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Non-bank institutional investors' ownership in non-financial companies listed in major European countries

F. Fancello, N. Linciano, L. Gasbarri, T. Giulianelli

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La presenza degli investitori istituzionali non bancari nelle maggiori società non finanziarie quotate europee

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Sintesi del lavoro

Il lavoro analizza i fattori che determinano la partecipazione degli investitori istituzionali non bancari nelle maggiori 100 società quotate in ciascuno dei cinque paesi europei considerati (Francia, Germania, Italia, Spagna e Regno Unito) nel periodo 2010-2015.

Sulla scorta della letteratura empirica, l'analisi verifica l'impatto sulle scelte degli investitori istituzionali di fattori macroeconomici, attinenti alle caratteristiche del paese di riferimento, e microeconomici, attinenti ai profili finanziari e di *governance* delle società.

Con riguardo al contesto macroeconomico, sono stati considerati la crescita economica e il rischio paese (rappresentato attraverso il rapporto debito pubblico/Pil e una *proxy* del grado di efficienza del sistema legale domestico, ossia i tempi di risoluzione delle cause civili); come *proxy* del livello di sviluppo finanziario si è fatto riferimento alla capitalizzazione complessiva del mercato.

Con riguardo alle caratteristiche delle società, le variabili finanziarie considerate comprendono misure di profittabilità (tasso di rendimento del capitale, ROE, e crescita del fatturato) e misure di rischiosità (leva finanziaria, probabilità di *default*). Oltre a tali indicatori di bilancio (tipicamente di natura microstrutturale), sono state considerate altre misure influenzate dalle fluttuazioni di mercato, quali il *dividend yield*, il *price-to-book*, la capitalizzazione di mercato, la percentuale di flottante (*proxy* della liquidità delle azioni) e la quota

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Gli autori ringraziano Giovanni Bruno (Università Bocconi) per gli utili commenti. Errori e imprecisioni sono imputabili esclusivamente agli autori. Le opinioni espresse nel lavoro sono attribuibili esclusivamente agli autori e non impegnano in alcun modo la responsabilità dell'Istituto. Nel citare il presente lavoro, non è, pertanto, corretto attribuire le argomentazioni ivi espresse alla Consob o ai suoi Vertici.

detenuta dal principale azionista (che può essere intesa sia come variabile inversamente correlata alla liquidità di un titolo sia come misura di contendibilità di una società).

Le variabili di *governance* prese in considerazione per ciascuna società includono, infine, la dimensione del consiglio di amministrazione, la percentuale di consiglieri indipendenti, la presenza del comitato nomine e del comitato remunerazioni, la coincidenza della carica di CEO e presidente (*Ceo duality*), nonché un indicatore sintetico della qualità della *governance*.

L'analisi econometrica, basata su specificazioni alternative, ha indagato le determinanti della quota di partecipazione di tutti gli investitori istituzionali, dei soli fondi comuni, dei fondi sovrani e, infine, degli *hedge funds*, al fine di tener conto delle differenze nell'approccio di portafoglio caratteristico delle diverse categorie di investitori considerate.

Inoltre, poiché le relazioni fra le suddette variabili potrebbero essere non lineari, l'analisi è stata effettuata utilizzando sia un modello di *fixed effect panel data* sia un modello di *fractional regression*.

Il lavoro mostra che la presenza di investitori istituzionali è correlata sia con variabili macroeconomiche sia con le caratteristiche delle singole imprese. Tuttavia, i risultati variano in relazione alla categoria di investitore istituzionale. Considerando tutti gli investitori istituzionali, l'analisi evidenzia l'impatto statisticamente significativo di: crescita del Pil (con effetto positivo) e crescita del debito pubblico (negativo); inefficienza del sistema legale (negativo); flottante sul mercato (positivo); incremento del ROE (positivo); *leverage* (negativo); presenza di consiglieri indipendenti nel consiglio di amministrazione (positivo).

Con particolare riferimento alla *governance* societaria, talune specificazioni suggeriscono anche un effetto positivo riferibile alla presenza di amministratori indipendenti e una relazione inversa con la dimensione dei consigli di amministrazione.

I risultati meno conclusivi relativi alle categorie dei *sovereign* funds e degli *hedge funds* vanno peraltro interpretati alla luce della loro natura di investitori rispettivamente strategici e *contrarian*/speculativi. Ad esempio, la presenza dei fondi sovrani e degli *hedge funds* nel capitale delle società quotate, che in alcune specificazioni risulta inversamente correlata alla crescita economica, sembrerebbe confermare l'evidenza aneddotica da cui si evince che tali investitori tenderebbero a incrementare la loro quota di partecipazione in fasi di recessione.

Lo studio contribuisce alla vasta letteratura esistente, portando evidenze empiriche aggiornate relative al contesto europeo e fornendo così elementi utili al dibattito di *policy* in corso, teso a ridurre la dipendenza delle imprese dal credito bancario e alla base del progetto dell'Unione dei mercati dei capitali.

Non-bank institutional investors' ownership in non-financial companies listed in major European countries

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Abstract

This study analyses the factors influencing institutional ownership in the largest non-financial companies listed in five major European countries from 2010 to 2015. Consistently with previous empirical literature, both country-level and firm-level variables result to be relevant. As for country variables, economic activity and the efficiency of the legal system turn out to be significant. As for firm variables, depending on the specification adopted and beyond market and financial indicators, institutional presence is positively associated with proxies of good quality of corporate governance, namely smaller board size and higher presence of independent directors. The paper adds to the existing literature by providing up-to-date empirical evidence from the European framework. This in turn may be relevant on policy grounds, as the understanding of the drivers of institutional holdings has become increasingly important after the latest financial crisis, marking reduced corporate access to bank credit and triggering European projects such as the Capital Markets Union.

JEL Classifications: G11, G23, G38

Keywords: institutional investors' ownership; institutional investors' portfolio choices and investment decisions; corporate finance and corporate governance; financial markets regulation.

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1 Introduction and main findings

The importance of institutional investors is fast growing in many developed and emerging economies. According to OECD (2016), at the end of 2015 financial assets of investment funds represented 103.5% of gross domestic product (GDP) in the US, up from 71.9% at the end of 2008. Over the same period, they reached 55.9% from 34.1% in Germany, 70.6% from 67.6% in France, while lagging behind in Italy, where they accounted for 17.4% of GDP (from 13.3%).

Institutional investors play a key role in financial markets development. With the background of finance and growth literature, an extensive stream of empirical work has investigated their contribution to both efficiency and modernisation of the 'allocative mechanisms' of a financial system, including corporate governance of listed firms (for a review see Davis, 2005).

Moreover, institutional investors constitute the largest source of equity capital in the world, with pension funds, life insurers and mutual funds active in retirement savings systems able to provide long-term capital (OECD, 2011). Both firms and countries may have strong incentives to draw from this investment pool to improve individual stock and overall market liquidity. These incentives may have become even stronger since the 2008 financial crisis, which exposed firms to the necessity of reducing reliance on bank credit and to increase their resilience at times of financial distress.

Finally, active institutional investors may engage in monitoring firm management and fostering an improvement in corporate governance practices, as long as ownership engagement is consistent with their business model (Serdar and Isaksson, 2014).

Benefits to financial system brought by institutional investors may be (partially) offset by some risks, as suggested by academic research, empirical evidence and regulatory debate. Previous academic work found a negative relationship between stock market liquidity and some structural characteristics of the mutual fund industry, with special reference to high information' funds (i.e., high fee, high performance funds, low number of funds per family and small funds; Massa, 2004).

Empirical evidence for the US, over 1980 – 2010, showed that institutional investors may ride stock misvaluation instead of trading against it (Zeng, 2016). This supports the view that institutional trend chasing, along with herding, may destabilise stock prices pushing them away from their fundamentals.[1]

The IMF (2011) warns about the potentially destabilizing effects of institutional asset allocation strategies, which may trigger assets bubbles and credit booms,

1 See, among the others, Grinblatt et al. (1995); Wermers (1999); Badrinath and Wahal (2002); Sias (2004); Sias (2007); Sias et al. (2006). Grinblatt et al. (1995) also show that institutions engaging in momentum trading perform better than other institutions and are therefore incentivised to ride stock misvaluation.

especially in emerging markets where growth prospects and declining risks raise attractiveness, should a shock prompt a sudden reversal. The IMF points also to the necessity to monitor permanent shifts in institutional asset allocations strategies driven by the 2008 financial crisis and by regulatory initiatives (e.g., the so-called Solvency II and Basel III). With particular reference to corporate bond markets, again the IMF (2015) claims a negative effect on market liquidity triggered by the development of larger but more homogeneous buy-side institutions along with higher concentration of holdings. Indeed, mutual funds have become more sensitive to redemption pressures and less likely to provide liquidity when markets are under stress; benchmark-driven investment has grown; even pension funds and insurance companies are less likely to act countercyclically. The accommodative monetary policies undertaken in response to the 2008 financial crisis have also triggered some of the aforementioned issues.[2]

Given the size and the role of institutional investors, understanding the drivers of asset managers' allocation decisions, and in particular of equity allocation in listed firms, is fundamental on policy grounds, in order for regulators to provide the proper incentives towards virtuous behaviour and to address the risks posed by these increasingly dominant players in finance.

This paper investigates the determinants of institutional investors' holdings in the 100 largest non-financial companies listed in each of the five European countries considered (i.e., France, Germany, Italy, Spain and the United Kingdom) over 2010-2015. By drawing a key distinction between actively and passively managed funds, we find evidence that both country-specific and firm-level characteristics play a relevant role in attracting active institutional investors. As for country variables, economic activity and the efficiency of the legal system turn out to be significant. As for firm variables, depending on the specification adopted, institutional presence is also positively associated with proxies of good quality of corporate governance, namely smaller board size and higher presence of independent directors.

