

Extending your team: motivated institutional investors and sell-side analyst activity

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Abstract

Using 2,888 firm-year observations for 436 non-financial companies listed on the Warsaw Stock Exchange, we examine whether motivated institutional investors—institutions for which a particular firm represents an important portfolio holding—generate demand for sell-side analyst services leading to an increase in analyst coverage of a given company. We find a positive relation between motivated institutional ownership and analyst coverage that is stronger for motivated investors that are non-blockholders, foreign, or long-term oriented, and for firms characterized by opaque information environments or a greater reliance on private communication, including family-controlled firms and firms with high bank-debt reliance. For family-controlled firms, the effect is particularly strong in companies with a high prevalence of analysts possessing prior professional industry experience. These findings suggest that motivated institutions value sell-side analysts not only for conventional research outputs, but also for their industry expertise and ability to facilitate access to corporate management.

Consistent with this interpretation, motivated institutional monitoring is unrelated to analyst forecast error but is associated with lower analyst forecast dispersion, suggesting complementary information production and potential information sharing between institutional investors and sell-side analysts. Finally, motivated institutional ownership is more strongly associated with firm value when firms are covered by analysts. Overall, our evidence suggests that sell-side analysts can extend motivated institutional investors' information-production and monitoring capabilities by providing specialized industry knowledge and facilitating access to management and firm-specific soft information.

Keywords: institutional investors, institutional ownership, institutional monitoring, analyst coverage, information production

JEL Classification: G23; G30; G32; G34; G21

1. Introduction

Institutional investors differ substantially in their incentives to monitor portfolio firms. An important source of this heterogeneity is the economic significance of an individual holding to the investor. Fich et al. (2015) show that monitoring incentives depend not only on the percentage stake an institution holds in a firm but also on the importance of that investment within the institution's portfolio. A firm that accounts for a substantial fraction of an institution's portfolio needs greater investor attention because it may have a disproportionately large effect on portfolio performance. Institutional investors for which a particular firm represents an important portfolio position—referred to as “motivated institutional investors”—therefore have especially strong incentives to engage with their portfolio companies to communicate information and preferences and monitor corporate insiders. Subsequent research documents that such monitoring affects a wide range of corporate outcomes, including firm performance, investment efficiency, payout policy, innovation, and executive compensation (Nagel et al., 2015; Ward et al., 2018, 2020; Miller et al., 2022; Liu and Yin, 2023).

The greater incentives to monitor, however, also create greater information needs. Effective monitoring requires investors to understand not only publicly observable firm outcomes but also managers' incentives underlying corporate decisions. Producing such information internally is costly. Institutional investors may therefore combine their own information acquisition (provided by the buy-side analysts hired by those institutions) with information and services supplied by external, sell-side analysts.

Sell-side analysts are particularly well positioned to provide such complementary services. Their role extends substantially beyond producing earnings forecasts and stock recommendations. Analysts accumulate specialized industry knowledge, maintain relationships with corporate executives, interpret public and private signals, and facilitate interactions between investors and management (Brown et al., 2015). These advantages are difficult for institutional investors to replicate across their portfolio companies. Brown et al. (2016) show that institutional investors—particularly those with long investment horizons—value sell-side analysts less for their short-term stock recommendations than for services that are costly to reproduce internally, especially industry expertise and access to management.

Access to management can be valuable because it provides information that cannot easily be obtained from conventional public disclosure. Recent evidence from Becht et al. (2026) demonstrates that private meetings between institutional investors and senior corporate managers convey economically valuable information that improves investors' trading decisions

and investment performance. Importantly, the informational advantage of such meetings is primarily associated with “soft information” rather than the transmission of readily quantifiable hard information. Sell-side analysts can facilitate this information channel by leveraging their relationships with corporate managers to arrange meetings and other private interactions between management and institutional clients. Their accumulated industry expertise may further help investors interpret the soft information obtained through these interactions.

Taken together, these findings suggest that sell-side analysts can effectively extend the “information-production capacity” of institutional investors. Importantly, the relation between institutional ownership and analyst following need not be unambiguously positive. While institutional investors are major consumers of sell-side research, large and sophisticated institutions may also possess substantial internal information-production capabilities. Consistent with this substitution view, Sabherwal and Smith (2008) find that analyst following increases with the number of institutional investors but decreases with the concentration of outside ownership. They suggest that, unlike institutions with relatively small holdings, large institutional shareholders may find it worthwhile to produce information internally. Motivated institutional investors may therefore respond to greater firm-specific information needs either by relying more heavily on external analyst services or by expanding proprietary information production. Whether internal and sell-side information production operate predominantly as complements or substitutes is an empirical question that motivates our analysis.

In our study, we examine the relation between motivated institutional ownership and analyst coverage using 2,888 firm-year observations for 436 non-financial firms listed on the Warsaw Stock Exchange between 2010 and 2019.

Poland provides a particularly useful setting for examining the relation between motivated institutional investors and sell-side analyst activity. Institutional investors hold relatively large stakes in Polish listed firms—aggregate institutional ownership places Poland among the highest-ranking OECD markets (De La Cruz et al., 2019)—yet they typically remain the largest minority shareholders in firms characterised by highly concentrated insider control (Aminadav and Papaioannou, 2020; Kałdoński and Jewartowski, 2025). Domestic institutions, historically dominated by pension funds, also hold relatively concentrated portfolios and frequently follow quasi-indexing strategies (Cremers et al., 2016), making portfolio importance particularly informative about the allocation of monitoring attention. At the same time, Polish listed firms operate in an information environment characterized by concentrated family and individual control (Gugler et al. 2014), and extensive reliance on bank financing and other private information channels (Białek-Jaworska and Krawczyk, 2019). These characteristics are

generally associated with weaker analyst following (Chang et al., 2001; Lang et al., 2004). Analyst coverage in our sample is relatively scarce: only 28% of firm-year observations are covered by at least one analyst¹. Poland therefore combines strong institutional monitoring incentives with limited public information intermediation, providing substantial variation in both motivated investors' need for third-party information production and the availability of sell-side analyst services.

Following Fich et al. (2015), we identify motivated institutional investors based on the importance of a particular firm within an institution's portfolio and examine whether their ownership is associated with greater sell-side analyst coverage.

Our baseline results show a strong positive relation between motivated institutional ownership and analyst coverage. The relation is robust to alternative measures of motivated monitoring. A series of robustness tests further mitigates concerns that motivated institutions simply select firms already followed by analysts. The relation survives first-difference estimation and propensity-score matching, and remains positive in an instrumental-variables analysis. Moreover, it is economically stronger for motivated quasi-indexers (that have little discretion to select firms) than for non-indexers, suggesting the direction of the observed relation is in line with our expectations. Collectively, these findings are consistent with motivated institutional ownership generating additional demand for sell-side analyst activity rather than analyst coverage merely attracting motivated institutional investors.

Our cross-sectional results provide evidence on the nature of this demand. The relationship between motivated institutional ownership and analyst coverage is substantially stronger when external information and access to management are particularly valuable. Specifically, the effect is stronger for family-controlled firms, firms operating in highly competitive industries, firms with proprietary costs that contribute to relatively opaque information environments, and firms relying heavily on private debt financing (i.e., bank debt). These firms are more likely to operate through information environments in which private communication can complement scarce public disclosure. Consistent with this interpretation, we document that the effect of motivated institutional ownership is particularly pronounced in family-controlled firms operating in industries extensively covered by analysts with prior professional industry experience.

The heterogeneity of motivated investors provides further evidence for this mechanism. The positive relation with analyst coverage is substantially stronger for motivated non-

¹ The analyst coverage in our sample (28%) is basically in line with Azevedo and Müller (2024), who report that the average analyst coverage for the group of largest firms listed on WSE is equal to approx. 35%.

blockholders than for motivated blockholders, for foreign rather than domestic institutions, and for long-term rather than shorter-horizon institutions. These are precisely the settings in which the marginal value of analysts' access-related services is likely to be particularly high. Non-blockholders have fewer direct channels to interact with management than large shareholders; foreign institutions face an informational and proximity disadvantage relative to domestic investors; and long-term institutions place relatively greater value on management access than on short-term stock recommendations. We obtain additional support from the implementation of the European Market Abuse Regulation (MAR). Following the increase in information frictions associated with MAR in Poland (Kudła and Gajus, 2024), analyst coverage increased particularly strongly in family firms with motivated non-blockholding institutional ownership, whereas we find no comparable effect for motivated blockholders.

Our analysis of analyst forecast properties provides further evidence on the nature of the relationship between motivated institutions and sell-side analysts. Motivated institutional monitoring is unrelated to analyst forecast error, suggesting that greater demand for sell-side analyst services does not translate into systematically more accurate earnings forecasts (as one would expect from the more generic findings by Cici et al. (2024) of the positive relation between the sell-side analyst interactions with institutional investors and their forecast accuracy). In contrast, motivated institutional monitoring is significantly associated with lower analyst forecast dispersion. This finding is particularly informative because lower forecast dispersion is consistent with a greater common-information component in analysts' information sets. Combined with evidence that institutional investors and sell-side analysts exchange information about firms of mutual interest, our results are consistent with a "two-way information-production network". Sell-side analysts contribute industry expertise and access to management, helping motivated institutions acquire and interpret firm-specific information, including soft information obtained through private interactions with managers. Motivated institutions, in turn, may share some of the information they acquire and process with sell-side analysts, increasing the common information incorporated into analysts' forecasts and thereby reducing forecast dispersion.

Finally, the analyst channel has economically meaningful consequences. Motivated institutional ownership is positively associated with industry-adjusted Tobin's Q, and this relation is significantly stronger among firms followed by sell-side analysts. This finding is consistent with analyst services complementing institutional monitoring: analysts provide industry knowledge, information-processing capacity, and access to corporate managers, which can reduce monitoring costs and increase its effectiveness for motivated institutions. Sell-side

analysts can therefore function as an extension of institutional investors' monitoring and information-production capabilities rather than merely as independent producers of earnings forecasts and recommendations.

Our study makes three main contributions. First, we contribute to the literature on institutional investors and firms' information environments by identifying investor-level monitoring motivation as an important source of demand for sell-side analyst services. Existing evidence links aggregate institutional ownership to analyst following and information production (O'Brien and Bhushan, 1990; Boone and White, 2015). We show that this relation is concentrated among institutions for which the firm is important within the portfolio and is particularly strong among motivated investors facing greater information or access constraints (frictions). Our findings therefore shift attention from how much institutional ownership a firm has to which institutions own it and how important the firm is to those institutions.

Second, we contribute to the literature on sell-side analysts by providing evidence about the economic sources of demand for analyst coverage. Whereas analyst research is commonly represented empirically by earnings forecasts and recommendations, our findings indicate that the value of sell-side analysts to sophisticated institutional investors extends well beyond these observable research outputs. In conjunction with the survey evidence of Brown et al. (2016) and the evidence on private management meetings in Becht et al. (2026), our results identify industry expertise and facilitated access to management—and the soft information associated with that access—as important channels linking institutional ownership to analyst activity. The lower dispersion of analyst forecasts associated with motivated institutional monitoring further suggests that the interaction between institutions and analysts may involve information sharing rather than a purely one-directional provision of analyst research.

Third, we contribute to the corporate governance literature by documenting a complementary relation between two important external governance mechanisms. Institutional investors and sell-side analysts are often studied separately as monitors of corporate insiders. Our evidence suggests instead that their roles can be mutually reinforcing. Analysts' informational resources and management connections can increase motivated institutions' monitoring capacity, while motivated institutions themselves may contribute information that increases the common information available to analysts. Consistent with this complementarity, the valuation effect of motivated institutional ownership is stronger when firms are covered by analysts. More broadly, our findings suggest that the governance role of financial analysts cannot be fully understood without considering the institutional investors that demand and use their services.

Overall, our evidence provides a unified explanation for why motivated institutional ownership predicts analyst coverage, which motivated investors generate the strongest effect, which firms attract the greatest incremental coverage, how institutional investors and analysts may jointly contribute to information production, and why the combination of motivated ownership and analyst activity is associated with higher firm value.

The rest of the paper is organised as follows. Section 2 presents the literature review and the hypothesis development. In Section 3, we describe the data and present our research design. In Section 4, we present our primary results and robustness test. In Section 5, we extend the research by changing the perspective and by analysing sell-side analysts' forecast errors and dispersion. In Section 6, we present the evidence of the combined impact of motivated institutional monitoring and analyst coverage on firm value. The last section concludes.

2. Literature review and hypothesis development

2.1. Motivated institutional investors' monitoring

Institutional investors differ substantially in both their motivation and ability to monitor portfolio firms. Prior research identifies several dimensions underlying this heterogeneity. First, monitoring incentives depend on the nature of an institution's relationship with its portfolio firms. Brickley et al. (1988) distinguish pressure-sensitive institutions, whose business relationships with portfolio companies may constrain their willingness to challenge management, from pressure-resistant institutions that are less exposed to such conflicts. Second, monitoring incentives depend on investment horizon. Chen et al. (2007) show that independent long-term institutional investors are particularly effective monitors: their presence is associated with better post-acquisition performance and a greater likelihood that managers withdraw value-destroying acquisition bids. Third, monitoring incentives and capacity depend on the size of the ownership stake. Larger shareholders have more wealth at stake and thus stronger incentives to incur monitoring costs, while their ownership positions may also give them greater ability to influence management (Shleifer and Vishny, 1986; Cronqvist and Fahlenbrach, 2009).

Institutional investors can influence portfolio firms through both voice and exit (Shleifer and Vishny, 1986; Admati et al., 1994; Maug, 1998; Admati and Pfleiderer, 2009; Edmans, 2009). Through the voice channel, investors can engage directly with senior executives and directors, often through behind-the-scenes discussions rather than public activism (McCahery et al., 2016). Through the exit channel, they can sell or threaten to sell their shares, allowing

informed trading to discipline managers even in the absence of direct intervention (Admati and Pfleiderer, 2009; Edmans, 2009).

Fich et al. (2015) show that monitoring incentives depend primarily on a firm's importance within an institution's portfolio. Because institutional investors have limited resources for monitoring, they concentrate their efforts on holdings that account for relatively large shares of their portfolios. Consistent with this motivated-monitoring argument, Fich et al. (2015) show that portfolio importance predicts institutional involvement in takeover decisions and affects acquisition outcomes. Thus, the intensity with which institutional investors use available governance mechanisms should depend on their motivation to monitor a particular portfolio firm.

A growing literature confirms the economic consequences of this type of selective monitoring. Nagel et al. (2015) find that motivated institutional investors affect firm payout and performance. Ward et al. (2018) show that motivated institutional monitoring increases the marginal value of corporate cash, while Ward et al. (2020) document improvements in investment efficiency. Miller et al. (2022) show that motivated institutional ownership enhances corporate innovation by reducing agency problems and managerial career concerns and encouraging managerial risk-taking. Liu and Yin (2023) find that motivated monitoring improves executive-compensation arrangements and relative performance evaluation. Together, these studies suggest that allocating greater attention to economically important portfolio firms can improve corporate policies and firm value.

