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Are institutional blockholders effective monitors? Evidence from corporate investment efficiency

Les investisseurs institutionnels sont-ils des contrôleurs efficaces ?
Preuves à partir de l'efficacité des investissements des entreprises

Son los accionistas institucionales monitores efectivos? Evidencia sobre
la eficiencia de las inversiones corporativas

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ABSTRACT

This paper investigates the relationship between institutional blockholdings and corporate investment efficiency. Using a sample of 283 French-listed firms during 2002-2016, we find that institutional blockholders improve investment efficiency and decrease the magnitude of over-investment. This finding withstands a battery of sensitivity checks and remains unchanged after accounting for endogeneity concerns. Moreover, we provide evidence that investment inefficiency decrease in the presence of institutional investors with longer-term investment horizons due to improved monitoring and information quality. Third, we find that both foreign and domestic institutional blockholders play a significant role in shaping firms' efficient investment behavior. Finally, cross-sectional tests indicate that institutional monitoring mitigates investment distortions to a greater extent for firms facing higher agency problems and greater information asymmetry.

Keywords: Institutional blockholders, Investment efficiency, Information asymmetry, agency problems, Investor horizon

Résumé

Cette étude examine l'impact des investisseurs institutionnels sur l'efficacité des investissements des entreprises. À l'aide d'un échantillon de 283 entreprises françaises cotées de 2002 à 2016, nous constatons que les investisseurs institutionnels ayant des blocs de contrôle dans le capital des firmes réduisent l'ampleur du surinvestissement. Cette conclusion reste inchangée après avoir pris en compte les biais liés à l'endogénéité. De plus, nos résultats montrent que l'inefficacité des investissements diminue en présence d'investisseurs institutionnels ayant des horizons d'investissement à plus long terme, nationaux ou étrangers, en raison de l'amélioration du contrôle interne et de la qualité de l'information. Enfin, Il apparaît que la réduction des distorsions d'investissement est plus marquée chez les entreprises confrontées à des problèmes d'agence et une asymétrie d'information importants.

Mots-clés : Actionnaires institutionnels, Efficacité des investissements, Asymétrie d'information, Problèmes d'agence, Horizon des investisseurs

Resumen

Este estudio examina el impacto de los inversores institucionales en la eficiencia de las inversiones de las empresas. Utilizando una muestra de 283 empresas francesas cotizadas de 2002 a 2016, constatamos que los inversores institucionales con bloques de control en el capital de las firmas reducen la magnitud de la sobreinversión. Esta conclusión se mantiene sin cambios después de haber tomado en cuenta los sesgos relacionados con la endogeneidad. Además, nuestros resultados muestran que la ineficiencia de las inversiones disminuye en presencia de inversores institucionales, tanto nacionales como extranjeros, con horizontes de inversión a más largo plazo, debido a la mejora del control interno y la calidad de la información. Finalmente, parece que la reducción de las distorsiones de inversión es más marcada en las empresas que enfrentan importantes problemas de agencia y asimetría de información.

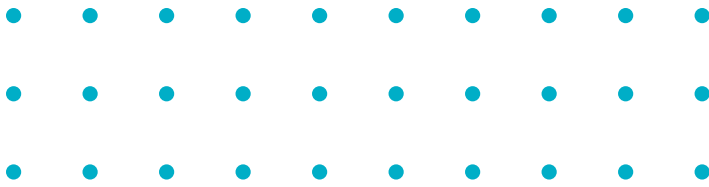
Palabras Claves: Accionistas institucionales, Eficiencia de la inversión, Asimetría de información, Problemas de agencia, Horizonte del inversor

JEL Classification: G30, G32

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Investment efficiency is an important driver of firm growth. In a perfect frictionless world, capital would be efficiently allocated to optimal projects with positive net present values (Modigliani and Miller, 1958). In the real world, however, firms often deviate from optimal investments due to frictions in the capital market, such as agency problems (Jensen and Meckling, 1976), information asymmetry (Myers and Majluf, 1984) and managerial optimism (Malmendier and Tate, 2005). Agency theory predicts that the misalignment between managerial incentives and shareholder interests and the gap of information lead managers to engage in self-maximizing behavior and make suboptimal investment decisions (i.e., overinvestment and underinvestment), especially in firms with poor corporate governance (Richardson, 2006). Prior work considers that high-quality financial information is associated with high investment efficiency (Biddle *et al.*, 2009; Gomariz and Ballesta, 2014; Boubaker *et al.*, 2018). In addition, prior studies document that the private information acquisition and interpretation by financial analysts (Chen *et al.*, 2017b; Choi *et al.*, 2020), institutional investors (Cao *et al.*, 2020), and foreign investors (Chen *et al.*, 2017a) improve investment efficiency by mitigating information asymmetry.

To date, a growing number of studies has documented the profound impacts of institutional investors on various corporate decisions and outcomes, such as executive pay levels (Hartzell and Starks, 2003), corporate investment (Alvarez *et al.*, 2018), earnings management (Chung *et al.*, 2002), mergers and acquisitions (Chen and Harford, 2007), corporate financing decisions (Klein and Zur, 2009; Boubaker *et al.*, 2017) and corporate philanthropy (Fu and Qin, 2021).

Our paper links these two research strands and examines the effect of large institutional investors (i.e., institutional blockholders with at least a 5% ownership stake) on corporate investment efficiency. It also explores the impact of Institutional investor horizon and nationality on investment efficiency and whether information asymmetry and agency problems matter for this relation.

Recent studies argue that not all institutional investors are effective monitors (Chen *et al.*, 2007; Borochin and Yang, 2017; Brav *et al.*, 2018; Trinh *et al.*, 2023). Institutional investors with large shareholdings are more likely to engage in costly monitoring for long-term benefits (Alvarez *et al.*, 2018; Ge *et al.*, 2021). In contrast, small dispersed institutional shareholders with relatively few shares in a firm cannot afford to engage in costly monitoring. They are more likely to liquidate their investment if the firm performs poorly (Jensen and Meckling, 1976). Therefore, we only focus on those institutional investors with significant ownership holdings. Following Chen *et al.* (2007), we define institutional blockholders as institutional investors who hold at least 5% of shares outstanding.

Our empirical analysis uses a sample of 283 French-listed firms over 2002–2016. Consistent with the monitoring argument, we find that institutional blockholders increase investment efficiency and reduce the likelihood of overinvesting. Our results are robust to endogeneity concerns, alternative proxies of the variables of interest, and different regression frameworks. We also explore the heterogeneity of institutional blockholders' monitoring incentives by controlling for investor horizon and institutional nationality. The results show that long-term investing institutions continue to negatively and significantly affect firms' investment inefficiency, owing

to their monitoring role. In contrast, the relations become insignificant for short-term institutional investors. Besides, when we split blockholders into those held by domestic and foreign institutional investors, we provide evidence that both foreign and domestic institutions reduce the extent of investment inefficiency. In additional analyses, we find that the negative relationship between institutional blockholders and inefficient investment mainly manifests in firms with higher information asymmetry and agency problems.

This paper has two main contributions. First, it contributes to the ongoing debate regarding whether institutional blockholders are effective. As stressed earlier, many scholars have analyzed the role of institutional investors on CEO compensation (e.g., Hartzell and Starks, 2003), corporate governance and market outcomes (Chen *et al.*, 2007), earnings management (Chung *et al.*, 2002, Trinh *et al.*, 2023); corporate investment (Alvarez *et al.*, 2018), capital structure decisions (Klein and Zur, 2009; Boubaker *et al.*, 2017) and corporate philanthropy (Fu and Qin, 2021). We extend this line of research by examining the relationship between institutional blockholders and investment efficiency.

This study also complements Cao *et al.* (2020), who document that institutional ownership, particularly pressure-resistant institutional investors, can improve investment efficiency by alleviating under and overinvestment problems. While institutional investors are not homogeneous and several characteristics differentiate between them, our study extends the work of Cao *et al.* (2020) by focusing on institutional blockholders (i.e., institutional ownership above 5% of outstanding common shares).

Finally, our paper sheds light on the role of institutional blockholders in improving the investment efficiency of French-listed firms and fills the gap of research outside the US on this subject. To the best of our knowledge, this topic has remained unexplored in France. Investment efficiency is a relevant topic in France, a concentrated ownership environment, where firms are mainly family-owned and the protection for outside investors is relatively weak (Faccio and Lang, 2002). Therefore, it is worth investigating whether better corporate governance mechanisms improve investment efficiency for French-listed firms.

The rest of the paper is organized as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the data and the main variables. Section 4 presents the empirical results. Section 5 provides robustness checks and additional analyses. Section 6 concludes.

Literature review and hypotheses development

Determinants of investment efficiency

In perfect financial markets, managers are expected to invest efficiently and accurately assess the intrinsic value of investment opportunities. Under Neoclassical theory, a firm's investment policy solely depends on its perceived investment opportunities as measured by the marginal Q ratio (Tobin, 1969; Hayashi, 1982). When markets are perfect, a firm obtains funding for all projects with a positive net present value at the prevailing cost of capital and continues to invest until the marginal return from investment equals

the marginal cost. However, prior literature recognizes that, in the presence of market imperfections, such as information asymmetry, and agency problems, a firm may deviate from its optimal investment (Chen *et al.*, 2017a), resulting in over- or underinvestment problems (Richardson, 2006; Biddle *et al.*, 2009). According to Myers and Majluf (1984), the adverse selection problem can affect the cost of raising funds and the optimal investment decisions of firms. In the presence of information asymmetry, the “lemons problem” of managers selling overpriced securities can lead to over-investment (Baker *et al.*, 2003; Biddle *et al.*, 2009). Alternatively, if outside investors with informational disadvantages detect such behaviors and respond rationally by increasing the firm’s cost of external financing, managers can refrain from raising funds, leading to under-investment (Stiglitz and Weiss, 1981; Biddle *et al.*, 2009).

