Institutional Investors, Capital Structure, and Financial Turmoil: A European Cross-Country Study

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Abstract

This study examines the impact of institutional ownership on corporate financing decisions, particularly in the midst of financial turmoil. The dataset encompasses 8,049 firm-year observations from 1,138 non-financial firms listed in France, Germany, and the United Kingdom. The observation period ranges from January 2002 to December 2018. Employing a multiple structural break analysis and several multivariate regression models, the results illustrate a significantly negative influence of institutional ownership on the debt ratio. This impact amplifies during periods of financial turmoil, with a heightened effect observed in the post-crisis era compared to the pre-crisis period. Regarding institutional investors' heterogeneity, this study also highlights substantial differences between grey and independent institutions, but not between domestic and foreign institutions. Additional empirical tests underscore the causality of the effect. These findings even withstand robustness checks, including a comprehensive set of firm-specific capital structure determinants, diverse investor type classifications, and various subsamples.

JEL Classifications: C1; G2; G3.
Keywords: Debt; financial crisis; institutional investors; monitoring.

1. Introduction

Corporate financing decisions are intricate and varied, and research in this domain has been ongoing since Modigliani and Miller's (1958) irrelevance propositions I and II. Numerous studies have sought to identify the optimal capital structure that maximises firm value (Bilgin 2020; DeAngelo 2022). Various theories, including the trade-off, pecking order, signalling, free cash flow, and market-timing theories, have been developed to examine the behaviour of finance managers. These theories propose that firm-specific factors like tangibility, size, profitability, liquidity, growth, firm value, tax shields, or risk can influence the debt ratio, commonly used as a proxy for capital structure (Chipeta *et al* 2013; Harrison and Widjaja 2014; Iqbal and

Kume 2014). Additionally, debt and equity procurement opportunities, along with the institutional and macroeconomic context of a country, may also exert influence (Antoniou *et al* 2008; Alves and Francisco 2015).

In the nexus of credit and equity supply, extensive research in corporate finance has also explored the impact of financial turmoil on financing decisions (Akbar *et al* 2017; Zeitun *et al* 2017; Amato 2020). According to market-timing theory, the composition of debt and equity reflects managers' evaluation of share prices. When prices decline and the cost of equity is high, managers tend to prefer debt, and vice versa (Baker and Wurgler 2002; Leary and Roberts 2005). However, studies examining the influence of credit shocks on corporate financing decisions yield mixed results (e.g., Kahle and Stulz 2013; Casey and O'Toole 2014; D'Aurizio *et al* 2015).

Therefore, after six decades of research, our understanding is confined to a catalogue of frictions, such as asymmetric information, financial distress costs, or taxes, that impact the debt ratio (DeAngelo 2022). However, it is plausible that financing decisions are determined jointly by firm-specific determinants, credit supply, and corporate policies (Chemmanur *et al* 2021). Hence, recent empirical research regarding financing decisions emphasises the significance of the corporate governance aspect of institutional investors. For instance, Li *et al* (2009) demonstrate that ownership structure influences up to six per cent of firms' leverage, while firm characteristics play a role in no more than eight per cent. Moreover, a survey by Brown *et al* (2019) reveals that 82 per cent of institutional investors believe they influence corporate debt ratios. To date, the literature on ownership structure and financing decisions during crises is limited. Thus, the research question posed is: To what extent do institutional investors influence the debt ratio during financial turmoil?

This question gains profound relevance within the framework of Jensen and Meckling's (1976) agency theory. Managers, acting as agents, are prone to exploit asymmetric information to pursue their own interests in the absence of effective corporate governance mechanisms from shareholders, who are the principals. Debt-related interest payments serve as an effective monitoring tool, constraining managerial discretion (Jensen 1986). However, this monitoring avenue becomes impractical in the face of credit restrictions during financial turmoil (Ivashina and Scharfstein 2010). In this case, institutional investors bear the responsibility of monitoring and substituting for the portion of debt intended to limit managerial discretion (Gillan and Starks 2003). Therefore, I anticipate a negative impact of institutional ownership (hereafter, IO) on the debt ratio, which increases during the crisis.

My study is grounded in a panel dataset comprising 1,138 listed non-financial firms from France, Germany, and the United Kingdom (UK), yielding 8,049 firm-year observations spanning from January 2002 to December 2018. Financial data are sourced from Compustat and shareholdings are gathered from FactSet. Employing a range of multivariate regression models, I identify a significantly negative impact of IO on the debt ratio. This influence intensifies

during the crisis period (i.e., 2008–2012) and becomes more pronounced in the post-crisis period (i.e., 2013–2018) compared to the pre-crisis period (i.e., 2002–2007). Multiple structural break tests validate these findings. Further analyses unveil notable distinctions between grey and independent institutions, though none between domestic and foreign institutions. The robustness of these results is maintained after controlling for a comprehensive set of firm-specific determinants of the debt ratio, diverse investor type classifications, and various subsamples. Analysing the differences between bank-based (i.e., France and Germany) and market-based (i.e., UK) financial systems does not alter my conclusions.

Closest to my research is the work of Sun *et al* (2016), who discern a significant impact of institutional investors on financing decisions during the financial crisis. Their investigation relies on a panel dataset of non-financial UK firms spanning from 1998 to 2012. I broaden their perspective by leveraging a novel cross-country dataset, demonstrating that institutional investors similarly exert influence over the debt ratio of German and French firms. Additionally, while Sun *et al* (2016) focus on the crisis period from 2007 to 2009, my study extends the observation period and empirically pinpoints structural breaks in 2008 and 2012. Another innovative aspect is my consideration of institutional investor heterogeneity. Unlike Sun *et al* (2016), who treat institutional investors as a homogeneous group, I explore differences in monitoring strength associated with the business model (grey vs. independent) and the location (domestic vs. foreign) of the institution. Finally, whereas Sun *et al* (2016) use a two-stage least-squares (2SLS) estimator to address endogeneity problems arising from reverse causality, my investigation employs the Generalised Method of Moments (GMM) and the Granger Causality Test to comprehensively tackle this concern.

This investigation contributes to other investigations in several ways. First, it expands on studies that analyse capital structure determinants during financial turmoil (e.g., Harrison and Widjaja 2014; Iqbal and Kume 2014; Zeitun *et al* 2017). Notably, my models incorporate institutional investors, revealing that these shareholders play a crucial role in determining the debt ratio during financial turmoil. Second, it builds upon studies on institutional investors and corporate governance with shorter observation periods, typically investigating time frames up to ten years (e.g., Ferreira and Matos 2008; Aggarwal *et al* 2011; Ferreira *et al* 2017), by demonstrating that institutional investors increase monitoring activity during and after financial turmoil. Third, I obtain similar results for both financial system settings, thereby expanding on single-country studies such as Dang *et al* (2014), D'Aurizio *et al* (2015) and Akbar *et al* (2017). My findings demonstrate that institutional investors perform monitoring in both financial system settings during financial turmoil.

