EXIT THREAT AND STOCK LIQUIDITY: EVIDENCE FROM OPEN-ENDED PENSION FUNDS' REFORM IN POLAND

Agnieszka Stróżyńska-Szajek[a], Aleksander Freitag[b], Szymon Stereńczak[c]*

Disclaimer: *This is an early draft of the paper and needs to be completed. Some of the results are not yet described.*

Abstract: In the traditional view, stock liquidity serves as an efficient governance mechanism by facilitating the blockholders' exit and thus increasing the exit threat. This, in turn, mitigates agency problems. However, the literature suggests that the relationship between stock liquidity and corporate governance is likely to be endogenous due to the reverse causality. In this paper, we address this issue by investigating whether an increase in the blockholder exit threat improves stock liquidity. To this end, we utilise a difference-in-differences methodology and a quasi-natural experiment from the 2014 reform of Open-Ended Pension Funds' (OFEs) in Poland. The results suggest that after the reform, which increased the exit threat of OFEs, the stock liquidity of the treated companies has improved, although this increase was not homogeneous across all companies. The effect of an increased exit threat was stronger among companies with multiple OFE blockholdings and higher agency conflicts between managers and outside investors. On the contrary, stock liquidity declined in companies with more severe agency conflicts between majority and minority shareholders. Given the beneficial role of stock liquidity for capital market efficiency and development, our study serves as a prompt for incorporating legal changes aimed at improving corporate governance.

Keywords: corporate governance, governance through exit, exit threat, stock liquidity, open-ended pension funds.

JEL codes: G14, G18, G23, G34.

Funding: The study was financed by the National Science Centre, Poland as a research project (grant number 2019/35/B/HS4/01002).

*Corresponding author.

[a] *Department of Corporate Finance, Poznań University of Economics and Business, al. Niepodległości 10, 61-875 Poznań, Poland. E-mail: agnieszka.strozynska-szajek@ue.poznan.pl, ORCID: 0000-0001-8611-5607*

[b] *Department of Corporate Finance, Poznań University of Economics and Business, al. Niepodległości 10, 61-875 Poznań, Poland. E-mail: aleksander.freitag@phd.ue.poznan.pl, ORCID: 0000-0002-1499-0944*

[c] *Department of Corporate Finance, Poznań University of Economics and Business, al. Niepodległości 10, 61-875 Poznań, Poland. E-mail: szymon.sterenczak@ue.poznan.pl, ORCID: 0000-0003-4825-3229*

1. Introduction

Market liquidity is widely recognised as integral to stock markets, shaping both investor behaviour and the overall market efficiency. Although the theoretical ideal envisions cost-free, instantaneous transactions, real-world conditions diverge significantly from this model. Consequently, investors face a choice between executing large orders immediately, thereby incurring higher transaction costs and price impact, or splitting orders into smaller trades, which introduces opportunity costs (Amihud & Mendelson, 1986; Huberman & Stanzl, 2005). Such constraints may deter frequent trading (Yang & Zhang, 2021) and lead to suboptimal portfolio holdings (Amihud, 2019; Constantinides, 1986). Ultimately, market participants bear both explicit expenses (e.g., spreads) and more intangible costs, such as reduced utility.

Building on the seminal work of Amihud and Mendelson (1986), extensive research has documented that stocks with lower liquidity often command higher expected returns—a so-called liquidity premium (Amihud, 2019; Amihud et al., 2015; Amihud & Mendelson, 2015; Amihud & Noh, 2021; Cakici & Zaremba, 2021; Chiang & Zheng, 2015; Guo et al., 2017; Hsieh & Nguyen, 2021; Huh, 2014). More recently, scholars have highlighted liquidity's broader role in corporate finance decisions. By influencing investors' required returns, liquidity affects a firm's cost of equity and thus the viability of its investment projects (Amihud & Levi, 2023; Becker-Blease & Paul, 2006). In addition, higher market liquidity helps mitigate information asymmetry, curbing both under- and overinvestment (Cheung et al., 2023; Xiong & Su, 2014) and thereby improving how capital is allocated. This, in turn, underpins more sustainable economic growth, particularly in emerging markets and transition economies.

Nevertheless, the extent to which liquidity delivers these benefits also depends on corporate governance structures - both at the market and the firm level. Well-monitored and transparent firms, featuring robust board oversight, independent directors, thorough disclosure standards, and effective shareholder rights, tend to exhibit narrower bid-ask spreads and higher trading volumes (Ali et al., 2017). From a broader perspective, strong institutional frameworks and regulatory oversight further reinforce these positive effects by building investor confidence and reducing agency conflicts. Moreover, institutional investors often hold significant stakes and can discipline management through the credible threat of exit (Edmans, 2009), which stabilizes liquidity conditions by assuring potential buyers and sellers of sound governance practices. A thorough understanding of how liquidity and corporate governance interact—across both firm-specific and systemic dimensions—remains essential for shaping policies (or

deregulatory measures) aimed at enhancing market efficiency and mitigating the adverse effects of illiquidity.

The link between stock liquidity and corporate governance is not purely one-directional, suggesting a potentially endogenous relationship (reverse causality problem). High stock liquidity facilitates blockholders to reduce their holdings if they are unhappy with the firm performance, thus increasing their exit threat and improving governance (Chen et al., 2020; Edmans et al., 2013). High stock liquidity supports the alignment of the interests of managers and shareholders by facilitating monitoring (Ahangar, 2021, 2022; Chen et al., 2020) and increasing the chances of hostile takeovers by making it easier for investors to disguise their buying (Ee et al., 2022), which in turn improves governance and decreases agency problems.

On the other hand, as suggested by Bhide (1993), high stock liquidity may decrease internal firm monitoring. Less liquid shares are held mostly by long-term investors who are more likely to be involved in monitoring because they have more time and opportunity to do it and intervene more intensively than short-term ones (Daryaei & Fattahi, 2022; Wang & Wei, 2021). When a company's shares are highly liquid, managers may be incentivised to boost short-term performance, which may attract short-term investors (Chang et al., 2017). Such managerial myopia boosts agency conflicts between managers and outside investors.

In this paper, we investigate whether an increase in the exit threat of institutional blockholders improves stock liquidity. Given the endogenous nature of the relationship under scrutiny, we utilise Open-Ended Pension Funds' (OFEs') reform in Poland as a quasi-natural experiment for an in-depth analysis of the effect of exit threat on stock liquidity. As suggested by Kałdoński and Jewartowski's (2024) study, after the reform had come into force, companies with at least one OFE as a blockholder experienced an increased exit threat, which led to improved governance. Thus, this event may serve as an exogenous event to study the effect of the institutional blockholder exit threat on stock liquidity, making our analyses free from endogeneity concerns. In the empirical approach, we employ a difference-in-differences (DiD) approach to compare changes in liquidity between firms with blockholder OFE and a control group of firms unaffected by the reform.

Based on the theoretical predictions and recent empirical evidence, we develop two conflicting hypotheses about the potential effect of increased institutional blockholder exit threat on stock liquidity. These hypotheses relate to two competing channels through which the exit threat may affect stock liquidity: a corporate governance-enhancing channel and an

uncertainty-enhancing channel. On the one hand, institutional blockholders may exert disciplinary pressure that encourages management to align their decisions with shareholders' interests and improve the quality of disclosure (Biswas, 2020; Edmans, 2009). This increases investor confidence and makes the communication with the market more transparent, ultimately leading to attracting more investors and reducing information asymmetry. Both a more diverse investor base and less information asymmetry enhance stock liquidity (Abedin et al., 2024; Balakrishnan et al., 2014; Chan et al., 2022).