The paper adds to the existing literature by providing up-to-date empirical evidence on the drivers of institutional ownership in the European markets. This in turn may be relevant on policy grounds, as the understanding of the factors triggering institutional holdings has become increasingly important after the latest financial crisis, marking reduced corporate access to bank credit and prompting European projects such as the Capital Markets Union.

The paper is organised as follows. Section 2 contains a brief review of the relevant literature. Section 3 deals with data set and variables description; Sections 4 and 5 respectively deliver model specifications and estimation results, while Section 6 concludes.

2 The most recent institutional debate has also highlighted the increasing proportion of passive investors relative to active investors, which in turn may trigger an instability issue linked to herding behaviour (see, for instance, IMF, Procyclical behavior of institutional investors during the recent financial crisis: Causes, impacts, and challenges (Working Paper, 2013).

2 Literature review

The determinants of institutional investors' ownership in listed firms have been extensively explored in many studies focusing on different research questions. Broadly speaking, empirical analyses can be categorised into two groups. One investigates institutional investment flows across macro–areas at a global level, with a special focus on the drivers of home bias (i.e., the documented investors' attitude to hold too high a proportion of domestic assets relative to what is predicted by standard portfolio theory). The other is linked to the stream of the literature dealing with the role of institutional investors in monitoring firms' management and corporate governance mechanisms.

The first strand of investigation focuses on various factors that may act as a barrier to cross-border investments, such as national economic and financial development, capital control, investor protection or more general transaction and information costs. Based on behavioral finance theory, moreover, recent research has highlighted additional factors that may impair investment flows across world areas, i.e., perceived familiarity, overconfidence and a range of characteristics accounting for cultural and geographical distance.[3] Indeed, several studies support the hypothesis that professional asset managers' preferences may be tilted towards familiar countries and stock markets (for a global perspective, see Chan et al., 2005) as well as towards locally headquartered firms (for the US case, see Coval and Moskowitz, 1999).

Kang and Stulz (1997) analyse foreign stock ownership in Japanese firms over the period 1975-1991 in order to detect and explain home bias. They find that foreign investors prefer large firms, small companies open to foreign trades and firms active in manufacturing industries. Additional drivers are good financial and market indicators (i.e., accounting performance, low leverage and high market-to-book ratios) and low unsystematic risk. Similarly, Gompers and Metrick (2001) in their focus on the US case over the 1980-1996 time-period argue that institutional investors demand for large, liquid stocks that have low past returns, while finding mixed evidence on the role of regulatory constraints to institutional investing.[4] Dahlquist and Robertsson (2001) build on Kang and Stulz (1997) in order to investigate foreign (institutional) ownership in Swedish listed firms over 1991-1997. They find that the main determinant is firm size, which proxies for several firm's attributes, such as recognition, presence in international markets, and dispersed ownership, and

3 See Huberman (2001), Kilka and Weber (2000) and Solnik (2008).

4 By following Del Guercio (1996), the authors also test the role of the so-called prudent-man rule as proxied by several variables identified as relevant in the prudence case law, such as firm age, dividend yield, S&P membership and stock-price volatility. The authors also delve deeper on the impact of institutional ownership on share prices by showing that over the time interval considered the increasing demand for large firms' stocks has driven an appreciation of their prices that, in turn, has led to a decline in the historical small-company stock premium.

overall explains not only foreign but also domestic (institutional) investors' preference for large companies.[5]

Aggarwal et al. (2005) give an additional contribution through a cross-country comparison. By analysing the portfolio holdings of actively-managed US mutual funds in 30 emerging market equities in 2000, the authors show that foreign capital is attracted by high country-wide investor protection along with firms' discretionary accounting and disclosure policies. In a similar vein, Ferreira and Matos (2008) explore the impact of country legal environment and quality of disclosure standards on institutional equity holdings in 27 countries over 2000-2005. They find that institutional preferences vary across groups of investors, depending on their nationality and on their business ties to corporations. Foreign and independent institutional investors are more prone to invest in liquid stocks and in countries with a strong legal environment, while this result does not hold for investors having business relations with local corporations (e.g., bank trusts and insurance companies), being potentially more loyal to management and less sensitive to good corporate governance practices because of their ties with the investee companies.

Surveys and several studies have also specifically explored institutional investors' consideration of corporate governance in their investment decisions. A study by McKinsey and Company (2002), covering 31 different countries, highlights that institutional investors consider corporate governance important in their investment decisions, being willing to avoid companies and/or decrease holdings in companies with poor governance. The survey also highlighted the areas that are key to institutional investors, i.e., timely and broad disclosure, effective board practices and management compensation. Additional evidence is brought forward by the survey published in McCahery, Sautner and Starks (2016). The authors gather data on institutional investors preferences and document widespread 'behind the scenes' interventions, such as off-the-record, private discussions with management and boards, aimed at improving corporate governance practices. Moreover, long-term investors and those less affected by stock liquidity concerns are found to intervene more intensively than short-term ones.

Giannetti and Simonov (2006) examine whether investors consider the quality of corporate governance in making their stock selections for a sample of listed Swedish firms in 2001.[6] They show that all investors not connected with company insiders (whether domestic or foreign, institutional or small individual investors) are less likely to invest in companies with poor corporate governance. Kim, Eppler-Kim, Kim and Byun (2010) reveal that foreign and local investors in Korea show different stock valuations regarding corporate governance, as the former may discount corporate governance more severely than the latter because of higher monitoring costs.

5 As documented also in Falkenstein (1996) and Gompers and Metric (1999), the authors claim for an institutional investor bias (i.e., the institutional tendency to overweigh large, liquid and hence visible stocks) rather than for the well documented home bias.

6 The quality of corporate governance is proxied by variables accounting for the extraction of private benefits of control, i.e. the ratio of control to cash flow rights of the principal shareholder; the control premium (i.e., the difference between the price per share paid for a control block and the price quoted in the market after the sale announcement), and a dummy variable proxying for the level of control entrenchment.

Khurshed, Lin, and Wang (2011) investigate the effect of two internal corporate governance mechanisms on institutional major holdings, namely directors' ownership and board composition, for a sample of UK companies. Institutional major holdings appear to be negatively related with directors' ownership and positively related with certain features of board composition. They also find that the investment preferences of UK institutional block-holders vary with the level of their shareholding.

Chung and Zhang (2011) analyse institutional investors' ownership in firms listed on the New York Stock Exchange, American Stock Exchange, and NASDAQ between January 2001 and December 2006. They find that strengthened shareholder rights and standards in composition and operation of the board of directors constitute the main attractive features among corporate governance variables, and that the positive relationship between institutional ownership and corporate governance is partially driven by institutional preference toward companies with better governance practices.

Hawas and Tse (2016) examine the effect of corporate governance on major shareholdings in non-financial listed companies in the United Kingdom from 2005 to 2009 and whether this relationship has changed after the 2008 financial crisis.

Their results show a significant positive link between corporate governance and institutional major shareholdings, with insurance companies and pension funds attracted by companies with better accountability and audit, and other institutional major shareholders (including mutual funds) by companies with good board composition and independence. Moreover, the relationship between corporate governance quality and major shareholdings becomes significant during the financial crisis.

Building on the existing literature, this study investigates the determinants of equity holdings of institutional investors across European countries by taking into account both country-level and firm-level variables, considering in the latter financial indicators and corporate governance variables.

3 Data set and key variables

Our sample includes the actively-managed shareholdings of institutional investors in the 100 largest non-financial companies listed in each of the five countries considered (i.e., France, Germany, Italy, Spain and the UK), therefore comprising 500 firms over the period 2010-2015. Firm size was evaluated in terms of market capitalization as of end of 2010. Only companies actively traded on an official exchange over the whole sample period are selected; merged entities are retained as long as they have not experienced a discontinuation in their listing over the considered time interval.[7] Overall, our sample includes 3,000 individual observations (i.e., 100 firms in five countries over six years).

7 See also Chen et al. (2009), including only stocks listed over the whole research period.

3.1 The dependent variable

To the purpose of the present study, non-bank institutional investors include the major categories of asset managers (i.e., mutual, sovereign and hedge funds) holding equity stakes in the sampled companies but financial institutions. Financial institutions such as banks and insurance companies were selected out, since their asset allocation choices are driven by factors which might be different from those underlying the investment strategy of non-financial investor (e.g., a bank's equity stake in a troubled company might be motivated by its engagement in a debt restructuring operation).

Keeping in mind that institutional investors' preferences may vary with their business model, in the following the analysis will be carried out first for the asset managers regarded as a whole, and second separately for each category, in order to take into account differences in behaviour across mutual, hedge and sovereign funds.[8]

Moreover, the analysis will focus on ownership by active institutional investors only. Indeed, passive managers basically follow some indices with the aim to replicate a specified benchmark return and may therefore assign less relevance to company level characteristics (both financial and corporate governance ones) than active managers do.[9]

Active institutional equity holdings were drawn from Thomson Reuters, reporting historical ownership data for specific investor classes as well as investor management style (i.e., active or passive). For each sampled firm, the dependent variable 'institutional ownership' is defined as the fraction of company's stocks held by institutional investors at the end of the year, i.e., the sum of the holdings of all reporting institutions divided by the total outstanding shares of the firm.[10]

Data on the nationality of institutional investors were not readily available. Recovering nationality would have entailed the adoption of a potentially arbitrary and biased classification. Indeed, it is difficult to sort out the nationality of the asset managers when asset managers are headquartered in a country (e.g., Ireland and Luxemburg) that is different from the country of their ultimate owner, without making a strong assumption about the subject that really makes the investment decisions. Therefore, we decided to left this topic to future research.