These results have implications for academia, firms, institutional investors, and policymakers alike. They offer valuable insights for researchers seeking to understand how institutional investors influence firms' debt ratios during financial turmoil, thereby enriching the foundation for future

studies. Additionally, these findings assist financial managers in planning sustainable financing strategies beyond crises. They should consider specific shareholder compositions and tailor financing strategies to align optimally with institutional investors' monitoring. Furthermore, the results highlight to institutional investors the importance of active monitoring during financial turmoil, particularly for firms with limited financing options and credit lines. Lastly, these findings can support policymakers and regulators in optimising the provision of credit during times of crisis.

The subsequent sections of this study are organised as follows: Section 2 conducts a comprehensive review of existing literature pertaining to the relation between IO and debt ratio. Section 3 delineates the dataset, and Section 4 expounds the methodologies. Section 5 provides an in-depth presentation and analysis of the results. Section 6 summarises the findings and recommends directions for future research.

2. Literature Review and Hypotheses

The capital structure puzzle remains one of the most vigorously debated subjects in corporate finance (Bilgin 2020; DeAngelo 2022). However, theories such as pecking order, trade-off, signalling, market timing, and free-cash flow already highlight that firm-specific characteristics play a pivotal role in shaping the debt ratio. Parameters of significance include profitability, growth, liquidity, tangibility, business risk, tax shields, market-to book value, and firm size (Chipeta *et al* 2013; Harrison and Widjaja 2014; Iqbal and Kume 2014; Akbar *et al* 2017; Amato 2020). Another dimension of the literature researches into the realm of asymmetric information between management and shareholders. The fundamental connection to financial decisions is based on the *Free-Cash Flow Theory* (Jensen 1986), which states that debt related interest payments limit managerial discretion. Institutional monitoring substitutes for the share of debt used to control managers (Gillan and Starks 2003). Hence, this literature review engages in a discourse on the impact of institutional investors on firms' financing decisions. An overview of the related capital structure theories can be found in Table 1.

Institutional Investor Monitoring

Institutional investors may influence corporate debt ratios directly or indirectly: On the one hand they can guide financing decisions instantaneously through their participation in management sessions, or by providing consulting services and own funds. On the other hand, they can exert an indirect influence by the execution of voting rights, for instance, when deciding on the issue of bonds or shares (Ferreira and Matos 2008). The literature highlights two competing theories on how institutional investors decide to use debt for monitoring purposes. *Entrenchment theory* emphasises that shareholders prefer debt for disciplining management in order to save on their own monitoring costs (Grossmann and Hart 1982). By contrast, *interest alignment theory* argues

Table 1: Institutional Monitoring Theories

This table presents an overview of the most important monitoring theories regarding the relationship between IO and debt ratio.

Theory	*Author(s)*	*Influence of Monitoring*	*Impact on Debt Ratio*
Institutional Ownership			
Entrenchment Theory	Grossman and Hart (1982)	Institutional investors prefer debt related interest payments to discipline management.	Increase
Interest Alignment Theory	Friend and Lang (1988)	Institutional investors monitor management by themselves and prefer lower debt ratios.	Decrease
Grey vs. Independent Institutions			
Grey Institutions Monitoring Theory	Ferreira and Matos (2008)	Grey institutions have better access to information because of business ties.	Decrease
Independent Institutions Monitoring Theory	Ferreira and Matos (2008)	Independent institutions perform more active monitoring because of less collaboration with management.	Decrease
Domestic vs. Foreign Institutions			
Hometown Advantage Theory	Kim *et al* (2016)	Domestic institutions are good monitors because of better information access.	Decrease
Global Investor Theory	Kim *et al* (2016)	Foreign institutions are good monitors because of superior global governance standards.	Decrease

that institutional investors prefer lower debt ratios and perform monitoring by themselves to maintain control rights and avoid bank covenants (Friend and Lang 1988). Empirical evidence is still mixed.

Several studies are consistent with the interest alignment theory. For instance, Michaely and Vincent (2012) demonstrate a negative relation between IO and debt ratio for US corporations. This effect is more pronounced for small and high-growth firms. Furthermore, Chung and Wang (2014) even find a decrease in leverage for US firms if IO increases. The effect strengthens when institutional investors have fewer business ties with management. Hence, both studies emphasise that the effect is more pronounced for firms with higher asymmetric information. Outside the US, Hernández-Canovas *et al* (2016) identify a negative impact on the debt ratio for Spanish small and medium-sized enterprises. The effect is more distinct for firms with an institution as

their main investor. This finding is supported by Chen and Strange (2005) for Chinese companies. State institutions, in particular, are averse to increasing debt ratios and prefer to exercise monitoring themselves. A study of Jordanian firms by Al-Najjar and Taylor (2008) likewise supports the idea that institutional investors exercise monitoring instead of using debt.

Other investigations align with the entrenchment theory. For instance, Sun *et al* (2016) identify an increase in leverage for UK firms with higher IO. This finding is supported by Butt and Hasan (2009), who identify a positive relation for listed Pakistani firms. They argue that IO reduces agency costs between management and outstanding lenders. Moreover, Chaudhary (2021) finds that leverage decreases for smaller levels of IO and increases for larger levels. In addition, Ashbaugh-Skaife *et al* (2006) demonstrate that concentrated IO increases the bond rating of US firms. They explain the result as being a result of better financing options for firms with institutional investors.

In total, I anticipate that the argument favouring *interest alignment* holds greater significance than the *entrenchment argument* in the context of financial turmoil. Institutional investors have to monitor management by themselves if credit restraints occur (Ivashina and Scharfstein 2010; Casey and O'Toole 2014). Given the escalating risk of bankruptcy, institutional investors may also be more eager to perform monitoring instead of using debt related interest payments. Accordingly, my initial null hypothesis H_1 states as follows:

H_1: The influence of IO on the debt ratio is not negative during financial turmoil.

Grey vs. Independent Institutions

Heretofore, institutional investors are considered as a homogeneous group. Nevertheless, the literature suggests that not every institution performs monitoring to the same extent (Aggarwal *et al* 2011). Hence, the influence of IO on the debt ratio might depend on the investor type. With respect to different business models, *grey institutions monitoring theory* predicts that banks and insurance firms perform superior monitoring. Stiglitz and Weiss (1983), Diamond (1984), and Fama (1985) argue that these institutions generate economies of scale from contract pooling, have better information access from networking, and have stronger assertiveness given their power to renegotiate loan contracts. However, Brickley *et al* (1988), and Chen *et al* (2007) demonstrate that grey institutions may not exercise superior monitoring, because of collaboration with management. Supervision could harm business ties and demolish potential or existing business opportunities.

By contrast, the *independent institutions monitoring theory* holds that independent institutions such as mutual funds, investment advisers, endowments, family offices or pension funds have a stronger assertiveness to monitor (Ferreira and Matos 2008). They face fewer regulatory requirements, have fewer business ties to directors, and are more likely to interfere in

operational decisions such as corporate financing (Aggarwal *et al* 2011). Regarding management collaboration, independent institutions are even called '*pressure-resistant*' and grey institutions '*pressure-sensitive*' (Brickley *et al* 1988). With respect to the commitment argument, independent institutions are known as '*active*' and grey institutions as '*passive*' monitoring investors (Almazan *et al* 2005).