This evidence is central to our argument because the greater monitoring incentives of motivated institutional investors should generate correspondingly greater information needs. Investors must understand business models, managerial strategies, investment opportunities, managerial ability and incentives, and the governance processes behind corporate decisions. Much of this information is inherently soft and costly to generate or interpret. Institutional investors possess substantial internal information-production capacity to facilitate monitoring. They employ portfolio managers, buy-side analysts, and governance specialists and acquire information through direct interaction with portfolio firms².

² The resource-intensive nature of such monitoring is also apparent in institutional practice. For example, Nationale-Nederlanden PTE, Poland's largest pension fund manager, reports an investment team comprising six portfolio managers, an analyst, a trader, and two corporate-governance specialists, supported by three investment-risk specialists (IGTE, 2024). Its CEO describes dialogue with portfolio companies on strategic issues as part of portfolio managers' daily work and emphasizes their industry specialization and interactions with management and supervisory boards. This example illustrates that active monitoring requires both specialized human capital and continuous acquisition and processing of firm- and industry-specific information.

Yet, just as limited monitoring capacity prevents institutions from monitoring all portfolio firms with equal intensity, their internal information-production capacity is also constrained. Producing in-house the full range of firm- and industry-specific information required for effective monitoring is costly and competes for the limited time and expertise of portfolio managers, buy-side analysts, and governance specialists. Motivated investors may therefore supplement their own information production and direct interactions with portfolio firms with information produced by external intermediaries. Consequently, greater monitoring incentives and the associated information needs can generate demand for complementary third-party information production. Sell-side analysts are particularly well positioned to provide such services.

2.2. Sell-side analysts as information providers and external monitors

Sell-side analysts are important information intermediaries in capital markets. Their traditional outputs include earnings forecasts, stock recommendations, and written research. By acquiring, processing, and disseminating information, analysts can reduce investors' information-acquisition costs and information asymmetry between corporate insiders and outside investors (Healy and Palepu, 2001).

For institutional investors, however, the value of sell-side analysts extends beyond these observable research outputs. This distinction is particularly relevant for investors that actively monitor portfolio firms. As discussed in Section 2.1, motivated institutional investors have strong incentives to acquire firm-specific information, but their own information-production resources are limited. Sell-side analysts can therefore complement institutions' internal resources by supplying specialized information, interpretation, and access that would otherwise be costly to produce internally.

Survey evidence supports this broader view of sell-side services. Brown et al. (2015) show that sell-side analysts regard industry knowledge and private communication with management as important inputs into their forecasts and recommendations. From the perspective of institutional demand, Brown et al. (2016) find that buy-side analysts attach relatively little importance to sell-side stock recommendations compared with other services. Among the most highly valued sell-side inputs are in-depth industry knowledge and access to corporate management³.

³ Studies referring to other markets in Europe (Larrán and Rees, 2003) and Asia (Chaudhury et al., 2022) confirm that institutional investors value sell-side analysts primarily for facilitating the access to company management.

Industry expertise represents one such resource. Because sell-side analysts specialize in relatively narrow sets of firms and industries, they accumulate knowledge about competitors, customers, suppliers, technologies, regulation, and industry-specific accounting practices. Such expertise can help institutional investors interpret firm-specific signals and evaluate managerial decisions in an appropriate industry context. A second important service is access to corporate management. Sell-side analysts facilitate interactions between institutional clients and corporate executives through conferences, roadshows, and private one-to-one meetings. Green et al. (2014) show that institutional investors' demand for management access through broker-hosted conferences is greater for firms with more complex information environments that are harder to value.

Non-deal roadshows provide particularly direct evidence of this intermediation role. Bradley et al. (2022) examine private meetings between corporate management and institutional investors that are typically organized by sell-side analysts and show that institutions trade heavily and profitably around these meetings. Recent evidence from Becht et al. (2026) further indicates that the trading advantages associated with private meetings primarily reflect soft, firm-specific information, concerning such matters as business models, financial metrics, management, boards, compensation, and governance.

These information-related services are closely connected to the governance role of financial analysts. The idea that analyst activity can serve as a monitoring mechanism has a long tradition. Moyer et al. (1989) argue that analyst following can arise as a monitoring response to agency problems. Chung and Jo (1996) propose that analysts' monitoring of corporate performance disciplines managers and reduces agency costs associated with the separation of ownership and control, and document a positive association between analyst following and firm value. Lang et al. (2004) similarly find that analyst coverage is associated with higher valuations, particularly among firms likely to face more severe governance problems. Sell-side analysts also explicitly incorporate governance information when forming their earnings forecasts and stock recommendations (Brown et al., 2015).

More recent studies provide evidence that reductions in analyst scrutiny adversely affect corporate behavior. Using exogenous decreases in analyst coverage associated with brokerage mergers, Irani and Oesch (2013) show that reduced analyst scrutiny lowers financial-reporting quality. Chen et al. (2015) document broader consequences: decreases in analyst coverage reduce the marginal value of excess cash, increase excessive CEO compensation, and make firms more likely to undertake value-destroying acquisitions. These findings suggest that analyst scrutiny can constrain managerial opportunism and improve corporate decision-making.

Chen et al. (2015) distinguish two channels through which analysts perform this external governance role. First, analysts engage in direct monitoring by scrutinizing firms' financial reports and interacting with management, including questioning executives during conference calls. Second, they provide indirect monitoring by disseminating public and privately acquired information to institutional and individual investors through research reports and media outlets. Information produced by analysts enables outside investors to evaluate managerial actions more effectively and increases the market and reputational consequences of poor managerial decisions.

Institutional monitoring and analyst monitoring therefore need not represent independent governance mechanisms. Analysts' industry knowledge, information-processing capacity, and relationships with management can reduce the informational costs institutions face when exercising voice or evaluating managerial decisions. Conversely, institutions with strong monitoring incentives constitute a natural clientele for analyst services that improve their ability to acquire and interpret firm-specific information. Sell-side analysts may thus operate as an extension of institutional investors' monitoring and information-production capabilities.

The equilibrium level of analyst activity should consequently depend partly on investor demand. Bhushan (1989) documents systematic relations between analyst following, firm characteristics, and institutional ownership. O'Brien and Bhushan (1990) explicitly model institutional ownership and analyst following as jointly determined: institutional investors generate demand for information, while analyst information can, in turn, attract institutional investors. Boone and White (2015), exploiting plausibly exogenous variation in quasi-indexer ownership, provide stronger evidence of a causal effect of institutional ownership on information production, showing that greater institutional ownership increases analyst coverage and improves firms' information environments. At the same time, Sabherwal and Smith (2008) find that analyst following increases with the number of institutional shareholders but decreases with concentrated outside ownership, suggesting that large sophisticated shareholders may sometimes substitute their own information production for external analyst services.

Motivated institutional investors need more firm-specific information but can respond either by increasing proprietary information production or by relying more heavily on external analysts. When sell-side analysts possess specialized industry knowledge, information-processing capacity, or relationships with corporate managers that are costly to replicate internally, analyst services can complement institutional monitoring. This complementarity should be particularly important when relevant information is soft, privately communicated, or costly to interpret, providing the basis for the competing predictions.

2.3. Institutional investors' need for third-party information production – hypotheses development

As developed in previous sections, portfolio importance increases institutional investors' incentives to monitor, while sell-side analysts can complement institutions' internal information-production capacity through specialized expertise, information processing, and access to corporate management. This suggests that motivated institutional investors should generate particularly strong demand for analyst services.

Institutional investors are important consumers of analyst research (Bhushan, 1989; O'Brien and Bhushan, 1990), but their demand for external information should vary with their monitoring incentives. Because monitoring resources are scarce, institutions concentrate attention on economically important portfolio positions (Fich et al., 2015; Kempf et al., 2017). Analysts similarly devote more effort to firms important to their institutional clients (Harford et al., 2018). Thus, portfolio importance should affect not only institutional monitoring effort but also demand for external information supporting that effort.

The complementarity between institutional monitoring and analyst services provides our primary prediction. Motivated investors have stronger incentives to acquire firm-specific information, while sell-side analysts provide informational resources that are costly to reproduce internally across portfolio firms. This argument is consistent with Boone and White (2015), who show that plausibly exogenous increases in quasi-indexer ownership lead to increased analyst following. Because quasi-indexers rely extensively on public information production, their evidence illustrates how demand for institutional information can induce a supply response from analysts.

Referring to the above arguments, we formulate our main hypothesis:

H1: Motivated institutional ownership is positively related to sell-side analyst coverage.

If the complementarity mechanism dominates, the value of analyst services should increase with the difficulty of obtaining and interpreting information about a portfolio firm. When public information is readily available, institutions can satisfy a greater proportion of their information needs without external intermediation. When information environments are opaque, or firms rely more extensively on private communication, analysts' industry knowledge and management relationships should have greater incremental value.

Family-controlled firms provide an important example. Family control is associated with corporate opacity and greater reliance on private information channels (Anderson et al., 2009),

while analyst following tends to be lower in family/management-controlled firms (Lang et al., 2004; Boubaker and Labégorre, 2008). Bank-dependent firms provide a related setting. Banks acquire substantial private borrower information (Diamond, 1991; Park, 2000), particularly from opaque firms (Denis and Mihov, 2003), but outside institutional shareholders do not automatically share this information. Information frictions may also arise from proprietary costs: Feng et al. (2022) show that firms facing greater product-market competition strategically reduce the disclosure of information that could benefit competitors, thereby limiting the information available to outside investors. Motivated investors should therefore benefit more from alternative information channels in both settings. The value of such intermediation should be further enhanced when analysts possess relevant industry expertise. Prior professional industry experience can provide analysts with specialized human capital and professional networks that improve their ability to interpret firm-specific information and facilitate interaction with management (Bradley et al., 2017). These advantages should be particularly valuable where private communication is important.

More generally, this reasoning implies that an increase in information frictions should increase demand for analyst services particularly among institutions lacking direct management access. We therefore predict:

H2: The positive relation between motivated institutional ownership and sell-side analyst coverage is stronger when firm-level information frictions are greater and private communication is more important.

The incremental value of analyst services should also vary with an institution's own ability to acquire information. Three investor characteristics provide useful variation in such constraints. First, large ownership positions can facilitate direct interaction with managers and directors (Cronqvist and Fahlenbrach, 2009). Motivated non-blockholders may therefore depend more strongly on analyst-facilitated access than motivated blockholders. Second, foreign institutions face informational and proximity disadvantages relative to local investors (Leuz et al., 2009; Kim et al., 2016), increasing the potential value of analysts' local knowledge and management relationships. Third, long-term institutions have stronger incentives to engage with portfolio companies (Chen et al., 2007; McCahery et al., 2016). Importantly, Brown et al. (2016) show that long-horizon investors place relatively little value on short-term recommendations but substantial value on management access. Their greater demand for sell-side services may therefore reflect sustained monitoring rather than investment advice.

These arguments led us to formulate another hypothesis:

H3: The positive relation between motivated institutional ownership and sell-side analyst coverage is stronger for motivated institutional investors with greater incremental demand for analysts' information and management-access services—specifically, for non-blockholders, foreign investors, and long-term investors.

Finally, complementarity between institutional investors and analysts should have implications for the effectiveness of monitoring. Prior studies show that motivated institutional monitoring improves corporate policies and firm value (Fich et al., 2015; Nagel et al., 2015; Ward et al., 2018, 2020; Miller et al., 2022; Liu and Yin, 2023). Separately, analyst scrutiny can constrain managerial opportunism and improve corporate outcomes (Irani and Oesch, 2013; Chen et al., 2015).

Our framework connects these two governance mechanisms. If analysts provide information, expertise, and management access that reduce institutions' monitoring costs, their presence should increase the effectiveness with which motivated investors exercise voice, evaluate managerial decisions, and use informed exit. Analyst coverage should therefore strengthen rather than merely accompany the governance effects of motivated institutional ownership. We therefore formulate another hypothesis:

H4: The positive relation between motivated institutional ownership and firm value is stronger for firms covered by sell-side analysts.

Taken together, the hypotheses describe a common mechanism. Portfolio importance creates monitoring incentives and associated information needs. Institutions can meet those needs through in-house information production, direct engagement, and external analyst services. H1 predicts complementarity between these sources. H2 and H3 identify, respectively, the firm- and investor-level conditions under which the marginal value of sell-side intermediation should be greatest. H4 examines whether analyst services ultimately increase the effectiveness of motivated institutional monitoring.

3. Data and research design

3.1. Sample

Our sample selection process began by obtaining institutional ownership characteristics for all nonfinancial companies listed on the Warsaw Stock Exchange (WSE) over the research period. We identified 379 institutional investors holding stocks in our sample companies, for whom portfolio data were available to calculate our measures of motivated institutional monitoring.

In the next step, we derived all available data on analysts' activities and merged it with data on ownership structure. After merging, we end up with a sample of 436 non-financial companies listed on the WSE in 2010–2019 (2,888 firm-year observations)⁴.

We mostly gathered the data on the ownership structure of our sample companies, their analyst coverage and financial characteristics, and the data characterizing the institutional investors that hold stocks of our sample firms using three data sources: S&P Capital IQ database, Amadeus database (Bureau Van Dijk – A Moody's Analytics Company) and Notoria Serwis (Polish data provider). The missing data points on local institutions' portfolios were collected by hand from their annual reports and the database of the Polish Financial Market Supervisor (KNF).

3.2. Research design

For our empirical investigation, as the number of analysts covering the firm is a count variable, we follow Rock et al. (2001) and employ count-data econometrics⁵. As suggested by Rajan and Servaes (1997), the data on analyst coverage may suffer from selection bias (i.e., missing data on analyst coverage could result from selection bias in the database provider's coverage, or from analyst interest in the firm). That's why we follow Boubakri and Bouslimi (2010) and use a two-step estimation method similar to Heckman's two-step procedure. In the

⁴ We choose not to extend our data beyond the year 2019 for two reasons. Firstly, to alleviate the impact of COVID-19 on public capital markets and related analyst services. As suggested by Ellul et al. (2020), COVID-19 significantly affected both firms' needs (demand side) for external financing and their access to it (supply side). Secondly, to mitigate the effects of MIFID II on research analyst activities. For example, Fang et al. (2020) suggest that after MIFID II implementation (i.e., unbundling investment research from other costs that investment firms charge to clients), sell-side analysts covering European firms focused on the firms important to the sell-side, and buy-side investment firms turned to more in-house research.

⁵ Rock et al. (2001) replicate the Bhushan (1989) study and find that using count data regression instead of linear regression brings contrasting results on the relationship between institutional ownership and analyst following. Moreover, their research supports the econometric superiority of the negative binomial model over both the OLS and Poisson models.

first stage, in line with previous studies, we include firm size, free float, industry and year effects and run a probit model explaining the decision of analysts to follow the firm (as described by Equation 1).

$$AN_COVERAGE_{i,t} = \alpha + \beta_1 \times SIZE_{i,t-1} + \beta_2 \times FLOAT_{i,t-1} + \alpha_t + \alpha_s + \varepsilon_{i,t} \quad (1)$$

Next, in the second stage, following Boubaker and Labégorre (2008), we employ a negative binomial model and estimate the analyst coverage equation (equation 2), which includes the correction factor for potential selection bias (MILLS) as predicted from the first stage.

$$AN_COVERAGE_{i,t} = \alpha + \beta_1 \times MOTIVATED_IO_{i,t-1} + \sum_{j=2}^n \beta_j \times CONTROLS_{j,i,t-1} + MILLS + \alpha_t + \alpha_s + \varepsilon_{i,t} \quad (2)$$

where $AN_COVERAGE_{i,t}$ refers to a number of analyst following given company i in year t , $MOTIVATED_IO_{i,t-1}$ is the variable measuring firm-level institutional motivated monitoring for company i in year $t-1$; $CONTROLS$ are control variables, $MILLS$ is the correction factor for selection bias, α is the intercept, α_t are year fixed effects, α_s are industry (sector) fixed effects and $\varepsilon_{i,t}$ represents the error term.

