVIST_HF%	0.0307	0.0280	0.6036	0.6316
	(0.621)	(0.002)***	(0.005)***	(0.004)***
IO_OTHER%	0.0331	-0.0035	-0.0032	-0.0066
	(0.145)	(0.296)	(0.974)	(0.946)
#ANALYST	-0.0769	0.0055	0.0010	0.0065
	(0.000)***	(0.000)***	(0.978)	(0.863)
MTR	0.0112	-0.0078	-0.3298	-0.3376
	(0.709)	(0.074)*	(0.012)**	(0.011)**
SIZE	0.0577	-0.0023	-0.0045	-0.0069
	(0.000)***	(0.000)***	(0.822)	(0.735)
FIRMAGE	0.0038	0.0009	-0.0111	-0.0102
	(0.545)	(0.404)	(0.684)	(0.712)
ROA	-0.1712	-0.0179	0.0931	0.0752
	(0.000)***	(0.002)***	(0.564)	(0.645)
BTM	0.0436	-0.0047	-0.0096	-0.0143
	(0.000)***	(0.000)***	(0.747)	(0.633)
LEVERAGE	0.0058	-0.0039	0.0065	0.0026
	(0.825)	(0.280)	(0.951)	(0.981)
Constant	-0.4105	0.0081	-0.0430	-0.0349
	(0.000)***	(0.144)	(0.768)	(0.812)
F	12.177***	20.179***	37.461***	37.380***
Adjusted R-sq.	.06	.20	.07	.07
N	11,117	11,117	11,117	11,117

p-values in parentheses; * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.8.- Regression of earnings management variables on activist hedge fund ownership and control variables (ctd).

	(9) REM_ASSET	(10) REM_AGG
ACTIVIST_HF%	-0.0015	0.6623
	(0.687)	(0.004)***
IO_OTHER%	0.0001	0.0265
	(0.956)	(0.798)
#ANALYST	0.0009	-0.0704
	(0.164)	(0.072)*
MTR	0.0003	-0.3264
	(0.879)	(0.017)**
SIZE	-0.0007	0.0508
	(0.048)**	(0.019)**
FIRMAGE	-0.0002	-0.0064
	(0.590)	(0.825)
ROA	-0.0041	-0.0960
	(0.019)**	(0.547)
BTM	-0.0002	0.0294
	(0.714)	(0.345)
LEVERAGE	0.0040	0.0084
	(0.051)*	(0.939)
Constant	0.0028	-0.4454
	(0.149)	(0.006)***
F	4.902***	32.856***
Adjusted R-sq.	.02	.07
N	7,742	11,117

p-values in parentheses; * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.9.- Analysis of suspect firms sample

Logistic regression of the likelihood to report a small profit.

	(11) MANAGE
	Odds ratio
ACTIVIST_HF%	6.22 (0.014)**
IO_OTHER%	0.73 (0.207)
SIZE	0.95 (0.278)
SALESGROWTH	0.49 (0.000)***
LEVERAGE	2.40 (0.000)***
CFO	0.34 (0.000)***
FIN_NEEDS	0.98 (0.859)
IND	Yes
YEAR	Yes
Constant	-3.6867 (0.000)***
Wald Chi-sq.	144.293***
Log-likelihood	1624
Pseudo R-sq.	.04
N	11,117

p-values in parentheses; * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.10.- Sample partitioning based on information asymmetry

Regression of earnings management variables on activist hedge fund ownership and control variables. The regression is run on the high information asymmetry firm group, based on the bid-ask spread.

	(12) REM_AGG
ACTIVIST_HF%	0.8560 (0.006)***
IO_OTHER%	-0.0830 (0.514)
#ANALYST	-0.0842 (0.130)
MTR	-0.2141 (0.241)
SIZE	0.0674 (0.029)**
FIRMAGE	0.0231 (0.546)
ROA	-0.1540 (0.368)
BTM	0.0244 (0.485)
LEVERAGE	0.0488 (0.757)
Constant	-0.3126 (0.109)
F	16.067***
Adjusted R-sq.	.06
N	5,556

p-values in parentheses; * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.11.- Handling endogeneity of the main independent variable
Fama-McBeth (1973) regression of ACTIVIST_HF% on its determinants.

	(13) ACTIVIST_HF%
SIZE	-0.008***
	(0.00)
VOLAT	-0.34***
	(0.001)
TURNOVER	0.003***
	(0.00)
AGE	-9.03E-04*
	(0.08)
BIDASK	-0.99***
	(0.00)
BHR_9M	-0.0026
	(0.26)
DIV_YLD	-0.45***
	(0.00)
CFO	0
	(0.67)
CASH	0.023***
	(0.00)
LEV	0.005
	(0.10)
IO_OTHER	0.06***
	(0.00)
R&D	0
	(0.32)
SP500	-0.016***
	(0.00)
Constant	yes
F	616.59***
Mean. Adj. R^2	0.16

Table 2.12.- Robustness test- alternative measure of the main independent variable

	(14) REM_ PROD	(15) REM_ DISXP	(16) REM_ AGG
RACTIVIST_HF%	0.0455	0.5519	0.5974
	(0.480)	(0.013)**	(0.011)**
IO_OTHER%	0.0360	0.0360	0.0720
	(0.126)	(0.726)	(0.505)
#ANALYST	-0.0769	0.0070	-0.0699
	(0.000)***	(0.852)	(0.075)*
MTR	0.0109	-0.3439	-0.3331
	(0.716)	(0.009)***	(0.015)**
SIZE	0.0575	-0.0102	0.0472
	(0.000)***	(0.614)	(0.029)**
FIRMAGE	0.0038	-0.0123	-0.0086
	(0.553)	(0.656)	(0.766)
ROA	-0.1714	0.0726	-0.0988
	(0.000)***	(0.657)	(0.535)
BTM	0.0437	-0.0124	0.0313
	(0.000)***	(0.679)	(0.314)
LEVERAGE	0.0058	0.0026	0.0084
	(0.827)	(0.980)	(0.939)
Constant	-0.4079	0.0250	-0.3829
	(0.000)***	(0.863)	(0.017)**
F	12.178***	37.219***	32.703***
Adjusted R-sq.	.06	.07	.07
N	11,117	11,117	11,117

p-values in parentheses; * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.13.- Test for non-linearity

Regression of earnings management variables on squared and unsquared activist hedge fund ownership and control variables.

	(17) REM_AGG
ACTIVIST_HF%	1.5465 (0.035)**
ACTIVIST_HFSQ%	-3.2850 (0.161)
IO_OTHER%	-0.0003 (0.998)
#ANALYST	-0.0706 (0.071)*
MTR	-0.3265 (0.017)**
SIZE	0.0513 (0.018)**
FIRMAGE	-0.0072 (0.802)
ROA	-0.0974 (0.541)
BTM	0.0284 (0.360)
LEVERAGE	0.0126 (0.910)
Constant	-0.4643 (0.005)***
F	31.478***
Adjusted R-squ.	.07
N	11,117

p-values in parentheses; * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.14.- Regression of CAR on activist HF ownership and control variables. The measure of CAR (model 18) is computed using a Fama-French Carhart four-factor market model.

	(18) CAR
UE	0.2137 (0.000)***
UEPS* ACTIVIST_HF%	-0.1364 (0.006)***
UEPS*IO_OTHER%	0.1054 (0.000)***
UEPS*BETA	0.0272 (0.099)*
UEPS*Q	0.0202 (0.000)***
UEPS*GROWTH	-0.0185 (0.189)
UEPS*LOSS	-0.0460 (0.000)***
UEPS*LEV	-0.0266 (0.302)
UEPS*BIG4	-0.0112 (0.607)
BIG4	0.0061 (0.104)
UEPS*SIZE	-0.0235 (0.000)***
Constant	0.0229 (0.003)***
F	28.19***
Adjusted R-squ.	.04
N	11,117

p-values in parentheses * denotes $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Chapter 3
Can overconfident managers trick the market ? Evidence from earnings announcements

Abstract

Within the corporate C-suite, CEOs are uniquely positioned to exert strong influence on the financial reporting process. CEO behaviour such as overconfidence has been shown to negatively influence financial reporting quality. Firms with overconfident managers exhibit lower financial reporting quality. Yet, little is known about the market reaction to managerial overconfidence, as well the moderating effect of corporate governance on overconfident managers. We study two questions in this paper. First, do market participants react negatively? to accounting earnings announced by an overconfident manager? Second, do strong forms of governance dampen the effect of overconfidence on earnings informativeness?