All-encompassing, grey institutions may excel in information acquisition, whereas independent institutions exhibit a diminished propensity to support managerial misbehaviour such as the consumption of perquisites. However, empirical evidence suggests that independent institutions exercise stronger monitoring than grey institutions (Almazan *et al* 2005; Chen *et al* 2007; Ferreira and Matos 2008; Aggarwal *et al* 2011; Chung and Wang 2014; Ashrafi 2019). In light of these observations, I expect that independent institutions perform considerably stronger monitoring than grey institutions during financial turmoil. Consequently, my second null hypothesis H_2 states as follows:

H_2: The influence of independent institutions on the debt ratio is not stronger than that of grey institutions during financial turmoil.

Domestic vs. Foreign Institutions

Another way of distinguishing investor types is based on their location. According to *hometown advantage theory*, domestic institutions implement superior monitoring standards because of better information procurement (Kim *et al* 2016). Resulting from geographic, cultural and language similarities, these investors have closer relationships to the firms in which they hold shares (Ferreira *et al* 2017). Consequently, domestic institutions have better opportunities to get in contact with management, participate in informal meetings, and increase their impact on earnings management as well as financing decisions (Waweru *et al* 2019). This information asymmetry problem is even more pronounced for firms operating in an international than a national setting.

By contrast, *global investor theory* holds that foreign institutions exercise stronger monitoring, given superior technologies and a higher propensity to exercise voting rights (Kim *et al* 2016). They have an advanced understanding of governance tools because of their global investing experience. Sophisticated foreign investors collect private information from one market and use it in another one (Ferreira *et al* 2017). Advanced knowledge combined with a higher proclivity toward activism increases the likelihood that they use their voting rights to steer financing decisions (Aggarwal *et al* 2011). The impact of internationally networked foreign investors might therefore be particularly strong.

However, empirical evidence on the monitoring effectiveness of domestic and foreign institutions is ambivalent. For example, Bae *et al* (2008) demonstrate that local analysts made more accurate earnings forecasts for local firms than

foreign analysts. Another cross-country study by Ferreira *et al* (2017) suggests that corporate governance standards are applied similarly by domestic and foreign institutions. By contrast, Ferreira and Matos (2008) highlight that only foreign institutional investors have a positive impact on firm value. In addition, Li *et al* (2009), and Vijayakumaran and Vijayakumaran (2019) find a negative relation between foreign ownership and leverage for Chinese listed firms. Both studies indicate stronger monitoring activity for foreign institutions.

Collectively, the existing literature suggests that both investor types possess the capability to engage in monitoring. The effectiveness might depend on individual and economic contexts. Nevertheless, there appears to be a trend indicating that foreign institutions exercise superior corporate governance standards. Hence, I anticipate that this investor type performs stronger monitoring than domestic institutions, particularly during financial turmoil. My third null hypothesis H_3 states as follows:

H_3: The influence of foreign institutions on the debt ratio is not stronger than that of domestic institutions during financial turmoil.

3. Data

This study analyses a panel data set of listed non-financial firms from France, Germany, and the UK, the three most developed economies in Europe. The data are collected from three databases for the period 2002 to 2018. Compustat Global provides more than 500 firm-specific operating numbers from the balance sheet, profit and loss statement, and cash flow analysis. This database covers more than 24,000 active and 10,000 inactive companies in over 80 countries outside the US and Canada. In addition, Compustat Securities Dailies provides market data regarding outstanding shares, prices, trading volumes or dividends on a daily basis. I always use the latest data for each year if no year-end data are available, and convert all sterling values to euros.

IO data are collected from FactSet (formerly: Lionshares). This database contains financial data on developed markets going back to the 1980s, and on emerging markets going back to the 1990s. It contains more than 70,000 companies located in approximately 100 countries. US data are compiled directly from 13F and N-30D filings. Data outside the US are gathered from various sources such as annual reports, stock market announcements, national regulatory agencies, and mutual fund publications. In addition to financial data on global indices, commodities, fixed income, and alternative investment income, FactSet provides data on institutional investors fund holdings.

Moreover, I make several data adjustments. Following Li *et al* (2006), I only consider firms with at least five per cent total IO. The effect may be too weak for firms with a lower percentage of IO. In line with Dang *et al* (2014), my study excludes financial firms with different regulatory requirements with respect to their debt ratios. Following Amato (2020), I only include firms with at least five firm-year observations, to enhance robustness of my statistical models. Lastly,

Table 2: Definitions of Variables

This table reports the definitions of the dependent as well as the independent variables.

Variable	*Definition*	*Source*
AT	Total assets as firm size measure, defined as the natural logarithm of total assets.	Chipeta *et al* (2013) / Iqbal and Kume (2014) / Amato (2020)
GROWTH	Asset growth ratio as measure for growth opportunities, defined as the annual growth rate of total assets.	Iqbal and Kume (2014) / Amato (2020)
IO	Percentage total institutional ownership, calculated as shares hold by institutional investors divided by total shares outstanding.	Ferreira and Matos (2008) / Ferreira *et al* (2017)
IO_IND	Percentage ownership of independent institutions, calculated as shares hold by independent institutions divided by total shares outstanding.	Ferreira and Matos (2008) / Ilhan *et al* (2023)
IO_GREY	Percentage ownership of grey institutions, calculated as shares hold by grey institutions divided by total shares outstanding.	Ferreira and Matos (2008) / Ilhan *et al* (2023)
IO_DOM	Percentage ownership of domestic institutions, calculated as shares hold by domestic institutions divided by total shares outstanding.	Kim *et al* (2016) / Ferreira *et al* (2017)
IO_FOR	Percentage ownership of foreign institutions, calculated as shares hold by foreign institutions divided by total shares outstanding.	Kim *et al* (2016) / Ferreira *et al* (2017)
LIAB	Assets to liabilities ratio as liquidity measure, defined as current assets divided by current liabilities.	Harrisson and Widjaja (2014) / Amato (2020)
MTB	Market-to-book ratio as firm value measure, defined as the ratio of the market value of equity plus total debt divided by total assets. The market value of equity equals the market capitalisation, calculated as the number of outstanding shares times the share price.	Lin *et al* (2013) / Boubaker *et al* (2017)
NDTS	Non-debt-tax shields as measure for tax advantages, defined as the ratio of depreciation to total assets.	Boubaker *et al* (2017) / Amato (2020)
ROA	Return on assets as measure for profitability, defined as earnings before interest taxes depreciation and amortisation divided by total assets.	Harrisson and Widjaja (2014) / Akbar *et al* (2017) / Amato (2020)
TANG	Asset tangibility as measure for tangibility, defined as total property, plant and equipment divided by total assets.	Boubaker *et al* (2017)
TDA	Debt ratio as measure for capital structure, defined as long-term debt plus debt in current liabilities divided by total assets.	Chipeta *et al* (2013) / Amato (2020)
Z_SCORE	Altman's z-score as measure for insolvency risk is defined as: (1.2*working capital+1.4*retained earnings +3.3* earnings before interest and taxes; +0.999*sales) / Total assets+0.6*(market capitalisation / Long-term debt).	Lin *et al* (2013) / Boubaker *et al* (2017)

according to Iqbal and Kume (2014), I exclude firms with negative debt ratios or negative market values, which would lead to a distortion of my results.