8 It is well known that different investors have different goals, philosophies and risk aversion (Bushee, 1998; Bushee et al. 2010; Thomsen and Pedersen, 2000; Cronqvist and Fahlenbrach, 2009; Chung and Zhang, 2011).

9 The recent academic and practitioners' debate has highlighted the increasing role of passive investors relative to active investors, which in turn may trigger instability issue linked to herding behaviour (see, for instance, Wurgler, J., On the Economic Consequences of Index-Linked Investing, in Challenges to Business in the Twenty-First Century: The Way Forward, W.T. Allen, R. Khurana, J. Lorsch, G. Rosenfeld, Eds., American Academy of Arts and Sciences, 2010). Notwithstanding the policy relevance of the issue, considering passive investors as well was beyond the purpose of our paper.

10 We therefore implicitly assume that institutional stakes in listed companies at the end of the year incorporate all the information about the factors influencing institutional ownership, although such stakes may have changed during the year following investors' buy, sell or hold decisions. The yearly frequency of observations was also led by data limitations, given that many firms' financial statements data were generally not always available on either a semi-annual or quarterly basis.

Table 1 reports the descriptive statistics for institutional investors' shareholdings in the largest 100 non-financial listed companies in five European economies over 2010-2015.

Table 1 – Summary statistics of institutional equity holdings in major European non-financial companies
(2010-2015)

Variable	Mean (%)	Std. Dev.	Min	Max	Obs
all active institutional investors	25.8	20.9	0.0	98.9	2,944
all active mutual funds	20.5	18.1	0.0	96.1	2,998
all active sovereign funds[1]	2.1	3.0	0.0	35.3	2,777
all active hedge funds[1]	0.6	2.8	0.0	38.3	2,393

Source: elaborations on Bloomberg and Thomson Reuters data. [1] Data might be underestimated due to incomplete disclosure.

On average, across the sample institutional stakes represent about 26% of common equity. Active mutual funds are the largest category among all active institutional investors (with an average shareholding of nearly 20.5 of equity versus 25.8 per cent of all institutional investors), while sovereign and hedge funds appear to be residual investors (indeed, their average shareholdings shrink to 2% and 0.6%, respectively, although the data might be underestimated because of incomplete disclosure).

Institutional ownership of non-financial companies shows a certain degree of variation across countries and, to a lesser extent, over time (Table 2 and Figure 1).

Table 2 – Country breakdown of institutional equity holdings in major European non-financial companies
(data refer to all institutional investors; 2010-2015)

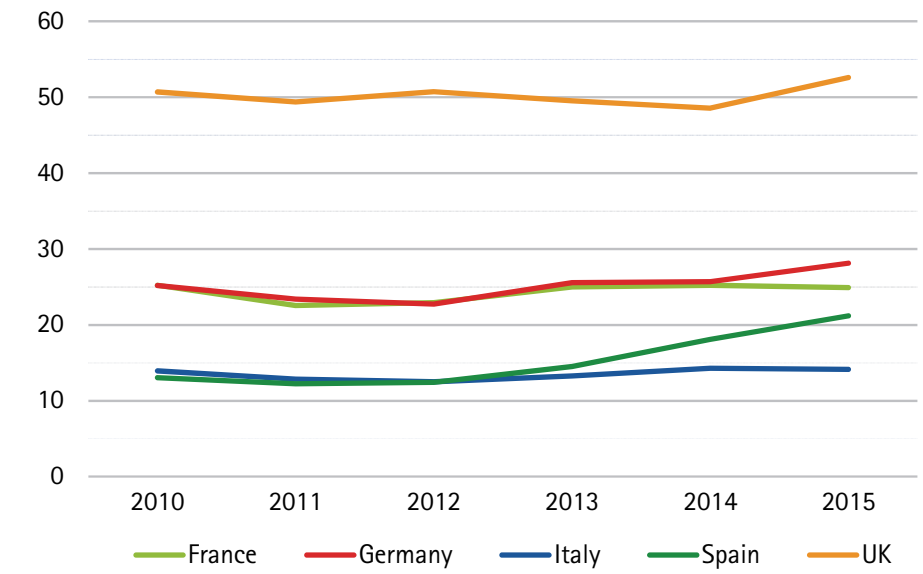
Country	Mean (%)	Std. Dev.	Min	Max
Italy	13.5	11.3	0.0	69.9
France	24.3	15.7	0.0	72.2
Germany	25.1	15.1	0.0	76.3
Spain	15.3	16.9	0.0	94.9
UK	50.2	20.6	0.0	98.9

Source: elaborations on Bloomberg and Thomson Reuters data.

In detail, over the sample period end-of-year institutional ownership values range from respectively 13.5% and 15% in Italy and Spain, to nearly 50% in the UK. This evidence mirrors the well-known differences across European financial systems in terms of presence of institutional investors and stock market development.

Over time, institutional ownership remained fairly stable in Italy and France, while rising in Spain, the UK and to a lesser extent in Germany.

Figure 1 – All institutional investors' shareholdings
(percentage)



Source: elaborations on Thomson Reuters data.

3.2 Explanatory variables

Following previous literature, our explanatory variables include both country-level and company-level regressors. The latter, in turn, encompass market, financial, and corporate governance variables.

Country-level variables comprise GDP growth as an indicator of economic development, and debt to GDP ratio as a proxy of country risk (see, among the others, Chan et al. 2005; Aggarwal et al., 2005). Over 2010-2015, the average annual growth across the main European countries was 0.9% (Table 3), with Italy and Spain recording the lowest values (-0.3% and -0.1%, respectively) and Germany and the UK recording the highest figure (+2%; Table a.1). Public debt averaged 93.3% of GDP (Table 3), ranging from a minimum of 60.1 for Spain to a maximum of 133 per cent in Italy (Table a.1).

Additional country level variables include some proxies of the efficiency of the legal and judiciary system, namely the insolvency recovery rate and the number of days required to enforce a contract. These variables allow to test the hypothesis, confirmed by several empirical studies, that the efficiency of the legal system in settling legal disputes plays a role in shaping the attractiveness of a financial market. In our sample, the average insolvency recovery rate stands at 72.5%, while it takes 583 days (or 19.4 months) to enforce a contract in court (Table 3). These indicators show a striking variability across jurisdictions. Indeed, the insolvency recovery rate ranges from about 57% in France (followed by Italy at 62%) to about 89% in the UK. As for the judiciary enforcement of a contract, Italy ranks the worst with 1,183 days, while France records the best indicator with about 393 days (Table a.1).

At the market level, stock market development was proxyied by total exchange capitalisation to GDP, with a sample average of 59.4 per cent, and values ranging over the sample period from a minimum of 20.2 (in Italy) to a maximum of 112.6 per cent (in the United Kingdom; Table 3).

Market variables at the company level include firm market capitalization, as size is frequently found to be a significant driver of institutional ownership in a number of studies (see the previous Section). Over the time period under analysis, the sample average stands at around 9.4 billion of euros (Table 3), although varying a lot across countries (Table a.1 for further details). The average market capitalization of the 100 largest Italian companies is 2.8 billion euros (Table 3), lower than the Spanish figure (3.5 billion), and about 6.5 times smaller than that of the average British company (18.3 billion; Table a1). German and French firms record respectively an average market value of about 10 and almost 12 billion euros.

In order to capture institutional preference for liquid assets, documented among the others by the Gompers and Metrics (1999) and Dahlquist and Robertsson (2001), free float is also taken into account.[11] This variable averages to slightly more than 60% over the sample period, recording its lowest in Italy (less than 43%) and its highest in the UK (about 86%; Table 3 and Table a.1). Free float is correlated with the share of the first shareholder, which was included among the regressors to proxy the degree of corporate control contestability. In principle, the degree of contestability should be positively associated with institutional investors' propensity to invest in a company, as higher contestability should imply higher market discipline and lower chances of managerial opportunistic behavior. On average, the stake of the first shareholder is nearly 29%, with the UK recording the lowest value (9.7%) and Italy achieving the highest figure (almost 46%).

Additional variables are the price-to-book value, as some researchers highlighted that market participants' overvaluation of a company has an explanatory power for institutional preferences (see, among the others, Aggarwal et al., 2005; Dahlquist and Robertsson, 2001), and the equity dividend yield.[12] In our sample, price-to-book averages 3.4, while over the sample period considered the mean dividend yield is about 3.3% (Table 3).

Among firm-level variables accounting for profitability, we tested for return on equity (ROE) and sales growth. Over the sample period, return on equity is on average relatively high (9.2%), sustained by consistent annalized sales growth (at nearly 6%; Table 3).

11 Market liquidity may be particularly important to institutional investors aiming at disciplining the firm management: the higher market liquidity the higher the chance for investors to signal their opinions by selling their shares (Dahlquist and Robertsson, 2001; Tesar and Werner, 1995).

12 See Froot, Scharfstein and Stein (1992), Bohn and Tesar (1996), Jegadeesh and Titman (2001) and Zeng (2016) showing that institutional investors tend to overweigh (underweigh) the overvalued (undervalued) stocks in their portfolios. On the contrary, Rakowski and Wang (2009) find that the behavior of institutional asset managers is consistent with contrarian strategies. In some cases, finally, behavior seems to vary across domestic and foreign investors, with the former tending to be contrarian traders and the latter being positive feedback traders (see Grinblatt and Keloharju, 2001, for Finland).