On the other hand, institutional investors are perceived as better informed as they have privileged access to information and more advanced analytical resources (Dang et al., 2018). As evidenced (e.g. by C. Y. Chung et al., 2017), institutional investors often act as informed traders as they exploit their informational advantage (Easley & O'Hara, 1987; Glosten & Milgrom, 1985). Consequently, when the threat of blockholder exit increases, investors in the capital market may reduce their trading activity to avoid disadvantageous transactions with informed investors (Brockman & Yan, 2009). Thus, an increased threat of institutional blockholder exit increases the probability of informed trading, reduces the participation of uninformed investors, and ultimately leads to reduced stock liquidity.

The results of our study suggest that an increase in the threat of institutional blockholder exit leads to improved stock liquidity. Following the 2014 OFE reform in Poland, stock liquidity of treated companies, i.e. those with a blockholder OFE, increased. However, the strength of this effect varies depending on the information environment of the company. In more informationally opaque companies, we observe a decline in stock liquidity as a consequence of an increased exit threat. This suggests that when investors do not have a reliable source of information from the company, their confidence decreases, which results in them refraining from trading. On the contrary, the improvement in stock liquidity is more pronounced for companies where the OFE exit threat is more likely, i.e. those with multiple blockholder OFEs. Thus, we can conclude that the threat of institutional blockholder exit improves stock liquidity only if it disciplines management and enhances the transparency in information disclosures (Ding et al., 2022). If the management does not improve the quality of information disclosure, the exit threat reduces stock liquidity by increasing the probability of informed trading and reducing investor confidence.

We perform a series of robustness tests to ensure that our results are not due to specific methodological choices. In particular, we repeat our baseline regression on the propensity

score-matched sample to alleviate the concerns about the non-randomness of the research sample and to mimic a randomised controlled trial. The results remain qualitatively unchanged and provide even stronger support for our baseline conclusions. We then applied entropy balancing as an alternative matching technique and the Heckman self-selection model to ensure that the results were not due to the OFEs' preference for companies with a particular ownership profile. Our results and conclusions remain qualitatively unchanged.

Our study contributes to the literature in several ways. In particular, we contribute to the ongoing debate on whether institutional investors improve or hinder stock liquidity (Dinh & Tran, 2024; Wang & Wei, 2021), offering insights into how institutional investors' exit threat affects stock liquidity. Recent studies on the institutional ownership and stock liquidity are inconclusive and provide evidence that institutional investors either enhance (Ajina et al., 2015; Hing & Chow, 2022; Jiang et al., 2011; Lai et al., 2024; B. Liu et al., 2021) or impede (Brockman & Yan, 2009; C. Y. Chung et al., 2017; Dinh & Tran, 2024; Wang & Wei, 2021; Yosra & Sioud, 2011) company stock liquidity. Although our study focuses on a specific group of institutional investors - pension funds - our results are free of endogeneity since we utilise the quasi-natural experiment from the 2014 OFE reform in Poland.

Secondly, by utilising the quasi-natural experiment from the 2014 OFE reform in Poland, we contribute to the recent literature on the effects of corporate governance mechanisms on stock liquidity. To the best of our knowledge, this is the first study that adopts a quasi-natural experiment to study this relationship. Prior studies have investigated the direct relationship between various corporate governance mechanisms, like corporate governance effectiveness (Al-Jaifi et al., 2017; Ali et al., 2016, 2017; Biswas, 2020; K. H. Chung et al., 2010; Prommin et al., 2014; Tang & Wang, 2011), internal control (Jain et al., 2016; Sun et al., 2024), board gender diversity (Ammad Ahmed & Ali, 2017; Li et al., 2024; Loukil et al., 2019; Shahrour et al., 2024; Ye et al., 2021), board independence (Bar-Yosef & Prencipe, 2013; Bazrafshan et al., 2021), CEO incentives (Chowdhury et al., 2024; Feng & Yan, 2019) and CEO characteristics (Michael et al., 2022; M. H. Pham, 2020), on company stock liquidity. However, in the literature, no research analyses the direct effects of blockholder exit threat on stock liquidity. By doing so, our study fills this significant research gap.

Our study also bridges two recent papers on the effects of the 2014 Open-Ended Pension Funds reform in Poland. Roszkowska et al. (2021) found that the demand shock resulting from the reform indirectly impaired companies' abilities to raise capital in the stock market. By

reducing cash availability to managers, lower companies' power to raise money in the public stock market may force them to invest more effectively, thus aligning their decisions more closely with shareholders' interests. As evidenced by Kałdoński and Jewartowski (2024), following the reform, companies with at least one OFE as a blockholder decreased the level of real earnings management, enhancing their informational environment. Both reduced access to external equity and a better informational environment should result in enhanced stock liquidity. By directly analysing the effect of the reform on stock liquidity, our study provides some interesting insights about the stock liquidity implications of the OFE reform in Poland. By doing so, our study on the relationship between institutional investors, corporate governance, and stock liquidity in the context of the 2014 OFE reform in Poland provides important implications for policymakers and market participants. Understanding how the increased threat of blockholder institutional investor exit influences stock liquidity can help regulators develop more effective corporate governance frameworks that balance investor protection with market efficiency.

The remainder of the paper is organised as follows. The following section presents a brief literature review with hypotheses development. Data and methods applied are described in Section 3. Section 4 outlines the basic results alongside additional analyses, and robustness tests are presented in Section 5. The final section discusses and concludes the study.

2. Literature review and hypotheses development

2.1. Corporate governance and stock liquidity

Corporate governance plays a fundamental role in shaping stock liquidity. Well-governed firms limit the extent to which management can expropriate firm value (Bebchuk et al., 2009; Bebchuk & Cohen, 2005). This enhances operational transparency, thereby reducing information asymmetry (Leuz et al., 2003) and ultimately improving stock liquidity (Aman & Moriyasu, 2022; Huang et al., 2024). Strong corporate governance reduces the degree of minority shareholders' expropriation, which creates incentives to issue more debt by reducing the level of free cash flow available for discretionary use (Jensen, 1986). Since a company's leverage is positively related to its shares' liquidity (Frieder & Martell, 2006), an increased debt issuance due to stronger governance may lead to increased stock liquidity. Brockman & Chung (2003) provide empirical evidence that better investors' protection in well-governed companies leads to higher stock liquidity.