My final sample consists of 8,049 observations from 1,138 distinct listed firms over the period 2002–2018. Similar to Amato (2020), I choose a five-year crisis period between 2008 and 2012, because leverage adjustments are accomplished in the following years as aftermaths of the shocks (Leary and Roberts 2005). In particular, the pre-crisis period (i.e., 2002–2007) includes 2,422 observations from 1,009 firms, the crisis period (i.e., 2008–2012) includes 2,676 observations from 1,055 firms, and the post crisis period (i.e., 2013–2018) includes 2,951 observations from 1,008 firms.

4. Methodology

I initiate my investigation by conducting a *multiple structural break analysis* to examine differences in the regression coefficients during the three subperiods. I calculate percentage IO as the shares held by institutional investors divided by total shares outstanding (Ferreira and Matos 2008). The debt ratio (*TDA*) is computed as long-term debt plus debt in current liabilities, divided by total assets (Amato 2020). Previous investigations have already considered a financial turmoil timeframe from 2008 to 2012, with shifts of one or two years (Iqbal and Kume 2014; Sun *et al* 2016; Akbar *et al* 2017; Amato 2020). As these studies do not address structural breaks, I test empirically for predetermined break dates in the years 2008 and 2012. The two models are outlined as follows:

$$Y_{it}(TDA) = \beta_0 + \beta_1 log\ (IO)_{it} + \beta_2 BREAK\_PRE_{it} + \beta_3 BREAKX_{it} + \varepsilon_{it} \quad (a)$$

$$Y_{it}(TDA) = \beta_0 + \beta_1 log\ (IO)_{it} + \beta_2 BREAK\_POST_{it} + \beta_3 BREAKY_{it} + \varepsilon_{it} \quad (b)$$

where the debt ratio *TDA* is the dependent variable. The natural logarithm of total IO *log (IO)* is the independent variable in each model; *BREAKX* and *BREAKY* are Bernoulli variables, denoting 1 for the pre-crisis or the post-crisis period, respectively. *BREAK_PRE* and *BREAK_POST* are the interaction terms of the break variables and IO, measuring the regression slope of the pre-crisis and the post-crisis period, respectively. The relationship between IO and debt ratio might exhibit non-linearities. For each one per cent increase in IO, the additional effort to perform monitoring might decrease (Ashrafi 2019; Chaudhary 2021). To address this concern, I follow the previous literature, which proposes the log transformation (see, for instance, Brailsford *et al* 2002; Kang *et al* 2018; Saunders and Song 2018) to linearise the ownership data.

I then construct three *multivariate linear/log regression models* with robust standard errors clustered at the firm level to assess my hypotheses. All models also include industry and year fixed effects. The *Ordinary Least Squares* (OLS) method is employed for estimation. This approach aligns with the methodology of Ferreira and Matos (2008), Aggarwal *et al* (2011), and Boubaker *et al* (2017), who also utilise linear OLS estimation among other methods. The investigation

commences with a baseline regression model to scrutinise the first null hypothesis H_1:

$$Y_{it}(TDA) = \beta_0 + \beta_1 log\ (IO)_{it} + \beta_2 ROA_{it} + \beta_3 AT\_GROWTH_{it} + \beta_4 AT\_LIAB_{it} + \beta_5 AT\_TANG_{it} + \beta_6 NDTS_{it} + \beta_7 Z\_SCORE_{it} + \beta_8 MTB_{it} + \beta_9 AT_{it} + \iota_{it} + \delta_t + \varepsilon_{it} \quad (1)$$

where the debt ratio *TDA* is the dependent variable and the natural logarithm of total IO *log (IO)* the independent variable. Again, I calculate the natural logarithm of the IO variable. Following Chipeta *et al* (2013), Harrison and Widjaja (2014), Iqbal and Kume (2014) and Boubaker *et al* (2017), the model also includes the most common firm-specific capital structure determinants as control variables. In addition to providing a theoretical basis, the adjusted R^2 is used primarily as a selection criterion. The definitions and purposes of all variables are presented in Table 2.

Certain factors align with the pecking order theory. These include profitability (*ROA*), growth (*GROWTH*), and the assets-to-liabilities ratio (*LIAB*) measuring liquidity. Other determinants refer to the trade-off theory. Factors considered are asset tangibility (*TANG*), non-debt tax shields (*NDTS*), Altman's z-score (*Z_SCORE*) as a risk measure, market-to-book ratio (*MTB*), and firm size (*AT*). A corresponding explanation of the theories for each significant factor follows in the results section. Finally, I also include industry dummies (ι_{it}) and year fixed effects (δ_t) to control for unobservable heteroscedasticity. Next, I divide total IO into independent and grey institutions. To avoid multicollinearity, I test the second null hypothesis H_2 in another model:

$$Y_{it}(TDA) = \beta_0 + \beta_1 log\ (IO\_IND)_{it} + \beta_2 log\ (IO\_GREY)_{it} + \gamma C_{it} + \iota_{it} + \delta_t + \varepsilon_{it} \quad (2)$$

where the debt ratio *TDA* remains the independent variable. Next I divide total IO into independent *log (IO_IND)* and grey *log (IO_GREY)* ownership. As in the first model, I calculate the natural logarithm of independent as well as grey IO. Variable γC_{it} denotes a matrix of eight selected explanatory variables of firm *i* in year *t*, already included in the first regression. This model also uses robust standard errors clustered at the firm level, as well as industry dummies (ι_{it}) and year fixed effects (δ_t). In addition, I perform the *Wald Test* to test for significant differences between the two investor type variables in each period.

The next step is to investigate whether domestic or foreign IO exerts a greater influence on the debt ratio during financial turmoil. Again, to avoid multicollinearity between the IO variables, I test the third null hypothesis H_3 in the following regression model:

$$Y_{it}(TDA) = \beta_0 + \beta_1 log\ (IO\_DOM)_{it} + \beta_2 log\ (IO\_FOR)_{it} + \gamma C_{it} + \iota_{it} + \delta_t + \varepsilon_{it} \quad (3)$$

where the debt ratio *TDA* remains the dependent variable. In contrast to the previous model, I divide total IO into domestic *log (IO_DOM)* and foreign *log (IO_FOR)* ownership. Following Kim *et al* (2016) and Ferreira *et al* (2017),

I always compare the country location of the firms' headquarters with that of the institutional investors for classification. Again, I calculate the natural logarithm values of the IO variables. All other elements of the third regression model are equivalent to the first and second models. Finally, I also perform the *Wald Test* to test for significant differences between both institutional investor types in each period.