Table 3 – Summary statistics

Variable	N	Mean	Std. Dev.	Min	Max
macroeconomic indicators					
GDP annual growth (%)	3,000	0.9	1.7	-2.8	4.1
GDP quarterly growth (%)	3,000	0.2	0.5	-1.0	0.8
debt-to-GDP ratio (%)	3,000	93.3	19.2	60.1	133.0
market capitalization to GDP (%)	3,000	59.4	26.1	20.2	112.6
insolvency recovery rate (%)	3,000	72.5	13.6	45.0	88.6
days required to enforce a contract	3,000	583	303	390	1,210
market indicators					
company market capitalization (€ bn)	2,888	9.4	20.8	0.1	237.4
equity free float (%)	2,940	60.4	27.6	0.3	100
share first shareholder (%)	1,425	28.9	22.8	0.8	99.5
price-to-book ratio (%)	2,863	3.4	13.7	0.1	646.7
dividend yield (%)	2,427	3.3	2.5	0.1	32.9
financial indicators					
sales growth (%)	2,850	6.0	46.8	-93.6	1,787.0
ROE (%)	2,750	9.2	30.5	-527.0	277.2
leverage	2,810	4.2	13.9	0.7	601.1
free cash flow (€ bn)	2,876	0.4	1.3	-8.2	18.7
probability of default (%)	2,904	0.4	0.9	0.0	18.5
Altman score	2,905	3.0	6.1	-192.2	71.6
corporate governance indicators					
governance quality score	1,121	61.3	26.1	0.0	96.9
board size	2,086	11.8	3.6	3	23
board attendance rate (%)	1,509	93.3	7.4	3.0	100
CEO duality dummy	2,123	0.2	0.4	0	1
presence of nomination committee dummy	2,988	0.5	0.5	0	1
presence of compensation committee dummy	2,987	0.2	0.4	0	1
independent directors (%)	1,652	55.9	19.0	0	100
independent directors in nomination committee (%)	1,394	75.5	23.0	0	100
independent directors in compensation committee (%)	1,469	81.4	22.5	0	100

Source: elaborations on Bloomberg and Thomson Reuters data.

As for indicators of financial resilience, leverage (i.e., corporate debt relative to equity) is on average equal to 4.2. Spanish companies show a much higher value at 6.3, Italian firms (at 4.3) are close to the sample average, while German, French and UK companies display lower values by recording, respectively, 3.1, 3.6 and 3.9 (Table a.1).

In order to test whether firms' governance affect institutional equity holdings, we included several corporate governance indicators, such as CEO duality (accounting for the CEO acting also as a chairman), board size, board members' attendance rate at the meetings, the percentage of independent directors in the

board, the presence of the compensation and nomination committees, the percentage of independent directors sitting in board committees, and discarded many others (Table 3). Moreover, we also tried a governance synthetic score provided by Bloomberg, which however usually failed to result statistically significant, possibly due to a missing data problem.

In our sample the average board size is 11.8 members, ranging from 10.4 members in the UK to 12.7 in France (Table 3 and Table a.1). The attendance rate is 93%, while independent directors account for almost 56% of the board members. This proportion rises in the nomination committee and in the compensation committee, respectively up to 75.5% and 81.4%.

4 Model specification

In order to analyse the determinants of institutional shareholding, we run two alternative models, i.e. a standard panel fixed effect model and a fractional regression model.

For each model, we present several specifications, including either a subset of regressors, or a mix of country-level and company-level indicators. We also report estimates with and without time dummies, in order to control for aggregate fluctuations of institutional ownership over time, due to market turmoil, changes in European regulation, technological progress, etc.. Finally, we reiterate each specification for each type of institutional investors (i.e., mutual, hedge and sovereign funds), in order to capture differences across categories of investors due to differences in their business model.

The standard fixed effect model estimates the following regression:

$$Y_{it} = \alpha + \beta X_{it} + \gamma Z_i + \varepsilon_{it} \quad (1)$$

where i = 1, 2, .. 500 (companies), t ranges from year 2010 to 2015, X_{it} is the vector of explanatory variables, Z_i represents the vector of fixed effects and ε_{it} is the error term. As mentioned above, the dependent variable Y_{it} is the end-of-the-year shareholding of a given investor class, while the vector of independent variables include the regressors analysed in the previous Section.

Following Mundlak's (1978), we routinely performed a robust Hausman test, rejecting the null hypothesis that the fixed effect model can be replaced by a random effect specification at the 95% confidence level. Therefore, the fixed effect model was deemed able to handle unobserved factors, such as the fund managers' ability, which may differ across individuals while remaining constant over the time-period considered. Finally, we used an estimator robust to heteroscedasticity.

As for the fractional regression model, institutional shareholdings might represent a censored variable, which may not assume values lower than zero, although at least one class of investors (i.e., hedge funds) ordinarily resort to short-selling. A non-linear model could therefore be best suited, since ignoring censoring might lead

to biased estimates. Therefore, as a robustness test, we run a heteroskedastic probit fractional regression model, allowing for a non–linear relationship between institutional equity holdings and the selected explanatory variables:

$$E(y|x) = \Phi\,(x\beta/\exp(z\gamma) \qquad (2)$$

5 Estimation results

5.1 Estimation results from the panel fixed effect model

Table 4 reports the estimates obtained from different specifications of the panel data regression with fixed effect. The results are in line with the great bulk of the empirical evidence.

In details, both country-level and firm-level variables are statistically significant and exhibit the expected sign. Specification (4) highlights that institutional investors' equity stakes are higher when firms are listed in countries experiencing positive GDP growth. This result, however, does not hold when time-effects are accounted for, probably because the time dummies capture variations in institutional investments led by cross-country differences in economic trends.

As expected, countries recording a rising public-debt-to-GDP ratio are less attractive, as the deterioration of their public finances may have a detrimental impact on domestic firms. Another strong result is that institutional investors' equity holdings decline with the inefficiency of the domestic legal system (as proxied by the number of days required to enforce a contract) and tends to rise as the environment becomes more business-friendly.

As for firm-level variables, specification (4) shows that both liquidity, profitability and financial resilience are statistically significant, regardless of the incorporation of time-effects. In particular, institutional investments are higher in companies recording a higher free float, a positive change in their ROE with respect to the previous period, and a lower indebtedness as measured by the leverage (note that in specification (2), including only firm-level market and financial variables, this effect is captured by the significance of the variable measuring the probability of default).[13] Finally, when controlling for time-effects no impact is detected for corporate governance variables, except for board size in specification (3). When neglecting time dummies, specification (4) records the significance at the 90% level of the percentage of independent directors sitting in the board. Note that in specification (1), considering the whole set of selected regressors, the presence of both the nomination committee and the remuneration committee is statistically significant, although the negative sign estimated for the coefficient of the nomination committee is somewhat counterintuitive.

13 Specification (2) also points to the negative impact of the share of the first shareholder, probably accounting for the investors' preferences for companies characterised by a higher degree of contestability.

Table 4 – Panel fixed effect model regression for the determinants of all institutional investors' equity holdings

variable	(1)		(2) financials only		(3) governance only	(4) mix (1)- (2)-(3)	
macroeconomic indicators							
GDP quarterly growth	-1.248 (-0.80)	1.170 (1.01)				-0.378 (-0.43)	1.39* (2.48)
debt-to-GDP ratio	0.44*** (3.50)	-0.039 (-0.45)					
delta debt-to-GDP ratio						-0.195** (-2.77)	-0.205*** (-3.55)
total exchange capitalization (ln)	-4.151 (-0.48)	-3.678 (-0.66)					
insolvency recovery rate	-0.109 (-1.51)	-0.003 (-0.05)					
days required to enforce a contract	0.0438 (1.17)	0.0117 (0.39)					
lag(1) days required to enforce a contract						-0.082*** (-4.04)	-0.063** (-3.24)
financials							
market capitalization (ln)	1.669 (0.84)	0.939 (0.42)	-0.327 (-0.29)	1.710* (1.74)			
equity free float %	0.0780 (1.00)	0.109 (1.56)	0.156*** (3.58)	0.174*** (4.29)		0.162*** (3.63)	0.17*** (3.59)
first shareholder %	-0.312* (-2.40)	-0.291* (-2.31)	-0.234*** (-3.47)	-0.262*** (-3.78)			
price-to-book	0.183 (0.81)	0.274 (1.18)	0.009 (1.45)	-0.001 (-0.02)		0.005 (1.24)	0.007 (1.87)
dividend yield	0.544 (1.57)	0.349 (1.08)	0.046 (0.44)	0.037 (0.34)			
sales growth	-0.019 (-0.69)	-0.010 (-0.32)	0.010 (0.51)	0.003 (-0.18)		0.041 (1.82)	0.028 (1.38)
roe	-0.015 (-0.54)	-0.019 (-0.66)					
delta roe			0.015 (1.19)	0.002 (0.20)		0.016** (3.11)	0.017** (3.14)
leverage	-0.545 (-1.34)	-0.539 (-1.12)				-0.018** (-2.84)	-0.014* (-2.38)
delta leverage			0.022 (0.09)	0.334 (1.42)			
free cash flow (ln)	-0.800 (-1.08)	-0.661 (-0.85)					
delta cash flow			-0.000 (-0.61)	-0.000 (-0.81)			
probability of default	-8.3*** (-3.99)	-7.31** (-2.94)	-3.193** (-2.45)	-2.527* (-1.77)			
delta prob. of default						79.04 (1.41)	67.9 (1.16)
Altman score	0.167 (0.56)	0.229 (0.72)					

- *cont.* -

- *cont. Table 4 – Panel fixed effect model regression for the determinants of all institutional investors' equity holdings* -

variable	(1)		(2) financials only		(3) governance only		(4) mix (1)-(2)-(3)	
governance								
CEO duality dummy	3.838 (1.95)	3.126 (1.43)			2.082 (1.56)	1.272 (0.93)		
Governance quality score	-0.050 (-0.87)	-0.044 (-0.75)			0.0118 (0.29)	0.008 (0.20)		
board size	-0.338 (-0.90)	-0.325 (-0.80)			-0.55* (-1.99)	-0.577 (-1.95)	-0.252 (-1.13)	-0.226 (-1.00)
board attendance	0.0065 (0.05)	0.020 (0.17)						
independent directors %	-0.001 (-0.02)	0.0027 (0.05)			0.087 (1.58)	0.091 (1.71)	0.047 (1.29)	0.064* (1.72)
independent directors % in nomination committee	-0.001 (-0.03)	0.0008 (0.02)						
independent directors % in compensation committee	-0.007 (-0.13)	-0.024 (-0.46)						
nomination committee dummy	-3.738 (-1.86)	-5.53** (-2.64)			0.0571 (0.05)	-1.757 (-1.44)		
compensation committee dummy	21.05*** (4.39)	13.5* (2.91)			6.747 (1.84)	4.180 (1.15)		
constant	-15.23 (-0.40)	35.98 (1.14)	26.26* (2.48)	9.05 (0.91)	29.3*** (5.08)	31.0*** (5.16)	64.2*** (5.43)	53.59*** (4.56)
time dummies	Yes	No	Yes	No	Yes	No	Yes	No
N obs	406	406	993	993	820	820	1254	1254
R^2	0.336	0.276	0.211	0.144	0.100	0.040	0.135	0.109

Legend: *,**,*** indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses.