As for moral hazard, distortions in investment decisions are attributed to the conflict of interests between managers and shareholders. Managers accurately assess the intrinsic value of investment opportunities; however, they may invest firm resources inefficiently to derive private benefits and follow personal agendas (Jensen and Meckling, 1976). For instance, self-interested managers may over-invest and use the firm’s cash in projects for empire-building, perquisite consumptions, and management entrenchment (Jensen, 1986). Alternatively, some behavioral traits of managers can also induce underinvestment. Bertrand and Mullainathan (2003) suggest that managers’ preference for a “quiet life” leads to a downward deviation from a firm’s optimal investment level. Furthermore, when they are not closely monitored, risk-averse managers tend to reject profitable projects, which in turn causes underinvestment (Ross, 1973).

Consistent with agency cost explanations, Richardson (2006) finds that firms with the highest levels of free cash flow are associated with more investment distortions in the form of over-investment. Such an effect can be mitigated through effective monitoring from activist shareholders. In support of this view, some recent work provides evidence that transparent information environments and effective monitoring mechanisms reduce the likelihood of over- and underinvestment (e.g., Biddle *et al.*, 2009; Chen *et al.*, 2011; Gomariz and Ballesta, 2014; Cao *et al.*, 2020).

Institutional ownership and investment efficiency

A large strand of literature documents that institutional investors can effectively restrain information asymmetry (Shleifer and Vishny, 1997) and improve investment efficiency (Cao *et al.*, 2020). Chung *et al.* (2002) show that earnings management is less likely in the presence of institutional investors. Ajinkya *et al.* (2005) report that firms with higher institutional ownership issue management earnings forecasts and provide better corporate disclosure. Burns *et al.* (2010) find that a higher concentration of holdings by institutional investors imposes greater monitoring and reduces the incentives for firms to misreport.

Institutional ownership also serves as an important external monitoring mechanism. Research shows that higher institutional ownership increases the performance sensitivity of executive pay and decreases the level of managerial compensation (Hartzell and Starks, 2003). Chen *et al.* (2007) also point out that monitoring and activism by independent long-term institutions lead to better post-merger performance. Consistently with the active monitoring hypothesis, Callen and Fang (2013) report that stable institutional groups reduce future stock price crash risk by curbing managerial bad news hoarding activities. Gaspar and Massa (2007) show that shareholder activism by local financial institutions is associated with better value-enhancing decisions (less over-investment and fewer but better acquisitions). In addition, Cheng *et al.* (2013) document that private information acquisition and interpretation by outside market participants, such as institutional investors and financial analysts, improve investment efficiency. In a cross-country study,

Chen *et al.* (2017) show that foreign institutional investors in privatized firms are associated with better investment efficiency. Cao *et al.* (2020) provide evidence that pressure-resistant institutional investors prevent managers from making non-optimal investment decisions, leading to less under-investment and over-investment decisions. For Ward *et al.* (2020), the motivation for institutions to engage in monitoring alleviates the problem of both over-investing free cash flows and under-investment arising from managers’ career concerns. Moradi *et al.* (2022) use data from listed firms in Iran and further report that institutional ownership improves investment efficiency by decreasing both under- and over-investment problems. McCahery *et al.* (2016) suggest that institutional investors first intervene more intensively behind the scenes by engaging management privately through direct negotiations with top management and discussions with the board of directors but without management’s presence. If these private interventions fail, institutional investors can take public measures, such as voting against management, submitting shareholder proposals, public criticism, or aggressively questioning management on a conference call. By doing so, institutional investors can limit opportunistic managerial behaviors and consequently improve corporate governance practices.

Another strand of the literature claims that when institutional investors are dissatisfied with their portfolio companies due to poor stock performance, they can also express their dissatisfaction through the exit by “voting with their feet.” (Admati and Pfleiderer, 2009; Edmans, 2009; Edmans and Manso, 2011). Parrino *et al.* (2003) document a strong relationship between institutional investors’ exit and subsequent CEO replacement, suggesting that massive sale of shares by institutional investors has a real impact on corporate decisions. Admati and Pfleiderer (2009) claim that institutional blockholders can effectively perform a governance role through the threat of exiting as a form of activism. When managers deviate from their responsibility and do not act in the best interest of their shareholders, informed institutional blockholders can express their dissatisfaction by simply selling their stocks, which negatively impacts stock prices. However, equity-based compensation and takeover threats make managers work to avoid the exit of informed blockholders. Edmans (2009) further shows that the threat of exit disciplines managers’ actions, inducing them to undertake more efficient real investments, such as research and development.

Based on the above discussions, we hypothesize that *ceteris paribus*, the presence of institutional blockholders, comes with better informational environments and monitoring, leading to higher firm investment efficiency. More specifically, we form the following hypothesis.

H₁: Institutional blockholdings come with lower corporate investment inefficiency

Institutional investment horizon and investment efficiency

An important factor that should affect the willingness of an institutional investor to engage in monitoring is the time horizon of their investment. The literature shows that the investment horizon of institutional investors helps mitigate investment inefficiencies and reduce agency problems associated with research and development (Bushee, 1998) and acquisitions (Gaspar *et al.*, 2005; Chen *et al.*, 2007). Bushee (1998) shows that dedicated investors with long-term institutional holdings cannot sell their assets easily and are highly motivated to foster information sharing and monitoring to protect their assets. Furthermore, McCahery *et al.* (2016) report that investor horizon matters for engagement. Investors with long-term horizons less concerned about stock liquidity engage more intensively and have strong incentives to monitor firms.

On the other hand, Bushee (1998, 2001) argues that some institutional investors, coined “transient” or “myopic,” have a short-term focus and passive behavior. According to Porter (1992), passive investors face strong regulatory and legal restrictions on their investments and often have difficulty assessing the companies’ long-term performance. Bushee (2001) provides evidence that institutional momentum traders with high portfolio turnovers (“transient investors”) prefer short-term earnings over long-run value. Gaspar *et al.* (2005) find that firms held by short-term investors exhibit negative abnormal returns around the merger announcement and higher long-run underperformance.

In other words, Institutional monitoring is well-grounded in large ownership positions and a long-term horizon. Dedicated institutions with concentrated investments and long investment horizons are more vigilant and have sufficient incentives to monitor firms. However, short-horizon institutions are uninvolved in corporate governance activism and have no incentive to control management (Gaspar *et al.*, 2005; Bushee, 2001; Harford *et al.*, 2018). Accordingly, as the monitoring incentives of institutional investors are hindered by short-termism, we hypothesize that monitoring by long-term investors should result in lower investment inefficiency.

More specifically, we form the following hypothesis

H2: Dedicated institutional investors have stronger effects on improving investment efficiency than transient institutional investors

Institutional Investor nationality and investment efficiency

Another stream of research investigates the monitoring effectiveness of foreign investors vis-a-vis domestic investors and provides mixed evidence. One view is that foreign institutional investors play a significant role in monitoring the companies they invest in by voicing their dissatisfaction or indirectly selling their shares (Gillan and Starks, 2003). Consistent with this view, foreign institutions are effective monitors for at least two potential reasons. First, foreign institutional investors often possess a wide range of knowledge and experience in governance framework and best practices through global investing (Ferreira and Matos, 2008; Lele, 2019) and can therefore serve as catalysts for promoting effective corporate governance on an international scale (Aggarwal *et al.*, 2011). Second, due to their arm’s-length relationships with the investee firm, foreign institutional investors are less constrained by close business ties with insiders (Brickley *et al.*, 1988). Their independent perspectives and management skills can lead to greater accountability, transparency regarding governance practices, and long-term value creation (Aggarwal *et al.*, 2011; Ferreira and Matos, 2008). Recent studies provide supporting evidence that the monitoring ability of foreign institutions improves the timeliness of accounting disclosure (Jiang and Kim, 2004), reduces earnings management (Lele, 2019; Gu *et al.*, 2023), urges companies to hire top-quality auditors (Guedhami *et al.*, 2009; Kim *et al.*, 2019), reduces stock liquidity commonality (Deng *et al.*, 2018), and enhances voluntary disclosure (Tsang *et al.*, 2019). Luo *et al.* (2014) find evidence that foreign investors are more informed and outperform their domestic counterparts due to their lack of business ties with local firms (Ferreira and Matos, 2008). In a similar vein, Dang *et al.* (2023) provide evidence that foreign institutional ownership is associated with low synchronicity of stock prices.

In contrast, the information disadvantage view suggests that foreign investors have access to less sophisticated and reliable information and may face more information disadvantages due to geographical, cultural language, and legal systems constraints (La Porta *et al.*, 1998; Dvořák, 2005; Kang and Kim, 2010). Liu *et al.* (2018) provide evidence that local investors outperform foreign investors simply due to their geographical proximity to management or interpersonal networking. As such, local institutional investors are better positioned to obtain superior firm-specific information,

reduced information gathering, and lower communication costs (Gaspar and Massa, 2007; Chhaochhria *et al.*, 2012). Additionally, Miller *et al.* (2021) show that domestic institutional investors face lower monitoring costs than their foreign peers and are thus more effective at constraining earnings management. Thus, we expect that the importance of both foreign and domestic institutional investors in monitoring and improving firm information environment reduces a company’s inefficient investment, leading to the following hypotheses:

H3: Corporate investment inefficiency decreases with the intensity of monitoring by foreign and domestic institutional blockholders.