Relying on a sample of US-listed firms over the 2006-2014 period, we predict and find that earnings informativeness, as measured by the earnings response coefficient (ERC), is lower for firms with overconfident managers. Further, for those firms, we find weak evidence that the ERC is incrementally higher when strong governance mechanisms are in place. Taken together, these results suggest that while managerial overconfidence introduce biases in the reporting process, market participants react differently to an earnings surprise announced by an overconfident manager, unconditional on the presence of strong governance.

3.1. Introduction

Given their position in the corporate executive hierarchy, the influence of CEOs has been the focus of numerous research. Recently, research derived from the early works of Allais (1953) and Kahneman & Tversky (1979, 2000) departs from the rational agent postulate to model more realistically the CEO's actual behavior. Cognitive and emotional biases of the CEO are sources of imbalances that may be detrimental to business decisions and firm outcomes. For instance, managerial overconfidence is a cognitive bias that leads to distorted corporate policies and strategic decisions (e.g. Roll, 1986; Malmendier & Tate, 2008). While behavioral assumptions are now common in the asset pricing and corporate finance literature, they are less common in the accounting literature on managerial decision-making (Barberis & Thaler, 2003). In this area, two recent studies document the influence of managerial overconfidence on financial misreporting (Schrand & Zechman, 2012) and accounting conservatism (Ahmed & Duellman, 2013), and both suggest that overconfidence leads to lower financial reporting quality. Yet, little is known about the context in which the influence of managerial overconfidence on reporting quality prevails or abates. In this area, research has yet to document evidence of an efficient monitoring mechanism capable of downplaying the influence of overconfidence on earnings quality. To fill this gap in the literature, we analyze two factors that are likely to influence the effect of overconfidence on conservatism. In particular, we study whether and how CEO power and strong external monitoring moderate the relation between overconfidence and accounting conservatism.

Using a sample of 11,180 US-listed firms over the 2006-2014 period, we predict and find that the earnings response coefficient is lower for firms run by overconfident CEO, consistent with the idea that earnings announcements are perceived as less credible by the investor community. This

result is robust to a battery of robustness tests, including several models dealing with endogeneity. Further, we find rather weak evidence that firms led by overconfident CEOs benefit from strong governance mechanisms in the form of incrementally higher ERC. Results suggest that our proxies for strong governance, including the presence of dedicated institutional investors or a greater proportion of financially expert board members do not improve earnings informativeness of firms run by overconfident managers. We do, though, find a moderating effect when the audit conducted is of high quality. Yet, this result is not consistent when we use specific models to deal with endogeneity. Overall, these results suggest that managerial overconfidence leads to lower perceived credibility of reported earnings, unconditional on the strength of corporate governance.

The rest of the paper is structured as follows. Section 3.2 reviews the existing literature. Section 3.3 develops the set of hypotheses. Section 3.4 presents the methodology employed and the data. Section 3.5 presents and discusses the empirical results. Section 3.6 presents and discusses additional tests. Finally, section 3.7 concludes.

3.2. Literature review

3.2.1. Managerial overconfidence

Theoretical and experimental evidence on cognitive and emotional biases of individuals are numerous (see e.g. Kahneman & Tversky, 2000 for a review) and have been recently incorporated in research fields outside of psychology and economics. This stream of thoughts suggests to depart from the rational agent assumption, as it proved to be a strong postulate to hold (Hirshleifer, Low, & Teoh, 2012). One source of overconfidence is commonly found in the self-attribution bias of the individual (Billett & Qian, 2008). An individual exhibiting such bias views her(him)self as the

only cause for her/his success, but blames external factors for failure (Kukla, 1972; Langer & Roth, 1975). Self-attribution bias gets stronger with the importance (Miller, 1976) and the difficulty of the task[14] (e.g. Klayman, Soll, González-Vallejo, & Barlas ,1999; Hirshleifer, 2001). Further, self-attribution biases any learning process that would reduce overconfidence bias over time, so that overconfidence is a persistent trait of the individual. Finally, Yaniv (2004) shows that more knowledgeable individuals are more likely to discount any given advice, suggesting that the illusion of knowledge- another behavioral trait- also contributes to the overconfidence bias.

Research on the effects of overconfident market participants focus on financial analysts and investors. Hilary & Menzly (2006) and Batchelor & Dua (1995) show that financial analysts' past success makes them overconfident. This is so because after a series of successful forecasts, analysts attach too few importance on their peers' forecasts and market reaction. Applied to investors, overconfidence has been found to lead to an underestimation of project risk and an overestimation expected returns. Gervais & Odean (2001) show that overconfident traders trade more aggressively, leading trade volumes and volatility to increase with the level of the bias, and lowering expected profits.

Managerial overconfidence bias has been found to lead to sub-optimal decisions and distort corporate financial policies. Malmendier & Tate (2005, 2008) show that overconfident managers are more likely to overestimate net present value projects. Other studies suggest that managerial overconfidence leads to lower dividend payouts (Deshmukh, Goel, & Howe, 2013), higher R&D expenses (Hirshleifer *et al.*, 2012) and higher debt levels and debt issuance (Hackbarth, 2008).

[14] Quoting Hirschleifer (2001, p.1548): "Overconfidence is greater for challenging judgmental tasks".

Evidence of managerial overconfidence focuses on CEOs: indeed, given the complex decisions that a CEO is "routinely" facing, the extent and effect of CEO overconfidence are likely to be more pronounced. Goel & Thakor (2008) show that overconfident CEOs under-invest in information production, and predict that the quality of information is poorer in firms with more overconfident CEOs. Such predictions form the base of a nascent research stream in accounting. In this regard, evidence on the implications of managerial overconfidence in accounting research is scarcer. Early experimental work has been performed by Libby, Bloomfield, & Nelson (2002). More recently, Schrand *et al.* (2012) show that overconfidence increases the likelihood to restate earnings. Ahmed *et al.* (2013) provides evidence that managerial overconfidence negatively influences accounting conservatism. An overconfident CEO is more likely to delay incorporating bad news into the financial reporting because (s)he believes that her/his private information set is more accurate, does not update her/his beliefs based on information changes, and therefore keeps positive net present value expectations on his projects. Hribar & Yang (2015) find that an overconfident CEO is more likely to issue earnings forecasts and miss them afterwards. Cormier, Lapointe-Antune & Magnan (2016) analyse a series of accounting scandals involving Canadian firms and find that in all cases, the CEO was considered *ex-post* as too powerful and overconfident.

As such, there is compelling evidence that CEO overconfidence introduces biases in the business decisions and the reporting process. A natural extension of this finding is how market participants assess the information content of earnings (i.e. earnings informativeness) for firms run by overconfident managers. Further, a follow-up question is whether any efficient counterweight to CEO overconfidence exist. Using various proxies for strong monitoring such as the percentage of independent directors and the overall level of institutional ownership, Ahmed *et al.* (2013) document that strong monitoring mechanisms are unable to moderate the influence of managerial

ownership on accounting conservatism. Yet, we deem that some of the proxies the authors use merit further investigation. In particular, we complement this research by analyzing in greater details the institutional ownership composition and the board members expertise, two strong governance mechanisms that may moderate the influence of managerial overconfidence on financial reporting quality.

3.2.2.Earnings informativeness

Since the Beaver (1968) and Ball & Brown(1967,1968) seminal papers, accounting scholars have used the return-based earnings response coefficient and the correlation between the information content of earnings and changes in investor equity valuations. In this setting, a higher earnings response coefficient suggests more informative earnings for equity valuation purposes. Hayn (1995) finds that firms posting losses exhibit lower earnings response coefficients.