Specification (3), finally, estimates a negative impact of the board size, signalling that cumbersome boards might not be particularly appreciated by institutional investors.

The results discussed so far partially holds for mutual funds too, as shown in Table a.2, although the model seems to fit better the behaviour of the institutional investors as a whole. Indeed, its explanatory power declines especially when it is estimated for the residual classes of sovereign and hedge funds alone (Table a.3 and Table a.4; we will return to this issue later on, when discussing the results from the fractional regression).

5.2 Estimation results from the fractional regression model

Institutional shareholdings might represent a censored variable, which may not assume values lower than zero, although at least one class of investors (i.e., hedge funds) ordinarily resort to short-selling.

A non-linear model could therefore be best suited. Ignoring this might lead to biased estimates. Therefore, as a robustness test, we run a (probit) fractional regression model, allowing for a non–linear relationship between institutional equity holdings and the selected explanatory variables.

The estimation results are reported in Table 5 and Table a.5-Table a.7, where the dependent variable has been normalised to fall in the interval [0,1].

Table 5 – Probit fractional regression for the determinants of the shareholdings of all institutional investors

variable	(1)		(2) only financials		(3) only governance	(4) mix (1), (2) and (3)	
macroeconomic indicators							
GDP quarterly growth	0.191*	0.0572				0.269***	0.167***
	(2.22)	(1.02)				(6.02)	(5.58)
debt-to-GDP ratio	-0.001	0.002					
	(-0.11)	(0.51)					
total exchange capitalization (ln)	0.471	0.368					
	(1.91)	(1.93)					
insolvency recovery rate	0.004	0.001					
	(1.29)	(0.40)					
days required to enforce a contract	-0.00001	-0.0003					
	(-0.01)	(-1.13)					
lag(1) days required to enforce a contract						-0.0001	-0.0001**
						(-1.44)	(-3.19)
financials							
market capitalization (ln)	-0.091***	-0.088***	-0.020	-0.016			
	(-3.36)	(-3.36)	(-1.05)	(-0.84)			
equity free float %	0.0061***	0.007***	0.014***	0.013***		0.0162***	0.0164***
	(3.37)	(3.66)	(10.36)	(10.50)		(25.98)	(25.98)
first shareholder %	-0.010***	-0.01***	-0.002	-0.002			
	(-4.39)	(-4.24)	(-1.46)	(-1.50)			
price-to-book	0.009	0.009	0.032***	0.035***		0.0006**	0.0007**
	(1.66)	(1.62)	(4.35)	(4.78)		(3.16)	(3.17)
dividend yield	0.0059	0.006					
	(0.54)	(0.58)					
Lag(1) dividend yield			-0.013*	-0.014**			
			(-2.45)	(-2.67)			
sales growth	-0.0023	-0.0019	-0.0002	-0.0001		0.0001	-0.0001
	(-1.38)	(-1.22)	(-0.23)	(-0.05)		(0.04)	(-0.06)
roe	0.0019*	0.0019*	0.0001	-0.0003		0.0017***	0.0017***
	(2.01)	(2.00)	(0.18)	(-0.36)		(5.27)	(5.34)
leverage	-0.032**	-0.031**					
	(-2.76)	(-2.82)					
Lag(1) leverage			0.0008	0.0013		0.0011	0.00103
			(0.08)	(0.14)		(0.55)	(0.51)
free cash flow (ln)	-0.0351	-0.0358	-0.054***	-0.055***			
	(-1.73)	(-1.79)	(-3.75)	(-3.84)			
probability of default	0.048	0.019	-0.107**	-0.104**			
	(0.57)	(0.24)	(-2.68)	(-2.66)			

- *cont.* -

- *cont. Table 5 – Probit fractional regression for the determinants of the shareholdings of all institutional investors* -

variable	(1)		(2) only financials		(3) only governance		(4) mix (1), (2) and (3)	
governance								
Altman score	-0.020*	-0.0198*	-0.008	-0.009				
	(-2.11)	(-2.08)	(-1.36)	(-1.44)				
CEO duality dummy	-0.061	-0.086			-0.171***	-0.172***		
	(-1.14)	(-1.61)			(-4.23)	(-4.23)		
Governance quality score	0.0017	0.0018			0.0087***	0.0087***		
	(1.32)	(1.43)			(10.75)	(10.72)		
Board size	-0.036***	-0.035***			-0.031***	-0.0305***	-0.043**	-0.044***
	(-4.12)	(-3.92)			(-4.84)	(-4.79)	(-10.11)	(-10.31)
board attendance	-0.0025	-0.0026						
	(-0.57)	(-0.64)						
independent directors %	-0.0026	-0.0025			0.0037***	0.0037***	-0.0026***	-0.0025**
	(-1.69)	(-1.61)			(3.72)	(3.71)	(-3.42)	(-3.27)
independent directors % in nomination committee	-0.0004	-0.0006						
	(-0.35)	(-0.49)						
independent directors % in compensation committee	0.0007	0.0010						
	(0.47)	(0.69)						
nomination committee dummy	0.142	0.115			0.185***	0.174***		
	(1.04)	(0.83)			(3.48)	(3.47)		
compensation committee dummy	0.188	0.075			0.060	0.0575		
	(1.49)	(0.73)			(1.63)	(1.56)		
constant	0.361	0.623	-0.977***	-0.985***	-1.064***	-1.102***	-1.021***	-0.967***
	(0.55)	(1.08)	(-5.25)	(-5.40)	(-8.21)	(-9.03)	(-12.09)	(-11.67)
N.Obs	406	406	812	812	820	820	1260	1260
Time Dummies	Yes	No	Yes	No	Yes	No	Yes	No

Legend: *, **, *** indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses.

Overall, as shown in Table 5, the estimation results for the whole class of institutional investors are not much different from those obtained with the basic fixed effect model.

However, many corporate governance variables (e.g. CEO duality, governance quality score, board size, percentage of independent directors) turn out to be statistically significant in some specifications, with board size almost always recording a statistically significant negative impact on institutional investors' holdings (Table 5 and Table a.5-Table a.7).

Moreover, the fractional regression seems to fit better the sub-sample data for sovereign and hedge funds (Table a.6 and Table a.7), contrasting the rather poor performance of the fixed effect model. Indeed, equity holdings for these categories of investors are equal to zero more frequently than those of mutual funds, thus making potentially more severe the estimation biases of a specification ignoring censoring.

Interestingly enough, in some cases, the coefficient signs estimated through the fractional regression might appear to defy conventional wisdom (e.g., Table a.7, specification (1), showing a negative impact of GDP growth on hedge funds' shareholdings). However, this evidence might be consistent with the contrarian investment policy followed by many hedge funds, whose *raison d'etre* and appeal often consists in betting (and hence, behaving) against the market sentiment.

6 Concluding remarks

This study investigates the variables influencing institutional ownership in the 500 largest non-financial companies listed in five major European countries over the period 2010-2015. Alternative models are estimated, i.e., a panel fixed effect and a fractional regression model, for actively managed funds referable to three categories of institutional investors, i.e., mutual funds, sovereign funds and hedge funds.

Consistently with previous empirical literature, both country-level and company-level factors result to be relevant. As expected, at the macro level institutional investors show their preference for companies operating in countries experiencing positive growth, characterised by healthy public finances and efficient legal systems that facilitate the conduct of business.

As for financial variables, we find evidence that the preference for liquid stocks is a relevant driver in the portfolio selection process. Also leverage results to be significant, by exhibiting a negative correlation with institutional investors' shareholdings.

Finally, as for corporate governance indicators, some specifications suggest that cumbersome boards are not appreciated by institutional investors, contrary to the presence of independent directors. To this respect, however, further investigation might be needed in order to test whether corporate governance is endogenous to institutional holdings, i.e., whether it is the (active) presence of asset managers in a listed company's equity capital to raise the quality of its governance rather the other way round.

This paper adds to the existing literature by providing up-to-date empirical evidence on the drivers of institutional equity holdings from the European framework. This in turn may be relevant on policy grounds, as the investigation of the factors underpinning institutional ownership has become increasingly important after the latest financial crisis. Indeed the difficulties experienced by non-financial companies' in accessing bank credit have brought to the attention of policy makers the need to complement bank credit with alternative funding sources within a truly unified European capital market. To this respect, understanding what can improve the role of the institutional investors as a source of equity capital and as contributors to the European-level project of the Capital Markets Union deserves special attention.