Nevertheless, certain studies highlight the possibility that changes in the debt ratio could influence institutional investors' portfolio choices. Regulatory requirements or risk profiles might also impact institutions' decisions (Tong and Ning 2004; Chen and Strange 2005). The OLS estimator does not account for endogeneity resulting from reverse causality. To address this concern, I also employ the two-step system *Generalised Method of Moments* (GMM) as well as the *Granger Caus*ality *test* for the baseline model. My approach aligns closely with that of Li *et al* (2009), Aggarwal *et al* (2011), Michaely and Vincent (2012), and Chung and Wang (2014), which also involves the use of lagged explanatory variables. The fundamental regression equation states as follows:

$$Y_{it}(TDA) = \beta_0 + \beta_1 log\ (IO)_{it-1} + \gamma C_{it-1} + \iota_{it} + \delta_t + \varepsilon_{it} \quad (4)$$

where the dependent variable *TDA* is measured in period *t*. All explanatory variables are lagged to *t*–1. For the Granger Causality test, simple lags in *t*–1 are

Table 3: Summary Statistics

This table represents the descriptive statistics for the total sample with 8,049 firm-year observations from 1,138 stock listed French, German and UK firms over the 2002 to 2018 period.

	N	*Mean*	*SD*	*P25*	*Median*	*P75*
TDA	8,049	0.196	0.139	0.090	0.180	0.275
ROA	8,049	0.108	0.101	0.074	0.110	0.149
GROWTH	8,049	0.146	0.653	–0.018	0.051	0.155
LIAB	8,049	1.648	1.311	1.005	1.351	1.859
TANG	8,049	0.228	0.204	0.071	0.173	0.320
NDTS	8,049	0.041	0.030	0.022	0.034	0.051
Z_SCORE	8,049	0.300	5,636	0.027	0.046	0.119
MTB	8,049	1.170	1.026	0.630	0.911	1.364
AT	8,049	6.450	2.240	4.849	6.279	7.885
IO	8,049	0.155	0.093	0.085	0.130	0.201
IO_DOM	8,049	0.082	0.078	0.029	0.062	0.109
IO_FOR	8,049	0.073	0.074	0.011	0.055	0.108
IO_IND	8,049	0.149	0.091	0.082	0.126	0.193
IO_GREY	8,049	0.006	0.016	0.000	0.001	0.006

used, while the two-step system GMM employs lags of the explanatory variables from *t*–3 to *t*–5 as instruments in relation to the equations in differences. To check the validity of the instruments, I also perform the Arellano-Bond Test (AR1 and AR2) and the Hansen-Test. The model incorporates control variables (γC_{it-1}), industry dummies (ι_{it}) and year fixed effects (δ_t), factors already accounted for in the three primary regression models.

5. Results and Discussion

Univariate Statistics

Table 3 presents the descriptive statistics. The debt ratio has a mean of 19.6 per cent, which is close to the median of 18.0 per cent. Hence, the distribution seems to be relatively symmetric. With respect to total IO, a mean of 15.5 per cent and a median of 13.0 per cent are found. Regarding the investor types, 14.9 per cent belong to the group of independent and 0.60 per cent to the group

Figure 1: Relationship between IO and Debt Ratio

This Figure illustrates the (inverse) relationship between IO and the debt ratios for each year. The data encompasses 8.049 firm-year observations and 1.138 firms over the 2002 to 2018 period.