Research dealing with governance assume that stronger governance mechanisms are associated to higher reliability and credibility of the financial statements. Prior studies relating governance mechanisms and the earnings response coefficients primarily focus on audit quality and ownership structure.

In the auditing literature, Teoh and Wong (1993) document that high auditor quality improves accounting earnings informativeness, as measured by a higher ERC. Manry, Tiras & Wheatley (2003) document that the ERC is higher for firms with a timely auditor review of interim earnings. Francis and Ke (2006) find that the investor valuation of earnings (i.e., the earnings response coefficient) is significantly lower for firms with high levels of non-audit fees than for firms with low levels of non-audit fees.

Looking at ownership structure, Francis, Schipper & Vincent (2005) find that firms with a dual-class structure - resulting in a "wedge" or a higher separation of cash flow rights and voting rights- exhibit a lower earnings response coefficient and attribute this finding to reduced accountability of the manager due to the wedge. Wang (2006) positive association between ownership by family founders and earnings informativeness. Warfield, Wild & Wild (1995) document a positive association between managerial stock ownership and earnings informativeness. Further, the relation is lower when the firm operates in a regulated industry, when compared to non-regulated firms.

According to Holthausen & Verrecchia (1988) and Teoh & Wong (1993), investor's response to an earnings surprise is conditional on the perceived credibility of the financial reporting. Within the corporate C-suite, CEOs are uniquely positioned to exert strong influence on the financial reporting process. Prior research documents that CEO attributes are related to the level of credibility of earnings reports. CEO characteristics such as ownership (e.g. Lafond & Roychowdhury, 2008) and overconfidence (e.g. Ahmed & Duellman, 2013) have been shown to influence financial reporting quality.

Recently, research links CEO behavioural biases to lower financial reporting quality (Schrand 2012; Cormier, Magnan & Lapointe 2016) which ultimately impairs the information environment. In this study, we analyse whether the earnings response coefficient differs between firms managed by overconfident executives versus those managed by non-overconfident executives. Further, we study whether strong corporate governance mechanisms help increase perceived credibility of the earnings report in presence of an overconfident CEO.

3.3. Hypothesis development

3.3.1. Managerial overconfidence and ERC

Given the evidence of negative associations between managerial overconfidence and financial reporting quality, we may ask whether the market incorporates this feature in assessing and incorporating information from earnings surprises. Do market participants discount information contained in earnings announcements of firms run by overconfident managers, based on the perceived lower credibility of accounting numbers? If that is the case, this would translate into lower ERC for firms run by overconfident managers. Hence the following hypothesis (stated in alternative form):

H1: The earnings response coefficient is lower for firms with an overconfident CEO

3.3.2. Moderating effect of governance mechanisms

Prior research (e.g. Ahmed *et al.* 2013) define strong monitoring mechanisms as a governance bundle including the % of independent directors or a higher level of institutional ownership. In their setting, they find that these governance mechanisms do not mitigate the influence of managerial overconfidence on conservatism. Goel *et al.* (2008, p.2772) argue that "[…] the interaction between CEO overconfidence and the effectiveness of corporate governance is an important issue" that merits further investigation. We draw on this argument to explore further this issue that has proved unresolved to date in empirical research. This allows us to formulate our next hypothesis, stated in alternative form:

H2. Firms managed by an overconfident CEO exhibit incrementally higher ERC in presence of strong governance mechanisms.

3.4. Research methodology and data

3.4.1. CAR-earnings surprise model

To test H1, we follow Dechow, Ge & Schrand (2010) and use the following model to estimate the earnings response coefficient. model[15]:

$$CAR_{jt} = \beta_0 + \beta_1 UE_{jt} + \beta_2 OVERCONF_{jt-1} + \beta_3 UE_{jt} * OVERCONF_{jt-1} + \beta_4 BETA_{jt} + \beta_5 UE_{jt} * BETA_{jt} + \beta_6 SIZE_{jt} + \beta_7 UE_{jt} * SIZE_{jt} + \beta_8 DEBT_{jt} + \beta_9 UE_{jt} * DEBT_{jt} + \beta_{10} Q_{jt} + \beta_{11} UE_{jt} * Q_{jt} + \beta_{12} LOSS_t + \beta_{13} UE_{jt} * LOSS_t + \beta_{14} GROWTH_t + \beta_{15} UE_{jt} * GROWTH_t + \beta_{16} CRISIS_t + \beta_{17} UE_{jt} * CRISIS_t + \beta_{18} REG_t + \beta_{19} UE_{jt} * REG_t + \varepsilon_{jt} \quad (1)$$

We follow prior research (e.g. Kothari 2001; Dechow *et al.* 2010) to identify relevant control variables that have an effect on the earnings informativeness, including growth, persistence, performance and systematic risk, leverage, an indicator for loss firms. CAR stands for Cumulative Abnormal Returns as defined in section 4.1; UE is Unexpected Earnings, being the difference between actual earnings minus the latest analyst consensus forecast; *OVERCONF* is our proxy for overconfidence as defined in section 4.2, *BETA* is our proxy for firm risk and is derived from the market model used to compute CAR; SIZE is the log of total market capitalization; LEVERAGE is asset leverage; Q is Total Q calculated from Peters and Taylor (2015) to better take into account the value of intangibles and is our proxy for growth and persistence; LOSS is a dummy variable taking the value of 1 if contemporaneous earnings is negative, and 0 otherwise; GROWTH is 2-year annual sale growth; CRISIS and REG are year and industry dummies, respectively.

We test for differential informativeness of earnings (as measured by the earnings response coefficient) conditioned on managerial overconfidence, using an interaction term of earnings

[15] A detailed list of variables definitions and sources can be found on table 1 of the appendix.

surprise with overconfidence. Our coefficient of interest in model 1 is the interaction coefficient β_3; a significantly negative β_3 coefficient would be evidence in favour of H1.

To test H2: we employ the following model:

$$CAR_{jt} = \beta_0 + \beta_1 UE_{jt} + \beta_2 OVERCONF_{jt-1} + \beta_3 UE_{jt} * OVERCONF_{jt-1} + \beta_4 GOV_{jt} + \beta_5 UE_{jt} * GOV_{jt} + \beta_6 UE_{jt} * OVERCONF_{jt-1} * GOV_{jt} + \beta_7 BETA_{jt} + \beta_8 UE_{jt} * BETA_{jt} + \beta_9 SIZE_{jt} + \beta_{10} UE_{jt} * SIZE_{jt} + \beta_{11} DEBT_{jt} + \beta_{12} UE_{jt} * DEBT_{jt} + \beta_{13} Q_{jt} + \beta_{14} UE_{jt} * Q_{jt} + \beta_{15} LOSS_t + \beta_{16} UE_{jt} * LOSS_t + \beta_{17} GROWTH_t + \beta_{18} UE_{jt} * GROWTH_t + \beta_{19} CRISIS_t + \beta_{20} UE_{jt} * CRISIS_t + \beta_{21} REG_t + \beta_{22} UE_{jt} * REG_t + \varepsilon_{jt} \quad (2)$$

Where GOV is our governance proxies as detailed in section 4.3 hereafter, and all other variables as previously defined. Our coefficient of interest in model 2 is the interaction coefficient β_6; a significantly positive β_6 coefficient would be evidence in favour of H2.

To mitigate measurement errors (Bartov et al. 2001), we compute cumulative abnormal returns (CAR) over the period separating the latest consensus forecast from the announcement date for each firm/earnings announcement. A Fama-French-Carhart market model is used to compute normal (expected) returns. Daily Fama-French-Carhart factors are retrieved from WRDS. The firm-level coefficients for market risk premium, size, book-to-market and momentum are obtained from a regression over a 120-day period, with at least 70 consecutive observations. Further, we impose that 20 trading days separate the end of the coefficient estimation window from the beginning of the event window, to mitigate the likelihood that the factor model estimates are affected by the event-window return variance.

Consistent with prior studies, we use standardized unexpected earnings (UE) to measure an earnings surprise. Earnings surprise is defined as the difference between the latest consensus earnings forecast and the actual earnings.