Several studies highlight specific corporate governance mechanisms that affect liquidity by shaping ownership incentives. Pham et al. (2023) show that bank loan announcements improve stock liquidity in Australia by strengthening the monitoring role of banks as an external governance tool. Similarly, dividend policy has been identified as a governance tool that influences liquidity. Given that dividend payouts reduce cash holdings and increase leverage, they also alleviate agency problems. Ali Taher and Al-Shboul (2023) and Stereńczak and Kubiak (2022) find that dividend-paying firms attract more investors and, consequently, have more liquid shares. Attracting various types of investors strengthens investor heterogeneity and improves stock liquidity (Chan et al., 2022). Furthermore, CEO career advancement perspectives and compensation structures have been linked to stock liquidity - Chowdhury et al. (2024) show that CEO's industry tournament incentives (CITIs), which serve as an effective governance mechanism, boost stock liquidity. This effect is stronger among firms with severe information asymmetry problems and weak governance mechanisms. At the macro level, country-wide improvements in governance standards can also impact market liquidity. Gagnon and Jeanneret (2023) found that changes in the country-level corporate governance environment (e.g., making Governance Codes effective for listed companies) result in a one-fifth drop in equity volatility. Given that stock volatility and liquidity are closely related (Chordia et al., 2003, 2005), such events may also affect stock liquidity.

Recent empirical studies support the link between corporate governance and stock liquidity. For instance, Chung et al. (2010), Tang and Wang (2011), Ali et al. (2016, 2017) and Biswas (2020) demonstrate that corporate governance improves stock liquidity. Better corporate governance quality improves firms' financial and operational transparency, thus resulting in enhanced stock liquidity (Al-Jaifi et al., 2017; Prommin et al., 2014). Thus far, the positive effect of corporate governance on stock liquidity has been analysed relative to internal mechanisms like internal monitoring of CEOs by the subordinate managers (Jain et al., 2016; Sun et al., 2024). Board and CEO characteristics as governance mechanisms also improve stock liquidity. As an example, companies with a lawyer CEO tend to exhibit higher stock liquidity (Michael et al., 2022; M. H. Pham, 2020). Higher stock liquidity is also observed among companies with CEO duality, higher board independence (Bar-Yosef & Prencipe, 2013), and higher board gender diversity (A Ahmed & Ali, 2017; Bazrafshan et al., 2021; Li et al., 2024; Loukil et al., 2019; Shahrour et al., 2024; Ye et al., 2021).

To sum up, corporate governance plays a significant role in shaping stock liquidity. As evidenced in the recent literature, internal governance mechanisms, such as board structure or

the CEO compensation system, contribute to the reduction of information asymmetry and agency conflicts. This leads to higher investors' confidence, a broader investor base, and enhanced liquidity as a consequence. This said, corporate governance is not only a tool for aligning the interests of different groups of stakeholders, but also an important factor in supporting stock liquidity. However, up-to-date empirical research focuses only on internal governance mechanisms and their role in enhancing stock liquidity.

2.2. Institutional ownership and stock liquidity

A key channel through which corporate governance may influence liquidity is institutional ownership as institutional investors play a central role in monitoring managers and mitigating agency problems. Large shareholders (blockholders), in particular institutional investors, possess both the resources and the incentives to monitor managerial behavior and influence disclosure practices (Ding et al., 2022; Edmans, 2009; Shleifer & Vishny, 1986). This monitoring reduces information asymmetry and increases investor confidence, thereby enhancing stock liquidity. However, the impact of institutional ownership on liquidity is not uniform and varies depending on the type of investor, investment horizon, and ownership concentration. Foreign institutional investors (FIIs), for instance, have been shown to improve liquidity in emerging markets by bridging informational gaps, thereby improving market efficiency (B. Liu et al., 2021). The investment horizon of institutional investors also plays an important role: while short-term institutional ownership tends to boost liquidity through active trading, long-term institutional holdings may have the opposite effect by reducing trading frequency and increasing adverse selection risks (Wang & Wei, 2021). Even so, both active and passive institutional investors can contribute to liquidity - active investors do so via more frequent trades, whereas passive investors reduce information asymmetry through their large, diversified portfolios (Hing & Chow, 2022). Ajina et al. (2015) prove that institutional shareholding, including pension funds, enhances stock liquidity.

On the other hand, some studies suggest that institutional ownership negatively affects stock liquidity (Dinh & Tran, 2024), particularly in the case of block institutional ownership (Dang et al., 2018). This relationship is often explained through the adverse selection problem, which posits that when informed investors - those with superior access to information - are present in the market, they exploit their informational advantage (Easley & O'Hara, 1987; Glosten & Milgrom, 1985). Institutional investors are frequently perceived as informed investors due to their analytical resources and privileged access to information (Dang et al.,

2018). According to the adverse selection problem, an increasing share of institutional ownership may exacerbate information asymmetry between institutional investors and other market participants since institutional investors trade as informed (C. Y. Chung et al., 2017; Yosra & Sioud, 2011). Consequently, to avoid unfavourable transactions with informed investors, uninformed investors may reduce their trading activity as the block ownership increases the probability of informed trading (Brockman & Yan, 2009). A decline in participation by uninformed investors can lead to an increase in average transaction costs per share for the remaining market participants. Collectively, these factors contribute to a reduction in stock liquidity, as fewer investors are willing to trade, and transaction costs continue to rise. These findings underscore institutional ownership's nuanced and multifaceted impact on stock liquidity.

2.3. Open-Ended Pension Funds' reform in Poland as an exogenous shock to exit threat

The 2014 pension reform in Poland provides a natural experiment to study this mechanism and its impact on liquidity under institutional change. Open-Ended Pension Funds (OFE), stable long-term institutional investors, faced a series of legal and operational constraints. These included the mandatory transfer of government bonds to the public pension agency (ZUS), the introduction of the "slider" mechanism that gradually transferred assets away from OFEs, and the elimination of automatic contributions. While these changes did not require the immediate sale of equity, they weakened OFEs' long-term investment capacity (Roszkowska et al., 2021) and triggered a shift in how their continued ownership was perceived by the market. This, in turn, resulted in a significant fund outflow from OFEs in first years following the reform.

2.4. Hypotheses development

One particularly relevant channel through which institutional blockholders can influence liquidity is the exit threat. Blockholders who can readily sell their shares in response to managerial underperformance, excessive risk-taking, or poor governance create a credible disciplinary mechanism that pressures executives to align their decisions with shareholder interests (Edmans, 2009). As a result, reduced agency problems and strengthened market confidence can, in turn, lower information asymmetry and enhance stock liquidity. While institutional blockholders are often seen as a governance-enhancing force through the credible

threat of exit, the way this mechanism operates and its effectiveness depend on how credible and informative such a threat remains in the market's view.

The 2014 pension reform resulted in OFEs' transition from balanced passive funds to active equity funds, which is evidenced in particular by an increased OFEs' portfolios turnovers (Kałdoński & Jewartowski, 2024). Ultimately, this leads to an increased blockholder exit threat in companies with large OFE stockholdings. However, the potential impact of OFEs reform on stock liquidity can depend on firm-specific governance environment. In some firms, OFEs may have retained the ability to exert effective oversight through threat of exit. In others, particularly less transparent firms, the anticipated changes in ownership may have increased information asymmetry and investor uncertainty, reducing stock liquidity. We therefore propose two competing theoretical channels: a corporate governance-enhancing channel and an uncertainty-enhancing channel - and we propose two main hypotheses for empirical research through which exit threat may affect stock liquidity.