Based on recent studies on the effect of institutional ownership on analyst activity (e.g., Boone and White (2015)), we measure the demand for analyst services by the number of analysts issuing earnings-per-share estimates for a given firm ($AN_COVERAGE$).

We follow Fich et al. (2015) and classify institutional investors as having incentives to monitor based on their portfolio allocation to the firm. Using data on institutional investors' portfolios, we calculate the market value of each portfolio and each firm's portfolio weight. All institutions whose holding value in the firm is in the top 20% of the institution's portfolio are classified as motivated institutions⁶.

Having identified the importance of stock at the institutional investor level and classified institutions according to their monitoring attention, we again adopt the perspective of a

⁶ In the most recent study on the role of motivated institutions in corporate policies of Polish listed firms, Kałdoński and Jewartowski (2026) argue that institutional investors in Poland have, on average, have more concentrated portfolios than their counterparts in the United States, and their "monitoring motivation and capacity" in terms of the number and value of important stocks is different. Following existing research, we also use holding value threshold in the firm to be in the top 20% of the institution's portfolio. Moreover, this threshold is in line with the recent research on the economics of institutional investors' engagement. As shown by Heath et al. (2024), on average US institutional investors engage with app. 12% of their portfolio companies. However, for Blackrock, the largest passive institution, the engagement ratio is equal to 20%.

company in our sample. For each company in each year, we calculate the proportion of stocks held by all institutional investors classified as motivated investors, that is, the motivated institutional ownership (MM_IO). We also calculate two alternative proxies to capture the strength of motivated institutional monitoring. The first one is the number of monitoring institutions (MM_NUM). The second one, TMATT, is computed following Ward et al. (2018) as a weighted average of a firm's institutional ownership, with the weights being the institutional investors' monitoring motivation.

In addition to the main explanatory variables, we include a set of control variables used in prior research on analyst activities and institutional investor monitoring. We control for general firm characteristics, which existing literature (e.g., Lang et al., 2004; Boone and White, 2015; Jiang et al., 2024) has proven to be related to AN_COVERAGE. These variables include firm size, profitability, leverage, market-to-book and earnings growth. We control for size and profitability because larger firms and better-performing firms are more likely to have more analysts covering them. Earnings growth and market-to-book are included to capture the possibility that analysts may be attracted to high-growth opportunity firms. For the same reason, we also control for a firm's leverage. Because clients using analysts' services can prefer firms with large trading volumes, we also include free float. As some firms' characteristics can directly influence the difficulty of gathering information and forecasting earnings, we also control for earnings surprise, beta, volatility, and a loss indicator. We also include Hirschman – Herfindahl institutional ownership index, as Sabherwal and Smith (2008) suggest that the concentration of outsider shareholdings negatively influences the number of analysts following the firm. The demand for sell-side analyst services is also affected by institutional shareholders' horizon (Brown et al., 2016). To better understand the role of motivated institutions in determining sell-side analyst activities, we also control for the firm's institutional investors' portfolio turnover as a proxy for investor horizons.

3.3. Summary statistics

Table 1 reports the distribution of our sample by industry. The sample is distributed over twenty industries. The capital goods industry is the most represented one. 28% of the sample firms have coverage from at least one analyst, though there is some concentration across three industries: materials, capital goods and consumer durables & apparel.

INSERT TABLE 1 HERE

The summary statistics for our sample firms are reported in Table 2. The mean firm in our sample has one analyst covering it, total assets of \$98.0 million, and motivated institutional ownership of 8%. On average, firms in our sample are held by two institutions classified as monitoring institutions.

INSERT TABLE 2 HERE

Table 3 presents the Pearson correlation coefficients between our main variables.

INSERT TABLE 3 HERE

4. Baseline results

4.1. Primary findings

To investigate the effect of monitoring institutions on analyst activity, we perform several multivariate tests. Table 4 reports the first-stage results (Equation (1)). As predicted, analysts' decision to cover the firm is strongly and positively related to firm size and free float, and is significant at the 1% level.

INSERT TABLE 4 HERE

We begin our primary analysis by examining the relationship between motivated institutional monitoring measures and analyst coverage. Table 5 displays the estimation results for Equation (2). Models 1-5 report results for our main dependent variable (AN_COVERAGE).

INSERT TABLE 5 HERE

Model 1 of Table 5 controls for fixed effects and includes only the fraction of ownership held by motivated institutional investors (MM_IO), where motivated investors are institutions whose holding value in the firm is in the top 20% of the institution's portfolio. The results show a positive and significant association between motivated institutional ownership and analyst coverage. In Model 2 of Table 5, after controlling for other factors, the coefficient on MM_IO remains positive (0.789) and statistically significant at the 1% level (t-statistic 3.78). The results of Model 2 show that an increase in stock holdings by motivated institutions responds to an increase in the number of analysts covering the firm, confirming our hypothesis *H1*.

Of the control variables, only a few are statistically significant, and most of their signs are basically in line with our expectations. Larger firms (SIZE), more profitable firms (ROA) and firms with greater MB tend to have more analyst coverage. The number of analysts following the firm is also positively related to earnings growth and beta. In contrast, the

negative coefficient on EARSUPRISE indicates that firms with large earnings surprises are less likely to experience analyst following. Both institutional ownership controlling variables (HHI_IO and PTFTURN) seem not to affect analyst coverage in a statistically significant way.

Models 3–4 in Table 5 substitute the fraction of ownership held by motivated institutional investors with other motivated-institutional-monitoring proxies. In line with Model 2, Model 3 shows a positive and significant coefficient for the number of monitoring institutions (MM_NUM). Model 4 shows that our results also remain unchanged when we substitute motivated institutional ownership with a total monitoring attention index (TMATT). After augmenting Model 2 with the fraction of ownership held by non-motivated institutional investors (NMM_IO), the coefficient on MM_IO also remains positive and statistically significant. Moreover, as expected, the findings of Model 5 show that institutions whose holdings in the firm are in the bottom 20% of the institution's portfolio (NMM_IO) don't demand analyst research and other services. All in all, as seen in Models 3–5 of Table 5, both the substitution of the motivated institutional monitoring measures and the inclusion of the shareholdings of the least motivated institutional investors have little effect on our findings. The observed relationships unambiguously confirm that firms with higher levels of motivated institutional monitoring are covered by more sell-side analysts.

4.2. Robustness tests

The baseline regression estimates reported in Table 5 indicate that institutions are more likely to demand more analyst services for their large-scale investments, i.e., investments that have a greater impact on their portfolios and thus warrant greater attention. However, these results could be biased if the analyst coverage determines the scale of the institution's investment in the firm. Previous studies (e.g., O'Brien and Bhushan (1990)) suggest a simultaneous relationship between analyst coverage and institutional ownership. For instance, Boone and White (2015) indicate that higher institutional ownership intensifies the demand for analyst services. On the other hand, Chan et al. (2013) show that some institutions do not invest randomly and favour firms with greater analyst following. In this case, institutional ownership is rather the effect than the cause of the firm's analyst activity. So, one can argue that even if institutions have the incentives and capacity (due to large stockholdings) to gather, process, and produce information themselves, they prefer to invest in companies with greater analyst coverage (a reverse-causality interpretation). Moreover, some unobservable factors may affect both motivated institutional ownership and analyst following, which we cannot control for and that bias our findings (omitted variable bias).

To address endogeneity concerns, we conduct several independent tests. First, we split the overall motivated institutional ownership into quasi-indexers and non-indexers. Next, we estimate change regressions. Furthermore, we use propensity score matching (PSM). Finally, we also employ a two-stage least squares (2SLS) analysis using instrumental variables.

4.2.1. Quasi-indexers vs. non-indexers

Several studies (e.g., Appel et al., 2016; Harford et al., 2018) provide evidence that indexing institutions affect a wide range of corporate outcomes. Boone and White (2015) find that indexers enhance firm transparency and information production, including analyst activity (Boone and White, 2015). Moreover, Bebchuk and Hirst (2019) document that, although on average index funds tend to underinvest in their stewardship activities, there is some evidence of their focus on the most important firms in their portfolios.

Derrien et al. (2013) suggest that splitting long-term investor ownership into two components, one that is plausibly exogenous (indexer ownership) and another that is possibly endogenous (non-indexer ownership), provides a useful identification strategy. We follow previous research on firm's information environment (Boone and White, 2015; Harford et al., 2018) and maintain that indexers' investment decisions are exogenous to the analyst coverage because their portfolio composition is largely determined by the constituents of their relative benchmark index.

Based on existing studies, we classify motivated investors into quasi-indexers and non-indexers using the active share measure proposed by Cremers and Petajisto (2009). Active share measures the distance between the weights on each firm in the investor's portfolio and the weights in the relevant index. In line with Cremers et al. (2016), we use WIG (i.e. the main index on the Warsaw Stock Exchange). Following Harford et al. (2011), we classify investors with an active share of up to 30% as quasi-indexers and all other investors as non-indexers.

INSERT TABLE 6 HERE

Table 6 displays the results of our test of association between these split measures of motivated institutional ownership and the number of analyst following the firm (AN_COVERAGE). The coefficients on both MM_IO_QUASI-INDEXER and MM_IO_NON-INDEXER are positive and significant at 1% and 10% level, respectively. Nevertheless, the effects are economically more significant for quasi-indexers (the coefficient 1.251) than non-indexers (the coefficient 0.470). Overall, possibly endogenous motivated institutional ownership (non-indexers) and plausibly exogenous quasi-indexers' ownership are

associated with greater analyst coverage. However, the greater magnitude of MM_IO_QUASI-INDEXER than the magnitude of MM_IO_NON-INDEXER at least partly contradicts the self-selection concern and supports our causal interpretation of the effects of motivated institutional investors.

4.2.2. Change regression

Firstly, we control for omitted variables bias by regressing the change in analyst coverage on changes in motivated institutional ownership and other independent variables. If the firm-specific omitted characteristics that jointly affect ownership structure and analyst activity are constant over time, focusing on changes eliminates the impact of such time-invariant and unobservable factors. To remain in the sample, we require a firm to have at least two consecutive firm-year observations. This leads to a sample containing 2,406 firm-year observations. Table 7 reveals the results of change regression (the first-difference regression).

INSERT TABLE 7 HERE

The regression results in Table 7 corroborate our primary findings. Controlling for changes in other firm characteristics, the change in motivated institutional ownership (Δ MM_IO) is positively related to the change in the number of analysts following the firm (Δ AN_COVERAGE). The observed effect remains statistically significant at the 1% level⁷.

4.2.3. Propensity score matching

To address selection bias due to observables (i.e., control for observable firm characteristics other than those of motivated institutional shareholders that may affect analyst activities), we use propensity score matching (PSM).

For each treatment-firm observation (i.e., a firm having at least one motivated institutional shareholder), we match a firm without a motivated institutional shareholder holding the firm's stocks (a control firm). We match the treatment and control firms based on the firm characteristics included on the right side of Equation (2). We conduct one-to-one matching without replacement and require a minimum calliper distance of 0.001. PSM results in 1,086 firm-years of matched treatment and control firms. The results of PSM are presented in Table

⁷ Because it is challenging to find a perfect solution to control for firm-specific omitted variable bias, we also estimate a firm fixed effects model (unreported). After controlling for firm fixed effects, our primary results remain unchanged, confirming the positive relationship between motivated institutional ownership and analyst coverage.

8. Panel A reports the mean values of firm characteristics for the treatment and control groups, as well as p-values from t-tests of differences. Except for institutional portfolio turnover (PTFTURN), no significant difference in either individual firm characteristics or overall propensity scores indicates successful matching.

INSERT TABLE 8 HERE

In the next step, we re-estimate the baseline model (i.e Equation 2) using the matched sample, and again, the results are consistent with the primary results shown in Table 5, supporting the positive association between motivated institutional ownership and the number of analysts following the firm.

4.2.4. Instrumental variables analysis using Polish pension funds reform

We also employ an instrumental variable two-stage least squares (2SLS) approach to conduct our endogeneity testing. Recent research (e.g., Kałdoński and Jewartowski, 2024) suggests that the Polish pension funds (OFEs) reform that occurred in 2013 provides a plausibly exogenous shock to pension funds' stockholdings of listed companies.

Before the reform, OFEs were forced to invest mostly in Polish treasury bonds and stocks traded in the domestic regulated market (Warsaw Stock Exchange), being the most prominent group of outside blockholders in Polish listed companies, holding about 28% of their capitalisation. The reform, among other things, completely remodelled the investment policy of OFEs, transforming them from balanced funds to equity funds. At the same time, the reform substantially increased the flexibility of their investment strategies, allowing for much higher involvement in international stock markets (gradually increasing the limit from 5% to 30%). Moreover, the reform not only encouraged OFEs to partially replace their domestic holdings with foreign stocks but also to rebalance their remaining portfolios of domestic companies⁸.

We posit that changes arising from rebuilding the investment policy of OFEs provide an exogenous shock to institutional ownership in WSE-listed companies, and thus we employ the instrumental variable OFERATIO_2013, which is equal to zero for the years before 2014 and

⁸ To avoid a rapid sell-off of domestic shares, OFEs were forced to hold at least 75% of their portfolios in domestic shares in the first year after the reform (2014). In the next years, the lower bound was gradually reduced to 55% in 2015, 35% in 2016, and 15% in 2017. Starting from 2018, no limits are placed on investing in stocks listed on the domestic regulated market.

is equal to the firm's stake held by OFE among all shares held by institutional owners as of the end of 2013 (when the reform was enacted)⁹.

To confirm the robustness of our findings on motivated institutional ownership, we also apply two other instrumental variables. We acknowledge that institutional ownership concentration (HHI_IO) can itself be endogenously determined. That's why we follow previous studies on both overall ownership structure and institutional ownership (e.g., Nguyen and Shiu, 2022) and utilize the firm's industry-average (median) of Hirschman-Herfidahl institutional ownership concentration index (IND_HHI_IO). Industry institutional holdings are unlikely to directly influence a particular firm's analyst coverage, but they are likely to be correlated with the firm's ownership structure.

Existing research suggests that institutional investors are more likely to include the constituents of certain indexes in their portfolios. For example, Ferreira and Matos (2008) document that MSCI ACWI is a commonly used benchmark index for foreign portfolio investors. At the same time, Bushee (2001) indicates that domestic institutions generally use local stock market indexes like the S&P 500. Because WSE-listed companies included in the MSCI ACWI index simultaneously constitute the WSE's largest indexes, we claim that both domestic and foreign institutions may pursue domestic indexes. Thus, we use WIG20, mWIG40 and sWIG80 and set a dummy (WIG20&mWIG40&sWIG80) that equals one if the stock is a member of these indexes.