3.4.2. Overconfidence measures

Our main overconfidence proxy (*OC_OPTION*) is a dummy variable indicating whether the CEO exercises exercisable options as part of his compensation package[16]. This proxy has conceptual and empirical validity and is therefore the most frequently used one in the literature. It is based on data collected from Execucomp and computed as follows (Malmendier *et al.* 2008; Ahmed *et al.* 2013): first, we compute the average strike price as the fiscal year-end stock price less the ratio of the value of unexercised exercisable options over the number of unexercised exercisable options. Then, the ratio of in-the-money option is calculated by dividing the value of unexercised exercisable options by the average strike price. Finally, *OC_OPTION* takes the value of 1 from the first year of observation if the ratio of in-the-money options is greater than 0.67, and 0 otherwise.

3.4.3. Governance measures

Prior research does not find any governance mechanisms capable of moderating the negative influence of managerial overconfidence on financial reporting quality. We revisit this prior finding by taking a closer look at specific governance mechanisms. We argue that the ownership proportion of dedicated institutional investors, financial expertise of non-executive directors, and

[16] In additional tests, we proxy overconfidence with two accounting-based measures developed in prior research, and we obtain similar results that do not change the inference.

the presence of a BIG4 auditor are potential moderating factors that can mitigate the negative effect of overconfident manager.

In this paper, we aim at investigating further the analysis of corporate governance factors that may moderate the influence of managerial overconfidence on earnings quality. To this end, based on recent research findings we focus on the presence of dedicated institutional investors, the financial expertise of board members, and audit quality as further areas worthy of investigation.

3.4.3.1. Proportion of dedicated institutional investors

First, it is important to analyze the ownership composition in greater detail. A large body of research documents the monitoring efficiency of institutional investors as large shareholders of their investee firms. However, not all investors are alike. Monitoring efficiency differs according to investor capabilities and fiduciary duties. (Tirole, 2010). Thus, independent and long-term investors seem to influence positively management behavior towards better earnings quality through tougher monitoring (Chung, Firth, & Kim, 2002). A further look at the presence of institutional investors with strong monitoring capabilities and incentives seems relevant to investigate the influence of institutional ownership beyond an aggregate measure. If independent sophisticated investors are one strong form of external monitoring agents, then they should moderate the relation between CEO overconfidence and earnings informativeness.

We rely on the Bushee classification to design the variable DED_IO%. We measure the presence of dedicated institutional investors with the use of the Bushee classification. The aggregated % of equity ownership is collected from the Thomson Reuters S34 database and the investor classification is based on the Brian Bushee's manager classification file. We focus on the dedicated institutional investors as they are the most susceptible to intervene in the financial reporting process to deter any opportunistic reporting bias.

3.4.3.2. Board financial expertise

The second monitor type is an internal mechanism. The SEC release statement #33-8220 explicitly states that "an audit committee comprised of independent directors is better situated to assess objectively the quality of the issuer's financial disclosure and the adequacy of internal controls than a committee that is affiliated with management." However, beyond board independence, regulators also praise board (financial) expertise, another board attribute that merits further investigation. Having more financially expert board members are desirable as they are more capable of challenging strategic and financial decisions and proposals of the CEO, as well as understanding the implications of poor reporting quality for the firm reputation and long-term prospects.

Prior studies focus on the financial expertise of the outside (independent) directors, as they are less likely to be influenced by powerful insiders such as the CEO and the CFO. Güner, Malmendier & Tate (2008) document that a greater proportion of bankers with board seats increases external funding including bond issues, but also worse acquisitions. In addition, the increase in funding benefits primarily to firms with high credit quality but also poor investment opportunities. Gul & Leung (2004) find that the negative relation between CEO duality and voluntary disclosure is moderated by a greater proportion of expert independent directors. Overall, while there may be strong calls in favour of greater financial expertise of independent directors, empirical evidence is mixed regarding the benefits of financial expertise. A debate also exists on the benefits of financial expertise versus literacy. In an experimental setting, McDaniel, Martin & Maines (2002) find that the judgment of financial reporting quality of financial experts may differ from financially-literates, and may actually complement each other. Thus, compared to financially literate individuals, financial experts may more likely judge financial reporting quality based on

qualitative attributes of financial reporting advocated by standard setters. Further, experts and literates tend to focus on different items in assessing financial reporting quality, with more attention given to "hot" issues by financial literates and to ongoing issues by financial experts.

We collect information about the financial expertise of firm board members from the Boardex database. The measure FINEXPERT_% is computed as the number of financially expert independent board members divided by the total board size.

3.4.3.3. BIG 4

Finally, we use the audit quality as an additional external independent governance mechanism that has strong involvement in the reporting process. Since DeAngelo (1981), audit quality is a function of detecting and reporting a material error. Audit effort, auditor tenure and specialization tenure affects the probability of detecting, whereas auditor independence affects the probability of reporting. Since DeAngelo (1981), there is a consensus that large audit firm (BIG 4 to date) perform better audit services. Some of the reasons are that BIG 4 firms face higher litigation risk and reputation costs when misleading audited information comes to light too late. BIG auditors also have strong industry expertise of their audit clients, a further signal of high audit quality. Several studies (e.g. Defond & Subramanyam 1998) find that firms audited by big audit firms exhibit significantly lower accrual-based earnings management. Caramanis & Lennox (2008) rely on a database of audit engagement hours to study the link between audit effort and earnings quality. They show that the presence and the magnitude of abnormal (increasing) accruals are negatively related to the audit engagement hours. Gul, Fung & Jaggi (2009) show the association between auditor tenure and accrual-based earnings management is moderated by auditor specialization. Hence, industry specialists are more likely to detect irregularities and provide better audit services,

even if the auditor lacks client specific knowledge.Therefore, higher audit quality is more likely to moderate the influence of managerial overconfidence on financial reporting quality.

We collect information regarding the auditor in Compustat and design a dummy variable BIG4 that takes the value of 1 if the firm is audited by a large audit firm (E&Y, PWC, Deloitte or KPMG), and 0 otherwise.

3.4.3.4. Summary measure of governance

To mitigate concerns about measures of corporate governance, we also design a summary governance proxy. The two measures DED_IO% and FINEXPERT_% are ranked by industry and year, so that they individually are assigned a score of 1 if their value lies above the industry-year sample median, and 0 otherwise. Then, together with the dummy BIG4, we design GOV as a governance score summing the three governance factors identified above. The score therefore ranges from 0 to 3, with 3 characterizing strong governance mechanisms.

3.4.4.Sample construction and descriptive statistics

To construct our sample, we collect relevant data from Compustat, Execucomp, Boardex and Thomson Reuters Institutional Ownership. The final sample is composed of 11,180 US-listed firm-year observations over the 2006-2014 period. We use the Cook's (1977) D statistics to remove outliers.

Table 3.2 presents a sample description by industry and year. The sample is reasonably well-balanced across years and the industry coverage is similar to many empirical studies. In particular, the sample exhibits a predominance of manufacturing firms (representing 30% of the entire sample), consistent with the Compustat industry universe.

[Insert table 3.2 here]

Table 3.3 presents descriptive statistics of the sample firms in our main regressions. Over the sample period, the average (median) sample firm exhibits profitability as described by positive annual sales growth and return on assets of +5% (5%), abnormal returns around the earnings announcement date of 1% (0%), a debt-to-asset ratio of 0.21 (0.19), a Tobin's "total" Q of 1.43 (0.83), a dividend payout of 45% (3%), is followed by 11 (9) financial analysts, 8% (6%) of its equity is held by dedicated institutional owners, 14% (11%) of its independent board members have financial expertise. Finally, the average (median) CEO receives $5.7mm ($4.1mm) of total annual compensation, which corresponds to 43% of the total compensation received by the 5 biggest executive directors of the average firm. Compared to the median Compustat firm over the same period (unreported), the median sample firm is larger, is followed by more analysts, has higher institutional ownership, pays a higher proportion of its income in the form of dividends, and exhibits similar debt levels, sales growth and R&D expenses. Finally, the statistical distribution of our overconfidence proxies are similar to prior studies.