Sample and data sources

We construct our sample by collecting data from several sources. We obtain Data on the portfolio holdings of institutional investors from the Thomson-Reuters Institutional Holdings (I3F) database. Accounting and financial data are from the Worldscope database. To construct our regression variables, we remove firms operating in the financial industry (SIC codes between 6000 and 6999) due to the specific nature of their activity and observations with missing data. These screening processes led to 3796 firm-year observations representing 283 French-listed firms over the sample period from 2002 to 2016.

Variable descriptions

Estimation of investment efficiency

Investment efficiency reflects a firm’s ability to carry out all projects with positive net present value (Gomariz and Ballesta, 2014). Following Biddle *et al.* (2009) and Chen *et al.* (2011), we analyze investment efficiency through the sensitivity of investment expenditures to growth opportunities. We first estimate expected investment as a function of investment opportunities (measured by sales growth) and then use the regression residuals as our proxies for firm-specific inefficient investment:

$$Investment_{i,t} = \beta_0 + \beta_1 SalesGrowth_{i,t-1} + \varepsilon_{it} \quad (1)$$

where $Investment_{i,t}$ is the total investment expenditure¹ of firm i in the year t , deflated by the lagged total assets. $SalesGrowth_{i,t-1}$ is the annual sales growth rate of firm i from year $t-2$ to year $t-1$, which proxies for growth opportunities. Based on acceleration theory, the authors assume that firms can adjust their investment levels to meet growth in product demand or sales revenue. By analyzing past sales growth patterns, firms can anticipate future demand and adjust their investment accordingly. Therefore, the lag of sales growth is a key determinant for the optimal investment. We estimate the investment model cross-sectionally for each year and industry. The residual term of the investment model captures the deviation from the expected level of investment and thus represents the magnitude of inefficient investment. Our dependent variable ($INVT_INEFF$) is the absolute value of the residuals. A higher value of $INVT_INEFF$ indicates a higher degree of investment inefficiency and *vice versa*.

To provide a more comprehensive assessment of firms’ investment behavior, we further classify under and over-investing firms based on the magnitude of residuals obtained from Equation (1) estimation. Firms that invest above their optimal (with positive residuals) are classified as over-investing firms. In contrast, those that do not carry out all profitable projects (with negative residuals) are considered under-investing firms.

1. In our main regression analysis and in line with prior literature (e.g. Li *et al.*, 2024; Khediri, 2021; Naeem, and Li, 2019; Boubaker *et al.*, 2018; Chen *et al.* 2011; McNichols and Stubben, 2008; Biddle and Hilary, 2006; Hubbard, 1998) our investment proxy, denoted by $Investment$, is measured by the ratio of capital expenditures to lagged total assets. In measuring investment expenditures, we consider only capital expenditures (CAPEX) which refers to cash outflow for purchase of fixed assets, intangible assets, and other long-term assets, minus cash receipts from asset sales (Biddle *et al.*, 2009). Furthermore, acquisitions are less frequent than capital expenditure for French companies, which does not affect investment long-term trends (McNichols and Stubben, 2008)

Institutional ownership variables

Following previous research (Brickley *et al.*, 1988; Burns *et al.*, 2010; Chen *et al.*, 2007), We define institutional blockholders as institutional investors who hold at least 5% of shares outstanding. In this study, we focus on two measures of institutional ownership: (1) we measure institutional block ownership (*BLOCK_DUM*) as a dummy variable that is equal to one if a firm has at least one or more institutional investors blockholders, and zero otherwise. (2) the percentage ownership by institutional blockholders with at least 5% stake of shares (*BLOCK%*).

To analyze the effect of institutional investment horizon on investment efficiency, we adopt the approach used by Bushee (2001). As such, we consider that “Dedicated” institutions are those with low portfolio turnover and more concentrated portfolio holdings. We classify them as long-term institutional investors. In contrast, “transient” institutions have the highest turnover and diversified portfolios (Bushee, 2001). We classify them as short-term institutional investors. *LONG_IO* (*SHORT_IO*) is the percentage of dedicated (Transient) institutional owners relative to the total outstanding shares.

Furthermore, to accurately reflect the heterogeneous monitoring incentives depending on institutional blockholders’ national origins, we divide *BLOCK%* into foreign institutional ownership (*FOREIGN*) and domestic institutional ownership (*DOMESTIC*). *FOREIGN* (*DOMESTIC*) is the fraction of shares owned by foreign (domestic) institutions with at least a 5% equity stake.

Control variables

Following prior literature (Biddle *et al.*, 2009; Chen *et al.*, 2011; Gomariz and Ballesta, 2014; Choi *et al.*, 2020; Boubaker *et al.*, 2022), we control for a range of firm characteristics that might affect investment efficiency: Leverage (*LEVERAGE*) is defined as total debt divided by total assets and proxies for financial distress. Firm size (*SIZE*) is the natural logarithm of sales. Tangibility (*TANGIBILITY*) proxies for capital intensity and is measured by the total property, plant, and equipment divided by total assets. Cash holdings (*CASH_HOLDING*) is computed as the cash and short-term investments divided by total assets. We also control for economic conditions using Loss (*LOSS*), a dummy variable that is equal to one if earnings before extraordinary items in year *t* are negative, and zero otherwise. The regressions control for growth opportunities and profitability using the market-to-book ratio (*MTB*) and the return on asset ratio (*ROA*), respectively. We also include the volatility of return on assets (*SDROA*), defined as the standard deviation of *ROA* calculated over the preceding three years, including the current year. All regressions also include the aggregate ownership held by all types of institutional investors in the 13F database (denoted “*IO*”) to control for overall institutional investment. The variable *IO* captures the effect of dispersed institutional investors (i.e., diversified ownership).

Model specification

We estimate the relationship between institutional investors blockholders and investment efficiency using the following model.

$$\begin{aligned} INVT_INEFF_{it} = & \beta_0 + \beta_1 BLOCK_Proxy_{it} + \beta_2 IO_{it} + \\ & \beta_3 LEVERAGE_{it} + \beta_4 SIZE_{it} + \beta_5 TANGIBILITY_{it} + \\ & \beta_6 CASH_HOLDING_{it} + \beta_7 LOSS_{it} + \beta_8 MTB_{it} + \beta_9 ROA_{it} + \\ & \beta_{10} SDROA_{it} + Year_FE + Industry_FE + \varepsilon_{it} \end{aligned} \quad (2)$$

where *i* and *t* denote the firm and year, respectively. *INVT_INEFF_{it}* is the main proxy for investment inefficiency. It captures the deviation of actual investment from its optimal level. *BLOCK_DUM_{it}* / *BLOCK%_{it}* are the main proxies for institutional ownership. Following previous studies (Borochin and Yang, 2017; Harford *et al.*, 2018, and Ge *et al.*, 2021), we include the aggregate ownership held by all types of institutional investors to control for institutional ownership dispersion (*IO*) in our regression. Lastly, we control for a range

of firm characteristics that are deemed to affect investment efficiency in prior studies, including firm-level leverage (*LEVERAGE*), firm size (*SIZE*), tangibility ratio (*TANGIBILITY*), Financial slack (*CASH_HOLDING*), economic conditions (*LOSS*), growth opportunities (*MTB*), firms’ profitability (*ROA*), and the volatility of return on assets (*SDROA*). We also include industry and year dummies in all regressions. All continuous variables are winsorized at the 1% and 99% levels to mitigate the effect of outliers. We use generalized least squares (*GLS*) regression to account for heteroskedasticity and serial correlation².

Summary statistics

Table 1 (Panel A) presents the summary statistics of the variables used in the analysis. The main proxy for firm investment inefficiency is the absolute value of the residuals (*INVT_INEFF*). Panel A shows that the mean value for *INVT_INEFF* is 5.5%. The mean value of *Inv_Over* (*Inv_Under*) reflects that the level of over-investment (under-investment) on average represents 7,7% (–4,2%), suggesting that overinvestment is more prominent for French firms than the under-investment problem. The mean value of *BLOCK%* is 2.305, indicating that, on average, 2% of a firm’s outstanding shares are owned by institutional blockholders. Panel B shows that 20% of the sample firms are owned by at least one institutional Blockholder. Further, the institutional ownership percentage shows a high ownership level, with a mean of 10,7%. This table also shows that the average firm in our study is relatively highly indebted (a mean leverage ratio of 20.1%), profitable (*ROA*=3.5%), and with acceptable growth opportunities (the mean *MB* ratio is 1.967). Similarly, the mean values for *TANGIBILITY* and *CASH_HOLDING* are 0.162 and 0.155, respectively.

Table 1 (Panel C) reports the correlation matrix for the variables in the analysis. The correlations between the independent variables are moderately low, and the highest variance inflation factor value is 2.29. Therefore, multicollinearity is not likely to be a problem in our study.

Empirical evidence

Regression results

Our baseline regression results estimated using Equation (2) are presented in Table 2. In all models, our dependent variable is *INV_INEFF*. The first column of Table 2 reports the results without institutional blockholdings. According to this specification, the overall effect of institutional ownership on the absolute value of investment inefficiency (*INV_INEFF*) is statistically insignificant for the full sample. Columns 2 and 3 show the results of the two proxies for institutional ownership. In line with our main hypothesis (H1), we observe a negative and statistically significant impact of institutional blockholders on the magnitude of investment inefficiency, suggesting that higher institutional blockholdings curb inefficient investments. Our main results are also economically significant. For example, the coefficient in [Column (3)] shows that a one-standard-deviation increase in institutional blockholdings (*BLOCK%*) leads to a 5.4% decrease in *INV_INEFF* (calculated as $5.542 * -0.004 / 0.408$).