INSERT TABLE 9 HERE

Table 9 provides the estimates from the 1st and second-stage regressions with AN_COVERAGE as the dependent variable. In the first stage, we regress each of the two institutional ownership variables (MM_IO and HHI_IO) on the instrumental variables and the set of control variables from Equation (2). The first stage results are reported in Models 1-2 of Table 9. The coefficient on OFERATIO_2013 is negative and significant at the 1% (10%) level in Model 1 (Model 2), where MM_IO (HHI_IO) is used as a measure of institutional ownership. This finding is broadly consistent with our prediction that OFE's ownership stake as of the end of 2013 reduces motivated institutional ownership and widens the institutional shareholder base in the post-reform period. Moreover, the first-stage regression result (Model 1) shows that membership in the main indices increases the probability that an institution's portfolio allocation to the firm will be large. At the same time, the results of Model 2 reveal a positive

⁹ In our sample, OFERATIO_2013 does not seem to be strongly correlated with analyst following, as the correlation between AN_COVERAGE and OFERATIO_2013 is 0.25.

and significant association between a firm's institutional ownership concentration and the industry (median) average for the portfolio of a firm's industry peers (IND_HHI_IO)¹⁰.

In the second stage, we estimate Equation (2), replacing our main explanatory variables with the predicted values obtained from the first stage. Consistent with the primary results, the coefficient on the predicted values of MM_IO is positive and significant. This supports our baseline finding that motivated institutional ownership positively affects analyst coverage.

4.3. Cross-sectional analysis

The positive effect of motivated institutional monitoring on analyst coverage is consistent with the idea that motivated institutions demand services provided by sell-side analysts. Nevertheless, we acknowledge that this effect may differ across firms depending on the reason they are followed by analysts. We argue that the observed effect should be stronger in firms where the monitoring role of motivated institutions is more relevant, and the need and benefits of using sell-side analysts to support motivated investors' monitoring are greater. Specifically, we examine the firm's information environment, the pre-analyst industry experience and the monitoring effectiveness of institutional investors.

4.3.1. Complex information environment and demand for management access

Borochin and Yang (2017) document that the differential impact of the type of institutional ownership on firm valuation and governance is driven by differences in information gathering. A recent study by Miller et al. (2022) shows positive effects of motivated institutional investors on the outcomes of their portfolio firms' activities associated with high information asymmetry. Motivated institutions enhance corporate innovation by: (1) encouraging managerial risk-taking, (2) mitigating agency problems, (3) easing managerial career concerns, and (4) mitigating corporate misvaluation. Most of these channels of influence suggest that motivated institutional investors can access firm-specific soft information. Evidence from private meetings between institutional investors and portfolio firms indicates that soft information about the firm is the primary benefit of access to management.

It is a common belief that institutional investors' demand for management access is greater for firms with more complex information environments that are harder to value (Green et al, 2014). Bushee et al. (2018) argue that "*managers likely prefer private disclosure when*

¹⁰ Unreported p-value of Hansen's overidentification tests (equal to 0.27) confirms the quality of the instruments used.

their information may be misinterpreted by unsophisticated investors; when investors demand privileged access; and when there are changes in the firm's information environment". Existing research confirms that less transparent firms with high information asymmetry are more likely to meet privately with current institutional investors. For example, non-deal roadshows (NDR), private meetings between management and institutional investors organised by sell-side analysts, typically occur for opaque firms when the expected benefits to the firm of providing private management access are greater (Bradley et al., 2022).

Ownership structure plays a crucial role in determining how corporate transparency affects firm valuation (Lang et al., 2012). Closely held companies, including family firms, are usually more opaque than diffuse-shareholder firms, and corporate opacity significantly lowers firm value when a family is a controlling shareholder (Anderson et al., 2009). To mitigate the negative effects of corporate opacity, firms, among other things, maintain different information dissemination structures and relationships with sell-side analysts who act as information intermediaries (Healey and Palepu 2001).

Analyst activity can be beneficial even in a setting where closely held companies predominate, and firms are likely to face governance problems (Lang et al., 2004). On the one hand, sell-side analysts are less likely to follow family- or management-controlled firms that may have incentives to withhold or manipulate information. On the other hand, once sell-side analysts decide to cover the firm, their activity offsets the lower value associated with concentrated insider control.

There are two competing arguments explaining the complex information environment in insider-controlled firms, including those involving family members (Anderson et al., 2009). Greater opacity allows controlling shareholders to entrench themselves and extract private benefits of control. By limiting corporate transparency, it is easier to extract firm resources at minority shareholders' expense and discourage external intervention by outside investors. Contrary to the entrenchment argument, the monitoring-based explanation (incentive argument) assumes that controlling shareholders are committed monitors who provide control and oversight that substitute for the governance role of corporate transparency. In this case, corporate opacity provides the firm with a competitive and cost advantage. Firm value increases because of lower expenses for generating and disclosing information and a lesser amount of operational information that corporate rivals can acquire.

The results of previous studies motivate further exploration of whether the observed demand for sell-side analyst activity is more pronounced among firms with complex information environments, thereby increasing institutional investors' need for access to

management. If motivated institutional shareholders act as monitors and enhance the number of sell-side analysts following the firm, who potentially facilitate management access, their effect on analyst coverage should be greater for less transparent firms that prefer private channels of communication. To capture the information environment for sample firms, three dummy variables are used.

In Poland, as in other continental European countries, the predominant ownership structure is one with a large controlling investor (a family or an individual), often an active shareholder involved in the firm as a member of the management board or the supervisory board (Gugler et al., 2014; Aminadav and Papaioannou, 2020). As in other CEE countries, Polish firms controlled by large individuals and their families often use various control-enhancing mechanisms, including pyramids and dual-class shares (Gugler et al., 2014). Moreover, more concentrated ownership structures of CEE firms are associated with less disclosure and transparency (Berglof and Pajuste, 2005). The presence of large individual investors and their family members as controlling shareholders enhances firm value (Gugler et al., 2014). However, the relation between large investors' control rights and firm value is non-monotonic; the incentive effect begins to outweigh any entrenchment effects at majority control. Based on previous studies, one can expect that majority-controlled firms may benefit in particular from private interactions with motivated institutional investors organised by sell-side analysts.

To test this conjecture, we construct a dummy variable, FAMILY. To classify a firm as family-controlled, we follow Kałdoński and Jewartowski (2026) and use firm-level data on controlling shareholders from Amadeus (Bureau van Dijk). In each firm-year with available data, we define a firm as family-controlled if Amadeus identifies a controlling shareholder as “one or more named individuals or families” at a 50% level. Due to data availability, we reduce the number of firm-year observations from 2,888 to 2,527.

To capture the complex information environment for the full sample of firm-year observations, two additional dummy variables are used. These additional variables draw from our competing arguments for corporate opacity. First, we construct a binary variable, TRANSP_DISADV, to indicate firms that are threatened by competitive disadvantage resulting from higher corporate transparency. The theoretical model by Verrecchia (1983) predicts that firms with higher proprietary costs of disclosure (i.e., the risk that disclosing business-sensitive information will harm a firm's competitive advantage) will disclose less than firms with lower proprietary costs of disclosure. A recent study by Feng et al. (2022) indicates that information transparency facilitates competition, leading to the erosion of profitability differences within an industry. At the same time, Nagel et al. (2015) document positive effects of motivated

institutional investors on firms' operating performance measured by return on assets. Thus, based on studies of the role of information transparency in the product market, we expect that more opaque firms in highly competitive industries are more likely to benefit from sell-side analyst services, including arranging access to management for motivated institutions.

Following Ellul et al. (2016), we compute a qualitative measure of transparency based on several firm-level characteristics (TRANSP) and construct another dummy variable, TRANSP_DISADV. In particular, we refer to: the identity of the auditor, type of accounting standards, and voluntary management disclosure. For each firm characteristic and year, a binary variable is defined as follows: (a) auditor equals 1 if the firm is covered by one of the Big 5 auditors, (b) accounting standard equals 1 if the firm uses IFRS, and (c) voluntary management disclosure equals 1 if the firm issues earnings forecasts. Then we compute our qualitative transparency index by summing these binary variables. TRANSP_DISADV takes the value 1 for any firm with a transparency index (TRANSP) below the sample median, and 0 otherwise. All low-transparency firms in highly competitive industries (i.e., those with an industry Herfindahl-Hirschman Index above the sample median) are classified as potentially suffering from exploiting the availability of information about rivals by competitors.

Information environment plays a crucial role in determining the choice of debt source (Lin et al., 2016). Several studies indicate that public debt is more sensitive to the information environment than bank debt. Park (2000) argues that concentrated bank debt claims allow banks to collect information about their customers and monitor firm managers more easily and efficiently. Accordingly, some firms that do not want to disclose proprietary and other private information to public debtholders substitute away from public debt to bank debt, and banks are more informed than public debtholders (Diamond, 1991). Existing research (e.g., Denis and Mihov, 2003) documents that firms with opaque information environments tend to use more bank debt.

A recent study on corporate debt structure around the world (Aghaee et al. 2024) shows that Polish listed companies rely mostly on bank debt (with the bank debt to total debt ratio of approximately 70%). Kałdoński and Jewartowski (2026) suggest that in firms with a poor information environment, bank monitoring may be more beneficial than monitoring by motivated institutional investors. However, we posit that even if motivated institutions will not engage in "hard" costly monitoring, they may still need and benefit from private management meetings. As shown by Becht et al. (2026), private meetings with high-level management convey mostly soft information about the firm and improve institutions' trading decisions and performance.

Based on this, we predict that motivated institutional monitoring-driven demand for analysts' services becomes more relevant for firms that extensively use bank debt financing. Thus, we construct a binary variable, BANKDEBT_HIGH, to indicate firms with high use of bank debt. BANKDEBT_HIGH takes a value of 1 for any firm with BANKDEBT above firm's industry median and zero otherwise. BANKDEBT is bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit. Total debt is the sum of all types of debt, including term loans, revolving credits, senior bonds and notes, subordinated bonds and notes, commercial papers, capital leases, and other debt.

INSERT TABLE 10 HERE

The results of our examination are reported in Table 10. We tested whether the coefficients of MM_IO are the same for firms with a complex information environment as for the rest of the sample by interacting our main explanatory variable from Equation (2) with FAMILY (Model 1), TRANSP_DISADV (Model 2) and BANKDEBT_HIGH (Model 3). The positive and significant coefficients on the interaction terms reported for Models 1- 3 ($MM_IO \times FAMILY$, $MM_IO \times TRANSP_DISADV$ and $MM_IO \times BANKDEBT_HIGH$) show that the effect of motivated institutional ownership is significantly larger for firms identified as being less transparent and preferring private channels of communication, all else equal. These results are in line with the information-environment-based channel of demand of motivated institutions for analysts' services and they confirm our hypothesis *H2*.

4.3.2. Pre-analyst professional industry ties

The pre-analyst industry experience is an important factor for analysts to play an effective monitoring role (Bradley et al., 2017). On the one hand, analysts with industry experience in firms they cover have a better understanding of strategies and decisions proposed or implemented by firm management. As a consequence, they are more likely to identify and bring attention to firm policies that are value-destroying (*effective monitoring*). On the other hand, their professional connections can undermine analysts' incentives to monitor firm management and mitigate corporate misbehaviour (*impaired monitoring*).

Cross-monitoring can play a crucial role in determining the extent to which analyst activities support institutional monitoring (Cline et al., 2020). Datta et al. (1999) maintain that "observable monitoring by one type of investors diminishes the duplicative monitoring of other investors". Based on these findings, we predict that because analyst activity is costly, motivated institutional shareholders will reduce demand for analyst services in industries covered by the highest number of analysts with prior industry experience. However, prior pre-analyst

professional industry ties can facilitate access to management and be beneficial at firms with a poor information environment.

To capture the effect of motivated institutional ownership on sell-side analyst coverage for firms in industries with the highest percentage of analysts with prior professional industry ties and experience, we interact the dummy variable ANPROFTIES_INDUSTRIY with motivated institutional ownership (Model 1) and family control representing the firm's preferences for private communication with investors (Model 2). As suggested by Bradley et al. (2017), we classify the following 4 GICS industries: 2550, 3510, 4510 and 4520, as having the highest percentage of analysts with prior professional industry ties and experience.

INSERT TABLE 11 HERE

Table 11 displays the results of our investigation. As expected, the coefficients on MM_IO reported in Model 1 of Table 11 show that the positive effect of motivated institutional shareholders on analyst coverage is significantly less pronounced for companies in industries classified as having the highest percentage of industry-expert analysts. However, it should be emphasised that the coefficient on MM_IO×ANPROFTIES_INDUSTRIY is slightly statistically significant at the 10% level (t-statistic: 1.66). In line with our expectations, the effect of motivated institutional ownership on analyst coverage is significantly larger for family firms operating in industries being extensively covered by analysts with pre-analyst industry experience, all else equal. In Model 2 of Table 11, after controlling for other factors, the coefficient on MM_IO is positive (19.726) and statistically significant at the 5% level (t-statistic 2.31).

Taken together, the results reported in Table 11 support our conjecture that pre-analyst professional industry ties strengthen the relationship between motivated institutional ownership and analyst coverage at firms that prefer private communication channels. Motivated institutions demand sell-side analysts who, by their prior professional connections, facilitate access to management.

4.3.3. Monitoring heterogeneity of motivated institutional investors

Scholars indicate that institutional investors are heterogeneous in terms of monitoring effectiveness. Chen et al. (2007) maintain that monitoring costs decrease and monitoring benefits increase not only with the size of the institutional stake but also with the length of time the institution has been invested in the firm. Moreover, the greater the institution's independence, the lower the monitoring costs. In this section, we study how the size of the

institutional stake, the independence of the institution, and the length of time the institution has been invested in the firm affect the demand of motivated institutional investors for sell-side analysts' services.

Cronqvist and Fahlenbrach (2009) indicate that blockholders (i.e. large shareholders owning at least 5% of firm's outstanding shares) have visible board representation and thus greater ability to monitor or influence the firm. Carleton, Nelson, and Weisbach (1998) argue that institutions with large ownership stakes often have access to board members and senior managers. If, as suggested by Chen et al. (2007), institutions' easier access to management reduces the total costs of monitoring and sell-side analysts facilitate access to corporate insiders, we expect stronger effects of motivated institutional shareholdings among non-blockholders, who are less likely to have access to the firm's managers¹¹.

Ferreira and Matos (2008) argue that because of fewer business ties with the firms they invest in, foreign institutions are more independent and may be in a better position than domestic investors to monitor corporate insiders. On the other hand, Leuz et al. (2009) suggest that foreign investors are at an informational disadvantage relative to local investors and demand more information intermediary services. Moreover, Kim et al. (2016) indicate the proximity to local information, including access to management, as the main driver behind the comparative monitoring advantage of domestic institutional investors over foreign institutions. If sell-side analysts' activities widen the gap in access to management between foreign and domestic institutions, we expect stronger effects for foreign-motivated institutional investors.