[Insert table 3.3 here]

Table 3.4 presents the Pearson/Spearman rank correlation table. The lower triangle shows Pearson coefficient and the higher triangle shows Spearman rank. Significant coefficient at the 5% level or better appear in bold. Interestingly, the option-based overconfidence (OC_OPTION) is positively related to the accounting-based proxy OC_INVEST with a Pearson coefficient of +0.13, but not significantly related to the alternative accounting-based proxy OC_CAPEX, suggesting that these proxies capture different facets of overconfidence.

[Insert table 3.4 here]

3.5. Results

Tables 3.5 to 3.8 show the results of the regression used to test our hypotheses. In all regressions, p-values are reported two-tailed and with clustered standard errors by firm (Petersen 2009).

Table 3.5 shows the regression of CAR on the various overconfidence proxies and control variables to test H1. The first model (1) is the base model including control variables identified in the literature. Most control variables are significant at 5% or better with the expected sign. Turning to the second regression (model 2), and consistent with our prediction, the interaction coefficient UE*OC_OPTION is significantly negative (p-value=0.005), suggesting that earnings informativeness is decreasing with overconfidence. Therefore, H1 finds support.

[Insert table 3.5 here]

Table 3.6 shows the effects of strong governance and their interactions with the ERC to test H2. In all models, the coefficient for the interaction term UE*OC_OPTION is significantly negative. Results from model 3 with the summary measure of strong governance show that the coefficient on the interaction term OVERCONF*UE*GOV is significantly positive (p-value = 0.056). This suggests that strong external monitoring, is capable of downplaying the effects of CEO overconfidence on earnings informativeness, which provides support for H2. Therefore, we find some first evidence that specific governance mechanisms are efficient at deterring the effects of CEO overconfidence on the perceived credibility of financial reporting. Models 4 to 6 presents the regression results of the influence of individual governance mechanisms on the ERC. Results suggest that neither higher presence of dedicated institutional investors nor a higher proportion of financially literate independent board members seem to moderate the relation between the ERC

and overconfidence, with respective p-values of 0.12 and 0.89. Of the three governance mechanisms analysed, only the presence of BIG4 (p-value=0.001) seems to dampen the influence of overconfidence on the ERC.

The nonsignificant moderating role of board financial experts calls for further analysis. Indeed, having financial expertise may be desirable, but may not be the only decisive factor. DeFond, Hann & Hu (2005) find that the nomination of audit committee members with accounting financial expertise is associated with positive abnormal stock returns only when the firm already exhibits strong governance prior to the nomination. Badolato, Donelson, & Ege (2014) that a higher presence of audit committee members with both financial expertise and a high status (such as a higher number of public and private board directorships) is associated with lower earnings management.

Therefore, while we have evidence that CEO overconfidence is significantly influencing earnings informativeness, results also suggest that high audit quality can help deterring its effects, which provides some support for H2.

[Insert table 3.6 here]

Overall, our results provide support for the following: First, firms run by overconfident managers exhibit lower earnings informativeness. Second, a look at governance mechanisms as potential moderators of the evidence found in H1 reveals that when governance if high, the relation between overconfidence and earnings informativeness is (weakly) incrementally higher. This suggests that while managerial overconfidence influence negatively earnings informativeness, strong monitoring mechanisms that we identify do not play a convincing role at mitigating its effects.

3.6. Additional tests

3.6.1. Endogeneity of overconfidence

A legitimate concern is that managerial overconfidence may be endogenous. In this case, introducing a regressor that is correlated with the error term may bias the coefficient and hence the inference. We tackle endogeneity in three ways. The first approach includes firm fixed effects. Second, we employ instrumental variable (IV) estimation. Finally, we use the system GMM approach (Arellano & Bond 1991; Blundell & Bond 1998).

3.6.1.1. Firm fixed-effects

To control for unobserved fixed factors that may be correlated with our main regressor, we include firm fixed effects. Results are presented in table 3.7. The coefficient for UE*OC_OPTION is significantly negative (p-value=0.003), further suggesting that earnings are less informative when the CEO is overconfident. However, the coefficient for UE*OC_OPTION*BIG4 when BIG4 is our proxy for strong governance, is not significant anymore (p-value=0.12), suggesting that our first evidence regarding H2 is subject to endogeneity bias.

[Insert table 3.7 here]

3.6.1.2. Instrumental variable estimation

In this section, we employ the Heckman (1979) 2-stage least square approach to tackle the endogeneity issue. This instrument shall be theoretically and empirically correlated to our main regressor but not correlated to our dependent variable. In our base model, under the plausible

assumption that our overconfidence proxy is endogenous, we have two endogenous regressors, OC_OPTION and UE*OC_OPTION.

We use CEO compensation as our instrument for the first-stage regression, as this has been found to be related to overconfidence (e.g. Hayward & Hambrick,1997; Paredes 2005). In practice, we test for endogeneity using two different instruments separately. First, we use the total CEO compensation COMP (variable tdc1 in Execucomp). For the second instrument, we design a variable CPS, derived from the CEO Pay Slice (CPS) by Bebchuk, Cremers, & Peyer (2011), which is the proportion of the total compensation of the top 5 highest paid executives that goes to the CEO. Subsequently, our two endogenous regressors are instrumented with COMP and UE*COMP in the first case, and CPS and UE*CPS in the second case. We have therefore exactly identified IV models.

Results from the first-stage regression of the 2SLS approach are provided in panel A of table 3.8. The first stage is a probit model for the propensity to be overconfident; in addition to the instrument (either CPS or COMP), we include all other regressors of the structural equation. For the sake of parsimony, we only present statistics for the instrument coefficient in the first stage. In both models presented, the coefficient for the chosen instrument is highly significant (p-value<=0.001) and positive, corroborating prior research findings cited above. These results provide empirical support for the validity of the instruments.

To statistically check the endogeneity of our main regressor and its interaction with the ERC, we perform the Wu-Hausman F test and the Durbin-Wu-Hausman chi-square test. Using the instruments described above, both tests (p-value <0.001) strongly reject at 1% the null of exogeneity of our overconfidence proxy. This suggests that the instrumental variable approach,

given the validity of our instruments, may be more appropriate than the OLS results obtained in the first tests.

Results from the second-stage regression can be found in panel B of table 8. The Anderson canonical correlation LM test of underidentification is rejected with a p-value <0.001. Further, the Cragg-Donald F statistics are way above the 10% critical value developed by Stock and Yogo (2005), suggesting that the chosen instruments are not weak. The interaction coefficient between unexpected earnings and overconfidence is strongly negative in both models (with respective p-value <0.001 and p-value =0.005 for the models with COMP and CPS as instruments). This suggests that firm earnings are less informative when the CEO is overconfident, and thus providing further support to our main finding.

[Insert table 3.8 here]

In addition, performing the same IV models when we introduce governance factors, the interaction term UE*OC_OPTION*GOV is not significant anymore. This result provides further evidence that our previous finding about the moderating influence of governance on earnings informativeness when the CEO is overconfident may be biased due to endogeneity. Yet, we may treat this result cautiously as this calls for a deeper analysis of the influence of other governance factors on earnings informativeness, which is left for future research.

3.6.1.3. System GMM

As a further remedy to endogeneity concerns, we adopt a second route advocated in Wintoki, Linck & Netter (2012). Given the dynamic nature of corporate governance practices, we employ the dynamic panel GMM estimator. Wintoki *et al.* (2012) argue that if there exists a dynamic relation

between current levels of regressors and past values of stock abnormal performance, a fixed effect regression may be biased. The dynamic GMM panel data approach attempts to control for endogeneity and heteroskedasticity, by using internal instruments. To this end a series of lagged levels and first-difference lags of all endogenous and exogenous variables are used in individual time-period regressions to form a "system" GMM.

Our estimated model takes the following form: board practices = f(past stock abnormal performance, CEO overconfidence, firm characteristics, fixed effects). We treat all but REG and CRISIS dummies (but not their interactions with unexpected earnings) as endogenous regressors. Following Roodman (2006), we employ the two-step GMM model with the Windmeijer correction for standard errors. The system GMM results are reported on table 3.9. The Hansen-J statistic null hypothesis of overidentifying restrictions is not rejected with a p-value of 0.626, the Arellano and Bond first-order autoregressive statistic is rejected at 1%, whereas the second (and also third and fourth) order autoregressive statistic is not rejected with a p-value of 0.495. The system GMM uses 670 instruments, to be compared to the number of firms (1,705). We have therefore some comfort regarding the model specification.