2. We use the Generalized Least Square (GLS) model as our main specification after conducting a number of formal tests:

- The Breusch Pagan and White General Heteroscedasticity tests show the presence of eteroscedasticity.
- The Lagrange-Multiplier test for serial correlation fails to reject the null hypothesis of no serial correlation.
- The different tests for normality (Skewness, Kurtosis, Jarque-Bera) indicate that there is a violation of the normal distribution assumption of error terms.

All assumptions of ordinary least squares (OLS) regression are violated, which make the GLS regression better suited to this study and should produce better results (Gujarati, 2002).

TABLE 1
Descriptive statistics and correlation matrix

Panel A: Descriptive statistics											
Variable	N	Mean	Standard deviation	5 th Percentile	Median	95 th Percentile					
<i>INVT_INEFF</i>	3796	0.055	0.408	0.002	0.025	0.156					
<i>NV_OVER</i>	1349	0.077	0.679	0.001	0.024	0.151					
<i>INV_UNDER</i>	2453	-0.042	0.069	-0.193	-0.025	-0.002					
<i>BLOCK%</i>	3796	2.305	5.542	0.000	0.000	13.34					
<i>IO</i>	3796	10.71	10.44	0.000	7.89	31.99					
<i>LEVERAGE</i>	3792	0.201	0.142	0.001	0.191	0.482					
<i>SIZE</i>	3787	5.988	2.236	2.339	5.773	10.186					
<i>TANGIBILITY</i>	3792	0.162	0.143	0.014	0.110	0.500					
<i>CASH_HOLDING</i>	3792	0.155	0.124	0.020	0.117	0.478					
<i>MTB</i>	3707	1.967	1.326	0.447	1.615	5.449					
<i>ROA</i>	3796	0.035	0.066	-0.149	0.044	0.137					
<i>SDROA</i>	3796	0.032	0.037	0.002	0.017	0.142					
Panel B: Frequency Tables for Dummy Variables Used in Our Models											
Variable	Value	Frequency	Percent								
<i>BLOCK_DUM</i>	0	3,019	79.53								
	1	777	20.47								
<i>LOSS</i>	0	2,928	80.28								
	1	678	18.80								
Panel C: Pearson correlation matrix											
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) <i>INVT_INEFF</i>	1										
(2) <i>BLOCK%</i>	-0.013	1									
(3) <i>IO</i>	-0.003	0.526***	1								
(4) <i>LEVERAGE</i>	0.022	0.003	0.130***	1							
(5) <i>SIZE</i>	-0.055***	-0.071***	0.452***	0.305***	1						
(6) <i>TANGIBILITY</i>	0.032	-0.004	0.014	0.318***	0.222***	1					
(7) <i>CASH_HOLDING</i>	-0.007	0.049***	-0.042***	-0.449***	-0.332***	-0.267***	1				
(8) <i>LOSS</i>	-0.016	0.024	-0.098***	0.050***	-0.269***	-0.041	0.114***	1			
(9) <i>MTB</i>	0.032	-0.068***	0.070***	-0.141***	-0.069***	-0.159***	0.235***	-0.054	1		
(10) <i>ROA</i>	0.014	-0.024	0.076***	-0.117***	0.213***	0.040	-0.033	-0.725***	0.173***	1	
(11) <i>SDROA</i>	-0.019	0.000	-0.160***	-0.121***	-0.408***	-0.167***	0.225***	0.452***	0.094***	-0.425***	1
VIF_TEST		1.74	2.22	1.40	2.00	1.17	1.41	2.22	1.17	2.29	1.48

Notes: This table reports descriptive statistics (Panel A, B) and Pearson correlation matrix (Panel C) for the variables included in the baseline regressions. The sample includes 283 French-listed firms over 2002-2016.

These findings further confirm that the positive relationship between the aggregate institutional holdings (IO) and investment inefficiency in Model (1) is driven by non-blockholders institutional investors.

As for control variables, firm size has a negative and statistically significant coefficient, showing that large firms tend to make more efficient investment decisions. However, the *MTB*, *TANGIBILITY*, and *LEVERAGE* coefficients are positive and statistically significant. These results suggest that investment inefficiency is more prevalent among firms with high growth opportunities, more tangible assets, and high leverage. These findings are consistent with previous studies on investment efficiency (e.g., Benlemlih and Bitar, 2018; Gomariz and Ballesta, 2014).

To better understand the impact of institutional investors on investment decisions, we separately investigate whether institutional blockholders mitigate over- or under-investment. We define overinvesting firms as those with positive residuals from Equation (2) (i.e., actual investment greater than expected level

of investment.) and underinvesting firms as those with negative residuals (i.e., actual investment less than expected level of investment). Higher values of *INV_OVER* or *INV_UNDER* are associated with higher degrees of investment inefficiency. We re-estimate our baseline regression for both subsamples and report the results in Table 2 (Column [4-7]). The empirical results show that institutional blockholders are significantly and negatively related to overinvestment (Column [4-5]), while they do not significantly impact the likelihood of underinvestment (Column [6-7]). We provide evidence that large institutional investors only improve the investment efficiency of overinvested firms. Consistent with findings from previous literature (Chen *et al.*, 2017; Cao *et al.*, 2020; Choi *et al.*, 2020), institutional ownership acts as a disciplinary force and reduce managerial overinvestment behavior “empire building”, which is only possible through reckless investment in negative NPV projects, as suggested by Jensen (1986).

Therefore, consistent with the monitoring view, our evidence suggest that the severity of agency costs is one path through which institutional blockholders improve investment efficiency. Such effects are stronger for overinvested firms that are more susceptible to moral hazard (e.g., empire building) compared with firms facing underinvestment problems. Additionally, in cases of underinvestment, firms forego some profitable projects that actually promise profits due to various constraints, such as asymmetric information and credit constraints. These impacts can cause a loss of opportunities, but does not necessarily lead to a waste of capital.

investment decisions than their short-term counterparts because optimal choices may not bring short-term benefits but should be reflected in stock prices over the long term (Gaspar *et al.* 2005 and Chen *et al.* 2007).

Regarding institutional blockholders' national origins, consistent with our hypothesis (H3), we find that corporate investment inefficiency and overinvestment problems decrease significantly with the intensity of monitoring by both foreign and domestic institutional blockholders. This finding suggests that foreign and domestic institutional monitoring influence firms' investment policies and help mitigate the agency conflicts associated with Investments (Aggarwal *et al.*, 2011; Liu *et al.*, 2018).

TABLE 2
Institutional blockholders and investment inefficiency: main evidence

Variables	Inefficient Investment						
	Without BLOCK	Full Model		INV_OVER		INV_UNDER	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
BLOCK_DUM		-0.049** [-2.54]			-0.125** [-2.58]		-0.001 [-0.47]
BLOCK%			-0.004*** [-3.06]	-0.012*** [-2.82]		0.000 [0.42]	
IO	0.0009 [1.36]	0.218** [2.53]	0.002*** [3.01]	0.007*** [2.87]	0.679*** [2.60]	0.000 [0.88]	0.024 [1.59]
LEVERAGE	0.095* [1.73]	0.094* [1.71]	0.097* [1.77]	0.172 [1.13]	0.172 [1.13]	-0.011 [-1.16]	-0.011 [-1.14]
SIZE	-0.019*** [-5.14]	-0.023*** [-5.70]	-0.024*** [-5.95]	-0.067*** [-5.75]	-0.064*** [-5.59]	0.000 [0.26]	0.000 [-0.08]
TANGIBILITY	0.115** [2.34]	0.122** [2.47]	0.124** [2.51]	0.292** [2.15]	0.285** [2.09]	0.011 [0.99]	0.011 [1.02]
CASH_HOLDING	-0.048 [-0.76]	-0.056 [-0.89]	-0.050 [-0.79]	-0.140 [-0.74]	-0.144 [-0.76]	-0.008 [-0.77]	-0.008 [-0.79]
LOSS	-0.015 [-0.59]	-0.015 [-0.60]	-0.014 [-0.57]	-0.013 [-0.19]	-0.015 [-0.21]	0.009** [2.12]	0.009** [2.13]
MTB	0.013** [2.50]	0.011** [2.05]	0.010** [1.97]	0.028* [1.88]	0.027* [1.85]	0.000 [0.76]	0.000 [0.63]
ROA	0.065 [0.42]	0.065 [0.42]	0.071 [0.46]	0.313 [0.69]	0.290 [0.64]	0.027 [1.01]	0.027 [1.02]
SDROA	-0.315 [-1.42]	-0.342 [-1.54]	-0.340 [-1.53]	-1.315** [-2.03]	-1.298** [-2.01]	-0.087** [-2.22]	-0.088** [-2.24]
Constant	0.109** [2.13]	0.127** [2.45]	0.129** [2.49]	0.224 [1.61]	0.221 [1.59]	-0.066*** [-6.85]	-0.065*** [-6.76]
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	3523	3523	3523	1271	1271	2258	2258
Chi-sq	120.92***	127.58***	130.59***	82.53***	80.58***	1186.52***	1186.59***

Notes: This table presents the regression results. The dependent variable is the inefficiency of investment (*INV_INEFF*), measured as the deviation of the actual investment from the optimal investment level estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms over 2002-2016. *, **, *** denote significance at 10%, 5% and 1% threshold levels, respectively. The Z-statistics are given in parentheses.