The longer the time of investment in the firm, the lower the costs of information gathering and processing and the better the experience and successful influence on management of the firm Chen et al. (2007). The survey research among buy-side analysts by Brown et al. (2016) indicates that institutional investors' horizons play a crucial role in the usefulness of the various services sell-side analysts provide to institutions. For example, as sell-side analysts generally have a relatively short-term focus, their stock recommendations are less useful to buy-side analysts with long investment horizons. On the other hand, the role of sell-side analysts in arranging contact with management is one of the two highest-rated services sell-side analysts provide to long-term-oriented institutional investors. Therefore, we also expect stronger effects

¹¹ Kałdoński and Jewartowski (2025) indicate that institutional investors in Poland acting as blockholders have some extra rights. Any shareholder holding at least 5% of shares in a Polish listed company is entitled to propose issues in shareholder meeting agendas, call for extraordinary shareholder meetings, and appoint a special-purpose auditor. Moreover, shareholders holding at least a 20% equity stake can call for appointing a member of the supervisory board in a special voting mode: a vote by separate groups. Thus any shareholder (or a group of minority shareholders) holding at least 20% of equity capital has a representative on the supervisory board.

for long-term investors, as their governance activities build on access to management, and they are more likely to exploit sell-side analysts' professional connections with their portfolio companies.

To address the importance of stake size, we follow Chen et al. (2007) and divide all motivated institutional investors into blockholders holding at least 5% of the shares (MM_IO_BLOCK) and others (MM_IO_NBLOCK). Based on the institutions' origin, we examine whether our effect is driven by motivated institutional investors domiciled abroad (MM_IO_FOR) versus those in the home country where the company is listed (MM_IO_DOM). We use portfolio turnover as a measure of investor horizon and compute it as proposed by Derrien et al. (2013). We then divide institutional investors in each year into two groups using the terciles of the portfolio turnover distribution. We classify motivated institutional investors as long-term investors (MM_IO_LT) if they fall into the first tercile, separately for each year¹². All other motivated institutions are classified as non-long-term investors (MM_IO_NON-LT).

INSERT TABLE 12 HERE

Firstly, we disentangle the effects of motivated institutional investors on the analyst coverage for blockholders and non-blockholding institutions (Model 1). We find that non-blockholding motivated institutional ownership (MM_IO_NBLOCK) has a stronger positive and significant effect on analyst activity than blockholders motivated institutional ownership (MM_IO_BLOCK). Model 2 presents the results for splitting motivated institutional ownership according to the institution's origin. Again, the results of Model 2 show a positive and significant association between motivated institutional ownership and analyst coverage for both subgroups. Nevertheless, the effects are economically more significant for foreign institutions (MM_IO_FOR) than their domestic counterparts (MM_IO_DOM). Model 3 reports the effects of motivated institutional investors on analyst coverage separately for long-term-oriented and non-long-term-oriented institutions. As expected, the results of Model 3 document that long-term motivated institutions (MM_IO_LT) affect analyst coverage more extensively than the rest of motivated institutional shareholders (MM_IO_NON-LT).

Overall, our results, reported in Table 12, confirm that the effects of motivated institutional investors on sell-side analyst activity are driven by institutions that have previously been shown to gain monitoring effectiveness through access to management. Thus, these results provide unambiguous support for our hypothesis *H3*.

¹² Higher portfolio turnover indicates a shorter investor horizon.

4.4. Exogenous shock to institutions' information asymmetry

In the preceding sections, we have identified the differential effects of motivated institutional investors on analyst coverage for different groups of firms and different types of institutions. We found that firms' opacity and private communication between firms and institutional investors are the focal point of our findings, and now seek to further test the information channel.

In April 2016, the European Commission implemented the Market Abuse Regulation (MAR) to address shortcomings in the Market Abuse Directive of 2005, aiming to harmonise monitoring and enforcement across European Union (EU) markets of market abuse, market manipulation, and insider trading. By (1) the nature of a regulation versus a directive, (2) the expanded scope of the regulation, (3) the increased oversight of the regulation, and (4) the establishment of standardised administrative sanctions for violations of the regulation, MAR brought significant changes to the trading landscape in the EU.

Surprisingly, contrary to the regulator's objectives, as suggested by Kudła and Gajus (2024), in Poland, MAR, due to the imprecise definition of inside information, resulted in a large amount of low-quality information by listed companies to fulfil regulatory requirements. To avoid being penalised for concealing information that could affect investors' decisions, managers were forced to publish a lot of unverified information (of low quality), thus increasing information asymmetry (Kudła and Gajus, 2024)¹³.

As a result, this regulation effectively serves as an exogenous shock to the complex information environment – driven by the need for the flow of private information. We take advantage of this exogenous shock to examine the importance of motivated institutional ownership for sell-side analysts' services. Specifically, we hypothesise that, by increasing firm opacity at firms with complex information structures, this regulation will result in greater analyst coverage for non-blockholding-motivated institutions that do not possess access to management to the same degree as motivated institutional blockholders.

INSERT TABLE 13 HERE

To test whether the increase in firm opacity stemming from MAR affects demand for sell-side activity at firms with a complex information environment, we interact a variable $MM_IO \times FAMILY$ (as in Model 1 of Table 10) with the POST indicator, taking the value of 1 from

¹³ The findings of Kudła and Gajos (2024) on WSE are in line with those of Brochet et al. (2026), who document that after MAR implementation, less transparent European firms experienced greater increases in information asymmetry.

2016 to 2019, and 0 from 2010 to 2015. Model 1 of Table 13 presents the estimation results for overall motivated institutional ownership. In Model 1, the coefficient on the interaction term $MM_IO \times FAMILY \times POST$ is 1.033 and significant at the 10% level (t-statistic 1.80). This finding indicates that family firms with more motivated institutional ownership experienced a statistically significant increase in analyst coverage after the implementation of MAR regulation. Next, we disentangle the effects of motivated institutional investors on analyst coverage for blockholding and non-blockholding institutions. As expected, we find that after MAR, non-blockholding institutional ownership ($MM_IO_NBLOCK \times FAMILY \times POST$) has a positive and significant effect on a firm's analyst following in family firms, but there is no evidence that higher blockholding-motivated institutional ownership is associated with more analyst coverage ($MM_IO_BLOCK \times FAMILY \times POST$), as presented in Model 2 of Table 13.

Overall, the findings around the MAR exogenous shock indicate that increasing firm opacity at firms with complex information structures enhances demand from motivated institutional investors with more needs for private communication for sell-side analyst coverage. These results also support the interpretation of access to management and private information as one channel for the observed effects of motivated institutional ownership on sell-side analyst activity.

5. Motivated institutional ownership and analysts' forecast properties

So far, in our study, we assume that motivated institutional investors don't care about sell-side analysts' stock recommendations and focus on other analysts' services. As a corollary to our primary findings that motivated institutional investors enhance sell-side analyst coverage, we examine whether these effects hold for the analysts' forecast properties.

To measure the effect of motivated institutional ownership on analysts' forecast properties, we use two well-accepted measures by existing research (e.g. Lang and Lundholm, 1996; Barron et al., 1998; Brown et al., 2015): 1) analyst forecast error ($AN_FORECERR$) and 2) analyst forecast dispersion ($AN_FORECDISP$). Analyst forecast error measures the quality of sell-side analysts' research output as the information in earnings forecasts affects analysts' stock recommendations (Brown et al., 2015). Analyst forecast dispersion measures the level of consensus among different analysts. The consensus (forecast dispersion) increases (decreases) as the use of private information declines in analysts' forecasting process (Barron et al., 1998).

If sell-side stock recommendations are less useful to institutions' buy-side analysts than other analyst services (Brown et al., 2016), we predict to find no association between motivated

institutional ownership and analyst forecast error. However, as Cici et al. (2024) documented the exchange of information about firms of mutual interest and thus private information flow from buy-side to sell-side analysts, we posit that motivated institutions share their private information gained through management access with sell-side analysts, thereby increasing analyst consensus (i.e., decreasing analyst forecast dispersion).

We compute AN_FORECERR as the absolute difference between the analysts' consensus (median) forecast of a firm's EPS and the actual EPS. This value is scaled by the year-end stock price. AN_FORECDISP is the standard deviation of individual analysts' EPS forecasts of a firm divided by the absolute value of the mean consensus estimate and scaled by year-end price.

INSERT TABLE 14 HERE

We regress the analyst forecast properties measures on our motivated institutional monitoring proxies (MM_IO and MM_NUM) along with the baseline controls and report the results in Models 1– 4 of Table 14. As expected, there is no evidence that higher motivated institutional ownership is associated with analyst forecast error, as presented in Models 1- 2 of Table 14. However, as shown in Models 3-4, all coefficients of motivated institutional monitoring are negative and significant (at the 5% level or better), implying that firms with higher levels of motivated institutional monitoring have lower analyst forecast dispersion. This finding further supports our interpretation of the main results, suggesting that sell-side analysts' other services, including access to management, play a crucial role in motivated institutions' demand for sell-side analyst following.

6. Motivated institutional ownership, analyst coverage and firm value

In the previous sections of our paper, we provided evidence that when motivated institutions serve as shareholders, firms tend to have higher sell-side analyst coverage. We argue that motivated institutions use sell-side analysts' services to monitor insiders more effectively, especially in firms with complex information environments. In this section, we present additional evidence that motivated institutional investors who use sell-side analyst services enhance firm value.

Several studies document that monitoring by motivated institutions improves corporate policies. The presence of motivated investors as shareholders enhances dividend payouts (Nagel et al., 2015), increases the marginal value of cash (Ward et al., 2018), ameliorates the pay-performance-sensitivity of CEO compensation (Liu and Yin, 2023), improves firms' M&A transactions (Fich et al., 2015) and investment efficiency (Ward et al., 2020) and enriches

corporate innovativeness (Miller et al., 2022). Monitoring by motivated institutional investors improves corporate governance (Liu and Yin, 2023), enhances corporate performance and increases firm value (Nagel et al. 2015).

Analysts also play a crucial role in monitoring corporate insiders. Firms with a decrease in analyst following experience more managerial misbehaviour, including lower financial reporting quality, a decrease in the marginal value of excess cash, an increase in the CEO's excessive compensation and are more likely to engage in value-destroying acquisitions (Irani and Oesch, 2013; Chen et al., 2015). Moreover, increased analyst following in firms likely to face governance problems (i.e. firms controlled by family/management group from weak-shareholder-protection countries) is associated with higher valuations (Lang et al., 2004).

If sell-side analyst services improve motivated investors' monitoring, making it less difficult and less costly, then a higher level of analyst coverage for firms with greater motivated institutional ownership should increase firm value. To test this prediction, we measure firm value using industry-adjusted Tobin's Q (Q_IA). Following Nagel et al. (2015), we expect to find a positive association between our primary motivated institutional monitoring proxy (MM_IO) and firm value. We also expect to observe stronger effects of motivated institutional ownership on firm value for a subgroup of firms covered by sell-side analysts.

INSERT TABLE 15 HERE

Table 15 displays the results of our investigation. Model 1 in Panel A of Table 15 controls for fixed effects and includes only the fraction of ownership held by motivated institutional investors (MM_IO). The results show a positive and significant association between motivated institutional ownership and analyst coverage. Next, in Model 2 of Table 15 (Panel A), we control for several firm characteristics that have been used in prior studies. In particular, we include: CEO ownership, debt, size, capex, cash holdings, assets tangibility, profitability and sales growth. As shown in Model 2, after controlling for other factors, the coefficient on MM_IO remains positive (0.662) and statistically significant at the 1% level (t-statistic 3.80). The results of Model 2 indicate that motivated institutions' stock holdings respond to an economically significant increase in firm value. To support our inference, in Model 3 we also control for additional institutional monitoring characteristics, following previous research: total institutional ownership, institutional investors' portfolio turnover, the Herfindahl-Hirschman institutional ownership concentration index, and multiple blockholdings. Furthermore, in Model 4, we control for firm-fixed effects, and in Model 5, we replace our primary explanatory variable (MM_IO) with the number of motivated institutions (MM_NUM). The results of

Models 3-5 show that after controlling for additional institutional monitoring characteristics, including firm-fixed effects, and replacing motivated institutional monitoring proxy our results remain unchanged.

To examine our prediction about the role that analyst services play in supporting motivated institutional monitoring, in Panel B of Table 14 we use AN_COVERAGE_D to split the sample into two subsamples based on whether it is covered by sell-side analysts. The results of these splits into firms with and without sell-side analyst coverage are reported in Models 1-2 of Panel B of Table 15. Consistent with our prediction on the monitoring role of motivated institutional investors supported by analyst activities, we find a stronger positive and significant coefficient on MM_IO in the firm subsample with analyst coverage (Model 1). The difference in coefficients on MM_IO between subsamples (Models 1–2 of Panel B of Table 15) is significant at the 5% level, indicating that the use of analyst services by motivated institutions enhances firm value.

To sum up, the results reported in Table 15 are in line with our conjecture that sell-side analyst services help motivated institutional shareholders in monitoring their portfolio companies and support the idea that the observed effects of monitoring institutions on analyst coverage are at least partly driven by “other services provided by sell-side analyst”. All in all, the results reported in Table 15 support our hypothesis *H4*.

7. Conclusions

Our study reveals a positive relationship between the shareholdings of motivated institutional investors and the analyst following. The observed relation seems to reflect the additional demand for analyst services and information production by motivated institutional investors. The relation survives alternative monitoring measures and several endogeneity tests, and is economically stronger for motivated quasi-indexers than for non-indexers. Taken together, the evidence is consistent with portfolio importance creating information needs that generate additional demand for sell-side analyst activity.

Cross-sectional results clarify the nature of this demand. The association is stronger for family-controlled firms, firms with opaque information environments arising in highly competitive industries, and firms relying heavily on bank debt, where public information is relatively limited and private communication is more important. In family firms, this effect is especially pronounced in industries with a high prevalence of analysts with prior professional industry experience. The effect is also stronger for motivated non-blockholders, foreign

institutions, and long-term investors, groups for which analysts' industry expertise and management-access services should have greater incremental value. Motivated institutional monitoring is unrelated to analyst forecast error but is associated with lower forecast dispersion, which is consistent with greater common information and potential two-way information sharing between institutions and analysts. Finally, motivated institutional ownership is more strongly increasing firm value when firms are covered by analysts, suggesting that analyst services complement institutional monitoring rather than merely accompany it.

These findings have practical implications. Institutional investors may benefit from viewing sell-side analysts as external support to in-house research and stewardship activities, particularly when monitoring opaque firms or when direct management access is constrained. Brokerage firms and analysts, in turn, may create value for institutional clients through industry expertise, interpretation of information, and management access facilitation rather than solely through forecasts and recommendations. For corporate managers and minority shareholders, analyst coverage may strengthen the effectiveness of informed external monitoring and thereby improve the information and governance environment of the firm.

Several limitations suggest directions for future research. Our single-country setting and sample period limit the extent to which the results generalize to markets with different ownership structures and disclosure regimes. Moreover, analyst coverage is an indirect proxy for the broader bundle of sell-side services; we do not directly observe private meetings, access facilitation, or information flows between buy-side and sell-side analysts. Future work could use direct measures of these interactions and exploit regulatory changes affecting the economics of sell-side research. In particular, Zhao and Zhao (2025) argue that when sell-side research is bundled with execution commissions, and its cost is imperfectly observable to fund investors, asset managers may overuse external research relative to internally produced information. Comparing the pre- and post-MiFID II environments could help distinguish this agency-based demand mechanism from the monitoring-information complementarity documented here and establish how research unbundling changes institutions' reliance on sell-side analysts.