Large institutional investors, such as OFEs, can play a crucial monitoring role in publicly traded companies. By posing a credible threat of exit, they exert disciplinary pressure that encourages management to act in the best interest of shareholders (Biswas, 2020; Edmans, 2009). In companies where OFEs remained blockholders, this mechanism may have continued to operate or even be strengthened after the reform. Managers aware of potential reactions from institutional investors – and of the broader market's sensitivity to changes in ownership structure – may act in such a way to maintain investor confidence (improve financial disclosure, more transparent communication with the market, and higher standards of corporate governance)(Ding et al., 2022). Such efforts reduce information asymmetry and may enhance stock liquidity. Hence, we hypothesise as follows:

H1: *An increase in the blockholder threat of exit caused by OFE reform improves stock liquidity.*

The strength of the exit threat may be reinforced when multiple OFEs act as blockholders. The presence of at least two institutional investors, each with a significant stake, increases the perceived monitoring intensity and potential exit threat. Edmans and Manso (2011) show that competition among blockholders enhances the flow of information into prices, while Cvijanović et al. (2022) emphasise that multiple blockholders can amplify market discipline. In such ownership structures, managers may have stronger incentives to align with

investor expectations, and the market may view institutional monitoring as more robust. Therefore, we condition our first main hypothesis in the following way:

H1a: *The beneficial effect of an increased exit threat on stock liquidity is more pronounced among companies with multiple OFE blockholdings.*

H1b: *The beneficial effect of an increased exit threat on stock liquidity is more pronounced among companies with more severe agency conflicts between managers and shareholders.*

As we mentioned, while institutional investors are often seen as enhancing stock liquidity, some studies point to potential downsides, particularly in the context of block ownership. From the perspective of the adverse selection problem, institutional blockholders may be perceived as better-informed traders. This perception can discourage uninformed investors from participating in the market, for fear of being at a disadvantage. As a result, stock liquidity may deteriorate. These concerns become particularly relevant in the context of the 2014 OFE reform. The reform may have triggered a reaction consistent with adverse selection problem: uninformed investors reduced their willingness to trade, anticipating a higher probability of trading with better-informed investor. This, in turn, would lead to lower turnover, wider bid-ask spreads, and ultimately, reduced stock liquidity. This mechanism motivates our second hypothesis:

H2: *The reform reduced stock liquidity in firms where OFEs are blockholders.*

The adverse impact described in *H2* is unlikely to be evenly distributed across all firms. One critical moderating factor is informational transparency – the degree to which a firm provides timely, accurate, and comprehensive disclosures to the market. In highly transparent firms, the informational advantage of institutional investors is limited, as less-informed investors can rely on publicly available data to assess company performance and risks. In contrast, in informationally opaque firms, institutional investors are more likely to possess more complete information. When the threat of exit by a well-informed investor increases, less-informed market participants may fear being on the losing side of a trade. This raises concerns about adverse selection, which can lead to reduced trading activity, wider bid-ask spreads, and ultimately, lower liquidity. Therefore, we condition our second main hypothesis as follows:

H2a*: The adverse effect of an increased exit threat on stock liquidity is more pronounced among more informationally opaque companies.*

H2b: *The adverse effect of an increased exit threat on stock liquidity is more pronounced among companies with more severe agency conflicts between majority and minority shareholders.*

3. Data and methods

3.1. Empirical framework

To test our hypotheses about the effect of the exit threat on stock liquidity and mitigate endogeneity concerns from reverse causality, we utilise a quasi-natural experiment from the Open-Ended Pension Funds (OFEs) reform in Poland. The reform, which has been effective since the beginning of 2014, resulted in an increased threat of blockholder exit for companies allocated to OFEs' portfolios (Kałdoński & Jewartowski, 2024). This resulted from OFEs' transition from passive balanced into active equity funds, forced by the implementation of the reform. This reform has increased the competition among OFEs, which may be interpreted as an increase in their exit threat. After the reform had become effective, OFEs may have become more willing to reduce their holdings if they were unhappy with the company's operations and performance. This, in turn, increased the OFEs' threat of exit. Meanwhile, this increase in exit threat concerned only some companies, i.e. those allocated to OFEs' portfolios. This allows us to use the difference-in-differences methodology and mitigate endogeneity concerns from reverse causality.

In our baseline approach, we perform the difference-in-differences analysis by estimating the following regression:

$$LIQ_{it} = \alpha + \beta_1 * Treat_{it} + \beta_2 * After_{it} + \beta_3 * \mathrm{Treat}_{it} * \mathrm{After}_{it} + \gamma * \mathrm{Controls}_{it\text{-}1} + \varepsilon_{it} \quad (1)$$

where *LIQ* is one of the considered liquidity measures, *Treat* is a dummy variable which equals 1 if a company is from the treatment group and 0 otherwise, *After* is a dummy variable that equals 1 for the observations after a reform (years 2014-2016) and 0 otherwise. The company is considered treated if at least one OFE held at least 5% of the company shares at the end of 2013. This said, we consider a company as treated if it had at least one OFE blockholder directly before the reform became effective. *Controls* is a set of control variables as described in Section

3.2. To avoid endogeneity concerns resulting from simultaneity and reverse causality, all control variables are lagged by one year relative to liquidity measures.

3.2. Variables

Our main variable of interest is companies' stock liquidity, which we proxy using four different measures reflecting several distinct liquidity dimensions. Given that no single measure is able to capture all the dimensions of liquidity simultaneously (Chou et al., 2013), such an approach allows for more in-depth insights about the effect of exit threat on stock liquidity. All the measures are calculated on an annual basis. First, we use Amihud's (2002) illiquidity ratio, which reflects the price impact. We calculate the ratio strictly following Amihud's (2002):

$$ILLIQ_{it} = \frac{1}{NoTD_{it}} \sum_{m=1}^{NoTD_{it}} \frac{|r_{imt}|}{Vol_{imt}} \quad (2)$$

where $NoTD_{it}$ denotes the number of days for which data are available for stock i in year t, r_{imt} is the ith stock's log-return on day m of year t, and Vol_{imt} is the respective trading volume in PLN million. Depth is measured by the turnover ratio, which is measured as follows:

$$Turn_{it} = \sum_{m=1}^{NoTD_t} \frac{V_{imt}}{NoSH_{imt}} \quad (3)$$

where V_{imt} is the unit trading volume for stock i on mth day of year t, and $NoSH_{imt}$ denotes the number of shares outstanding on that day. The cost dimension of liquidity is captured by the Percent Quoted Closing Spread, computed based on the bid and ask prices quoted at the end of the trading day (K. H. Chung & Zhang, 2014):

$$PQCS_{it} = \sum_{m=1}^{NoTD_{it}} \frac{ask_{imt} - bid_{imt}}{mid_{imt}} \quad (4)$$

where mid_{imt} is the average of ask_{imt} and bid_{imt} prices for stock i at the end of day m of year t. Similarly, we calculate Percent Effective Closing Spread:

$$PECS_{it} = \sum_{m=1}^{NoTD_{it}} \frac{|close_{imt} - mid_{imt}|}{mid_{imt}} \quad (5)$$

where $close_{imt}$ is the day m of year t closing price for stock i.

To avoid non-normality issues resulting from excessive skewness and kurtosis of liquidity measure, we log-transform the values of all liquidity measures. This results in the distribution of these measures becoming more closely aligned with the normal distribution. Given that *ILLIQ*, *PQCS* and *PECS* reflect illiquidity, i.e. their higher values denote less liquidity, and *Turn* measures liquidity, i.e. liquidity increases with the values of *Turn*, to facilitate the interpretation of the results, we multiply the values of *ILLIQ*, *PQCS* and *PECS* by -1, so the liquidity increases with their values. The main coefficient of interest is β_3. If the

hypothesis ***H1*** on the beneficial effect of increased exit threat to stock liquidity is true, β_3 is expected to be positive. Inversely, if hypothesis ***H2*** is about the detrimental effect of increased institutions' threat of exit on stock liquidity is true, β_3 is expected to be negative.