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Appendix

Table a.1 – Country breakdown of selected sample statistics

Variable	Country	Mean	Std. Dev.	Min	Max
GDP annual growth (%)	Italy	-0.3	1.5	-2.8	1.7
	France	1.1	0.8	0.2	2.1
	Germany	2.0	1.5	0.3	4.1
	Spain	-0.1	2.0	-2.6	3.2
	UK	2.0	0.6	1.2	2.9
GDP quarterly growth (%)	Italy	-0.2	0.5	-1.0	.5
	France	0.3	0.2	0	0.6
	Germany	0.3	0.5	-0.5	0.8
	Spain	0.0	0.6	-1.0	0.8
	UK	0.4	0.4	-0.2	0.8
debt-to-GDP ratio (%)	Italy	127.3	5.8	119.1	133
	France	90.7	5.0	82.4	96.2
	Germany	78.4	4.2	71.2	83.4
	Spain	83.9	14.9	60.1	99.2
	UK	86.4	4.9	76.1	91.1
days required to enforce a contract	Italy	1,183	30.1	1,120	1,210
	France	393	2.5	390	395
	Germany	406	16.5	394	429
	Spain	512	2.3	510	515
	UK	424	17.9	399	437
insolvency recovery rate	Italy	61.8	1.9	58	63.4
	France	56.9	14.5	45	77.5
	Germany	82.2	1.8	78.4	83.7
	Spain	72.9	2.3	70.5	76.5
	UK	88.6	0.0	88.6	88.6
market capitalization (€ bn)	Italy	2.8	7.6	0.03	66.4
	France	11.8	18.9	0.27	145.9
	Germany	9.9	17.8	0.05	95.8
	Spain	3.5	10.0	0.00	81.5
	UK	18.3	33.9	0.02	237.4

- *cont.* -

- *Cont. Table a.1 – Country breakdown of selected sample statistics* -

Variable	Country	Mean	Std. Dev.	Min	Max
free float (%)	Italy	42.5	16.9	8.7	100
	France	58.3	26.9	1.1	100
	Germany	62.3	27.3	0.3	100
	Spain	52.6	24.9	0.4	100
	UK	85.8	20.3	22.1	100
share of the first shareholder	Italy	45.7	16.9	5.0	89.8
	France	26.5	20.9	1.5	84.9
	Germany	29.4	24.4	2.1	93.5
	Spain	32.4	23.8	0.8	99.5
	UK	9.7	6.8	3.0	39.2
leverage	Italy	4.3	12.4	1.2	288.4
	France	3.6	3.7	1.4	50.4
	Germany	3.1	1.7	1.2	13.7
	Spain	6.3	27.3	0.8	601.1
	UK	3.9	10.7	1.0	241.1
probability of default (%)	Italy	0.48	0.8	0.001	8.0
	France	0.21	0.4	0.003	5.0
	Germany	0.23	0.6	0.001	12.5
	Spain	0.78	1.5	0.001	18.5
	UK	0.22	0.9	0.003	12.5
board size	Italy	11.2	2.8	5	21
	France	12.7	3.1	4	22
	Germany	12.6	5.2	3	23
	Spain	12.3	3.1	4	20
	UK	10.4	2.2	6	19
independent directors (%)	Italy	53.6	18.0	16.7	100
	France	51.7	18.1	11.1	100
	Germany	75.3	24.8	0.9	100
	Spain	40.1	17.1	0.0	89.0
	UK	64.4	12.0	30	92.8

Source: elaborations on Bloomberg and Thomson Reuters data.

Table a.2 – Panel fixed effect model regression for the determinants of mutual funds' equity holdings

Variable	(1)		(2) only financials		(3) only governance		(4) Mix (1)-(2)-(3)	
GDP quarterly growth	-1.052	0.430					-0.508	0.830
	(-0.72)	(0.44)					(-0.65)	(1.79)
debt-to-GDP ratio	0.176	-0.137*						
	(1.55)	(-2.01)						
delta debt-to-GDP ratio							-0.095	-0.104*
							(-1.61)	(-2.09)
total exchange capitalization (ln)	-5.754	-4.412						
	(-0.69)	(-0.95)						
insolvency recovery rate	-0.052	0.006						
	(-0.67)	(0.14)						
days required to enforce a contract	0.016	-0.005						
	(0.44)	(-0.18)						
lag(1) days required to enforce a contract							-0.068***	-0.056**
							(-3.76)	(-3.24)
market capitalization (ln)	4.012*	3.544	0.700	1.036				
	(2.01)	(1.80)	(0.76)	(1.24)				
equity free float %	0.098	0.118	0.159***	0.160***			0.108*	0.110*
	(1.22)	(1.63)	(3.45)	(3.51)			(2.54)	(2.52)
first shareholder %	-0.279*	-0.265*	-0.167**	-0.172**				
	(-2.18)	(-2.13)	(-3.15)	(-3.28)				
price-to-book	0.240	0.300	0.006	0.006			0.010***	0.011***
	(0.98)	(1.24)	(1.08)	(1.11)			(3.46)	(3.85)
dividend yield	0.748	0.621	0.121	0.123				
	(1.92)	(1.58)	(1.43)	(1.48)				
sales growth	-0.014	-0.008	0.018	0.014			0.038	0.032
	(-0.52)	(-0.28)	(1.32)	(1.09)			(1.80)	(1.62)
return on equity	-0.006	-0.009						
	(-0.20)	(-0.33)						
delta return on equity			0.010	0.009			0.004	0.005
			(1.09)	(0.97)			(0.82)	(0.93)
leverage	-0.435	-0.420					0.011	0.014
	(-1.20)	(-1.01)					(1.64)	(1.97)
delta leverage			0.159	0.172				
			(0.72)	(0.79)				
free cash flow (ln)	-0.877	-0.788						
	(-1.27)	(-1.14)						
delta cash flow			-0.0001*	-0.000*				
			(-2.17)	(-2.05)				
probability of default	-7.069***	-6.425***	-1.596*	-1.606*				
	(-4.55)	(-4.04)	(-2.17)	(-2.18)				
delta Prob. of Default							32.667	28.866
							(1.71)	(1.51)
Altman score	0.003	0.047						
	(0.01)	(0.16)						
CEO duality dummy	-1.889	-2.389			-0.208	-1.139		
	(-0.69)	(-0.87)			(-0.13)	(-0.75)		
governance quality score	-0.056	-0.053			0.006	0.002		
	(-1.00)	(-0.95)			(0.16)	(0.06)		
board size	-0.139	-0.126			-0.398	-0.389	-0.281	-0.261
	(-0.42)	(-0.36)			(-1.64)	(-1.55)	(-1.35)	(-1.26)
board attendance	0.003	0.011						
	(0.02)	(0.10)						
independent directors %	0.037	0.040			0.109*	0.096*	0.050	0.057
	(0.72)	(0.79)			(2.32)	(2.04)	(1.51)	(1.67)
independent directors % in nominating Committee	-0.011	-0.010						
	(-0.36)	(-0.31)						
independent directors % in Compensation Committee	0.006	-0.005						
	(0.14)	(-0.12)						
nominating Committee dummy	-4.723*	-5.989**			0.627	0.066		
	(-2.39)	(-2.92)			(0.55)	(0.06)		
compensation Committee dummy	15.264**	10.229*			4.976	2.798		
	(2.96)	(2.09)			(1.37)	(0.79)		
constant	-13.589	19.635	10.176	7.399	22.404***	22.971***	55.287***	48.608***
	(-0.38)	(0.71)	(1.21)	(0.93)	(4.50)	(4.55)	(5.41)	(4.75)
time dummies	Yes	No	Yes	No	Yes	No	Yes	No
N obs	406	406	993	993	820	820	1255	1255
R^2	0.326	0.296	0.158	0.153	0.093	0.038	0.086	0.076

Legend: ·, ··, ··· indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses

Table a.3 – Panel fixed effect model regression for the determinants of sovereign funds' equity holdings