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Appendix - Variable Definitions

Variable	Variable Definition
Analyst Activity Variables	
AN_COVERAGE	number of analysts issuing earnings per share estimates for a particular firm.
AN_COVERAGE_D	=1 if at least one analyst issues earnings per share estimate for a particular firm and 0 otherwise.
Institutional Investor Characteristics Variables	
MM_IO	fraction of shares owned by monitoring motivated institutions, where motivated institutions are institutions whose holding value in the firm is in the top 20% of the institution's portfolio.
MM_NUM	number of monitoring motivated institutions.
TMATT	firm-level weighted average of a firm's institutional ownership, with the weights being the institutional investors' monitoring motivation. See Ward et al. (2018) for complete details.
NMM_IO	fraction of shares owned by non-monitoring motivated institutions, where motivated institutions are institutions whose holding value in the firm is in the bottom 20% of the institution's portfolio.
IO	aggregate institutional ownership.
HHI_IO	Hirschman-Herfindahl institutional ownership concentration index. calculated as the sum (over all institutional investors) of the squared percentage owned of the firm's shares outstanding.
PTFTURN	firm-level weighted average three-year portfolio turnover rate by institutional investors. Portfolio turnover is computed as the fraction of the investor's portfolio that is no longer held at the end of the three year period. See Derrien et al. (2013) for computing investor portfolio turnover.
MULTIBLOCK	firm-level weighted average multiple blockholding residual, where residual is calculated from the regression of $\ln(1 + \text{raw blockholding number})$ on the value of total equity holdings of the institutional investor. See Kang et al. (2018) for complete details.
MM_IO_BLOCK	fraction of shares owned by blockholding motivated investors, where blockholder is defined as holding at least the 5% stake in a firm for the year.
MM_IO_NBLOCK	fraction of shares owned by non – blockholding motivated investors.
MM_IO_LT	fraction of shares owned by long-term motivated investors, where long-term institutional investors are defined as those with overall three-year portfolio turnover rate in the bottom tercile.
MM_IO_NON_LT	fraction of shares owned by non long-term motivated investors.
MM_IO_DOM	fraction of shares owned by domestic motivated institutional investors.
MM_IO_FOR	fraction of shares owned by foreign motivated institutional investors.
MM_IO_QUASI-INDEXER	fraction of shares owned by institutional investors that are both monitoring motivated investors and quasi-indexers. Investors with active share of 30% or less are classified as “quasi-indexers”. Active share is computed as half of the sum across all firms of the distance between the weight of a firm in the portfolio minus its weight in the main index on Warsaw Stock Exchange. See Cremers and Petajisto (2009) for complete details.
MM_IO_NON-QUASI-INDEXER	fraction of shares owned by institutional investors that are both monitoring motivated investors and non-quasi-indexers.
General Control Variables	
SIZE	natural logarithm of total assets.
ROA	return on assets computed as net income scaled by total assets.
LEV	total debt scaled by total assets where total debt is the sum of all types of debt, including term loans, revolving credits, senior bonds and notes, subordinated bonds and notes, commercial papers, capital leases, and other debt.
MB	market-to-book ratio.
EARGROWTH	average growth in earnings over the preceding three years.
LOSS	=1 if a firm's earnings per share is negative, and 0 otherwise.
EARSUPRISE	absolute difference in earnings per share between year t and year t-1, divided by the firm's stock price.

VOLATILITY	standard deviation of a firm's daily stock returns during a year.
BETA	one year beta.
FLOAT	free float.
Cross Sectional Analysis and Corroborating Analysis Additional Variables	
Q_IA	firm's Tobin's Q industry average (median) adjusted, where industry is classified based on 4-digit Global Industry Classification System. Tobin's Q is computed as total assets less the book value of equity plus the market value of equity scaled by total assets.
PROFIT	return on assets computed as EBITDA scaled by total assets.
TANG	net property, plant, and equipment scaled by total assets
CAPEX	capital expenditures scaled by total assets.
CASH	cash holdings scaled by total assets.
GROWTH	annual percentage change in sales.
CEOOWN	percentage of common equity owned by chief executive officer.
FAMILY	=1 if the firm is controlled by one or more individuals or families at the 50% threshold of control and 0 otherwise.
AN_FORECERR	absolute difference between the analysts' consensus (median) forecast of a firm's EPS and the actual EPS, scaled by the year-end stock price.
AN_FORECDISP	standard deviation of individual analysts' EPS forecasts of a firm divided by the absolute value of the mean consensus estimate and scaled by the year-end price.
BANKDEBT_HIGH	=1 if the firm's bank debt is above average (median) bank debt in the firm's industry, where industry is classified based on 4-digit Global Industry Classification System and 0 otherwise. Bank debt financing is bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit. Total debt is the sum of all types of debt, including term loans, revolving credits, senior bonds and notes, subordinated bonds and notes, commercial papers, capital leases, and other debt.
OFERATIO_2013	proportion of firm's ownership stake held by OFE among all institutional holdings as of the end of 2013 and 0 for the years before 2014.
WIG20&mWIG40&WIG80	= 1 if the firm's stock is a member of WIG20 or mWIG40 or sWIG80 index, zero otherwise.
HHI_IO_IND	average (median) Hirschman – Herfindahl institutional ownership concentration index in the firm's industry, where industry is classified on the basis of 4-digit Global Industry Classification System.
ANPROFTIES_INDUSTY	= 1 if the firm' industry belongs to one of the following 4-GICS industries: 2550, 3510, 4510 and 4520, and zero otherwise.
POST	=1 for the post market abuse regulation period (2016-2019) and zero otherwise.
QUAL_TRANSP	qualitative transparency index which refers to following firm characteristics: identity of the auditor, type of accounting standards and voluntary management disclosure. For each firm characteristics and year, a binary variable is defined as follows: (a) auditor equals 1 if the firm is covered by one of the Big 5 auditors, (b) accounting standard equals 1 if the firm uses IFRS and (c) voluntary management disclosure equals 1 if the firm issues earnings forecasts. The qualitative transparency index is the sum of these binary variables. See Ellul et al. (2016) for complete details.
IND_HHI	Herfindahl-Hirschman Index calculated as the sum of the squared market shares using firm sales, based on 4-digit (GICS) industry classification.
TRANSP	The transparency index is the sum of binary variables referring to the following firm characteristics: the identity of the auditor, type of accounting standards and voluntary management disclosure. For each firm characteristic and year, a binary variable is defined as follows: (a) auditor equals 1 if the firm is covered by one of the Big 5 auditors, (b) accounting standard equals 1 if the firm uses IFRS and (c) voluntary management disclosure equals 1 if the firm issues earnings forecasts. See Ellul et al. (2016) for complete details.
TRANSP_DISADV	=1 if the firm simultaneously has qualitative transparency index and Herfindahl-Hirschman Index below sample median and zero otherwise.

Table 1. Sample distribution by industry

INDUSTRY	4 GICS CODE	ALL FIRMS		FIRMS WITH ANALYST COVERAGE	
		No	%	No	% of ALL FIRMS
Energy	1010	75	3%	52	69%
Materials	1510	371	13%	119	32%
Capital Goods	2010	666	23%	114	17%
Commercial & Professional Services	2020	100	3%	13	13%
Transportation	2030	47	2%	8	17%
Automobiles & Components	2510	33	1%	11	33%
Consumer Durables & Apparel	2520	266	9%	102	38%
Consumer Services	2530	101	3%	43	43%
Retailing	2550	117	4%	27	23%
Food & Staples Retailing	3010	55	2%	21	38%
Food, Beverage & Tobacco	3020	230	8%	64	28%
Household & Personal Products	3030	19	1%	0	0%
Health Care Equipment & Services	3510	86	3%	34	40%
Pharmaceuticals, Biotechnology & Life Sciences	3520	43	1%	17	40%
Software & Services	4510	183	6%	52	28%
Technology Hardware & Equipment	4520	128	4%	40	31%
Communication Services	5010	66	2%	26	39%
Media & Entertainment	5020	164	6%	56	34%
Utilities	5510	11	0%	0	0%
Real Estate	6010	127	4%	20	16%
Total		2,888	100%	819	28%

The table reports the sample distribution by industry and analyst coverage within the firm's industry classified on the basis of 4-digit Global Industry Classification System (GICS).

Table 2. Variable distributions - summary statistics

VARIABLES	No	Mean	Std	25th	Median	75th
Analyst Following						
<i>AN_COVERAGE</i>	2,888	0.845	2.114	0.000	0.000	1.000
Motivated Institutional Monitoring Variables						
<i>MM_IO</i>	2,888	0.081	0.146	0.000	0.000	0.110
<i>MM_NUM</i>	2,888	1.696	3.950	0.000	0.000	1.000
<i>TMATT</i>	2,888	2.641	2.424	0.330	2.260	4.130
General Control Variables						
<i>SIZE (Mio USD)</i>	2,888	98.006	5.000	31.817	89,121	278.662
<i>ROA</i>	2,888	-0.016	1.652	0.000	0,030	0.070
<i>LEV</i>	2,888	0.232	0.203	0.090	0,200	0.310
<i>MB</i>	2,888	1.424	2.614	0.590	1,000	1.670
<i>EARGROWTH</i>	2,888	-0.455	5.975	-0.364	-0.100	0.208
<i>LOSS</i>	2,888	0.241	0.428	0.000	0.000	0.000
<i>EARSUPRISE</i>	2,888	0.389	1.326	0.018	0.051	0.167
<i>VOLATILITY</i>	2,888	0.010	0.005	0.010	0.010	0.010
<i>BETA</i>	2,888	0.364	0.341	0.170	0.355	0.550
<i>FLOAT</i>	2,888	0.439	0.219	0.284	0.414	0.587
<i>HHI_IO</i>	2,888	0.037	0.076	0.000	0.010	0.030
<i>PTFTURN</i>	2,888	0.303	0.207	0.180	0.290	0.430

A detailed description of the variables can be found in the Appendix.

Table 3. Pearson Correlations Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	<i>AN_COVERAGE</i>	1,00													
2	<i>MM_IO</i>	0,39	1,00												
3	<i>SIZE</i>	0,60	0,35	1,00											
4	<i>ROA</i>	0,02	0,02	0,13	1,00										
5	<i>LEV</i>	-0,02	0,00	0,06	-0,12	1,00									
6	<i>MB</i>	0,10	0,12	0,02	0,02	-0,03	1,00								
7	<i>EARGROWTH</i>	0,04	0,02	0,05	0,01	-0,05	0,02	1,00							
8	<i>LOSS</i>	-0,13	-0,11	-0,17	-0,06	0,23	-0,09	-0,14	1,00						
9	<i>EARSUPRISE</i>	-0,09	-0,07	-0,05	-0,04	0,31	-0,11	-0,18	0,32	1,00					
10	<i>VOLATILITY</i>	-0,11	-0,11	-0,20	-0,06	0,19	-0,08	-0,04	0,25	0,35	1,00				
11	<i>BETA</i>	0,18	0,04	0,23	0,00	0,00	-0,04	0,00	0,06	0,00	0,11	1,00			
12	<i>FLOAT</i>	0,17	0,25	0,13	-0,03	0,03	-0,02	-0,02	0,07	0,09	0,07	0,16	1,00		
13	<i>HHI_IO</i>	0,07	0,58	0,08	0,01	0,05	0,04	0,00	0,00	0,01	-0,03	0,00	0,09	1,00	
14	<i>PTFTURN</i>	-0,05	0,10	-0,01	0,03	-0,07	-0,02	0,00	-0,07	-0,09	-0,10	-0,02	0,03	0,03	1,00

Bolded coefficients are statistically significant at the 10% level or higher.

Table 4. Determinants of analyst coverage

	AN_COVERAGE_D
	(1)
Intercept	−5.179*** (−19.62)
Variables	
<i>SIZE_{t-1}</i>	0.730*** (22.73)
<i>FLOAT_{t-1}</i>	1.090*** (7.46)
Industry Fixed Effects	YES
Year Fixed Effects	YES
Obs.	2,888
McFadden R ²	0.396

The table presents the results of the first stage (using Heckman's (1979) two-step procedure) regression (using a probit model) of a firm's analyst coverage on the firm's size and free float. The sample consists of 2,888 firm-year observations of firms listed on the WSE over the period 2010 – 2019, with the required data for the regressions. AN_COVERAGE_D is a dummy variable that equals 1 if the firm is followed by analysts during the year, and 0 otherwise.

A detailed description of the variables can be found in the Appendix. We estimate z-statistics (in parentheses). ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

Table 5. Motivated institutional monitoring and analyst coverage

	AN COVERAGE				
	(1)	(2)	(3)	(4)	(5)
Intercept	-7.018*** (-26.62)	-6.910*** (-25.46)	-6.972*** (-25.56)	-7.132*** (-26.20)	-6.917*** (-25.45)
Motivated Institutional Monitoring					
<i>MM_IO_{t-1}</i>	1.017*** (6.88)	0.789*** (3.78)	X X	X X	0.824*** (3.70)
<i>MM_NUM_{t-1}</i>	X X	X X	0.013** (2.47)	X X	X X
<i>TMATT_{t-1}</i>	X X	X X	X X	0.066*** (4.28)	X X
<i>NMM_IO_{t-1}</i>	X X	X X	X X	X X	0.202 (0.44)
Control Variables					
<i>SIZE_{t-1}</i>	X X	0.148*** (2.64)	0.096 (1.47)	0.157*** (2.77)	0.148*** (2.66)
<i>ROA_{t-1}</i>	X X	2.426*** (5.25)	2.425*** (5.10)	2.453*** (5.17)	2.414*** (5.22)
<i>LEV_{t-1}</i>	X X	-0.276 (-1.43)	-0.160 (-0.83)	-0.238 (-1.25)	-0.282 (-1.45)
<i>MB_{t-1}</i>	X X	0.090*** (6.50)	0.087*** (6.00)	0.098*** (7.29)	0.090*** (6.51)
<i>EARGROWTH_{t-1}</i>	X X	0.022** (1.99)	0.020* (1.81)	0.022* (1.91)	0.023** (2.00)
<i>LOSS_{t-1}</i>	X X	-0.063 (-0.71)	-0.070 (-0.78)	-0.072 (-0.81)	-0.062 (-0.71)
<i>EARSUPRISE_{t-1}</i>	X X	-0.424*** (-4.40)	-0.440*** (-4.32)	-0.423*** (-4.30)	-0.424*** (-4.02)
<i>VOLATILITY_{t-1}</i>	X X	-1.001 (-0.16)	-1.898 (-0.31)	-1.785 (-0.29)	-1.048 (-0.18)
<i>BETA_{t-1}</i>	X X	0.248*** (2.67)	0.218** (2.33)	0.196** (2.11)	0.250*** (2.70)
<i>FLOAT_{t-1}</i>	X X	-0.158 (-0.86)	-0.080 (-0.46)	-0.042 (-0.26)	-0.171 (-0.92)
<i>HHI_IO_{t-1}</i>	X X	0.397 (0.96)	1.413*** (4.64)	0.370 (0.97)	0.310 (0.68)
<i>PTFTURN_{t-1}</i>	X X	0.213 (1.29)	0.297* (1.79)	0.169 (1.02)	0.219 (1.32)
<i>Mills</i>	5.818*** (33.83)	4.964*** (11.87)	5.279*** (11.78)	4.913*** (11.58)	4.967*** (11.88)
<i>alpha</i>	0.389*** (4.86)	0.110** (2.19)	0.121** (2.35)	0.110** (2.15)	0.110** (2.19)
Industry Fixed Effects	YES	YES	YES	YES	YES

Year Fixed Effects	YES	YES	YES	YES	YES
Obs.	2,888	2,888	2,888	2,888	2,888
Pseudo R ²	0.310	0.366	0.364	0.366	0.366
F-test					1.98

The table presents the results of the second stage (using negative binomial model I - NegBin I) regressions of firms' analyst coverage on motivated institutional monitoring proxies. The sample consists of 2,888 firm-year observations of firms listed on the WSE over the period 2010 – 2019, with the required data for the regressions. AN_COVERAGE is measured by the number of analysts issuing earnings-per-share estimates for a given firm. Motivated institutions are institutions whose holding value in the firm is in the top 20% of the institution's portfolio. Motivated institutional ownership (MM_IO) is measured as a fraction of the firm's shares owned by all motivated institutions. MM_NUM is the number of monitoring institutions. TMATT is computed following Ward et al. (2018) as a weighted average of a firm's institutional ownership, with the weights being the institutional investors' monitoring motivation. Non-motivated institutions are those whose holdings in the firm are in the bottom 20% of the institution's portfolio. Non-motivated institutional ownership (NMM_IO) is measured as the fraction of the firm's shares owned by all non-motivated institutions.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Alpha is a t-test for overdispersion.