We also employ some control variables to avoid the confounding effect of other companies' characteristics on stock liquidity. Following the recent research in the field (e.g. Ali et al., 2017; Biswas, 2020; Chowdhury et al., 2024; K. H. Chung et al., 2010), we control for the size of a company as measured by the natural logarithm of the market value of equity (*lnMV*), company age (*Age*), as measured by the natural logarithm of the number of years since first listing. Next, we control for the risk (*Volatility*), measured as a standard deviation of weekly log returns in a given year, and the company indebtedness (*Leverage*) – the book value of debt relative to the book value of total capital, which is the sum of equity and debt. We control for growth opportunities proxied by book-to-market ratio (*BV/MV*) and the company's asset tangibility (*Tangibility*) as proxied by the net property, plant and equipment scaled by total assets. All control variables are cross-sectionally (year-by-year) winsorised at the 2.5th and 97.5th percentiles to account for outliers.

3.3. Data sources and research sample

All the data required to calculate the variables of interest have been gathered from the S&P Capital IQ database. In particular, we gather quotation data, i.e. prices and volumes, to calculate our liquidity measures, companies' financial data to compute control variables, and detailed ownership data to calculate ownership variables and indicate which companies have faced an increased threat of exit, i.e. were held by the OFEs. Given that the OFEs reform has been effective since the beginning of 2014, and that we aim to analyse the changes in stock liquidity around the reform implementation, we focus on companies that were listed on the Warsaw Stock Exchange throughout the entire 2013 and 2014. To avoid biased inferences, we focus only on companies with their primary listing in the WSE. If a company is primarily listed on another exchange, stock liquidity measures calculated based on WSE quotations may simply reflect stock performance in the primary exchange. Then, we discarded financial companies due to their unique financial statements and more strict governance regulations. Moreover, these companies are often closely related to investment fund companies that manage Open-Ended Pension Funds. After applying these filters, we are left with 318 companies. The time scope of our study covers six years from 2011 to 2016. Given that some of the companies included in

the sample were not listed throughout the entire period, we have 1,806 annual firm-year observations, which gives an average number of 301 companies per year. Table 1 presents the descriptive statistics for all considered variables, and the pairwise correlation matrix among the variables is in Table 2.

4. Results

4.1. Baseline results

The baseline regression results are presented in Table 3. Panel A presents the estimated coefficients without controlling for firm-level characteristics and Panel B reports the estimates for the models that include control variables. The coefficient of interest, i.e., the interactive variable *Treatment*After*, captures the effect of the 2014 OFE reform on the liquidity of firms with OFE blockholders.

In Panel A, the interactive variable (*Treatment*After*) is positive and statistically significant only for *ILLIQ*, suggesting a potential improvement in liquidity. However, this effect is weak and not robust across other measures: coefficients for all remaining liquidity measures (*PQCS* and *PECS*) are statistically indistinguishable from zero. Furthermore, the adjusted R^2 values in Panel A are very low, indicating that the explanatory power of these models is marginal. The lack of model fit implies that omitted firm-level heterogeneity confounds the results. In Panel B, after introducing control variables, the explanatory power improves substantially, confirming that stock liquidity correlates with company characteristics. However, once controls are included, the previously weak positive effect for *ILLIQ* disappears entirely, and the interactive variable *Treatment*After* does not show statistically significant effects on any of the liquidity measures.

The estimated coeffcients on control variables are of expected values. In particular, larger and older companies tend to have more liquid shares, as evidenced by positive estimated coefficients on *lnMV* and *Age*, respectively. Volatility is positively related to turnover ratio and Liu measure, indicating that more actively traded stocks tend to be more volatile. However, these stocks are traded at higher cost (as measured by *PQCS* and *PECS*). Thus, our findings confirm the recent evidence that more volatile shares tend to have larger spreads. Additionally, significantly positive estimated coefficient on *B-MV* suggests that undervalued companies tend

to have more liquid shares. Interestingly, leverage and tangibility do not exhibit a significant relationship with stock liquidity.

Collectively, these baseline estimates provide no consistent evidence to support either ***H1*** or ***H2***. On this basis, there is no indication that the reform improved liquidity (***H1***), nor is there support for the hypothesis that liquidity decreased due to exit threat effects (***H2***). One possible explanation for these findings is that the OFEs may have preferred certain types of firms, leading to a non-random distribution of treatment across the sample. This sample selection bias may have obscured the true effects. These limitations underscore the need to apply more robust identification methods (such as PSM or entropy balancing) to draw more reliable conclusions.

4.2. Multiple blockholder OFE

To test the hypothesis *H1a* that the effect of increased blockholder exit threat is more pronounced among companies with multiple blockholder OFE, we re-run our baseline DiD regression with a redefined treatment variable (*Treatment2*). *Treatment2* is a dummy variable that equals 1 for companies with at least two blockholder OFEs, and 0 otherwise. The results of the estimation of the baseline model with an alternative treatment variable are presented in Table 4. Across both model specifications - without (Panel A) and with control variables (Panel B) - the coefficient on the interactive variable (*Treatment2*After*) is positive and statistically significant for most liquidity measures, as evidenced in the Amihud (2002) illiquidity ratio (*ILLIQ*), quoted and effective closing spreads (*PQCS* and *PECS*), and the turnover ratio (*Turn*). The results provide empirical support for the hypothesis ***H1a*** that the exit threat in firms with multiple OFE blockholders acted as a disciplinary force, ultimately enhancing liquidity in the post-reform period.

4.3. The role of agency conflicts

The details of the estimation for the role of agency conflicts are presented in Table 5 and Table 6 (Panels A-G).

4.4. Does information asymmetry matter?

Further analyses aim to investigate the heterogeneity of OFE reform on stock liquidity, in particular among the subsamples of companies with different intensities of information asymmetry and transparency.

The details of the estimation for the role of information transparency of the firm are presented Table 5 and Table 6 (Panel H).

5. Robustness tests

5.1. Propensity score matching

Given that OFEs may prefer a certain company profile, to alleviate the concerns resulting from non-randomness of the research sample and to mimic a randomised controlled trial, we applied a propensity score matching (PSM) to remove all observable differences in firms' characteristics between the companies with blockholder OFE (or OFEs) and not. We aim to compare stock liquidity between groups of very similar companies, but differing in only one detail, namely, having or not having blockholder OFEs in their shareholders' structures. To this end, we collect the data and determine certain firms' characteristics as of the end of 2013. To match companies that differ only in one aspect, i.e. being treated or not, we construct several measures to reflect the company ownership. First, we calculate the institutional ownership (*InstOwn*) as a percent of outstanding shares held by the institutional investors and insider ownership (*InsOwn*) as a percent of shares held by insiders. We also use a binary variable for state-owned enterprises (*SOE*), which equals 1 if one of the company's ultimate owners is the state treasury. To reflect the ownership concentration, we use the percent of shares held by the largest investor (*MaxOwn*) and the Herfindahl-Hirschman index of shares owned by investors owning more than 5% (*HHI_5*) and 1% (*HHI_1*) of outstanding shares. We also use other company characteristics (*lnMV, Age, Volatility, Leverage and BV/MV*), defined in Section 3 as control variables, as well as company profitability as measured by *ROA* and *ROE*. The descriptive statistics for these variables, calculated from the sample of companies at the end of 2013, are presented in Table 7.