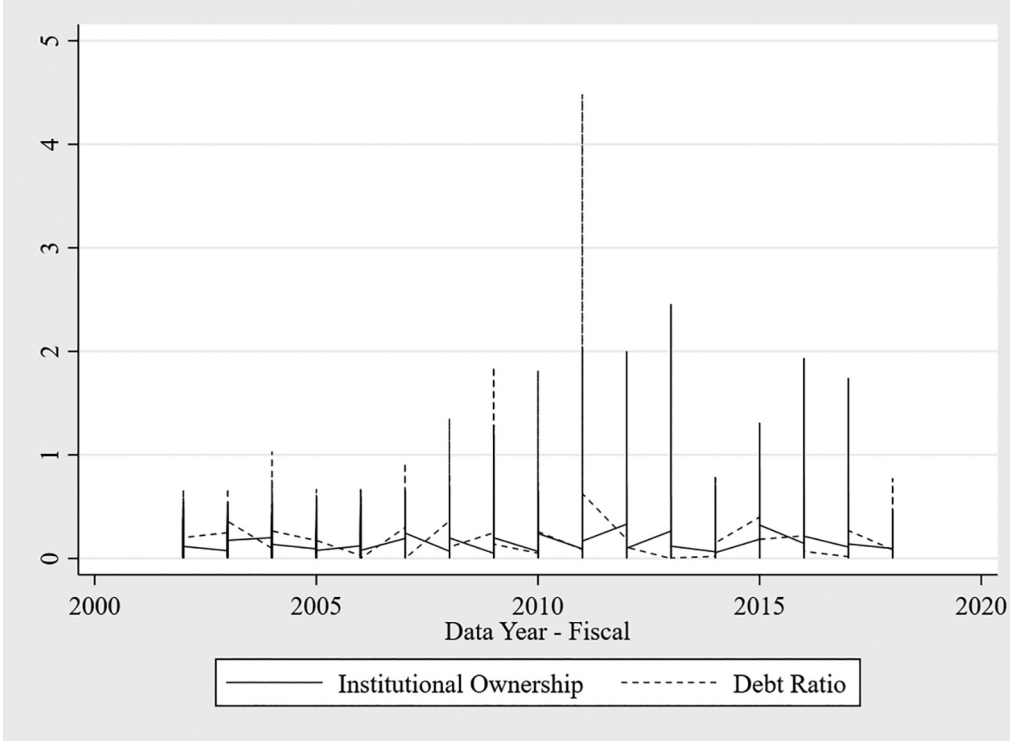

Table 4: Correlation Matrix

This table shows the correlations between all independent variables included in the regression models for the total sample, encompassing 8,049 firm-year observations and 1,138 firms from 2002 to 2018. Significance of results shown as 1%***, 5%** and 10%* levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) ROA	1.000												
(2) GROWTH	-0.004 (0.738)	1.000											
(3) LIAB	-0.118*** (0.000)	-0.001 (0.953)	1.000										
(4) TANG	0.115*** (0.000)	-0.004 (0.747)	-0.126*** (0.000)	1.000									
(5) NDTS	0.163*** (0.000)	-0.007 (0.516)	-0.123*** (0.000)	0.265*** (0.000)	1.000								
(6) Z_SCORE	0.016 (0.145)	-0.001 (0.953)	0.036*** (0.001)	-0.032*** (0.003)	-0.013 (0.221)	1.000							
(7) MTB	0.139*** (0.000)	0.009 (0.427)	0.189*** (0.000)	-0.071*** (0.000)	0.038*** (0.001)	0.046*** (0.000)	1.000						
(8) AT	0.192*** (0.000)	-0.005 (0.646)	-0.209*** (0.000)	0.127*** (0.000)	-0.104*** (0.000)	-0.010 (0.371)	-0.158*** (0.000)	1.000					
(9) IO	0.059*** (0.000)	-0.017 (0.124)	-0.064*** (0.000)	-0.021* (0.060)	-0.016 (0.153)	-0.005 (0.657)	0.024** (0.031)	0.213*** (0.000)	1.000				
(10) IO_DOM	-0.018 (0.109)	-0.012 (0.286)	-0.026** (0.017)	-0.032*** (0.004)	0.045*** (0.000)	-0.004 (0.708)	0.002 (0.840)	-0.239*** (0.000)	0.624*** (0.000)	1.000			
(11) IO_FOR	0.091*** (0.000)	-0.009 (0.410)	-0.053*** (0.000)	0.006 (0.562)	-0.065*** (0.000)	-0.002 (0.865)	0.027** (0.014)	0.508*** (0.000)	0.606*** (0.000)	-0.243*** (0.000)	1.000		
(12) IO_IND	0.057*** (0.000)	-0.017 (0.122)	-0.056*** (0.000)	-0.026** (0.017)	-0.007 (0.503)	-0.003 (0.763)	0.027** (0.013)	0.179*** (0.000)	0.986*** (0.000)	0.629*** (0.000)	0.584*** (0.000)	1.000	
(13) IO_GREY	0.015 (0.172)	-0.001 (0.899)	-0.054*** (0.000)	0.030*** (0.006)	-0.050*** (0.000)	-0.010 (0.380)	-0.019* (0.093)	0.219*** (0.000)	0.198*** (0.000)	0.043*** (0.000)	0.202*** (0.000)	0.030*** (0.007)	1.000

of grey institutions. With respect to the location, 8.2 per cent are assigned to be domestic and 7.3 per cent are foreign institutions. The reported ownership values are comparable to those in Ferreira and Matos (2008), and Ferreira *et al* (2017), who also use FactSet data for France, Germany, and the UK from 2000 to 2005 and from 2000 to 2010, respectively. Moreover, Ilhan *et al* (2023) report distinctly smaller values for grey relative to independent institutions.

The development of the variables over time is analysed next. Figure 1 illustrates the relationship between IO and the corporate debt ratios for each year. Noticeable are the years 2002, 2003, 2005 2007, 2008, 2011, 2012, 2013, and 2015, showing an inverse relationship. This is particularly striking in the years 2008/2009 around the financial crisis and the years 2011/2012. While IO decreases, debt ratio increases and vice versa. In non-tabulated results, I also compare the development of the two variables within each of the three subperiods and find significant co-movement. These findings support the assumption of a negative relationship between IO and debt ratio. It further underpins the existence of structural breaks in the years 2008 and 2012.

Finally, Table 4 presents the correlation matrix for all independent variables included in the regression models. The correlation coefficients between total, domestic, foreign and independent IO are significant and exceed the threshold of 0.60 for multicollinearity assumption. Domestic and foreign ownership, as

Table 5: Multiple Structural Break Test

This table shows the results of the structural break test regarding the relation between total institutional ownership and the debt ratio. Column 1 tests for structural breaks at the predetermined year 2008 and column 2 at the predetermined year 2012. Significance of results shown as 1%***, 5%** and 10%* levels.

	Pre-Crisis Break (1) TDA	Post-Crisis Break (2) TDA
log (IO)	0.263***	0.150***
	(5.02)	(4.15)
BREAK_PRE	–0.587***	
	(–4.30)	
BREAKX	–0.025***	
	(–4.16)	
BREAK_POST		–0.038***
		(–3.34)
BREAKY		–0.015***
		(–2.75)
F-Statistics	9.26	7.03
P-Values	(0.000)	(0.000)

well as independent and grey ownership, are subsamples of total IO and exhibit overlaps. The other coefficients are significant but quite low, indicating that my models have no or at most modest problems with multicollinearity. In addition, I calculate variance inflation factors (VIFs) for each independent variable. The average VIF is below five in my models, which is regarded as the common threshold for multicollinearity (Studentmunt 1997). Therefore, I conclude that my sample has no problem with multicollinearity. Results of the VIF test can be obtained on request.

Multiple Structural Break Test

Before performing the regression analyses, I conduct a multiple structural break test to substantiate the time frame segmentation. To the best of my knowledge, I am the first to consider structural breaks between the IO and debt ratio relation. Closest to me is Chipeta *et al* (2013), finding structural breaks for capital structure determinants during political turmoil in South Africa. Table 5 presents the results. With an F-Statistic of 9.26 and 7.03, my analysis indicates break dates for the predetermined years 2008 and 2012 at the one per cent level. Consequently, I reject my null hypothesis of no significant differences during financial turmoil compared to the pre- and post-crisis periods. This result is in line with the findings in Figure 1 and complements previous studies investigating the financial crisis (e.g., Harrison and Widjaja 2014; Iqbal and Kume 2014; Akbar *et al* 2017; Zeitun *et al* 2017; Amato 2020). It further suggests temporal timeframe segmentation for future investigations.

Regression Analysis

To inspect my null hypotheses, I employ three *multivariate linear/log regression models*. The first model tests the null hypothesis H_1, the second model the null hypothesis H_2, and the third model the null hypothesis H_3. All results are disaggregated for the pre-crisis, crisis, and post-crisis subperiods. Additionally, a fourth model addresses concern over endogeneity resulting from reverse causality. The significance levels are distinguished at the one***, five**, and ten* percent levels.

Table 6 presents the results of my first regression model, to test hypothesis H_1. The coefficient is significantly negative at the five per cent level for the total period (coeff. –0.010**). A one per cent increase in total IO leads to a 1.00 per cent decrease in the debt ratio. Comparing the three subperiods reveals a significantly negative influence during the crisis and the post-crisis period, while results are insignificant for the pre-crisis period. In non-tabulated results, I also find the same result when distinguishing between short-term and long-term debt. Therefore, I reject my first null hypothesis H_1. My results support the view that institutional monitoring substitutes for debt monitoring during and after financial turmoil. This finding is in line with Chen and Strange (2005), Al-Najjar and Taylor (2008), Michaely and Vincent (2012), Chung and Wang (2014), and Hernández-Canovas *et al* (2016). My primary contribution

Table 6: Regression Results
Total IO

This table tests hypothesis H_1 regarding the regression model (1). The sample encompasses 8,049 firm-year observations from 1,138 different firms. Column 1 illustrates the results for the total period, column 2 for the pre-crisis period, column 3 for the crisis period and column 4 for the post-crisis period. Significance of results shown as 1%***, 5%** and 10%* levels.