Table 6. Motivated institutional ownership and analyst coverage: quasi-indexers vs non-indexers

	AN_COVERAGE
	(1)
Intercept	−6.807*** (−24.75)
Motivated Institutional Ownership	
$MM_IO_QUASI-INDEXER_{t-1}$	1.251*** (4.01)
$MM_IO_NON-INDEXER_{t-1}$	0.470* (1.76)
<i>Mills</i>	4.980*** (11.82)
<i>alpha</i>	0.106** (2.14)
Control Variables	YES
Industry Fixed Effects	YES
Year Fixed Effects	YES
Obs.	2,888
Pseudo R ²	0.366
F-test	
$MM_IO_QUASI-INDEXER_{t-1} = MM_IO_NON-INDEXER_{t-1}$	3.96

The table presents the results of the second stage of NegBin I regressions of firms' analyst coverage on quasi-indexing and non-indexing-motivated institutional ownership. The sample consists of 2,888 firm-year observations of firms listed on WSE over the period 2010 – 2019 with required data for the regressions. Analyst coverage is defined as in Table 5.

We classify motivated institutions into quasi-indexers and non-indexers using the active share measure proposed by Cremers and Petajisto (2009). Active share is the distance between the weights on each firm in the investor's portfolio and the weights in the relevant index. For the index, we use WIG, which is the main index on the Warsaw Stock Exchange. We classify investors with active share of up to 30% as quasi-indexers, and all other investors as non-indexers.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Alpha is a t-test for overdispersion.

Table 7. Motivated institutional ownership and analyst coverage: change regression

	$\Delta \text{AN_COVERAGE}$
	(1)
Intercept	-0.135 (-1.38)
Motivated Institutional Ownership	
$\Delta \text{MM_IO}_{t-1}$	0.938*** (2.76)
Control Variables	
ΔSIZE_{t-1}	-0.107 (-1.12)
ΔROA_{t-1}	0.006 (1.02)
ΔLEV_{t-1}	-0.298* (-1.88)
ΔMB_{t-1}	0.003 (0.96)
$\Delta \text{EARGROWTH}_{t-1}$	-0.002 (-1.18)
ΔLOSS_{t-1}	0.022 (0.48)
$\Delta \text{EARSUPRISE}_{t-1}$	-0.021 (-1.57)
$\Delta \text{VOLATILITY}_{t-1}$	1.545 (0.23)
ΔBETA_{t-1}	-0.121** (-2.27)
$\Delta \text{FLOAT}_{t-1}$	-0.436* (-1.79)
$\Delta \text{HHI_IO}_{t-1}$	-0.771* (-1.79)
$\Delta \text{PTFTURN}_{t-1}$	0.079 (0.97)
ΔMills	2.920*** (3.27)
Industry Fixed Effects	YES
Year Fixed Effects	YES
Obs.	2,406
Adjusted R ²	0.018

The table presents the results of a pooled OLS regression of the change in a firm's analyst coverage on the change in motivated institutional ownership. The sample consists of 2,406 firm-year observations of firms listed on the WSE over the period 2010 – 2019, with the required data for the regressions. Analyst coverage and motivated institutional ownership are defined as in Table 5.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

Table 8. Motivated institutional ownership and analyst coverage: propensity score matched sample

Panel A - Univariate Test of Differences of Subsamples								
Covariates from Selection Equation								
	FULL SAMPLE				PSM SAMPLE			
	Treatment (n=1,235)	Control (n=1,653)	Mean diff.	p- value	Treatment (n=543)	Control (n=543)	Mean diff.	p- value
<i>SIZE</i>	5.302	3.843	1.459	0.00	4.728	4.748	-0.020	0.80
<i>ROA</i>	0.036	-0.063	0.099	0.08	0.027	0.027	0.001	0.94
<i>LEV</i>	0.223	0.240	-0.017	0.00	0.211	0.214	-0.003	0.76
<i>MB</i>	1.832	1.016	0.817	0.00	1.546	1.505	0.041	0.73
<i>EARGROWTH</i>	-0.062	-0.801	0.739	0.00	-0.219	-0.352	0.133	0.63
<i>LOSS</i>	0.141	0.333	-0.192	0.00	0.190	0.168	0.022	0.34
<i>EARSUPRISE</i>	0.164	0.587	-0.423	0.00	0.246	0.187	0.059	0.23
<i>VOLATILITY</i>	0.007	0.010	-0.002	0.00	0.008	0.008	0.000	0.48
<i>BETA</i>	0.400	0.330	0.070	0.00	0.376	0.380	-0.004	0.82
<i>FLOAT</i>	0.490	0.386	0.103	0.00	0.439	0.434	0.005	0.69
<i>HHI_IO</i>	0.056	0.014	0.042	0.00	0.043	0.044	-0.001	0.78
<i>PTFTURN</i>	0.345	0.274	0.071	0.00	0.388	0.300	0.088	0.00
<i>MM_IO</i>	0.152	0.000	0.152	0.00	0.136	0.000	0.136	0.00
<i>PROPNESITY SCORE</i>	-	-	-	-	0.481	0.481	0.000	0.99
ANALYST_ACTIVITY								
<i>AN_COVERAGE</i>	1.405	0.111	1.293	0.00	0.762	0.322	0.440	0.00
Panel B – Multivariate analysis – PSM sample								
	AN_COVERAGE							
	(1)							
Intercept	-5.790*** (-11.93)							
Motivated Institutional Ownership								
<i>MM_IO_{t-1}</i>	0.931** (2.24)							
Control Variables								
<i>SIZE_{t-1}</i>	0.783*** (17.51)							
<i>ROA_{t-1}</i>	2.240*** (2.81)							
<i>LEV_{t-1}</i>	-0.680* (-1.74)							
<i>MB_{t-1}</i>	0.023 (0.73)							
<i>EARGROWTH_{t-1}</i>	0.060* (1.87)							
<i>LOSS_{t-1}</i>	0.108 (0.62)							
<i>EARSUPRISE_{t-1}</i>	-0.250** (-2.36)							
<i>VOLATILITY_{t-1}</i>	8.979 (0.72)							

$BETA_{t-1}$	0.426* (1.82)
$FLOAT_{t-1}$	1.024*** (3.77)
HHI_IO_{t-1}	1.500** (2.35)
$PTFTURN_{t-1}$	-0.108 (-0.35)
α	0.021 (0.30)
Industry Fixed Effects	YES
Year Fixed Effects	YES
Obs.	1,086
Pseudo R^2	0.248

The table presents the results of the second stage of NegBin I regression of firm's analyst coverage on motivated institutional ownership using a propensity score-matched sample. The matched sample consists of 1,086 firm-year observations of firms listed on the WSE over the period 2010 – 2019 that have required data for the regressions. The treatment (control) group consists of all firms with (without) at least one motivated institution holding the firm's shares. Analyst coverage and motivated institutional ownership are defined as in Table 5.

Panel A reports a univariate test of differences of the basic dependent and independent variables for both full and propensity score-matched treatment and control samples. The table in Panel B presents the results of NegBin I regressions of a firm's analyst coverage on motivated institutional ownership using the PSM sample.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Alpha is a t-test for overdispersion.

Table 9. Motivated institutional monitoring and analyst coverage: 2SLS

	1 st stage		2 nd stage
	MM_IO	HHI_IO	AN_COVERAGE
	(1)	(2)	(3)
Intercept	-0.151*** (-5.18)	-0.028* (-1.67)	-1.172* (-1.75)
Motivated Institutional Monitoring			
<i>MM_IO_{t-1}</i>	X X	X X	12.735*** (3.05)
Instrumental Variables			
<i>OFERATIO_2013</i>	-0.042*** (-2.59)	-0.016* (-1.69)	X X
<i>IND_HHI_IO_{t-1}</i>	1.043 (0.96)	1.174* (1.78)	X X
<i>WIG20&mWIG40&sWIG80_{t-1}</i>	0.025** (2.04)	-0.010 (-1.49)	X X
Control Variables			
<i>SIZE_{t-1}</i>	0.031*** (6.38)	0.007** (2.54)	0.375*** (3.29)
<i>ROA_{t-1}</i>	-0.002*** (-3.77)	-0.000 (-0.65)	-0.042*** (-3.42)
<i>LEV_{t-1}</i>	-0.009 (-0.47)	0.011 (0.95)	-0.125 (-0.35)
<i>MB_{t-1}</i>	0.005* (1.84)	0.001 (1.51)	0.009 (0.33)
<i>EARGROWTH_{t-1}</i>	-0.000 (-0.10)	0.000 (0.60)	-0.000 (-0.11)
<i>LOSS_{t-1}</i>	-0.013* (-1.91)	-0.001 (-0.28)	0.023 (0.23)
<i>EARSUPRISE_{t-1}</i>	-0.003 (-1.03)	0.001 (0.53)	-0.005 (-1.11)
<i>VOLATILITY_{t-1}</i>	-0.377 (-0.45)	-0.181 (-0.49)	14.051 (1.19)
<i>BETA_{t-1}</i>	-0.024** (-2.33)	-0.003 (-0.42)	0.265 (1.32)
<i>FLOAT_{t-1}</i>	0.143*** (5.28)	0.033*** (2.82)	-0.881 (-1.30)
<i>HHI_IO_{t-1}</i>	X X	X X	-8.822 (-1.01)
<i>PTFTURN_{t-1}</i>	0.058*** (2.87)	0.008 (0.55)	-1.111*** (-3.29)
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Obs.	2,888	2,888	2,888

Adjusted R ²	0.239	0.071	0.381
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The table presents the results of a two-stage least squares regression of a firm's analyst coverage on motivated institutional ownership, using the 2014 Polish pension funds reform as an exogenous shock, the firm's industry ownership structure and index membership as instrumental variables. The sample consists of 2,888 firm-year observations of firms listed on the WSE over the period 2010 – 2019, with the required data for the regressions. Analyst coverage and motivated institutional ownership are defined as in Table 5.

Models (1)-(2) present first-stage results and Model (3) presents second-stage results, respectively. To predict motivated institutional ownership and institutional ownership concentration, as instrumental variables we use: 1) firm's ownership stake held by pension funds (OFE) at the end of 2013, 2) firm's industry - average (median) of the Herfindahl-Hirschman institutional ownership concentration index, and 3) a dummy variable indicating the stock membership in WIG20 or mWIG40 or sWIG80 indexes.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table 10. Motivated institutional ownership and analyst coverage: the effect of firm's complex information environment and preferences for private communication

	AN_COVERAGE		
	(1)	(2)	(3)
Intercept	-6.845*** (-18.76)	-6.837*** (-24.44)	-6.726*** (-24.68)
Motivated Institutional Ownership			
<i>MM_IO_{t-1}</i>	0.624*** (2.76)	0.695*** (3.17)	0.429* (1.80)
<i>FAMILY_{t-1}</i>	-0.491*** (-4.13)	X X	X X
<i>MM_IO_{t-1} x FAMILY_{t-1}</i>	1.462*** (4.10)	X X	X X
<i>TRANSP_DISADV_{t-1}</i>	X	-0.134 (-1.20)	X X
<i>MM_IO_{t-1} x TRANSP_DISADV_{t-1}</i>	X	0.755** (2.19)	X X
<i>BANKDEBT_HIGH_{t-1}</i>	X	X	-0.215*** (-3.11)
<i>MM_IO_{t-1} x BANKDEBT_HIGH_{t-1}</i>	X	X	0.849*** (3.90)
<i>Mills</i>	5.061*** (10.45)	4.892*** (11.64)	4.810*** (11.27)
<i>alpha</i>	0.108* (1.92)	0.104** (2.08)	0.010** (2.03)
Control Variables	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Obs.	2,527	2,888	2,888
Pseudo R ²	0.375	0.367	0.368

The table presents the results of the second stage of NegBin I regressions of the effects of firm's preferences for private communication on the relation between motivated institutional ownership and analyst coverage. In Model 1 (Models 2-3), the sample consists of 2,527 (2,888) firm-year observations of firms listed on WSE over the period 2010 – 2019 with required data for the regressions. Analyst coverage and motivated institutional ownership are defined as in Table 5.

To capture the effect of motivated institutional ownership on analyst coverage for firms with a firm's complex information environment and private communication preferences, we interact dummy variables FAMILY, TRANSP_DISADV and BANKDEBT_HIGH with motivated institutional ownership.

FAMILY takes a value of 1 for any family-controlled firm where family controls more than 50% of voting rights and zero otherwise. TRANSP_DISADV takes a value of 1 for any firm that simultaneously has both the qualitative transparency index and Hirschman-Herfindahl industry concentration index below sample median. Following Ellul et al. (2016), we construct a qualitative transparency index (TRANSP), which refers to the following firm characteristics: the identity of the auditor, type of accounting standards and voluntary management disclosure. For each firm characteristic and year, a binary variable is defined as follows: (a) auditor equals 1 if the firm is covered by one of the Big 5 auditors, (b) accounting standard equals 1 if the firm uses IFRS and (c) voluntary management disclosure equals 1 if the firm issues earnings forecasts. The transparency index is the sum of these binary variables. Hirschman-Herfindahl firm's industry concentration index is calculated as the sum (over all firms within 4 GICS industry) of the squared market shares. BANKDEBT_HIGH takes a value of 1 for any firm with BANKDEBT above the firm's industry median and zero otherwise. BANKDEBT is bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit. Total debt is the sum of all types of

debt, including term loans, revolving credits, senior bonds and notes, subordinated bonds and notes, commercial papers, capital leases, and other debt.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Alpha is a t-test for overdispersion.