In the next step, we estimate the probit model with a dummy variable (*Treatment*) which equals 1 for treated companies and 0 otherwise. Like in the baseline analysis, a company is

considered as treated if it is allocated to the portfolio of at least one OFE that holds at least 5% of the company shares. The remaining companies are considered a control group. The set of explanatory variables in the probit model is selected based on the correlation matrix (Table 8) and encompasses one liquidity variable (*PQCS*), two ownership-related variables (*InstOwn* and *InsOwn*) and four financial companies' characteristics (*lnMV, Age, BV/MV* and *ROA*). The results of the estimation are presented in the first column in Panel A of Table 9. We used predicted probabilities from this model to conduct the nearest-neighbourhood propensity score matching. One company from the control group with the least difference in predicted probability has been assigned to each company from the treatment group. If a company from the control group has been assigned to more than one company from the treatment group, only the one with the lowest difference is considered in a matched sample. Our initial sample consists of 318 companies, and the matched sample comprises 94 companies.

In the matched sample, all matching variables are statistically insignificant in the estimated probit model. In the post-match regression, Mac-Fadden R^2 falls significantly relative to the pre-match estimation, and the χ^2 test fails to reject the null hypothesis that all the estimated coefficients are equal to zero. We can thus conclude that the PSM has been successful in removing all observable differences in companies' characteristics between the treatment and control groups. This also pertains to variables not considered in the probit regression. All the differences in these characteristics are statistically indistinguishable from zero (Panel B of Table 9). The PSM procedure also resulted in including in the research sample companies with a lower number of OFEs in shareholders' structure and lower OFEs' ownership relative to the full sample. Figure 1 and Figure 2 display the distribution of the number of OFEs (Panels A) and the total OFEs ownership (Panels B) among the full and matched samples, respectively. PSM procedure resulted in dropping the companies with excessively high numbers of OFEs in shareholders' structure and companies with excessively large OFEs ownership.

Table 10 presents the results of the difference-in-differences estimation on the matched sample. In Panel A (no control variables), the interactive variable *Treatment*After* is negative and statistically significant only for the turnover *(Turn)*, suggesting a decline in trading activity post-reform for treated firms. For the remaining liquidity measures (*ILLIQ*, *PQCS* and *PECS*), no statistically significant effects are observed. The lack of significance implies no robust improvement or deterioration in liquidity. In Panel B, where firm-level control variables are included, the results remain unchanged. The only statistically significant effect persists for turnover *(Turn)*, reinforcing the finding that trading activity declined in treated firms relative to

controls after the reform. Other liquidity measures remain statistically insignificant. The adjusted R^2 values are relatively high for models using *ILLIQ*, *PQCS*, and *PECS*, suggesting good model fit, but the core treatment effect remains limited to turnover. These results provide no evidence of liquidity improvement following the reform in firms with a single OFE blockholder and instead point to a reduction in trading activity, which may reflect investor caution. The presence of a single institutional blockholder does not appear sufficient to trigger improvements in liquidity. These findings partially align with ***H2***, suggesting that the reform may have reduced trading, possibly due to adverse selection concerns.

To further corroborate our baseline results, we run additional PSM with our second treatment variable, i.e. *Treatment2*. The procedure mimics that presented earlier, except that we estimate the probit model with a dummy variable (*Treatment2*) which equals 1 for companies with at least two blockholder OFEs, and 0 otherwise. The results of the estimation are presented in the first column in Panel A of Table 11. In this case, the matched sample comprises 72 companies, and PSM procedure has also been successful in removing all observable differences between treated and control companies, as evidenced by the post-match probit regression (last column in Panel A of Table 11) and the statistical insignificance of the differences in means between the two groups (Panel B of Table 11). Accordingly, Figure 3 presents the distribution of the OFEs in the shareholders' structure in the post-match sample. As evidenced, the matched control group comprises some companies with one blockholder OFE.

Table 12 presents the results of the difference-in-differences estimation on the matched sample with an alternative treatment variable. In Panel A (without control variables), the coefficient on the interactive variable *Treatment2*After* is positive and statistically significant across all liquidity measures. Since liquidity proxies (except *Turn*) were multiplied by -1 for interpretational clarity, positive values indicate improved liquidity for treated firms relative to control firms after the reform. In Panel B, where firm-level control variables are introduced, the results remain largely consistent. While the coefficient on *Treatment2*After* becomes statistically weaker in some models, it remains positive and significant for most liquidity variables (*Turn*, *PQCS* and *PECS*). These findings provide support for hypothesis ***H1a***: firms with multiple OFE blockholders, i.e., those subject to a stronger exit threat, experienced statistically significant improvements in liquidity after the reform. Notably, the findings contrast with results where the presence of a single OFE blockholder did not give similar effects. This suggests that the intensity of institutional ownership concentration matters, and

that a credible exit threat, rather than institutional presence only, is necessary for improvements in market liquidity.

5.2. Entropy balancing

In the previous section, we have applied the PSM procedure to alleviate the concerns resulting from non-randomness of the research sample and to mimic a randomised controlled trial. PSM has removed all observable differences in firms' characteristics between the treatment and control groups. However, PSM results in a significant truncation of the research sample and the loss of information from companies not included in the matched sample. To further corroborate our results without losing information, we apply another statistical procedure aimed at eliminating the observable differences in variables' distributions between treated and control groups. To this end, we apply entropy balancing as proposed by Hainmueller (2012). Each observation in our sample is assigned a weight: observations from the treatment group are assigned a unit weight, while observations from the control group are assigned such weights so that the moments of control variables' distributions in treatment and control groups are roughly equal. To ensure robust balance between the groups, we aim to match three moments of distributions: means, variances, and skewness. After balancing, we re-run the DiD regression as in equation (1) using Weighted Least Squares (WLS) with analytical weights from entropy balancing. To account for potential heteroskedasticity and autocorrelation of the residuals, standard errors are clustered by a firm and by year.

Table 13 presents the moments of the variables' distributions in an entropy-balanced sample, confirming successful balancing: means, variances, and skewness values for all firm-level control variables are exactly matched across groups, indicating that observable differences have been effectively eliminated. Table 14 presents the DiD coefficients estimated on the entropy-balanced sample. In Panel A (no control variables), the interactive variable *Treatment*After* is positive and statistically significant for *ILLIQ*. The results indicate a significant improvement in stock liquidity following the reform for firms with OFE blockholders. Other measures, including turnover and quoted/effective spreads, show no significant effects. In Panel B, where control variables are added, the treatment effects become weaker and lose statistical significance across all metrics. Thus, some of the observed effects in Panel A may be explained by firm characteristics, particularly size, age, and volatility, which exhibit strong and consistent effects in the models.