Variable	(1)		(2) only financials		(3) only governance		(4) Mix (1)-(2)-(3)	
GDP quarterly growth	-0.524	-0.373					-0.784*	-0.009
	(-0.91)	(-1.17)					(-2.02)	(-0.06)
debt-to-GDP ratio	-0.019	0.012						
	(-0.32)	(0.48)						
delta debt-to-GDP ratio							-0.028*	-0.041***
							(-2.21)	(-4.62)
total exchange capitalization (ln)	-3.547	2.588						
	(-0.90)	(1.06)						
insolvency recovery rate	0.044	0.016						
	(1.01)	(1.00)						
days required to enforce a contract	0.018*	0.029*						
	(2.07)	(2.26)						
lag(1) days required to enforce a contract							-0.010*	-0.003
							(-2.16)	(-0.73)
market capitalization (ln)	-1.223	-1.122	0.050	0.392				
	(-1.12)	(-1.11)	(0.11)	(1.10)				
equity free float %	0.042	0.037	0.042	0.040			0.030	0.028
	(0.93)	(0.88)	(1.43)	(1.37)			(1.68)	(1.55)
first shareholder %	0.025	0.023	0.017	0.015				
	(0.44)	(0.42)	(0.80)	(0.74)				
price-to-book	-0.032	-0.010	0.005	0.004			-0.002*	-0.001
	(-0.28)	(-0.11)	(1.51)	(1.56)			(-1.98)	(-1.05)
dividend yield	-0.241	-0.237	-0.072	-0.070				
	(-0.68)	(-0.70)	(-1.29)	(-1.20)				
sales growth	0.010	0.003	-0.003	-0.010			0.003	-0.004
	(0.76)	(0.34)	(-0.43)	(-1.50)			(0.62)	(-0.86)
return on equity	-0.005	-0.006						
	(-0.57)	(-0.82)						
delta return on equity			0.008*	0.009*			-0.001	-0.001
			(1.99)	(2.14)			(-1.02)	(-0.89)
leverage	-0.122	-0.087					-0.010***	-0.008***
	(-1.30)	(-0.84)					(-8.34)	(-7.23)
delta leverage			-0.150	-0.107				
			(-1.58)	(-1.26)				
free cash flow (ln)	-0.029	-0.062						
	(-0.09)	(-0.22)						
delta cash flow			-0.000	0.000				
			(-0.11)	(0.07)				
probability of default	1.520	1.570	0.449	0.291				
	(1.52)	(1.64)	(1.53)	(1.18)				
delta Prob. of Default							-3.960	-8.742
							(-0.95)	(-1.90)
Altman score	0.143	0.170*						
	(1.63)	(2.30)						
CEO duality dummy	3.176	3.328			1.034	1.308		
	(1.20)	(1.21)			(0.80)	(1.00)		
governance quality score	0.013	0.009			0.016	0.016		
	(0.40)	(0.30)			(0.89)	(0.91)		
board size	-0.134	-0.138			0.009	-0.015	0.057	0.067
	(-1.83)	(-1.88)			(0.09)	(-0.14)	(0.81)	(0.90)
board attendance	-0.026	-0.028						
	(-0.72)	(-0.75)						
independent directors %	0.009	0.011			0.008	0.021	0.0001	0.006
	(0.62)	(0.70)			(0.72)	(1.89)	(0.05)	(0.99)
independent directors % in nominating Committee	-0.002	-0.001						
	(-0.29)	(-0.14)						
independent directors % in Compensation Committee	0.014	0.016						
	(0.98)	(1.08)						
nominating Committee dummy	0.226	0.301			0.009	-0.511*		
	(0.34)	(0.46)			(0.04)	(-2.34)		
compensation Committee dummy	-0.486	-0.051			0.263	0.618*		
	(-0.42)	(-0.06)			(0.82)	(2.10)		
constant	5.260	-6.100	-1.242	-3.627	0.042	0.515	5.164*	1.429
	(0.51)	(-0.60)	(-0.33)	(-0.96)	(0.02)	(0.26)	(2.12)	(0.51)
time dummies	Yes	No	Yes	No	Yes	No	Yes	No
N obs	406	406	993	993	820	820	1249	1249
R2	0.189	0.180	0.065	0.049	0.075	0.028	0.059	0.023

Legend: *, **, *** indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses.

Table a.4 – Panel fixed effect model regression for the determinants of hedge funds' equity holdings

Variable	(1)		(2) only financials		(3) only governance		(4) Mix (1)-(2)-(3)	
GDP quarterly growth	-0.031 (-0.27)	-0.176* (-1.98)					0.166 (1.08)	0.004 (0.05)
debt-to-GDP ratio	0.021* (2.08)	0.002 (0.39)						
delta debt-to-GDP ratio							-0.018 (-1.63)	-0.011 (-1.16)
total exchange capitalization (ln)	-1.414 (-1.88)	-0.142 (-0.37)						
insolvency recovery rate	0.014* (2.25)	0.001 (0.45)						
days required to enforce a contract	-0.001 (-0.23)	-0.002 (-0.65)						
lag(1) days required to enforce a contract							-0.005 (-1.32)	-0.006 (-1.69)
market capitalization (ln)	-0.118 (-0.80)	-0.167 (-1.12)	-0.023 (-0.19)	0.034 (0.26)				
equity free float %	-0.002 (-0.52)	-0.001 (-0.17)	0.0001 (0.09)	0.001 (0.15)			-0.001 (-0.16)	-0.001 (-0.15)
first shareholder %	0.001 (0.09)	0.001 (0.07)	-0.006 (-0.83)	-0.007 (-0.88)				
price-to-book	0.089 (1.48)	0.085 (1.40)	0.001 (0.86)	0.0001 (0.48)			0.0001 (0.08)	-0.0001 (-0.09)
dividend yield	0.021 (1.49)	0.003 (0.22)	-0.020 (-1.74)	-0.020 (-1.76)				
sales growth	0.003 (1.34)	0.004 (1.76)	0.003 (1.59)	0.003 (1.41)			-0.001 (-0.37)	-0.0001 (-0.17)
return on equity	0.002 (0.78)	0.002 (1.13)						
delta return on equity			0.002 (1.25)	0.002 (1.14)			0.000 (0.19)	0.000 (0.21)
leverage	-0.083 (-1.32)	-0.079 (-1.32)					-0.009*** (-8.72)	-0.009*** (-8.81)
delta leverage			-0.010 (-0.34)	0.001 (0.05)				
free cash flow (ln)	-0.077 (-1.83)	-0.072 (-1.84)						
delta cash flow			-0.0001 (-1.33)	-0.0001 (-1.51)				
probability of default	0.022 (0.15)	-0.007 (-0.04)	0.076 (0.80)	0.073 (0.94)				
delta Prob. of Default							0.949 (0.50)	0.973 (0.60)
Altman score	-0.098 (-1.70)	-0.097 (-1.67)						
CEO duality dummy	0.161 (1.59)	0.104 (1.11)			-0.238 (-0.71)	-0.274 (-0.78)		
governance quality score	-0.006 (-1.42)	-0.006 (-1.26)			0.001 (0.26)	0.002 (0.33)		
board size	-0.031 (-0.99)	-0.024 (-0.75)			-0.010 (-0.51)	-0.010 (-0.51)	-0.045 (-0.84)	-0.048 (-0.89)
board attendance	-0.006 (-0.48)	-0.006 (-0.45)						
independent directors %	-0.005 (-0.64)	-0.005 (-0.67)			-0.001 (-0.32)	-0.001 (-0.29)	0.007 (1.15)	0.007 (1.10)
independent directors % in nominating Committee	-0.001 (-0.66)	-0.002 (-0.90)						
independent directors % in Compensation Committee	-0.0001 (-0.14)	-0.0001 (-0.08)						
nominating Committee dummy	0.229 (0.94)	0.245 (1.00)			0.358 (1.48)	0.192* (2.12)		
compensation Committee dummy	-0.510 (-0.75)	-1.061 (-1.35)			-0.171 (-0.62)	-0.345 (-1.45)		
constant	2.82 (0.86)	5.11 (1.66)	0.48 (0.41)	0.041 (0.03)	0.096 (0.17)	0.269 (0.55)	3.14 (1.61)	3.66 (1.92)
time dummies	Yes	No	Yes	No	Yes	No	Yes	No
N obs	406	406	993	993	820	820	1153	1153
r^2	0.151	0.128	0.012	0.009	0.027	0.010	0.024	0.018

Legend: *, **, *** indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses.

Table a.5 – Probit fractional regression for the determinants of the shareholdings of mutual funds

Variable	(1)		(2) only financials		(3) only governance		(4) Mix (1), (2) and (3)	
GDP quarterly growth	0.172*	0.040					0.262***	0.138***
	(2.17)	(0.77)					(5.99)	(4.61)
debt-to-GDP ratio	-0.005	-0.001						
	(-0.98)	(-0.16)						
total exchange capitalization (ln)	0.489*	0.300						
	(2.46)	(1.76)						
insolvency recovery rate	0.003	0.001						
	(1.33)	(0.71)						
days required to enforce a contract	0.0001	-0.0001						
	(0.99)	(-0.35)						
Lag(1) days to enforce a contract							-0.0001	-0.0001
							(0.26)	(-2.24)
market capitalization (ln)	-0.120***	-0.115***	-0.067***	-0.069***				
	(-4.80)	(-4.71)	(-3.63)	(-3.79)				
equity free float %	0.008***	0.008***	0.014***	0.015***			0.015***	0.016***
	(4.22)	(4.49)	(11.35)	(11.43)			(25.52)	(25.63)
first shareholder %	-0.009***	-0.008***	-0.001	-0.001				
	(-3.74)	(-3.56)	(-0.99)	(-0.95)				
price-to-book	0.010	0.010	0.037***	0.035***			0.001***	0.001***
	(1.48)	(1.42)	(5.12)	(5.09)			(4.39)	(4.52)
dividend yield	0.0001	0.001						
	(0.01)	(0.11)						
Lag(1) dividend yield			-0.014*	-0.014*				
			(-2.46)	(-257)				
sales growth	-0.002	-0.001	0.0001	0.0001			0.0001	0.0001
	(-1.03)	(-0.87)	(0.33)	(0.42)			(0.01)	(0.00)
return on equity	0.002	0.002	-0.0001	-0.0001			0.002***	0.002***
	(1.71)	(1.67)	(-0.55)	(-0.19)			(5.57)	(5.72)
leverage	-0.026*	-0.025*						
	(-2.56)	(-2.49)						
Lag(1) leverage			-0.006	-0.005			-0.003	-0.003
			(-076)	(-0.71)			(-0.85)	(-0.96)
free cash flow (ln)	-0.006	-0.008	-0.020	-0.018				
	(-0.32)	(-0.43)	(-01.52)	(-1.40)				
probability of default	-0.028	-0.053	-0.136***	-0.135***				
	(-0.44)	(-0.88)	(-4.08)	(-4.13)				
Altman score	-0.014	-0.013	-0.004	-0.004				
	(-1.56)	(-1.47)	(-0.70)	(-0.68)				
CEO duality dummy	-0.160**	-0.185***			-0.243***	-0.249***		
	(-3.02)	(-3.51)			(-6.49)	(-6.56)		
governance quality score	0.001	0.001			0.008***	0.008***		
	(0.52)	(0.65)			(9.81)	(9.74)		
board size	-0.022**	-0.021**			-0.028***	-0.028***	-0.046***	-0.047***
	(-2.79)	(-2.65)			(-4.72)	(-4.60)	(-11.14)	(-11.39)
board attendance	-0.002	-0.003						
	(-0.56)	(-0.67)						
independent directors %	-0.002	-0.001			0.004***	0.004***	-0.002**	-0.002**
	(-1.05)	(-1.02)			(4.19)	(4.06)	(-2.67)	(-2.59)
independent directors % in nominating Committee	-0.001	-0.001						
	(-0.89)	(-0.97)						
independent directors % in Compensation Committee	0.001	0.001						
	(0.68)	(0.87)						
nominating Committee dummy	0.015	-0.030			0.174**	0.168***		
	(0.12)	(-0.22)			(3.27)	(3.33)		
compensation Committee dummy	0.272*	0.143			0.087*	0.086*		
	(2.54)	(1.55)			(2.40)	(2.36)		
constant	0.233	0.460	-0.98***	-1.00***	-1.173***	-1.234***	-1.139***	-1.091***
	(0.38)	(0.85)	(-5.34)	(-5.52)	(-9.39)	(-10.37)	(-13.59)	(-13.23)
time dummies	Yes	No	Yes	No	Yes	No	Yes	No
N.Obs	406	406	812	812	820	820	1266	1266

Legend: *, **, *** indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses.