Table 3 reports the results of testing the effect of investor horizon and country origins on firm investment efficiency. As expected, the coefficients of *LONG_IO* are significant with an expected negative sign at the 1% level, while the coefficient of *SHORT_IO* is insignificant at any conventional level [Columns [1-2]]. The above results are consistent with H2, suggesting that the monitoring of the long-term institutional blockholders improves investment efficiency by reducing overinvestment. Our results support the view that dedicated institutional investors have a greater influence on corporate

TABLE 3
Institutional investor heterogeneity and investment inefficiency

Variables	LONG_IO vs SHORT_IO			FOREIGN vs DOMESTIC		
	<i>INV_INEFF</i>	<i>INV_OVER</i>	<i>INV_UNDER</i>	<i>INV_INEFF</i>	<i>INV_OVER</i>	<i>INV_UNDER</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>LONG_IO</i>	-0.005*** [-2.91]	-0.013*** [-2.63]	0.000 [0.02]			
<i>SHORT_IO</i>	-0.004 [-0.64]	-0.004 [-0.21]	-0.000 [-0.20]			
<i>FOREIGN</i>				-0.005** [-2.36]	-0.010* [-1.92]	-0.000 [-0.34]
<i>DOMESTIC</i>				-0.005** [-2.50]	-0.018** [-2.57]	0.000 [0.22]
<i>IO</i>	0.002*** [2.92]	0.007*** [2.69]	0.000 [1.19]	0.002*** [3.00]	0.007*** [2.83]	0.000 [1.21]
<i>LEVERAGE</i>	0.103* [1.88]	0.177 [1.16]	-0.011 [-1.13]	0.098* [1.80]	0.177 [1.16]	-0.011 [-1.11]
<i>SIZE</i>	-0.024*** [-5.89]	-0.065*** [-5.64]	0.000 [0.07]	-0.024*** [-5.94]	-0.067*** [-5.80]	0.000 [0.07]
<i>TANGIBILITY</i>	0.119** [2.41]	0.294** [2.16]	0.011 [1.02]	0.122** [2.48]	0.300** [2.20]	0.011 [0.99]
<i>CASH_HOLDING</i>	-0.050 [-0.79]	-0.133 [-0.70]	-0.008 [-0.77]	-0.051 [-0.81]	-0.136 [-0.72]	-0.008 [-0.79]
<i>LOSS</i>	-0.016 [-0.65]	-0.022 [-0.30]	0.009** [2.13]	-0.015 [-0.62]	-0.024 [-0.34]	0.009** [2.12]
<i>MTB</i>	0.011** [2.01]	0.028* [1.88]	0.000 [0.69]	0.010** [1.98]	0.027* [1.83]	0.000 [0.72]
<i>ROA</i>	0.063 [0.41]	0.271 [0.59]	0.027 [1.02]	0.072 [0.46]	0.261 [0.57]	0.027 [1.02]
<i>SDROA</i>	-0.344 [-1.55]	-1.315** [-2.03]	-0.087** [-2.23]	-0.341 [-1.53]	-1.372** [-2.12]	-0.087** [-2.23]
Constant	0.126** [2.43]	0.211 [1.52]	-0.065*** [-6.81]	0.127** [2.46]	0.225 [1.62]	-0.065*** [-6.82]
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	3523	1271	2258	3523	1271	2258
Chi-sq	129.44***	81.40***	1186.32***	130.54***	83.41***	1186.62***

Notes: This table presents the regression results of the effect of Institutional investor heterogeneity on investment inefficiency. The dependent variable is the inefficiency of investment (*INV_INEFF*), measured as the deviation of the actual investment from the optimal investment level estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms over 2002-2016. *, **, *** denote significance at 10%, 5% and 1% threshold levels, respectively. The Z-statistics are given in parentheses.

Robustness tests

This section performs several sensitivity tests to confirm the validity of our findings and further address the potential endogeneity problems.

Endogeneity bias

Although our results thus far support a negative relation between institutional blockholdings and investment efficiency, they could be driven by the endogeneity problem. To alleviate this concern, we used three different approaches.

First, we consider the generalized method of moments (GMM) approach proposed by Arellano and Bover (1995) and modified by Blundell and Bond (1998), which instruments all explanatory variables with their past lags. The GMM analysis offers valid instruments that address unobserved heterogeneity and simultaneity. A major advantage of this approach is that it allows explicit control for lagged values of the *INVT_INEFF*. In addition, we conduct the Hansen test of over-identifying constraints and the Arellano-Bond test for autocorrelation to validate the results obtained from GMM estimation. The findings shown in [Columns 1–2] of Table 4 suggest that the instruments used are valid (confirmed (AR (2) p-value and the Hansen test). Our inferences remain similar for all the institutional blockholders measures. In columns [1–2], we find that *BLOCK_DUM* and *BLOCK%* significantly negatively affect *INVT_INEFF*, meaning that higher institutional blockholdings lessen the overall absolute value of corporate investment inefficiency. Overall, the results confirm the validity of the GMM approach and provide further reassurance that the endogeneity concerns do not mar our results.

Second, we apply the propensity score matching analysis (PSM) technique to ensure that confounding effects due to observable covariates do not drive our findings. More precisely, we identify a control sample of firms without institutional blockholders (control firms) but with similar characteristics to those that are block-held (i.e., with at least one institution blockholding more than 5% of the firm outstanding shares) (treated firms). Then, we estimate the propensity score of each observation being treated through a probit model that regresses *BLOCK_DUM* on all control variables in our baseline regression (2), except *IO*. We perform a one-to-one nearest neighbor matching procedure without replacement using the propensity scores, with a maximum distance of 1%. The PSM technique results in a matched sample of 1472 firm-year observations. The results, reported in Table 4 [Columns 3–4], show a negative relationship between institutional blockholdings and investment inefficiency, consistent with our previous results.

In the third approach, we re-estimate our main regression using residual institutional ownership as the explanatory variable (Ramalingegowda and Yu, 2012). Previous research has shown that institutional ownership is endogenously influenced by various firm-level characteristics, including size, information environment, and investment opportunities (Gompers and Metrick, 2001). Since these economic factors also affect investment efficiency, they can lead to a spurious relationship between firm investment efficiency and institutional ownership (Ramalingegowda and Yu 2012). Following Gompers and Metrick (2001), we estimate the residual institutional ownership using Fama–Mac Beth annual cross-sectional regressions. More specifically, we run the following model:

$$BLOCK\%_{i,t} = \beta_0 + \beta_1 BTM_{i,t-1} + \beta_2 MV_{i,t} + \beta_3 Turnover_{i,t} + \beta_4 Price_{i,t} + \beta_5 CAC40_{i,t} + \beta_6 Yield_{i,t-1} + \beta_7 Spread_{i,t-1} + \varepsilon_{it}$$

where *BLOCK%*_{*i,t*} is the percentage ownership by institutional blockholders over the year *t*. *BTM*_{*i,t-1*} is the book-to-market ratio at the beginning of the fiscal year. *MV*_{*i,t*} is the market value of equity at the end year; *Turnover*_{*i,t*} defined as the average daily trading volume at the beginning of the fiscal year divided by the number of ordinary shares outstanding; *Price*_{*i,t*} is the share price at the end of the year *t*; *CAC40*_{*i,t*} is a dummy indicator equal to one if the firm is included in the CAC40 index at the end of the year *t* and zero otherwise; *Yield*_{*i,t-1*} is the dividend yield, calculated as cash dividend divided by share price; *Spread*_{*i,t-1*} is the average daily bid-ask spread at the beginning of the fiscal year.

Then, to further test whether the reverse causality exists, we perform a lead-lagged relationship between investment efficiency and institutional blockholders. In the spirit of Ramalingegowda and Yu (2012), we examine how the level of investment efficiency is related to lagged, current, and lead residual ownership by institutional blockholders by adding lagged and lead residual ownership into the baseline regression model in Eq. (2): The results are reported in [Column (5)] of Table 4. Interestingly, the coefficients on lagged residual institutional blockholdings (*BLOCKS' RESIDUAL*_{*i,t-1*}) are strongly negative and significant at the 5% level. In contrast, the coefficient estimates on *BLOCKS' RESIDUAL*_{*i,t+1*} are not statistically significant, indicating that reverse causality is far from being a plausible explanation for our findings. This evidence confirms that higher institutional ownership improves firm investment efficiency, not vice versa.