To further corroborate our baseline results, we repeat the entropy balancing procedure using an alternative treatment variable, i.e. *Treatment2*. The moments of variables' distributions and estimated DiD coefficients are presented in Table 15 and Table 16, respectively. Based on the results, we can conclude that firms with multiple OFE blockholders experienced a statistically significant improvement in stock liquidity following the OFE reform. As shown in Table 15, the entropy balancing successfully eliminated observable differences between treatment and control groups, ensuring perfect alignment in means, variances, and skewness across all firm-level characteristics. Table 16 reports the estimated DiD coefficients based on the entropy-balanced sample. In Panel A (without control variables), the interactive variable *Treatment2*After* is positive and significant across all four liquidity measures. These results indicate consistent improvements in stock liquidity for treated firms relative to their controls. In Panel B, where firm-level control variables are included, the effects largely persist. The interaction term remains positive and statistically significant for three out of four liquidity measures (*PQCS*, *PECS* and *ILLIQ*).

Importantly, the entropy balancing results align with earlier findings based on PSM and confirm that the magnitude of institutional (OFE) ownership matters. Only firms with at least two OFEs exhibited statistically robust improvements in liquidity. These results provide empirical support for **H1a**, suggesting that the presence of multiple institutional blockholders created a credible exit threat, which could trigger stronger governance by firms and result in greater liquidity.

5.3. Placebo test

The results of the placebo test are presented in Table 17.

5.4. Parallel trends assumption

The results for the parallel trends assumption analysis are presented in Table 18 and Table 19 for our baseline and alternative treatment variables, respectively.

6. Concluding remarks

In the traditional view, stock liquidity serves as an efficient governance mechanism by increasing blockholders' exit threat, which, in turn, alleviates agency problems. However, the link between stock liquidity and corporate governance is not purely one-directional, suggesting a potentially endogenous relationship due to reverse causality. Well-governed and thus transparent firms tend to exhibit narrower bid-ask spreads and higher trading volumes, i.e. higher stock liquidity. Our paper was aimed at an in-depth analysis of whether an increase in blockholder's exit threat improves stock liquidity. To alleviate endogeneity concerns, we utilise a quasi-natural experiment which exerted an exogenous increase in blockholders' exit threat and thus improved governance in companies held by these blockholders. An Open-Ended Pension Funds (OFEs) reform in Poland, implemented in 2014, is considered such an experiment (Kałdoński & Jewartowski, 2024).

The mere presence of an OFE as a single blockholder in a company's ownership structure did not translate into any significant change in stock liquidity following the reform. The baseline analysis points to a neutral outcome: the reform neither improved nor deteriorated liquidity among firms with at least one OFE blockholder. The picture changes when we focus on firms with a stronger OFE presence — specifically, those in which at least two pension funds are blockholders. In this group, we observe improvement in liquidity following the reform, regardless of the estimation method applied (including baseline models, propensity score matching, and entropy balancing). Our results thus support the notion that greater OFEs' ownership - and the associated credible exit threat - can have an impact on stock liquidity. When a company had more than one OFE blockholder, it is possible that firms responded by taking steps to strengthen their market appeal, for example, by improving transparency, which may have contributed to enhanced market liquidity.

We conclude that the effects of institutional investors are conditional - they depend on the context, particularly on the intensity of their engagement. Future research will explore potential heterogeneity in the effects of the OFE reform across different types of firms, particularly those facing more severe agency conflicts or higher levels of information asymmetry. These analyses will provide a more detailed understanding of the mechanisms through which exit threats affect stock liquidity.

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Table 1. Descriptive statistics

Variable	Mean	Std.Dev.	Skewness	Kurtosis	5th percentile	Median	95th percentile
ILLIQ	-1.009	3.308	0.588	0.236	-5.472	-1.715	5.272
Turn	-2.084	1.486	-0.711	1.945	-4.773	-1.980	0.106
PQCS	3.810	0.912	-0.632	-1.045	2.115	3.848	5.215
PECS	4.512	0.931	-0.609	-0.940	2.754	4.559	5.956
lnMV	5.093	1.631	0.381	-0.114	2.607	4.935	8.358
Age	1.809	0.932	-1.151	1.531	0.024	1.945	2.916
Volatility	0.064	0.039	2.650	9.044	0.029	0.053	0.151
Leverage	0.266	0.214	0.779	0.234	0.000	0.244	0.704
BV/MV	1.133	1.082	1.207	4.002	0.082	0.880	3.443
Tangibility	0.287	0.228	0.516	-0.764	0.003	0.254	0.746

The table presents the descriptive statistics for all considered variables in the full sample and covers both the pre- and post-treatment period (2011-2016). *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets.

Table 2. Correlation matrix

Variable	*Turn*	*PQCS*	*PECS*	*lnMV*	*Age*	*Volatility*	*Leverage*	*BV/MV*	*Tangibility*
ILLIQ	**-0.1596**	**0.7868**	**0.7911**	**-0.4010**	**-0.1809**	**0.4481**	-0.0109	**-0.0510**	**-0.1485**
Turn		**-0.0840**	**-0.0759**	**-0.0480**	**0.0688**	**0.3703**	**0.1212**	**0.0941**	**-0.0491**
PQCS			**0.9916**	**-0.4772**	**-0.1837**	**0.6090**	0.0226	**-0.0579**	**-0.1479**
PECS				**-0.4803**	**-0.1869**	**0.6182**	0.0344	**-0.0664**	**-0.1517**
lnMV					**0.1729**	**-0.4456**	**-0.0546**	**-0.1866**	**0.1929**
Age						**-0.1563**	**0.0841**	**0.1842**	**0.0766**
Volatility							**0.1095**	0.0373	**-0.1958**
Leverage								0.0160	**0.0552**
BV/MV									**0.0678**

The table presents the pairwise correlations among all considered variables in the full sample and covers both the pre- and post-treatment period (2011-2016). *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. Values statistically significant at the 5% level are in bold.

Table 3. Difference-in-Differences estimation

Panel A: No control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-1.542***	-1.997***	3.564***	4.245***
	(4.14)	(16.62)	(36.06)	(43.41)
Treatment	1.388**	0.169	0.535***	0.554***
	(3.55)	(1.43)	(4.74)	(4.93)
After	-0.318	-0.308**	-0.035	-0.008
	(1.13)	(3.77)	(0.42)	(0.11)
*Treatment*After*	0.381*	-0.003	0.120	0.117
	(2.02)	(0.17)	(1.42)	(1.43)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.057	0.013	0.106	0.108
Panel B: Control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.583***	-3.545***	2.353***	3.033***
	(17.25)	(12.11)	(19.84)	(23.94)
Treatment	-0.148	0.194	0.075	0.080
	(0.53)	(1.39)	(1.33)	(1.42)
After	-0.418*	-0.467**	-0.061	-0.033
	(2.47)	(3.93)	(1.89)	(0.89)
*Treatment*After*	0.066	0.056	0.022	0.014
	(0.38)	(1.00)	(0.55)	(0.34)
lnMV	1.435***	0.064	0.300***	0.307***
	(14.37)	(1.35)	(15.91)	(15.91)
Age	0.449***	0.305**	0.096**	0.095**
	(4.87)	(3.91)	(3.41)	(3.40)
Volatility	2.609	7.903***	-6.023***	-6.346***
	(1.05)	(8.26)	(8.02)	(7.79)
Leverage	0.681	0.365	0.114	0.092
	(1.81)	(1.49)	(1.04)	(0.82)
BV/MV	0.333***	0.135*	0.097***	0.095***
	(4.18)	(2.25)	(4.64)	(4.58)
Tangibility	-0.026	-0.094	-0.011	-0.007
	(0.05)	(0.30)	(0.09)	(0.05)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.093	0.526	0.536