Table a.6 – Probit fractional regression for the determinants of the shareholdings of sovereign funds

Regressors	(1)		(2) only financials		(3) only governance		(4) Mix (1), (2) and (3)	
GDP quarterly growth	-0.063 (-0.61)	-0.012 (-0.20)					0.018 (-0.29)	0.051 (1.61)
debt-to-GDP ratio	-0.000 (-0.08)	0.008* (2.55)						
total exchange capitalization (ln)	0.498 (1.91)	0.391 (1.84)						
insolvency recovery rate	0.002 (0.48)	0.004 (1.00)						
days required to enforce a contract	-0.000 (-0.37)	-0.001* (-2.17)						
Lag(1) days to enforce a contract							-0.0001 (-1.44)	-0.0001*** (-4.92)
market capitalization (ln)	-0.026 (-0.87)	-0.022 (-0.73)	0.097** (2.88)	0.103** (3.11)				
equity free float %	-0.005* (-2.07)	-0.005* (-2.18)	0.002 (1.09)	0.002 (0.96)			0.004*** (4.91)	0.004*** (4.61)
first shareholder %	-0.003 (-1.33)	-0.003 (-1.33)	-0.004* (-2.53)	-0.004** (-2.65)				
price-to-book	0.004 (0.64)	0.004 (0.69)	-0.010 (-1.27)	-0.007 (-0.96)			-0.003 (-0.74)	-0.002 (-0.78)
dividend yield	0.043** (2.67)	0.044** (2.65)						
Lag(1) dividend yield			0.007 (0.93)	0.007 (0.97)				
sales growth	0.003 (1.69)	0.002 (1.18)	-0.0001 (-0.23)	-0.001 (-1.10)			0.0001 (0.04)	-0.001 (-1.57)
return on equity	-0.001 (-0.85)	-0.001 (-1.00)	0.001 (1.08)	0.001 (0.67)			-0.0001 (-1.06)	-0.000 (-1.14)
leverage	-0.012 (-0.60)	-0.012 (-0.56)						
Lag(1) leverage			0.028 (1.68)	0.028 (1.58)			0.002 (0.53)	0.002 (0.45)
free cash flow (ln)	-0.033 (-1.30)	-0.036 (-1.43)	-0.077** (-3.04)	-0.083** (-3.26)				
probability of default	0.089 (0.91)	0.101 (1.03)	0.029 (0.58)	0.010 (0.20)				
Altman score	-0.026** (-2.70)	-0.024* (-2.57)	-0.010 (-1.33)	-0.010 (-1.28)				
CEO duality dummy	0.161* (2.11)	0.186* (2.28)			0.086 (1.55)	0.098 (1.74)		
governance quality score	0.004** (2.58)	0.004** (2.68)			0.005*** (4.51)	0.005*** (4.32)		
board size	-0.031* (-2.48)	-0.032* (-2.48)			-0.005 (-0.58)	-0.006 (-0.72)	0.008 (1.36)	0.008 (1.42)
board attendance	0.013** (2.65)	0.014** (2.97)						
independent directors %	0.001 (0.59)	0.001 (0.72)			0.002 (1.91)	0.002* (2.36)	0.001 (1.11)	0.001 (1.17)
independent directors % in nominating Committee	0.0001 (0.38)	0.001 (0.85)						
independent directors % in Compensation Committee	0.003* (2.03)	0.002 (1.57)						
nominating Committee dummy	0.340* (2.39)	0.349* (2.39)			-0.053 (-0.67)	-0.039 (-0.53)		
compensation Committee dummy	0.170 (1.16)	0.140 (1.21)			-0.036 (-0.84)	-0.032 (-0.71)		
constant	-3.462*** (-4.45)	-4.026*** (-6.11)	-2.554*** (-12.90)	-2.496*** (-12.56)	-2.363*** (-18.57)	-2.261*** (-16.53)	-2.268*** (-21.65)	-2.217*** (-21.22)
time dummies	Yes	No	Yes	No	Yes	No	Yes	No
N.Obs	406	406	812	812	820	820	1260	1255

Legend: * , **, *** indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses.

Table a.7 – Probit fractional regression for the determinants of the shareholdings of hedge funds

Regressors	(1)		(2) only financials		(3) only governance		(4) Mix (1), (2) and (3)	
GDP quarterly growth	0.357*	-0.327**					0.266	0.040
	(2.02)	(-2.62)					(1.57)	(0.42)
debt-to-GDP ratio	0.011	0.008						
	(1.02)	(0.91)						
total exchange capitalization (ln)	-0.576	-0.666						
	(-1.49)	(-1.84)						
insolvency recovery rate	0.032***	0.014						
	(3.29)	(1.62)						
days required to enforce a contract	-0.002*	-0.006**						
	(-2.10)	(-3.02)						
Lag(1) days to enforce a contract							-0.000	-0.000
							(-0.05)	(-1.06)
market capitalization (ln)	0.024	0.016	-0.100	-0.091				
	(0.31)	(0.23)	(-1.55)	(-1.54)				
equity free float %	-0.003	-0.001	0.008	0.007			0.003	0.003
	(-0.74)	(-0.28)	(1.87)	(1.84)			(1.81)	(1.94)
first shareholder %	-0.006	-0.004	0.002	0.002				
	(-0.97)	(-0.71)	(0.27)	(0.26)				
price-to-book	0.019*	0.020*	0.024	0.029			-0.002	-0.001
	(2.02)	(2.04)	(1.08)	(1.48)			(-0.11)	(-0.12)
dividend yield	-0.130**	-0.145**						
	(-2.90)	(-3.29)						
Lag(1) dividend yield			-0.035	-0.033				
			(-0.99)	(-0.99)				
sales growth	0.007	0.007	0.005	0.004			0.002	0.003
	(1.82)	(1.77)	(1.14)	(0.69)			(0.87)	(1.07)
return on equity	-0.0001	0.0001	-0.001	-0.002			0.000	-0.000
	(-0.04)	(0.02)	(-0.48)	(-1.05)			(0.01)	(-0.05)
leverage	-0.047	-0.046						
	(-1.26)	(-1.32)						
Lag(1) leverage			0.006	0.003			-0.013	-0.014
			(0.17)	(0.09)			(-0.95)	(-1.00)
free cash flow (ln)	-0.184***	-0.183***	-0.096*	-0.100**				
	(-4.60)	(-5.23)	(-2.28)	(-2.90)				
probability of default	0.018	-0.157	-0.146	-0.162				
	(0.11)	(-1.06)	(-1.23)	(-1.59)				
Altman score	-0.058**	-0.063***	-0.017	-0.016				
	(-3.23)	(-3.34)	(-0.74)	(-0.63)				
CEO duality dummy	-0.013	-0.214			-0.248	-0.261		
	(-0.07)	(-1.24)			(-1.69)	(-1.72)		
governance quality score	0.004	0.001			-0.000	-0.000		
	(0.96)	(0.31)			(-0.19)	(-0.06)		
board size	-0.050*	-0.047*			-0.000	0.003	-0.051***	-0.052***
	(-2.28)	(-2.07)			(-0.02)	(0.13)	(-3.84)	(-3.97)
board attendance	-0.024*	-0.021*						
	(-2.47)	(-2.14)						
independent directors %	0.002	0.003			0.002	0.002	-0.001	-0.001
	(0.39)	(0.60)			(0.78)	(0.55)	(-0.25)	(-0.28)
independent directors % in nominating Committee	-0.001	-0.002						
	(-0.26)	(-0.33)						
independent directors % in Compensation Committee	-0.011*	-0.011						
	(-1.99)	(-1.75)						
nominating Committee dummy	0.806	0.701			0.686**	0.511**		
	(1.90)	(1.82)			(2.72)	(2.71)		
compensation Committee dummy	-0.180	-0.806***			-0.396***	-0.410***		
	(-0.79)	(-3.77)			(-3.30)	(-3.42)		
constant	-0.302	3.077	-2.195**	-2.091**	-3.523***	-3.395***	-2.313***	-2.209***
	(-0.20)	(1.71)	(-3.03)	(-2.97)	(-8.79)	(-9.62)	(-8.23)	(-7.53)
time dummies	Yes	No	Yes	No	Yes	No	Yes	No
N.Obs	406	406	812	812	820	820	1159	1159

Legend: *, **, *** indicate significance the 90%, 95%, 99% confidence level; t statistics in parentheses.

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