TABLE 4
Endogeneity concern

Variables	Dependent Variable = INVT_INEFF				Causality test
	GMM Regression		PSM sample		
	(1)	(2)	(3)	(4)	
<i>BLOCK_DUM</i>	-0.635*** [-3.90]		-0.079*** [-2.14]		
<i>BLOCK%</i>		-0.081*** [-5.40]		-0.007*** [-2.57]	
<i>BLOCKS' RESIDUAL</i> _{<i>i,t-1</i>}					-0.036** [-2.13]
<i>BLOCKS' RESIDUAL</i> _{<i>i,t</i>}					-0.042** [-2.43]
<i>BLOCKS' RESIDUAL</i> _{<i>i,t+1</i>}					-0.026 [-1.60]
<i>IO</i>	0.030*** (2.84)	0.061*** (4.66)	0.002 (1.27)	0.004* (1.90)	-0.0002*** [-3.11]
<i>LEVERAGE</i>	0.550 (0.98)	0.823 (1.50)	0.167 (1.31)	0.179 (1.41)	0.014*** (3.22)
<i>SIZE</i>	-0.455*** [-13.84]	-0.492*** [-14.57]	-0.039*** [-4.08]	-0.045*** [-4.37]	-0.001*** [-3.49]
<i>TANGIBILITY</i>	1.247* (1.78)	1.024 (1.53)	0.198* (1.80)	0.203* (1.84)	0.028*** (4.34)
<i>CASH_HOLDING</i>	-2.028*** [-5.46]	-3.079*** [-8.69]	-0.090 [-0.61]	-0.069 [-0.47]	-0.003 [-0.49]
<i>LOSS</i>	-0.061 [-0.54]	0.104 (0.89)	-0.018 [-0.32]	-0.017 [-0.30]	-0.012*** [-4.88]
<i>MTB</i>	-0.010 [-0.25]	-0.082* [-1.78]	0.027 (1.79)	0.024 (1.59)	0.000 (1.44)
<i>ROA</i>	2.186*** (2.60)	3.030*** (3.62)	0.142 (0.39)	0.155 (0.43)	-0.042*** [-2.91]
<i>SDROA</i>	-3.414** [-2.10]	-4.226*** [-3.00]	-0.692 [-1.28]	-0.698 [-1.29]	0.043** (1.99)
<i>Constant</i>	3.386*** (3.82)	2.450** (2.48)	0.182 (1.36)	-1.715 [-0.69]	0.020*** (4.37)
Hansen test (p-value)	48.84 (0.993)	57.25 (0.947)			
AR (1) test (p-value)	-4.00 (0.000)	-4.38 (0.000)			
AR (2) test (p-value)	0.22 (0.829)	-0.84 (0.400)			
Sample size	3296	3296	1472	1472	886
Chi-sq (F-value)	4364.51***	5520.55***	2.14***	2.21***	508.27***

Notes: This table presents the results of testing the endogeneity concern. The dependent variable is the inefficiency of investment (*INVT_INEFF*), measured as the deviation of the actual investment from the optimal investment level estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms over 2002–2016. *, **, *** denote significance at the 10%, 5% and 1% threshold levels, respectively. t-statistics are given in parentheses.

Additional robustness tests

To further assess the quality of our results, we perform additional robustness tests and the results are shown in Table 5. First, we test the robustness of our main results to the possible non-linear relationship between institutional blockholdings and investment efficiency. We rerun our main regression by including a squared term for institutional blockholdings ($BLOCK\%_C^2$) in Eq. 2. Since there is a strong correlation between the $BLOCK\%$ and its squared term, the latter was centered by subtracting the mean from each value to reduce multicollinearity issues in our regression (Rupert 2004). As expected, the squared term $BLOCK\%_C^2$ is insignificant [see Column (1)]. In contrast, the sign of institutional blockholders is always negative and statistically significant. This is interesting, as it suggests simply that the nonlinearity is almost undetectable.

TABLE 5 Testing the nonlinear relation	
Variables	Dependent Variable = INVT_INEFF
	(1)
$BLOCK\%_C$	-0.005** (-2.19)
$BLOCK\%_C^2$	0.000 (0.55)
IO	0.002*** (3.04)
$LEVERAGE$	0.097* (1.77)
$SIZE$	-0.025*** (-5.97)
$TANGIBILITY$	0.124** (2.51)
$CASH_HOLDING$	-0.052 (-0.82)
$LOSS$	-0.014 (-0.57)
MTB	0.010* (1.93)
ROA	0.072 (0.47)
$SDROA$	-0.346 (-1.55)
Constant	0.118** (2.30)
Year_FE	Yes
Industry_FE	Yes
Sample size	3523
Chi-sq	130.90***

Notes: This table presents the results of testing the nonlinear relation between institutional blockholdings and investment efficiency. The dependent variable is the inefficiency of investment ($INVT_INEFF$), measured as the deviation of the actual investment from the optimal investment level estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms over 2002-2016. *, **, *** denote significance at the 10%, 5% and 1% threshold levels, respectively. t-statistics are given in parentheses.

We conduct three sensitivity tests related to our measurement of investment efficiency. First, we re-estimate the expected level of investment using an expanded model based on Chen *et al.*, (2011).

According to the authors, the relationship between investment and sales growth could differ in the case of positive or negative growth. Hence, the previous year's sales growth determines the expected investment level. We augment Equation (1) with the product of $SalesGrowth$ and dummy variable (NEG) that equals one for negative sales growth and zero otherwise.

$$Investment_{i,t} = \beta_0 + \beta_1 SalesGrowth_{i,t-1} + \beta_2 NEG_{i,t-1} + \beta_3 NEG_{i,t-1} * SalesGrowth_{i,t-1} + \varepsilon_{it} \quad (3)$$

The deviations from the model, as reflected in the error term of the investment model, represent investment inefficiency ($INVE2$). We use the absolute value of these residuals as a firm-specific proxy for investment inefficiency. The results of estimating Equation (2) using this investment efficiency proxy are similar to those reported earlier. As shown in Table 6 (Columns [1-2]), the coefficients of $BLOCK_DUM$ and $BLOCK\%$ are negative and statistically significant, indicating that firms with higher institutional block ownership exhibit lower investment inefficiency.

As our second test, we measure investment efficiency ($INEFF3$) according to the model provided by Richardson (2006). The authors modeled suboptimal investment at firm level using Tobin's Q to represent investment opportunities. In their model, they also control for other factors that may affect investment decisions, including leverage, lagged cash holdings, firm age, firm size, lagged stock returns, the previous period's investment, and year and industry dummies as follows:

$$Total\ Investment_{i,t} = \beta_0 + \beta_1 Q_{i,t-1} + \beta_2 Lev_{i,t-1} + \beta_3 Cash_{i,t-1} + \beta_4 Age_{i,t-1} + \beta_5 Size_{i,t-1} + \beta_6 Ret_{i,t-1} + \beta_7 Total\ Investment_{i,t-1} + Year_FE + Industry_FE + \varepsilon_{it} \quad (4)$$

Where total Investment is computed as the sum of capital expenditure including intangible assets, and acquisition expenditures, less cash receipts from asset sales, scaled by lagged total assets (Biddle *et al.*, 2009). The results, reported in columns (3) – (4) of Table 6, are similar to those of the main test specifications, and no inferences are affected.

Furthermore, following (Biddle *et al.*, 2009), we re-estimate our baseline model (1) using $Total\ investment$. The regression residuals are then used as our proxies for firm-specific inefficient investment. Results reported in Table 6 (Columns [5-6]) indicate that the association between institutional blockholders and investment efficiency are significantly negative. The conclusion is qualitatively the same as before. Thus, adding acquisitions expenditures to the investment variable does not alter our results

Thirdly, we examine whether our findings hold for alternative measures of concentrated institutional investors' holdings. Following Hartzell and Starks (2003) and Borochin and Yang (2017), we employ the Herfindahl index of institutional ownership (HHL_IO) as a proxy for ownership concentration. The results in Table 7 (Column [1]) show a negative relationship between ownership concentration and investment inefficiency, suggesting that our main findings are not driven by a particular measure of block ownership.

An alternative specification is tested, replacing institutional blockholdings with institutional investor cross-holding. It is generally agreed that institutional cross-ownership within the same industry would impose greater peer pressure on managers, leading to sufficient monitoring benefits (Edmans *et al.*, 2019; Bai *et al.*, 2023)). Institutional cross-ownership is measured as the proportion of shares held by all institutional cross-owners for a firm every year. We define a common owner as an institutional investor who holds significant stakes (at least 5% ownership) in multiple firms in a four-digit Standard Industrial Classification (SIC) industry (Fu and Qin, 2021; Gao *et al.*, 2019; He and Huang, 2017). The results reported in Table 7 (Column [2]) show that firms cross-held by institutional investors make better investment decisions.

TABLE 6
Alternative proxies for investment efficiency

Variables	Alternative dep. variables: INEFF_2		Alternative dep. variables: INEFF_3		Alternative Investment measures: <i>Total Investment</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>(6) BLOCK_DUM</i>	-0.048** [-2.46]		-0.010*** [-3.47]		-0.012*** [-3.23]	
<i>BLOCK%</i>		-0.004*** [-2.96]		-0.001*** [-4.76]		-0.001*** [-3.47]
<i>IO</i>	0.197** [2.29]	0.002*** [2.78]	0.0006*** [4.31]	0.0008*** [4.99]	0.0006*** [3.60]	0.0008*** [3.94]
<i>LEVERAGE</i>	0.084 [1.55]	0.087 [1.59]	0.037*** [4.22]	0.039*** [4.49]	0.044*** [4.08]	0.044*** [4.10]
<i>SIZE</i>	-0.021*** [-5.23]	-0.022*** [-5.48]	-0.002*** [-3.59]	-0.003*** [-4.21]	-0.005*** [-6.27]	-0.006*** [-6.56]
<i>TANGIBILITY</i>	0.120** [2.44]	0.122** [2.47]	-0.009 [-1.14]	-0.008 [-1.03]	-0.023*** [-2.29]	-0.019 [-1.97]
<i>CASH_HOLDING</i>	-0.055 [-0.87]	-0.048 [-0.77]	0.002 [0.30]	0.001 [0.16]	-0.015 [-1.32]	-0.014 [-1.26]
<i>LOSS</i>	-0.016 [-0.65]	-0.015 [-0.62]	0.002 [0.50]	0.001 [0.47]	-0.001 [-0.39]	-0.002 [-0.51]
<i>MTB</i>	0.012** [2.20]	0.011** [2.11]	0.002*** [2.80]	0.002** [2.56]	0.002** [2.12]	0.002** [2.25]
<i>ROA</i>	0.061 [0.40]	0.067 [0.43]	0.065** [2.45]	0.064** [2.53]	0.005 [0.19]	0.004 [0.13]
<i>SDROA</i>	-0.411* [-1.85]	-0.409* [-1.84]	0.130*** [3.35]	0.126*** [3.36]	0.108** [2.33]	0.103** [2.26]
Constant	0.122** [2.36]	0.124** [2.40]	-0.002 [-0.34]	-0.0005 [-0.07]	0.025** [2.49]	0.026 [2.62]
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	3501	3501	3521	3521	3523	3523
Chi-sq	125.95***	128.77***	475.23***	491.51***	525.92***	524.16***

Notes: This table presents the results of additional robustness tests using alternative measurements for investments and investment efficiency. In Columns (1) and (2), investment inefficiency is calculated by using the model of Chen *et al.*, [2011]. In Columns (3) and (4), investment efficiency is estimated following Richardson [2006]. In Columns (5) and (6), investment inefficiency is calculated by using the model of Biddle *et al.*, [2009] where the total investment investment defined as the sum of capital expenditure including intangible assets, and acquisition expenditures, less cash receipts from asset sales, scaled by lagged total assets. The sample includes 283 French-listed firms over 2002-2016. *, **, *** denote significance at the 10%, 5% and 1% threshold levels, respectively. t-statistics are given in parentheses.