Table 11. Motivated institutional ownership and analyst coverage: the effect of pre-analyst professional industry ties

	AN_COVERAGE	
	(1)	(2)
Intercept	−6.739*** (−30.41)	−6.739*** (−26.45)
Motivated Institutional Ownership		
<i>MM_IO_{t-1}</i>	0.685*** (2.97)	0.681*** (2.80)
<i>ANPROFTIES_INDUSTRIY_{t-1}</i>	−0.150 (−0.14)	−0.188* (−1.64)
<i>MM_IO_{t-1} x ANPROFTIES_INDUSTRIY_{t-1}</i>	−0.449* (−1.66)	−0.530* (−1.67)
<i>FAMILY_{t-1}</i>	X	−0.443*** (−3.58)
<i>MM_IO_{t-1} x FAMILY_{t-1}</i>	X	1.159*** (3.14)
<i>FAMILY_{t-1} x ANPROFTIES_INDUSTRIY_{t-1}</i>	X	−1.138*** (−1.01)
<i>MM_IO_{t-1} x ANPROFTIES_INDUSTRIY_{t-1} x FAMILY_{t-1}</i>	X	19.726** (2.31)
<i>Mills</i>	3.954*** (15.13)	4.303*** (15.21)
<i>alpha</i>	0.200*** (3.52)	0.192** (2.95)
Control Variables	YES	YES
Industry Fixed Effects	NO	NO
Year Fixed Effects	YES	YES
Obs.	2,888	2,527
Pseudo R ²	0.367	0.368

The table presents the results of the second stage of NegBin I regressions of the effects of pre-analyst professional industry ties on the relation between motivated institutional ownership and analyst coverage. In Model 1 (Model 2), the sample consists of 2,888 (2,527) firm-year observations of firms listed on WSE over the period 2010 – 2019 with required data for the regressions. Analyst coverage and motivated institutional ownership are defined as in Table 5.

To capture the effect of motivated institutional ownership on analyst coverage for firms in industries with highest percentage of analyst with prior professional industry ties we interact dummy variable ANPROFTIES_INDUSTRIY with motivated institutional ownership (Model 1) and family control representing firm's preference for private communication (Model 2). As proposed by Bradley et al. (2017), we classify following 4-GICS industries: 2550, 3510, 4510 and 4520, as having highest percentage of analyst with prior professional industry ties. Family control is defined as in Table 10.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Alpha is a t-test for overdispersion.

Table 12. Motivated institutional ownership and analyst coverage: the effect of institutional investor heterogeneity

	AN_COVERAGE		
	(1)	(2)	(3)
Intercept	−6.820*** (−25.01)	−6.925*** (−25.45)	−6.890*** (−25.44)
Motivated Institutional Monitoring			
<i>MM_IO_BLOCK_{t-1}</i>	0.516** (2.14)	X X	X X
<i>MM_IO_NBLOCK_{t-1}</i>	1.994*** (3.69)	X X	X X
<i>MM_IO_DOM_{t-1}</i>	X X	0.770*** (3.77)	X X
<i>MM_IO_FOR_{t-1}</i>	X X	0.884** (2.30)	X X
<i>MM_IO_LT_{t-1}</i>	X X	X X	0.972*** (4.34)
<i>MM_IO_NON_LT_{t-1}</i>	X X	X X	0.619* (1.70)
<i>Mills</i>	5.184*** (11.96)	4.961*** (11.85)	4.993*** (11.85)
<i>alpha</i>	0.104** (2.10)	0.109** (2.16)	0.106** (2.13)
Control Variables	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Obs.	2,888	2,888	2,888
Pseudo R ²	0.367	0.366	0.367
F-test			
<i>MM_IO_BLOCK_{t-1}</i> = <i>MM_IO_NBLOCK_{t-1}</i>	4.45		
<i>MM_IO_DOM_{t-1}</i> = <i>MM_IO_FOR_{t-1}</i>		3.36	
<i>MM_IO_LT_{t-1}</i> = <i>MM_IO_NON_LT_{t-1}</i>			3.47

The table presents the results of the second stage of NegBin I regressions of firm's analyst coverage on heterogeneous motivated institutional ownership. The sample consists of 2,888 firm-year observations of firms listed on WSE over the period 2010 – 2019 with required data for the regressions. Analyst coverage is defined as in Table 5.

Following Chen et al. (2007), we classify institutions holding at least a 5% stake in a firm for the year as blockholders. As proposed by Ferreira and Matos (2008), according to the geographic origin we partition institutional investors into foreign (i.e. domiciled in a country different from the country the stock is issued) and domestic. We split institutional investors into long-term and non-long-term using a three-year portfolio turnover. Long-term institutional investors are defined as those with an overall three-year portfolio turnover rate in the bottom tercile. Portfolio turnover is computed following Derrien et al. (2013) as the fraction of the investor's portfolio that is no longer held at the end of the three-year period.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Alpha is a t-test for overdispersion.

Table 13. Motivated institutional ownership and analyst coverage: the effect of market abuse regulation of 2016 (MAR)

	AN_COVERAGE	
	(1)	(2)
Intercept	−6.975*** (−18.85)	−6.959*** (−18.70)
Motivated Institutional Ownership		
<i>MM_IO_{t-1}</i>	0.739*** (3.10)	X X
<i>MM_IO_BLOCK_{t-1}</i>	X	0.251 (0.87)
<i>MM_IO_NBLOCK_{t-1}</i>	X	2.331*** (3.67)
<i>FAMILY_{t-1}</i>	−0.430*** (−3.48)	−0.725*** (−4.25)
<i>MM_IO_{t-1} x FAMILY_{t-1}</i>	0.166 (0.82)	X X
<i>MM_IO_BLOCK_{t-1} x FAMILY_{t-1}</i>	X	1.216*** (2.66)
<i>MM_IO_NBLOCK_{t-1} x FAMILY_{t-1}</i>	X	3.881*** (3.01)
<i>MM_IO_{t-1} x POST</i>	−0.321 (−0.95)	X X
<i>MM_IO_BLOCK_{t-1} x POST</i>	X	0.413 (1.12)
<i>MM_IO_NBLOCK_{t-1} x POST</i>	X	−2.865*** (−3.30)
<i>FAMILY_{t-1} x POST</i>	0.282 (1.31)	0.297 (0.98)
<i>MM_IO_{t-1} x FAMILY_{t-1} x POST</i>	1.033* (1.80)	X X
<i>MM_IO_BLOCK_{t-1} x FAMILY_{t-1} x POST</i>	X	−0.750 (−1.04)
<i>MM_IO_NBLOCK_{t-1} x FAMILY_{t-1} x POST</i>	X	6.524** (2.19)
<i>Mills</i>	5.241*** (10.71)	5.853*** (12.00)
<i>Alpha</i>	0.105* (1.88)	0.079 (1.50)
Control Variables	YES	YES
Industry Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Obs.	2,527	2,527
Pseudo R ²	0.375	0.380

The table presents the results of the second stage of NegBin I regressions of the effects of market abuse regulation of 2016 on the relation between motivated institutional ownership and analyst coverage. The sample consists of 2,527 firm-year

observations of firms listed on WSE over the period 2010 – 2019 with required data for the regressions. Analyst coverage and motivated institutional ownership are defined as in Table 5.

To capture the effect of motivated institutional ownership on analyst coverage for pre and post market abuse regulation of 2016 we interact dummy variable POST with motivated institutional ownership and family control representing firm's preference for private communication. POST is an indicator variable coded as one for the post market abuse regulation period (2016-2019) and zero otherwise. Family control is defined as in Table 10 and blockholding motivated institutional ownership is defined as in Table 9.

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Alpha is a t-test for overdispersion.

Table 14. Motivated institutional monitoring and analyst forecast properties

	AN_FORECERR		AN_FORECDISP	
	(1)	(2)	(3)	(4)
Intercept	0.006 (0.06)	0.069 (0.72)	-0.045 (-1.20)	-0.072 (-1.63)
Motivated Institutional Monitoring				
<i>MM_IO_{t-1}</i>	0.065 (0.99)	X X	-0.097** (-2.45)	X X
<i>MM_NUM_{t-1}</i>	X X	0.005 (1.33)	X X	-0.003*** (-2.86)
Control Variables				
<i>SIZE_{t-1}</i>	0.008 (0.81)	-0.002 (-0.17)	0.007* (1.80)	0.011** (2.64)
<i>ROA_{t-1}</i>	-1.179*** (-3.68)	-1.214*** (-3.62)	0.054 (1.54)	0.071* (1.77)
<i>LEV_{t-1}</i>	0.032 (0.32)	0.038 (0.38)	0.035 (1.95)	0.030* (1.73)
<i>MB_{t-1}</i>	0.003 (0.49)	-0.001 (-0.21)	-0.001 (-0.91)	0.000 (0.24)
<i>EARGROWTH_{t-1}</i>	-0.006 (-0.81)	-0.006 (-0.77)	0.001 (0.80)	0.001 (0.73)
<i>LOSS_{t-1}</i>	0.086* (1.71)	0.089* (1.83)	0.041 (1.63)	0.041 (1.65)
<i>EARSUPRISE_{t-1}</i>	-0.034 (-1.45)	-0.033 (-1.23)	0.007 (0.51)	0.010 (0.67)
<i>VOLATILITY_{t-1}</i>	-0.895 (-0.41)	-0.871 (-0.41)	1.140 (0.71)	1.152 (0.72)
<i>BETA_{t-1}</i>	0.063* (1.66)	0.066* (1.77)	-0.004 (-0.20)	-0.003 (-0.16)
<i>FLOAT_{t-1}</i>	0.061 (1.26)	0.044 (0.99)	0.045** (2.02)	0.043** (2.01)
<i>HHI_IO_{t-1}</i>	-0.127 (-1.10)	-0.067 (-0.59)	0.137** (2.22)	0.033 (0.82)
<i>PTFTURN_{t-1}</i>	-0.049 (-0.68)	-0.043 (-0.61)	-0.041 (-1.48)	-0.050* (-1.79)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Obs.	816	816	816	816
Adjusted R ²	0.210	0.214	0.139	0.141

The table presents the results of a pooled OLS regression of firms' analysts' forecast properties on proxies for motivated institutional monitoring. We measure analyst forecast properties as analyst forecast error (AN_FORECERR) and analyst forecast dispersion (AN_FORECDISP). AN_FORECERR is computed as the absolute difference between the analysts' consensus (median) forecast of a firm's EPS and the actual EPS. This value is scaled by the year-end stock price. AN_FORECDISP is the standard deviation of individual analysts' EPS forecasts of a firm divided by the absolute value of the mean consensus estimate and scaled by year-end price. The sample consists of 816 firm-year observations of firms listed

on the WSE over the period 2010 – 2019, with the required data for the regressions (i.e. at least three analysts issuing earnings per share estimates for a particular firm).
Motivated institutional ownership and the number of motivated institutions are defined as in Table 5.
A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

Table 15. Motivated institutional monitoring and firm value: the effect of analyst coverage

	Q IA				
	(1)	(2)	(3)	(4)	(5)
Panel A.					
Intercept	0.055 (1.23)	0.093 (0.90)	0.175 (1.60)	1.113*** (3.64)	0.371*** (2.84)
Motivated Institutional Monitoring					
<i>MM_IO_{t-1}</i>	0.418* (2.26)	0.662*** (3.80)	0.900*** (3.74)	0.346** (2.02)	X X
<i>MM_NUM_{t-1}</i>	X X	X X	X X	X X	0.061*** (4.00)
Control Variables					
<i>CEOOWN_{t-1}</i>	X	0.055 (0.38)	0.073 (0.50)	0.342 (1.19)	0.028 (0.200)
<i>DEBT_RATIO_{t-1}</i>	X	1.054*** (6.52)	1.083*** (6.77)	1.135*** (5.27)	1.103*** (7.15)
<i>SIZE_{t-1}</i>	X	-0.085** *	-0.104***	-0.249***	-0.150** *
<i>CAPEX_{t-1}</i>	X	(-4.69)	(-5.09)	(-4.47)	(-6.03)
<i>CASH_{t-1}</i>	X	1.622*** (3.04)	1.574*** (2.97)	0.158 (0.52)	1.250** (2.52)
<i>TANG_{t-1}</i>	X	1.731*** (4.81)	1.679*** (4.74)	0.806*** (3.70)	1.573*** (4.64)
<i>PROFIT_{t-1}</i>	X	-0.227* (-1.81)	-0.210* (-1.78)	-0.149 (-0.68)	-0.216* (-1.87)
<i>GROWTH_{t-1}</i>	X	-0.047 (-0.12)	-0.075 (-0.19)	-0.183 (-0.63)	-0.106 (-0.28)
<i>HHI_IO_{t-1}</i>	X	0.058 (1.06)	0.062 (1.14)	0.032 (1.00)	0.060 (1.12)
<i>PORTFTURN_{t-1}</i>	X	X	-1.013** (-2.23)	X	X
<i>MULTIBLOC_{K_{t-1}}</i>	X	X	-0.294*** (-3.33)	X	X
<i>IO_{t-1}</i>	X	X	0.042* (1.70)	X	X
	X	X	0.158 (1.03)	X	X
Firm Fixed Effects	NO	NO	NO	YES	NO
Year Fixed Effects	YES	YES	YES	YES	YES

Obs.	2,888	2,888	2,888	2,888	2,888
Adjusted R ²	0.006	0.155	0.165	0.679	0.205

Panel B.

	AN_COVERA GE _1 = 1	AN_COVERAGE _1 = 0	Diff. (t- statistics)
	(1)	(2)	(3)
Intercept	0.486* (1.93)	0.209 (1.53)	- -
Motivated Institutional Monitoring			
<i>MM_IO_{t-1}</i>	0.668*** (2.93)	0.283* (1.70)	** (2.12)
Control Variables			
<i>CEOOWN_{t-1}</i>	0.605 (1.40)	-0.840 (-0.76)	** (2.44)
<i>DEBT_RATIO_{t-1}</i>	-0.060 (-0.20)	1.282*** (7.61)	*** (-6.39)
<i>SIZE_{t-1}</i>	-0.141*** (-3.93)	-0.115*** (-4.06)	*** (-0.87)
<i>CAPEX_{t-1}</i>	3.497*** (2.69)	0.875** (1.98)	*** (2.80)
<i>CASH_{t-1}</i>	2.062*** (4.63)	1.104*** (3.71)	** (2.36)
<i>TANG_{t-1}</i>	-0.396 (-1.24)	-0.151 (-1.26)	 (-1.00)
<i>PROFIT_{t-1}</i>	1.854* (1.74)	-0.276 (-0.79)	** (2.17)
<i>GROWTH_{t-1}</i>	0.251* (1.87)	0.015 (0.33)	 (1.52)
Year Fixed Effects	YES	YES	-
Obs.	819	2,069	-
Adjusted R ²	0.313	0.199	-

The table presents the results of pooled OLS regressions of industry (median) adjusted Tobin's Q on motivated institutional ownership and analyst coverage. The sample consists of 2,888 firm-year observations of firms listed on the WSE over the period 2010 – 2019, with the required data for the regressions. Motivated institutional ownership and the number of motivated institutions are defined as in Table 5. Analyst coverage is a dummy variable as defined in Table 4. Panel A reports the results for the full sample. Panel B reports the results separately for subsamples of firms covered by analysts (Model 1) and firms without analyst following (Model 2).

A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.