[Insert table 3.9 here]

The results provide additional support for our main findings, *i.e.* earnings informativeness, as proxied by the earnings response coefficient, is lower in presence of an overconfident CEO.

In conclusion of this section, we have compelling evidence that our main finding (H1) does not seem to suffer from endogeneity. Through these results, we find that after controlling for unobserved sources of heterogeneity, potential simultaneity, and the effects of past values of stock

abnormal performance on its determinants, earnings informativeness is lower in firms run by overconfident managers.

3.6.2.Alternative proxy for overconfidence

Recognizing that overconfidence may be measured with errors, and consistent with prior research, we use two alternative overconfidence proxies based on accounting data. An advantage of accounting-based measures is that they allow to construct larger samples because they require more conventional data. A disadvantage of accounting-based measures of overconfidence is that it is more difficult to link their observed levels directly to a personal behavioral trait of the CEO.

Our first accounting-based proxy OC_CAPEX follows Ahmed *et al.* (2013) and takes the value of 1 if firm's capital expenditures deflated by lagged total assets are greater than the (SIC-2) industry yearly median. Finally, following Malmendier *et al.* (2008), OC_INVEST, our second accounting-based overconfidence proxy, is a dummy variable that equals to 1 if the firm residual of the regression of asset growth on sales growth run by industry-year is positive, and 0 otherwise. Regressions exhibited in table 3.10 reveals similar relations, i.e. a negative influence of overconfidence on the ERC; this suggests that the inference is unchanged when we use OC_CAPEX or OC_INVEST as proxies for overconfidence. Therefore, the negative influence of overconfidence on the ERC does not seem to depend on the choice of the proxy for overconfidence.

[Insert table 3.10 here]

3.6.3. Outlier treatment

Finally, we employ two alternative techniques to test the influence of outliers on our results. In the first case, we use a quantile-based regression, and in the second case we define outliers as lying outside the interquartile range (IQR) +/- 1.5. Results from these two models are provided on table 3.11 and show that both models yield similar results to our main ones, with negative coefficients for the interaction term UExOC_OPTION, and a p-values of 0.03 for the quantile-based regression and 0.08 for the regression model using the IQR method for outliers. We have therefore further comfort regarding the robustness of our results to the treatment of outliers.

[Insert table 3.11 here]

3.7. Conclusion

This study complement prior research on the effects of managerial overconfidence in capital market accounting research. Extant research shows that earnings quality is negatively related to CEO overconfidence, yet external monitoring is unable to deter their effects. Our contributions are twofold. First, we provide evidence of lower earnings informativeness in presence of managerial overconfidence, suggesting that investors integrate this behavioral bias into their valuations. This finding is consistent across various proxies for overconfidence and robust to endogeneity. Second, consistent with prior research on the relation between managerial overconfidence and governance, we do not find strong evidence of incrementally higher ERC for firms run by overconfident managers but monitored by strong governance mechanisms. As such, in complement to Schrand *et al.* (2012) and Ahmed *et al.* (2013), we provide further evidence that usually well-accepted strong monitoring mechanisms do not moderate the optimistic bias found in earnings

announcements of firms run by overconfident managers. Complementing Schrand *et al.* (2012), two possible explanations can be formulated. First, research has yet to study efficient mechanisms of governance capable of downplaying the impact of managerial overconfidence on financial reporting. An alternative explanation, rooted in a traditional cost-benefit analysis, maybe that costs engaged in monitoring overconfident managers outweigh its potential benefits. After all, we provide compelling evidence in this paper that equity market participants do not take earnings surprises at face value when the CEO is overconfident, thereby lowering the need to specifically moderate this behavioural bias.

To shed more light on this debate, we foresee two extensions of this paper. First, a deeper analysis of the board characteristics, with a focus on audit committee and their influence in constraining managerial overconfidence, merits further investigation. Second, future studies could investigate in other settings the role of the governance mechanisms developed in this paper as moderators of alternative behavioural biases of managers.

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Appendix

Table 3.1.- Variable description

Variable name	Definition
CAR	Compounded Abnormal Return, calculated from a Fama-French-Carhardt 4-factor model (CRSP and -French's website for the daily factors)
UE	Unexpected Earnings, computed as the difference between actual earnings and latest analyst consensus forecast (I/B/E/S)
BETA	Stock beta computed from a Fama-French-Carhardt 4-factor model
REG	Dummy variable taking the value of 1 if the firm is operating in a regulated industry, and 0 otherwise. Regulated industries are defined as in Warfield *et al.* (1995) based on SIC-1 code 6 and SIC-2 codes 40-49 (Compustat)
OC_OPTION	Overconfidence proxy based on option data (Execucomp)
OC_LEVERAGE	Overconfidence proxy based on accounting data (Compustat)
OC_CAPEX	Overconfidence proxy based on accounting data (Compustat)
SIZE	Firm size defined as log(prcc_f*csho) (Compustat)
Q	Tobin's Q formulated by Peters and Taylor (Compustat)
LEV	Asset leverage, defined as (dlcc+dlt)/at (Compustat codes)
LOSS	Dummy variable taking the value of 1 is contemporaneous annual earnings is negative, and 0 otherwise (Compustat)
CEO_DUALITY	Dummy variable taking the value of 1 if the CEO is also the Chairman of the Board
COMP	CEO total compensation (variable tdc1 in Execucomp, including salary, bonus, other annual compensation, restricted stock grants and long-term incentive plan)
CPS	Proportion of the total compensation (variable tdc1 in Execucomp, including salary, bonus, other annual compensation, restricted stock grants and long-term incentive plan) of the top 5 highest paid executives that goes to the CEO
GROWTH	Average two-year sales growth, defined as $\sqrt{(sales_t / sales_{t-2})}-1$ (Compustat)
DED_IO%	% of dedicated institutional ownership (Thomson Reuters S34 and Prof. Bushee's website)
BIG4	Dummy variable taking the value of 1 if the firm is audited by a Big4 audit firm, and 0 otherwise (Compustat)
FINEXPERT_%	% of independent directors with financial expertise (Boardex)
CRISIS	Dummy variable taking the value of 1 for the 2008-2009 years, and 0 otherwise (Compustat)

Table 3.2.- Sample breakdown by industry (based on 1-digit SIC code)

Industry/Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Agriculture, Forestry & Fishing	61	57	58	74	79	85	87	90	80	**671**
Mining and construction	180	179	182	206	217	212	214	216	214	**1,820**
Manufacturing	349	349	335	386	409	404	388	379	371	**3,370**
Transportation, Communications, Electric & Gas	124	111	114	145	148	146	145	150	147	**1,230**
Wholesale and Retail trade	143	145	125	142	161	166	158	152	150	**1,342**
Finance, Insurance and Real Estate	70	65	57	96	106	109	110	111	125	**849**
Services	135	143	142	166	166	169	165	163	163	**1,412**
Other	46	47	48	61	60	58	61	55	50	**486**
Total	**1,108**	**1,096**	**1,061**	**1,276**	**1,346**	**1,349**	**1,328**	**1,316**	**1,300**	**11,180**

Table 3.3.- Sample descriptive statistics

Variable	mean	sd	p25	p50	p75
CAR	0.01	0.09	-0.05	0	0.06
UE	0.02	0.12	-0.01	0.02	0.06
BETA	1.05	0.4	0.79	1.02	1.27
OC_OPTION	0.48	0.5	0	0	1
ROA	0.05	0.1	0.02	0.05	0.09
Q	1.43	3.05	0.49	0.83	1.46
GROWTH	0.08	0.21	0	0.06	0.14
REG	0.19	0.39	0	0	0
LOSS	0.13	0.33	0	0	0
SIZE	7.78	1.53	6.68	7.66	8.82
LEVERAGE	0.21	0.19	0.04	0.19	0.32
PAYOUT	0.45	15.23	0	0.03	0.32
OC_CAPEX	0.01	0.1	0	0	0
OC_LEVERAGE	0.31	0.46	0	0	1
GOVSCORE	2.01	0.77	1	2	3
BIG4	0.93	0.26	1	1	1
DED_IO%	0.08	0.07	0.02	0.06	0.11
FINEXPERT_%	0.14	0.09	0.07	0.11	0.19
COMP ($ mln)	5,735	5,384	2,044	4,086	7,484
CEO_CPS	0.43	0.14	0.35	0.42	0.49