TABLE 7
Alternative proxies for Institutional Blockholdings

Variables	Dependent Variable = INVT_INEFF	
	(4)	(5)
<i>HHI_IO</i>	-0.136*** [-4.28]	
<i>CROSS_BLOCK</i>		-0.004** [-2.13]
<i>IO</i>	0.000 [0.15]	0.001** [2.24]
<i>LEVERAGE</i>	0.109* [1.83]	0.101* [1.85]
<i>SIZE</i>	-0.031*** [-6.71]	-0.022*** [-5.54]
<i>TANGIBILITY</i>	0.117** [2.21]	0.115** [2.34]
<i>CASH_HOLDING</i>	-0.102 [-1.48]	-0.046 [-0.74]
<i>LOSS</i>	-0.013 [-0.50]	-0.015 [-0.60]
<i>MTB</i>	0.008 [1.44]	0.012** [2.33]

TABLE 7
Alternative proxies for Institutional Blockholdings

Variables	Dependent Variable = INVT_INEFF	
	(4)	(5)
<i>ROA</i>	0.103 [0.60]	0.068 [0.44]
<i>SDROA</i>	-0.355 [-1.42]	-0.324 [-1.46]
Constant	0.241*** [3.90]	0.116** [2.25]
Year_FE	Yes	Yes
Industry_FE	Yes	Yes
Sample size	3277	3523
Chi-sq	135.12***	125.63***

Notes: This table presents the results of testing alternative proxies for Institutional Blockholdings. The dependent variable is the inefficiency of investment (*INVT_INEFF*), measured as the deviation of the actual investment from the optimal investment level estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms over 2002-2016. *, **, *** denote significance at the 10%, 5% and 1% threshold levels, respectively. t-statistics are given in parentheses.

Finally, we test the reliability of our findings with other regression settings. The results are reported in Table 8. More specifically, we re-estimate Equation (2) using Fama Mac-Beth (1973) method to compute standard errors and mitigate cross-sectional dependence concerns (Columns [1-2]), (2) Newey–West specifications to account for the serial correlation of standard errors (Columns [3-4]), and (3) an ordinary least squares regression with robust standard errors clustered by the firm and year levels to control for cross-sectional and time-series dependence (Columns [5-6]). The estimated coefficient on *BLOCK_DUM* and *BLOCK%* loads significantly negatively on investment inefficiency in all these regressions, suggesting that our findings are robust to using different estimation methods.

Additional analysis

Does the severity of information asymmetries and agency problems matter?

One would expect that the severity of information asymmetry and agency problems indeed matters in altering the relation between the presence of institutional blockholders and corporate investment efficiency. Previous research argues that firms suffering from adverse selection and moral hazards exhibit more deviation from

the optimal level of investment and are more vulnerable to inefficient investment (Jensen and Meckling, 1976; Myers and Majluf, 1984). Recent studies stress that high-quality financial information is associated with high investment efficiency (Biddle *et al.*, 2009; Gomariz and Ballesta, 2014). In particular, private information acquisition and interpretation by financial analysts (Chen *et al.*, 2017b; Choi *et al.*, 2020), institutional investors (Cao *et al.*, 2020), and foreign investors (Chen *et al.*, 2017a) are shown to improve investment efficiency by mitigating information asymmetry. In this vein, Ajinkya *et al.* (2005) further report that firms with higher institutional ownership are more inclined to issue management forecasts and provide better disclosure. Furthermore, Rajkovic (2020) reports that the presence of a lead independent director on the corporate board is associated with higher investment efficiency. Such effects are stronger for firms with weaker corporate governance standards, lower financial disclosure, and greater financial constraint. In a similar vein, Chen *et al.* (2017) find that high-quality forecast increases firm-level investment efficiency, particularly in firms with higher information asymmetry and lower institutional stock ownership. Jiang *et al.* (2018) document that multiple large shareholders improve the efficiency of firms' investment decisions and this positive effect is more pronounced in firms with poor governance and greater information asymmetry.

TABLE 8
Alternative regression frameworks

Variables	Dependent Variable = <i>INVT_INEFF</i>					
	Fama Mac-Beth (1973)		Newey-West		Cluster effect	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>BLOCK_DUM</i>	-0.042* (-2.00)		-0.049* (-1.73)		-0.049* (-1.73)	
<i>BLOCK%</i>		-0.004** (-2.16)		-0.004* (-1.78)		-0.004* (-1.78)
<i>IO</i>	0.002* (2.02)	0.002** (2.12)	0.002* (1.64)	0.002* (1.70)	0.002* (1.64)	0.002* (1.70)
<i>LEVERAGE</i>	0.092* (1.77)	0.091* (1.74)	0.094* (1.70)	0.097* (1.70)	0.094* (1.70)	0.097* (1.70)
<i>SIZE</i>	-0.023** (-2.19)	-0.025** (-2.20)	-0.023* (-1.86)	-0.024* (-1.86)	-0.023* (-1.86)	-0.024* (-1.86)
<i>TANGIBILITY</i>	0.113*** (3.02)	0.115*** (3.08)	0.122** (2.26)	0.124** (2.26)	0.122** (2.26)	0.124** (2.26)
<i>CASH_HOLDING</i>	-0.054** (-2.60)	-0.047** (-2.77)	-0.056** (-2.04)	-0.050** (-1.99)	-0.056** (-2.04)	-0.050** (-1.99)
<i>LOSS</i>	-0.007 (-1.64)	-0.002 (-0.98)	-0.015* (-1.77)	-0.014* (-1.75)	-0.015* (-1.77)	-0.014 (-1.75)
<i>MTB</i>	0.012** (2.83)	0.011** (2.79)	0.011** (2.13)	0.010** (2.12)	0.011** (2.13)	0.010** (2.12)
<i>ROA</i>	0.104 (2.17)	0.111** (2.17)	0.065 (1.46)	0.071 (1.52)	0.065* (1.46)	0.071 (1.52)
<i>SDROA</i>	-0.446 (-1.58)	-0.472 (-1.56)	-0.342 (-1.34)	-0.340 (-1.34)	-0.342 (-1.34)	-0.340 (-1.34)
Constant	0.017 (1.16)	0.005* (1.97)	0.127*** (2.92)	0.129*** (2.91)	0.127** (2.92)	0.129** (2.91)
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	3523	3523	3523	3523	3,523	3,523
F-value	45.02***	42.37***	7.83***	7.46***	7.83***	7.46***

Notes: This table presents the results of testing Alternative regression frameworks. The dependent variable is the inefficiency of investment (*INV_INEFF*), measured as the deviation of the actual investment from the optimal investment level estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms over 2002-2016. *, **, *** denote significance at the 10%, 5% and 1% threshold levels, respectively. t-statistics are given in parentheses.

Based on this reasoning, if institutional blockholders engage in monitoring activities, their governance role is expected to be stronger in firms facing greater information asymmetry and those with higher expropriation risk (e.g., firms with higher free cash flow levels or weak internal governance mechanisms). Accordingly, we expect the negative relationship to be more pronounced in firms facing greater information asymmetry and agency problems.

To investigate this hypothesis, we first measure information asymmetry using analyst coverage (*COV*), analyst forecast errors (*Error*), and bid-ask spreads (*Spread*). Analyst coverage is from the IBES database and is defined as the number of analysts following a firm in a given year. Higher analyst coverage reflects low information asymmetry (Lang and Lundholm, 1996). *Error* is a proxy for information opacity. Forecast errors indicate a lack of precise information that helps analysts provide accurate and less biased forecasts. It is calculated as the absolute value of the difference between the actual and the forecasted earnings per share (*EPS*) deflated by stock Price. The higher the forecast error, the higher the information asymmetry between insiders and outsiders. The bid-ask spread (*Spread*) is another measure of information opacity, calculated by annually averaging the ratio of the daily bid-ask spread to the closing price. A high level of bid-ask spread indicates a poor information environment. We partition our sample into high (low) information asymmetry groups based on the median value of these variables and then perform the regressions in Equation (2) for these subsamples.

We report the results of our subsample analysis in Table 9. The findings show a significant negative effect of institutional blockholders on investment inefficiency only for companies facing greater

information asymmetry as proxied by lower analyst following (*Analysts*) in Panel A), higher forecast error (*Error*) in Panel B, and higher bid-ask spreads (*Spread*) in Panel C.