	Total Period OLS (1) TDA	Pre-Crisis OLS (2) TDA	Crisis Period OLS (3) TDA	Post-Crisis OLS (4) TDA
log (IO)	–0.010**	–0.005	–0.018**	–0.012**
	(–2.17)	(–1.28)	(-–3.59)	(–2.92)
ROA	–0.136***	–0.125**	–0.130	–0.090
	(–8.93)	(–3.22)	(–0.99)	(–1.86)
GROWTH	0.000	0.000	–0.001	0.002
	(0.60)	(1.00)	(–0.09)	(1.00)
LIAB	–0.013***	–0.006**	–0.007	–0.005*
	(–6.02)	(–2.57)	(–2.09)	(–2.08)
TANG	0.039	0.018	0.032	0.149*
	(1.32)	(0.70)	(0.40)	(2.22)
NDTS	0.206	–0.011	0.430	0.045
	(1.72)	(–0.07)	(0.73)	(0.34)
Z_SCORE	–0.000	–0.000**	–0.000*	–0.000
	(–1.35)	(–3.79)	(–2.22)	(–1.27)
MTB	0.004	0.005	0.013	0.003
	(1.48)	(1.50)	(1.24)	(0.85)
AT	0.040***	0.056***	0.034	0.051***
	(7.84)	(5.84)	(1.40)	(5.67)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.763	0.824	0.809	0.869
Observations	8,049	2,422	2,676	2,951

to these studies lies in demonstrating that institutional investor monitoring increases notably during times of crisis. This effect persists into the post-crisis subperiod, albeit with a marginal decline.

Next, I turn to the second regression model to test hypothesis H_2. The results in Table 7 demonstrate that the influence of independent institutions is significantly negative at the five per cent level for the total period. The effect is insignificant for the pre-crisis period, but also significantly negative for the

Table 7: Regression Results
Grey vs. Independent Institutions

This table tests hypothesis H_2 regarding the regression model (2). The sample encompasses 8,049 firm-year observations from 1,138 different firms. Column 1 illustrates the results for the total period, column 2 for the pre-crisis period, column 3 for the crisis period and column 4 for the post-crisis period. Significance of results shown as 1%***, 5%** and 10%* levels.

	Total Period OLS (1) TDA	Pre-Crisis OLS (2) TDA	Crisis Period OLS (3) TDA	Post-Crisis OLS (4) TDA
log (IO_IND)	–0.010**	–0.007	–0.019**	–0.011**
	(–2.37)	(–1.65)	(–4.19)	(–2.65)
log (IO_GREY)	0.000	–0.000	0.000	0.001
	(0.77)	(–0.13)	(0.12)	(1.58)
ROA	–0.135***	–0.125**	–0.129	–0.090
	(–9.01)	(–3.25)	(–0.98)	(–1.88)
GROWTH	0.000	0.000	–0.001	0.001
	(0.39)	(0.91)	(–0.09)	(0.98)
LIAB	–0.013***	–0.006*	–0.007	–0.005*
	(–6.07)	(–2.57)	(–2.12)	(–2.13)
TANG	0.039	0.018	0.031	0.148*
	(1.32)	(0.67)	(0.40)	(2.22)
NDTS	0.207	–0.009	0.433	0.043
	(1.72)	(–0.06)	(0.73)	(0.32)
Z_SCORE	–0.000	–0.000**	–0.000*	–0.000
	(–1.36)	(–3.81)	(–2.36)	(–1.33)
MTB	0.004	0.005	0.013	0.003
	(1.51)	(1.43)	(1.24)	(0.95)
AT	0.040***	0.054***	0.035	0.052***
	(7.57)	(5.24)	(1.44)	(5.83)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.763	0.824	0.809	0.870
Observations	8,049	2,422	2,676	2,951
Wald-Test (IO)	5.98	2.44	15.10	9.81
P-Value	(0.0265)	(0.1789)	(0.0178)	(0.0259)

crisis and post-crisis period at the five per cent level. By contrast, the influence of grey institutions is insignificant for the total period and all three subperiods. With an F-statistic of 5.98, the Wald test rejects the null hypothesis of no significant differences of the regression coefficients between independent and

grey institutions for the total period at the five per cent level. The Wald test also indicates significant differences for the crisis and post-crisis subperiods at the five per cent level. Therefore, I reject my second null hypothesis H_2 and conclude that there is a significant monitoring difference between these two investor types. The findings are in line with previous research (e.g., Chen *et al* 2007; Ferreira and Matos 2008; Ashrafi 2019; Chaudhary 2021). Overall, I extend these studies by showing that the increase in monitoring activity during and after the financial crisis is predominantly attributed to independent institutions rather than grey institutions.

With respect to the third model testing my hypothesis H_3, the results in Table 8 indicate that neither domestic nor foreign IO has a significantly negative influence on the debt ratio for the total period. With respect to the subperiods, only the influence of domestic ownership is significant for the pre-crisis period, at the ten per cent level. The Wald test indicates no significant differences for the total period as well as the crisis and the post-crisis subperiods. Therefore, I do not reject my third null hypothesis H_3, and conclude that both investor types have comparable monitoring strength during financial turmoil. This is a surprising finding as my results contradict Ferreira and Matos (2008), Li *et al* (2009), and Aggarwal *et al* (2011), who identify stronger monitoring of foreign institutions. My main contribution to this literature is to demonstrate empirically that there are no differences in monitoring during financial turmoil. Moreover, the significantly negative impact of total IO coupled with inconclusive findings pertaining to domestic and foreign institutions, hints at the potential existence of a superior cross-monitoring effect between these two investor types.

The fourth regression model addresses concerns related to endogeneity resulting from reverse causality. In tackling this issue, I employ the two-step system GMM and the Granger Causality Test. The Granger Causality Test utilises lagged variables in t–1 of the explanatory variables, while the GMM employs the lags of the explanatory variables as instruments and controls for endogeneity in the error term (Wintoki *et al* 2012). For the latter, I re-estimate my baseline regression model, employing lags from t–3 to t–5 of the explanatory variables as instruments concerning the equations in differences. Additionally, I utilise one instrument for the equations in levels (Blundell and Bond 1998). The results in Table 9 reaffirm my conclusions, that the impact of IO on the debt ratio remains negative and statistically significant at the one per cent level. The insignificant values of the Hansen and the AR Tests are pivotal, signifying a high validity of my model. Further results for the Granger Causality Test support the assumption of forward causality.

Finally, this study scrutinises the effects of control variables. Utilising the baseline regression presented in Table 6, I exclude *GROWTH*, *TANG*, *NDTS*, *Z_SCORE*, and *MTB* because of their insignificant coefficients. Notably, *ROA* exhibits a significantly negative impact on the debt ratio, aligning with pecking order theory. Highly profitable firms tend to rely less on external debt, as

Table 8: Regression Results
Domestic vs. Foreign Institutions

This Table tests hypothesis H_3 regarding the regression model (3). The sample encompasses 8,049 firm-year observations from 1,138 different firms. Column 1 illustrates the results for the total period, column 2 for the pre-crisis period, column 3 for the crisis period and column 4 for the post-crisis period. Significance of results shown as 1%***, 5%** and 10%* levels.