Table 3.4.- Pearson/Spearman correlation matrix

The lower triangle shows Pearson coefficient and the higher triangle shows Spearman rank. Significant coefficient at the 5% level or better appear in bold.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CAR	1		**0.23**	**0.02**	0.00	**-0.05**	**0.03**	**-0.05**	**-0.02**	**-0.03**	**-0.03**	0.00	0.01	0.01	-0.01	**0.03**	0.00	0.02	0.02
UE	2	**0.20**		0.01	0.01	-0.01	0.00	-0.01	**-0.07**	**0.06**	**-0.03**	-0.01	-0.01	**0.03**	**0.04**	0.01	0.01	**0.09**	**0.02**
BETA	3	**0.02**	-0.01		**0.06**	**-0.09**	**0.03**	**-0.11**	**0.09**	**-0.04**	-0.02	**-0.03**	**0.04**	**0.05**	0.01	**0.04**	**0.06**	**0.03**	0.00
OC_OPTION	4	0.00	0.01	**0.06**		**0.18**	**0.13**	**-0.06**	**-0.08**	**0.09**	-0.02	0.01	**0.13**	**0.02**	**-0.03**	**0.07**	0.01	**0.09**	**0.03**
Q	5	**-0.03**	0.02	-0.01	**0.05**		**0.31**	0.00	**-0.27**	**0.30**	**-0.09**	**0.06**	**0.14**	**0.02**	**-0.02**	**0.03**	**0.03**	**0.07**	**-0.04**
GROWTH	6	**0.02**	0.01	**0.03**	**0.08**	**0.10**		**-0.06**	**-0.20**	**0.03**	**-0.09**	-0.01	**0.23**	0.00	**-0.06**	**0.04**	**0.02**	-0.01	**-0.05**
REG	7	**-0.05**	0.02	**-0.09**	**-0.06**	**0.15**	**-0.04**		**-0.09**	**0.14**	**0.18**	**0.16**	**-0.06**	**0.03**	**0.08**	**-0.09**	**-0.09**	**0.03**	**-0.06**
LOSS	8	**-0.02**	**-0.08**	**0.09**	**-0.08**	**-0.09**	**-0.13**	**-0.09**		**-0.27**	**0.04**	**0.02**	**-0.04**	0.00	**-0.04**	**0.04**	0.02	**-0.15**	**-0.03**
SIZE	9	**-0.03**	**0.07**	**-0.03**	**0.08**	**0.11**	**0.02**	**0.14**	**-0.28**		**0.21**	-0.01	**0.02**	**0.14**	**0.27**	**0.07**	**-0.05**	**0.74**	**0.10**
LEVERAGE	10	**-0.02**	**-0.04**	0.00	-0.01	**-0.03**	**-0.03**	**0.16**	**0.05**	**0.15**		**0.04**	**-0.05**	**0.10**	**0.18**	**0.06**	-0.01	**0.25**	**0.11**
OC_CAPEX	11	0.00	0.00	**-0.03**	0.01	**0.10**	0.00	**0.16**	**0.02**	-0.01	**0.05**		0.01	0.00	**-0.03**	-0.01	-0.02	**-0.03**	-0.02
OC_INVEST	12	0.01	0.00	**0.03**	**0.13**	**0.06**	**0.17**	**-0.06**	**-0.04**	**0.03**	**-0.05**	0.01		**0.03**	**-0.02**	**0.04**	**0.03**	0.00	-0.01
GOVSCORE	13	0.01	**0.02**	**0.05**	0.02	**0.03**	0.00	**0.03**	0.00	**0.14**	**0.11**	0.00	0.03		**0.33**	**0.60**	**0.58**	**0.13**	0.02
BIG4	14	-0.01	**0.02**	0.02	**-0.03**	-0.01	**-0.05**	**0.08**	**-0.04**	**0.27**	**0.16**	**-0.03**	**-0.02**	**0.37**		**0.06**	-0.01	**0.23**	**0.05**
DED_IO%	15	**0.02**	0.00	**0.03**	**0.04**	-0.02	**0.02**	**-0.08**	**0.07**	0.00	**0.08**	-0.01	0.02	**0.50**	**0.05**		**0.06**	**0.10**	**0.03**
FINEXPERT_%	16	0.00	0.01	**0.06**	0.01	0.01	0.01	**-0.09**	0.01	**-0.05**	**0.02**	-0.02	**0.03**	**0.52**	0.00	**0.06**		**-0.04**	**-0.03**
COMP	17	0.01	**0.06**	**0.02**	**0.06**	0.00	0.01	**0.04**	**-0.12**	**0.68**	**0.15**	-0.02	0.00	**0.10**	**0.16**	**0.04**	**-0.05**		**0.41**
CPS	18	**0.02**	0.02	0.01	**0.03**	**-0.04**	-0.02	**-0.04**	**-0.02**	**0.05**	**0.08**	-0.02	-0.01	0.01	**0.03**	**0.02**	**-0.03**	**0.30**	

Table 3.5.- Regressions of CAR on managerial overconfidence and control variables

All non-interacted terms are included in the regressions but not shown.

	(1)	(2)
UE	0.3578 (0.000)***	0.3612 (0.000)***
UE*OC_OPTION		-0.0354 (0.005)***
UE*BETA	-0.0134 (0.311)	-0.0106 (0.422)
UE*Q	0.0020 (0.007)***	0.0018 (0.018)**
UE*SIZE	-0.0242 (0.000)***	-0.0218 (0.000)***
UE*GROWTH	0.0580 (0.048)**	0.0620 (0.035)**
UE*LOSS	-0.0791 (0.000)***	-0.0823 (0.000)***
UE*LEV	-0.0178 (0.516)	-0.0241 (0.379)
UE*BIG4	0.0184 (0.525)	0.0137 (0.632)
UE*REG	-0.0528 (0.000)***	-0.0561 (0.000)***
UE*CRISIS	0.0360 (0.011)**	0.0359 (0.011)**
Constant	0.0155 (0.006)***	0.0156 (0.006)***
F	40.45***	36.60***
Adjusted R-sq	.046	.046
N	11,180	11,180

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.6.- Influence of governance mechanisms
Regressions of CAR on managerial overconfidence, governance and control variables. Other control variables as well as non-interacted terms are included in the regression but not shown.

	(3) GOV= GOVSCORE	(4) GOV= DED_IO%	(5) GOV= BIG4	(6) GOV= FINEXPERT_%
UE	0.4210	0.3829	0.3903	0.3877
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
UE*OC_OPTION	-0.1014	-0.0534	-0.1849	-0.0310
	(0.004)***	(0.003)***	(0.000)***	(0.087)*
UE*GOV*OC_OPTION	0.0317	0.0361	0.1595	-0.0032
	(0.056)*	(0.121)	(0.001)***	(0.897)
UE*BETA	-0.0124	-0.0034	-0.0150	-0.0157
	(0.353)	(0.798)	(0.260)	(0.243)
UE*Q	0.0019	0.0023	0.0018	0.0016
	(0.014)**	(0.004)***	(0.018)**	(0.041)**
UE*SIZE	-0.0250	-0.0222	-0.0217	-0.0238
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
UE*GROWTH	0.0870	0.0856	0.0568	0.0963
	(0.003)***	(0.003)***	(0.051)*	(0.001)***
UE*LOSS	-0.0792	-0.0840	-0.0747	-0.0743
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Constant	0.0165	0.0187	0.0124	0.0148
	(0.008)***	(0.001)***	(0.044)**	(0.012)**
F	35.69***	30.94***	32.65***	30.82***
p	0.000	0.000	0.000	0.000
Adjusted R-sq	.051	.047	.046	.05
N	9,946	10,773	11,156	10,218

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.7.- Panel fixed effect regressions of CAR on managerial overconfidence
Other control variables as well as non-interacted terms are included in the regression but not shown.