Second, we examine whether the effect of institutional investors on investment efficiency depends on the severity of the agency problem. The first proxy for agency problems is the firm's free cash flow (*Free Cash Flow*). High free cash flows leave more room for agency problems, leading managers to over-invest in negative NPV projects (Jensen and Meckling, 1976; Jensen, 1986). Free cash flow (*FCF*) is measured as the income before extraordinary items plus depreciation expense divided by total assets. Higher FCF translate into higher agency problems. We use CEO duality as an additional proxy for agency problems (Jensen, 1993). According to Forker (1992), when the CEO is also chair of the board, the monitoring quality decreases and firms make inefficient investments. *CEO Duality* is a dummy variable that takes the value of one if the CEO is also the board's chair and zero otherwise. We partition our sample into high (low) agency problems based on FCF and CEO duality, respectively. We then regress our main model for these subsamples and present the estimation results in Table 10. The results show that the negative impact of institutional blockholders on investment inefficiency prevails only among firms that face high agency problems, as captured by high free cash flows (Panel A) and the presence of CEO duality (Panel B).

Overall, our findings support the previously reported findings, and we find strong evidence that institutional blockholders lead to significantly lower investment inefficiencies. The negative relationship identified is mainly driven by long-term institutional ownership. Besides, foreign and domestic institutions reduce the extent of inefficiency in investments. We additionally demonstrate

TABLE 9
The effect of information asymmetry

Variables	Dependent Variable = INVT_INEFF							
	Panel A: Analyst coverage							
	Low Ac (1)	High AC (2)	Low Ac (3)	High AC (4)	Low Ac (5)	High AC (6)	Low Ac (7)	High AC (8)
<i>BLOCK_DUM</i>	-0.104** [-2.37]	-0.002 [-0.70]						
<i>BLOCK%</i>			-0.017*** [-4.06]	-0.000 [-1.09]				
<i>LONG_IO</i>					-0.016*** [-3.61]	-0.000 [-1.16]		
<i>SHORT_IO</i>					-0.016 [-1.54]	-0.000 [-0.07]		
<i>FOREIGN</i>							-0.013** [-2.44]	-0.000 [-0.54]
<i>DOMESTIC</i>							-0.017*** [-3.76]	-0.000 [-1.00]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	1610	1913	1610	1913	1610	1913	1610	1913
Chi-sq	92.56***	482.01***	104.02***	482.89***	100.99***	483.09***	102.44***	482.85***
Chow test	4.63 (0.000)		6.00 (0.000)		4.93 (0.000)		4.82 (0.000)	

TABLE 9
The effect of information asymmetry

Variables	Dependent Variable = <i>INVT_INEFF</i>							
	Panel B: Error							
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
<i>BLOCK_DUM</i>	0.001 (0.31)	-0.091** (-2.40)						
<i>BLOCK%</i>			-0.000 (-0.65)	-0.011*** (-3.48)				
<i>LONG_IO</i>					-0.000 (-0.35)	-0.007*** (-3.00)		
<i>SHORT_IO</i>					-0.000 (-0.11)	-0.003 (-0.39)		
<i>FOREIGN</i>							0.000 (1.01)	-0.007** (-2.57)
<i>DOMESTIC</i>							-0.000 (-0.94)	-0.007** (-2.41)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	960	1831	1692	1831	1692	2563	960	2563
Chi-sq	454.09***	94.74***	521.40***	101.36***	521.02***	106.28***	457.88***	107.24***
Chow test	1.13 (0.330)		1.09 (0.359)		1.00 (0.445)		0.964 (0.480)	
Variables	Panel C: Spread							
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
<i>BLOCK_DUM</i>	-0.002 (-0.50)	-0.091** (-2.40)						
<i>BLOCK%</i>			-0.000 (-0.65)	-0.011*** (-3.48)				
<i>LONG_IO</i>					-0.000 (-0.35)	-0.012*** (-3.35)		
<i>SHORT_IO</i>					-0.000 (-0.11)	-0.009 (-0.85)		
<i>FOREIGN</i>							-0.000 (-0.61)	-0.010** (-2.44)
<i>DOMESTIC</i>							-0.000 (-0.48)	-0.013*** (-3.11)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	1692	1831	1692	1831	1692	1831	1692	1831
Chi-sq	521.17***	94.74***	521.40***	101.36***	521.02***	100.58***	521.49***	100.99***
Chow test	3.93 (0.000)		4.35 (0.000)		3.78 (0.000)		3.82 (0.000)	

Notes: This table reports regression results on the impact of information asymmetry on the relation between institutional blockholdings and investment efficiency. In each specification, the dependent variable is the inefficiency of investment (*INVT_INEFF*), measured as the deviation of the actual investment from the optimal investment level, estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms covered over 2002–2016. *, **, *** denote significance at the 10%, 5% and 1% threshold levels, respectively. The Z-statistics are given in parentheses.

TABLE 10
The effect of agency problems

Variables	Dependent Variable = INVT_INEFF							
	Panel A: FCF							
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
<i>BLOCK_DUM</i>	-0.000 (-0.02)	-0.099*** (-2.62)						
<i>BLOCK%</i>			-0.000 (-0.15)	-0.008*** (-3.07)				
<i>LONG_IO</i>					-0.000 (-0.15)	-0.010*** (-3.03)		
<i>SHORT_IO</i>					-0.000 (-0.24)	-0.010 (-0.95)		
<i>FOREIGN</i>							0.000 (0.38)	-0.011*** (-2.77)
<i>DOMESTIC</i>							-0.000 (-0.19)	-0.009*** (-2.69)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	1717	1806	1717	1806	1717	1806	1717	1806
Chi-sq	454.26***	94.63***	454.29***	97.30***	454.35***	97.60***	454.35***	99.63***
Chow test	2.59 (0.000)		3.89 (0.000)		2.59 (0.000)		3.59 (0.000)	
Variables	Panel B: CEO Duality							
	The CEO is not the board chair	The CEO is the board chair	The CEO is not the board chair	The CEO is the board chair	The CEO is not the board chair	The CEO is the board chair	The CEO is not the board chair	The CEO is the board chair
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>BLOCK_DUM</i>	-0.002 (-0.48)	-0.082** (-2.41)						
<i>BLOCK%</i>			0.000 (0.43)	-0.008*** (-3.00)				
<i>LONG_IO</i>					0.000 (0.68)	-0.007*** (-2.66)		
<i>SHORT_IO</i>					0.004* (1.73)	-0.009 (-0.98)		
<i>FOREIGN</i>							-0.000 (-0.81)	-0.007** (-2.07)
<i>DOMESTIC</i>							0.000 (1.45)	-0.008** (-2.49)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	1493	2000	1493	2000	1493	2000	1493	2000
Chi-sq	375.39***	101.13***	375.33***	104.47***	375.34***	102.99***	379.35***	103.67***
Chow test	2.35 (0.006)		2.59 (0.002)		2.27 (0.007)		2.29 (0.006)	

Notes: This table reports regression results on the impact of agency problems on the relation between institutional blockholdings and investment efficiency. In each specification, the dependent variable is the inefficiency of investment (*INVT_INEFF*), measured as the deviation of the actual investment from the optimal investment level, estimated as a function of a firm's sales growth. The sample includes 283 French-listed firms covered over 2002-2016. *, **, *** denote significance at the 10%, 5% and 1% threshold levels, respectively. The Z-statistics are given in parentheses.

that the effect is more pronounced for firms facing more information asymmetry and agency problems, further supporting the monitoring view.

Conclusion

In this paper, we examine the effect of institutional blockholders on corporate investment efficiency in France using 3796 firm-year observations from 2002 to 2016. Firm-specific inefficient investment is defined as the deviation of actual investment from the expected level of investment estimated as a function of sales growth (Biddle *et al.*, 2009). Our empirical work adds several notable and interesting key findings to the existing literature. First, consistent with the monitoring effectiveness prediction, we provide evidence that institutional blockholders (shareholders with ownership $\geq 5\%$) improve investment efficiency by decreasing the magnitude of over-investment. This finding stands up to a range of robustness tests, including mitigating endogeneity concerns, using alternative proxies, and alternative regression frameworks. Second, among institutions with differing investment horizons, long-term investing institutions play a more important role in enhancing investment efficiency via their monitoring compared with short-term institutions. Finally, when we split institutional blockholdings into those held by domestic and foreign institutional investors, we provide evidence that both foreign and domestic institutions reduce the extent of inefficiency in investments. Third, in cross-sectional analysis, we also show that the role of institutional investors' monitoring in reducing investment inefficiency is stronger for firms with greater information asymmetry and higher agency problems, providing further empirical support for the mechanism driving our results.

Overall, our study's results support the evidence that institutional blockholders can reduce enterprise investment inefficiency through monitoring and activism (Chen *et al.*, 2017a; Cao *et al.*, 2020), leading to high firms' subsequent performance. We, therefore, identify a potential channel through which institutional blockholders can increase firm value in the French stock market. Our empirical evidence has practical implications for investors and policymakers. Consistent with the bright side of institutional investors, our results strongly suggest that monitoring by institutional blockholders can directly benefit investors in the form of more efficient investments. Thus, our findings should be of direct interest to investors and portfolio managers to identify potential investees with better investment efficiency. Moreover, the study offers practical implications for policymakers and financial market regulators in France, aiming to reform corporate governance practices. They should promote institutional investors' active participation, which comes with a better corporate investment environment.

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