	Total Period OLS (1) TDA	Pre-Crisis OLS (2) TDA	Crisis Period OLS (3) TDA	Post-Crisis OLS (4) TDA
log (IO_DOM)	0.001	0.005*	–0.003	–0.001
	(0.69)	(2.13)	(–1.30)	(–0.62)
log (IO_FOR)	–0.001	–0.001	–0.000	–0.001
	(–1.10)	(–1.12)	(–0.25)	(–1.20)
ROA	–0.138***	–0.127**	–0.134	–0.095
	(–8.90)	(–3.20)	(–1.04)	(–1.96)
GROWTH	0.000	0.000	0.000	0.002
	(1.56)	(1.83)	(0.02)	(1.05)
LIAB	–0.013***	–0.006*	–0.008	–0.005*
	(–6.05)	(–2.56)	(–2.07)	(–2.10)
TANG	0.041	0.021	0.035	0.148*
	(1.38)	(0.80)	(0.45)	(2.18)
NDTS	0.209	0.004	0.420	0.048
	(1.73)	(0.03)	(0.72)	(0.36)
Z_SCORE	–0.000	–0.000***	–0.000*	–0.000
	(–1.33)	(–4.07)	(–2.18)	(–1.27)
MTB	0.004	0.005	0.013	0.003
	(1.43)	(1.62)	(1.22)	(0.86)
AT	0.040***	0.057***	0.031	0.051***
	(7.87)	(6.00)	(1.27)	(5.56)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.762	0.825	0.808	0.869
Observations	8,049	2,422	2,676	2,951
Wald-Test (IO)	1.19	4.70	1.25	0.01
P-Value	(0.2923)	(0.0824)	(0.3260)	(0.9185)

internal funding proves to be sufficient. This finding is further supported by the significantly negative relationship between *LIAB* and the debt ratio. Following pecking order theory, firms with higher liquidity may opt to utilise excess cash rather than resorting to debt. Finally, the significantly positive impact of *AT*

Table 9: Endogeneity
GMM & Granger Causality

This Table addresses endogeneity concerns and shows the results for the regression model (4). The sample encompasses 8,049 firm-year observations from 1,138 different firms. Columns 1 illustrates the results for the baseline model using the OLS estimator (for comparison), column 2 for the two-step system GMM and column 3 for the Granger causality test. Significance of results shown as 1%***, 5%** and 10%* levels.

	OLS Estimation all values in t (1) TDA	Two-Step System GMM t–3 and t–5 (2) TDA	Granger Causality Test in t–1 (3) TDA
log (IO)	–0.010**	–0.017***	–0.005*
	(–2.17)	(–316.63)	(–1.76)
ROA	–0.136***	–0.675***	–0.160***
	(–8.93)	(–1.381.73)	(–10.14)
GROWTH	0.000	0.001***	0.002*
	(0.60)	(159.57)	(1.82)
LIAB	–0.013***	–0.019***	–0.016***
	(–6.02)	(–532.33)	(–11.61)
TANG	0.039	0.118***	0.104***
	(1.32)	(186.51)	(11.47)
NDTS	0.206	0.820***	0.479***
	(1.72)	(591.50)	(8.48)
Z_SCORE	–0.000	–0.001***	–0.000***
	(–1.35)	(–295.63)	(–4.69)
MTB	0.004	0.002***	0.003*
	(1.48)	(55.43)	(1.92)
AT	0.040***	0.015***	0.016***
	(7.84)	(251.71)	(20.08)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Adjusted R-squared	0.763	n/a	0.230
Observations	8,049	8,049	6,627
AR (1) Test	n/a	Yes	n/a
AR (2) Test	n/a	Yes	n/a
Hansen Test	n/a	Yes	n/a

on the debt ratio lends support to trade-off theory. Larger firms, with a high degree of diversification, enjoy constant cash flows, resulting in lower costs of financial distress compared to smaller companies. Hence, larger firms may prefer debt over equity financing.

Robustness Checks

Additional robustness checks are performed to validate my findings. It is plausible to assume that macroeconomic characteristics such as funding sources, interest rates, tax treatments or economic growth influence institutional monitoring (Alves and Francisco 2015; Mozumder *et al* 2015). Hence, the literature regards France and Germany as countries with a bank-based, and the UK as a country with a market-based financial system (Antoniou *et al* 2008). The regression results indicate a negative impact of IO on the debt ratio for both subsamples. Again, the Wald test rejects the null hypothesis of no significant differences between independent and grey institutions, but not across domestic and foreign institutions in both financial systems. In addition, a chi-square test does not reveal any significant disparity between the regression coefficients of both subsamples. These results let me assume that institutional investors perform monitoring during financial turmoil in both economies.

Next, some researchers also use another investor type classification. Bushee (2001) distinguishes between dedicated, quasi-indexer and transient institutions. A differentiation between active and passive investors is also commonly used (Almazan *et al* 2005). In the case of independent institutions, pension funds are regarded as quasi-indexer or passive, and mutual funds as dedicated or active investors. With respect to grey institutions, the degree of management collaboration may also vary between banks and insurances. Hence, I test my hypotheses with other investor type classifications and find significant differences between these groups. This result supports my finding of monitoring heterogeneity between independent and grey institutions.

Not least, I divide my total sample into subsamples regarding low and high values of the debt ratio and IO, respectively. Therefore, I consider the 25th percentile values of the two variables (see Table 3). The results indicate a significantly negative impact of IO on the debt ratio for firms with low and high shareholdings. However, I identify a significantly negative impact only for firms with high leverage rather than low leverage. This result is consistent with monitoring theory. Institutional monitoring may substitute for debt monitoring during times of financial turmoil when bankruptcy risk increases for firms with high leverage (Gillan and Starks 2003). The results of all robustness checks are available on request.

6. Conclusion

This study contributes to the existing literature in several key ways. It reveals a significantly negative influence of IO on the debt ratio. The effect intensifies during the crisis period and exhibits greater strength in the post-crisis era compared to the pre-crisis subperiod. These findings suggest that institutional investors' monitoring capabilities can effectively substitute for debt monitoring during crises. Hence, IO addresses agency conflicts between managers and shareholders, particularly when credit constraints limit debt monitoring. The study also underpins the diversity among institutional investors. Independent

institutions demonstrate superior monitoring capabilities compared to grey institutions during and after financial turmoil. However, no significant difference is observed between domestic and foreign institutions in either the crisis or post-crisis subperiods. Notably, this research does not identify significant disparities in institutional monitoring between a bank-based financial system (i.e., France and Germany) and a market-based financial system (i.e., the UK).

Finally, this study opens avenues for further research. Beyond IO, corporate governance encompasses various aspects, including compensation contracts, stock analyst coverage, and the board of directors. Subsequent studies should explore the influence of these factors on financing decisions during crises. Moreover, considering the interplay between debt and firm value, future research could investigate how IO impacts firm value during financial turmoil. Lastly, country-level characteristics such as culture, capital mobility, trade openness, and regulatory requirements are recognised influencers of institutional monitoring effectiveness. Thus, there is a need for additional corporate governance research that compares developed and emerging markets during periods of crises.

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Endnote

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