	(7) CAR	(8) CAR & GOV=BIG4
UE	0.3632 (0.000)***	0.3662 (0.000)***
UE*OC_OPTION	-0.0452 (0.003)***	-0.1261 (0.019)**
UE*OC_OPTION *BIG4		0.0867 (0.122)
UE*BETA	-0.0196 (0.205)	-0.0264 (0.091)*
UE*Q	0.0020 (0.094)*	0.0019 (0.100)
UE*SIZE	-0.0206 (0.000)***	-0.0204 (0.000)***
UE*GROWTH	0.0648 (0.092)*	0.0523 (0.166)
UE*LOSS	-0.0928 (0.000)***	-0.0823 (0.000)***
UE*BIG4	0.0256 (0.458)	0.0270 (0.550)
UE*REG	-0.0561 (0.001)***	-0.0551 (0.001)***
UE*CRISIS	0.0512 (0.002)***	0.0508 (0.003)***
Other terms	Included	Included
Fixed effects	Yes	Yes
Constant	0.2180 (0.000)***	0.2077 (0.000)***
F	30.56***	26.98***
Adjusted R-sq	.06	.06
N	11,180	11,156

p-values in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.8.- Endogeneity test- Instrumental variable estimation

Panel A: First-stage regression : propensity for the CEO to be overconfident

	(9) OC_OPTION	(10) OC_OPTION
CEO_COMP	0.1059 (0.000)***	
CEO_CPS		0.2834 (0.001)***
Other variables	Yes	Yes
Constant	-1.0372 (0.000)***	-0.6812 (0.000)***
Chi2	346.932***	318.786***
Pseudo R-sq	.02	.02
N	11,326	11,227

p-values in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel B: Second-stage regression: regression of CAR on instrumented overconfidence

	(11) INST = CEO compensation	(12) INST = CEO pay slice
UE	0.4810 (0.000)***	0.4337 (0.000)***
UE*OC_OPTION	-0.5427 (0.000)***	-0.3682 (0.005)***
UE*BETA	0.0333 (0.187)	0.0162 (0.583)
UE*SIZE	-0.0096 (0.172)	-0.0149 (0.070)*
UE*LOSS	-0.1080 (0.000)***	-0.0939 (0.005)***
Other variables	Yes	Yes
Constant	-0.0217 (0.045)**	-0.0160 (0.545)
Chi2	523.53***	321.70***
Adjusted R-sq	.055	.046
N	10,779	10,694

p-values in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.9.- Alternative endogeneity test

System GMM approach developed by Arellano & Bond (1991) and Blundell & Bond (1998). P-values with Windmeijer correction for standard errors. Other control variables as well as non-interacted terms are included in the regression but not shown.

	(13) CAR
UE	0.896 (0.067)*
UEPS*OC_OPTION	-0.362 (0.021)**
UEPS*BETA	.0027 (0.99)
UEPS*Q	.0708 (0.522)
UEPS*SIZE	-.0994 (0.068)*
UEPS*LOSS	0.040 (0.860)
UEPS*LEV	.200 (0.675)
UEPS*BIG4	.276 (0.377)
UEPS*REG	0.119 (0.564)
UEPS*CRISIS	.548 (0.034)**
Other variables and constant	Included
Wald Chi2	73.37***
Nb instruments	670
Nb fims	1,705
N	9,212
Arellano-Bond test for AR(1)	0
Arellano-Bond test for AR(2)	0.49
Hansen test of overid. Restrictions	0.62
Difference-in-Hansen tests of exogeneity of instrument subsets	0.89

p-values in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.10.- Alternative proxies for overconfidence

Regressions of CAR on managerial overconfidence and control variables. Other control variables as well as non-interacted terms are included in the regression but not shown.

	(14) OC=CAPEX	(15) OC=INVEST
UE	0.2928	0.3086
	(0.000)***	(0.000)***
UE*OC	-0.0951	-0.0169
	(0.000)***	(0.037)**
UE*BETA	0.0392	0.0435
	(0.000)***	(0.000)***
UE*Q	0.0023	0.0014
	(0.000)***	(0.008)***
UE*SIZE	-0.0215	-0.0219
	(0.000)***	(0.000)***
UE*GROWTH	-0.0179	-0.0123
	(0.036)**	(0.077)*
UE*LOSS	-0.0572	-0.0618
	(0.000)***	(0.000)***
UE*LEV	-0.0396	-0.0456
	(0.022)**	(0.004)***
UE*REG	-0.0464	-0.0534
	(0.000)***	(0.000)***
UE*CRISIS	0.0161	0.0152
	(0.156)	(0.150)
UE*BIG4	-0.0203	-0.0200
	(0.195)	(0.171)
Constant	0.0088	0.0085
	(0.028)**	(0.022)**
F	42.55***	51.48***
p	0.000	0.000
Adjusted R-sq	.033	.037
N	21,201	20,750

p-values in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.11.- Robustness test - influence of outliers

The first model is a quantile(median)-based regression, whereas the second model identifies and removes outliers based on the interquartile range method. All variables are as previously defined. Intermediate terms are included in the regression but not shown.

	(16) Quantile	(17) IQR
UE	0.2046 (0.000)***	0.8638 (0.000)***
UE*OC_OPTION	-0.0290 (0.031)**	-0.0724 (0.086)*
UE*BETA	-0.0131 (0.330)	-0.0419 (0.441)
UE*GROWTH	0.0482 (0.024)**	0.1611 (0.309)
UE*LOSS	-0.0535 (0.001)***	-0.1332 (0.027)**
UE*LEV	-0.0214 (0.423)	0.1250 (0.308)
UE*Q	0.0015 (0.334)	0.0093 (0.763)
UE*SIZE	-0.0139 (0.002)***	-0.0499 (0.002)***
UE*BIG4	0.0761 (0.004)***	-0.0918 (0.265)
UE*REG	-0.0465 (0.002)***	-0.0837 (0.138)
UE*CRISIS	0.0438 (0.004)***	0.1240 (0.013)**
Constant	0.0201 (0.001)***	0.0186 (0.016)**
F	-	18.78***
Adjusted R-sq	0.02	.04
N	11,867	9,212

p-values in parentheses;* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Conclusion

How governance mechanisms shape the financial reporting process is a very rich field of research, with numerous issues yet to be resolved. The three essays presented in this thesis shed light on important aspects of corporate governance and capital-market accounting.

The first essay provides evidence that activist HF are positively related to governance improvements of their targeted firms. Evidence suggests that they also do care about best governance practices that have direct implications for stakeholders. However, there may be side-effects to intensive monitoring, what Tirole (2010) calls "over monitoring". The second essay supports this idea, in that the presence of activist hedge funds is positively related to financial reporting aggressiveness. Taken together, results show that while the presence of activist HF is associated with improvements to governance, it may also introduce additional moral hazard. Empirical results suggest that public perceptions about their short-term stance are supported.

An extension of the first essay would be to study the different channels through which shareholder activists impound their influence on governance. Future studies regarding the second essay could investigate how an activist's influence changes when he succeeds in appointing one of his nominees at the audit committee. In addition, the scope of study has some limitations, including narrowing the influence of activist HF on corporate governance and financial reporting practices. These financially driven shareholders may also have a material impact on social and environmental issues that have not been investigated here.

The third essay provides evidence that market participants incorporate the behavioural biases of managers and their resulting influence on reporting quality into their valuations, unconditional on the strength of corporate governance. Here, empirical results suggest that strong governance is not perceived by investors as an efficient moderator to the influence of managerial overconfidence on financial reporting quality. An interesting research avenue would be to analyse the influence of other behavioural biases on financial reporting.

In essence, there is still scope for further research on these critical aspects of corporate governance and the financial reporting process. I look forward to engaging future collaborations in this regard.

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