Treatment equals 1 for treated companies and 0 for control firms; *After* takes the value of 1 for 2014-2016 and 0 for 2011-2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. . t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 4. Difference-in-Differences estimation - alternative treatment variable

Panel A: No control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-1.243**	-1.957***	3.686***	4.370***
	(3.93)	(20.42)	(46.07)	(54.78)
Treatment2	1.339**	0.149	0.492***	0.511***
	(3.52)	(1.45)	(4.62)	(4.83)
After	-0.277	-0.332***	-0.020	0.003
	(1.16)	(4.19)	(0.29)	(0.05)
*Treatment2*After*	0.513***	0.095***	0.151*	0.157*
	(4.08)	(5.51)	(2.04)	(2.18)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.043	0.013	0.070	0.073
Panel B: Control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.576***	-3.500***	2.376***	3.059***
	(16.81)	(12.17)	(19.57)	(23.76)
Treatment2	-0.239	0.150	0.044	0.050
	(0.90)	(1.26)	(0.73)	(0.84)
After	-0.464**	-0.478***	-0.074*	-0.050
	(3.48)	(4.47)	(2.51)	(1.51)
*Treatment2*After*	0.328*	0.135***	0.090*	0.093*
	(2.54)	(4.22)	(2.29)	(2.42)
lnMV	1.430***	0.067	0.300***	0.307***
	(14.85)	(1.51)	(16.33)	(16.36)
Age	0.448***	0.309**	0.097**	0.096**
	(4.83)	(3.89)	(3.45)	(3.43)
Volatility	2.803	7.622***	-6.125***	-6.439***
	(1.12)	(7.87)	(8.09)	(7.88)
Leverage	0.686	0.359	0.112	0.090
	(1.83)	(1.45)	(1.03)	(0.81)
BV/MV	0.333***	0.137*	0.098***	0.095***
	(4.18)	(2.26)	(4.62)	(4.57)
Tangibility	-0.031	-0.092	-0.011	-0.006
	(0.06)	(0.30)	(0.09)	(0.05)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.093	0.526	0.536

Treatment2 equals 1 for treated companies and 0 for control firms; *After* takes the value of 1 for 2014-2016 and 0 for 2011-2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. . t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 5. Difference-in-Differences estimation – the moderating role of agency conflicts and informational transparency

Panel A: Cash holdings				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.584***	-3.545***	2.351***	3.031***
	(17.27)	(12.09)	(19.84)	(23.93)
Treatment	-0.148	0.194	0.075	0.080
	(0.53)	(1.39)	(1.33)	(1.43)
After	-0.418*	-0.467**	-0.061	-0.033
	(2.47)	(3.93)	(1.88)	(0.89)
*Treatment*After*	0.051	0.065	-0.009	-0.022
	(0.22)	(0.70)	(0.19)	(0.47)
*Treatment*After*HAC*	0.027	-0.016	0.053	0.063
	(0.11)	(0.11)	(0.85)	(0.99)
lnMV	1.435***	0.064	0.300***	0.307***
	(14.37)	(1.35)	(15.93)	(15.94)
Age	0.449***	0.305**	0.095**	0.095**
	(4.87)	(3.91)	(3.41)	(3.39)
Volatility	2.608	7.903***	-6.025***	-6.358***
	(1.05)	(8.25)	(8.04)	(7.81)
Leverage	0.682	0.364	0.116	0.095
	(1.82)	(1.48)	(1.07)	(0.85)
BV/MV	0.334***	0.135*	0.098***	0.095***
	(4.20)	(2.25)	(4.68)	(4.62)
Tangibility	-0.025	-0.094	-0.009	0.004
	(0.05)	(0.31)	(0.07)	(0.03)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.093	0.526	0.536
Panel B: Cash from operations				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.563***	-3.546***	2.358***	3.038***
	(17.04)	(12.07)	(19.87)	(24.05)
Treatment	-0.144	0.194	0.076	0.081
	(0.52)	(1.38)	(1.34)	(1.44)
After	-0.422*	-0.467**	-0.062	-0.034
	(2.47)	(3.93)	(1.90)	(0.92)
*Treatment*After*	-0.229	0.070	-0.043	0.054
	(1.04)	(0.67)	(0.93)	(1.20)
*Treatment*After*HAC*	0.505	-0.024	0.111	0.115
	(1.35)	(0.15)	(1.35)	(1.42)
lnMV	1.431***	0.064	0.299***	0.306***
	(14.09)	(1.34)	(15.60)	(15.69)
Age	0.452***	0.305**	0.096**	0.096**
	(4.89)	(3.90)	(3.43)	(3.42)
Volatility	2.568	7.905***	-6.032***	-6.355***
	(1.05)	(8.24)	(8.08)	(7.85)
Leverage	0.728	0.363	0.124	0.102
	(1.94)	(1.47)	(1.14)	(0.92)
BV/MV	0.335***	0.135*	0.097***	0.095***
	(4.11)	(2.26)	(4.51)	(4.47)
Tangibility	-0.076	-0.092	-0.022	-0.018
	(0.16)	(0.29)	(0.18)	(0.14)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.506	0.093	0.527	0.536
Panel C: CAPEX volatility				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.585***	-3.546***	2.353***	3.033***
	(17.27)	(12.13)	(19.86)	(23.97)
Treatment	-0.149	0.194	0.075	0.080
	(0.54)	(1.38)	(1.32)	(1.42)
After	-0.418*	-0.467**	-0.061	-0.033
	(2.47)	(3.93)	(1.90)	(0.90)
*Treatment*After*	-0.013	0.034	-0.001	-0.011
	(0.06)	(0.42)	(0.02)	(0.20)
*Treatment*After*HAC*	0.164	0.045	0.048	0.051
	(0.63)	(0.32)	(0.75)	(0.82)
lnMV	1.436***	0.064	0.300***	0.307***
	(14.38)	(1.36)	(15.85)	(15.86)
Age	0.450***	0.305**	0.096**	0.095**
	(4.88)	(3.91)	(3.42)	(3.41)

Volatility	2.603	7.901***	-6.025***	-6.348***
	(1.05)	(8.25)	(8.03)	(7.80)
Leverage	0.679	0.364	0.113	0.091
	(1.81)	(1.48)	(1.04)	(0.82)
BV/MV	0.335***	0.136*	0.098***	0.095***
	(4.21)	(2.25)	(4.59)	(4.55)
Tangibility	-0.041	-0.098	-0.016	-0.011
	(0.08)	(0.31)	(0.12)	(0.09)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.093	0.526	0.536
Panel D: Insider Ownership				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.524***	-3.567***	2.354***	3.033***
	(16.59)	(12.20)	(19.68)	(23.83)
Treatment	-0.142	0.192	0.075	0.080
	(0.51)	(1.37)	(1.32)	(1.42)
After	-0.416*	-0.468**	-0.061	-0.033
	(2.47)	(3.94)	(1.89)	(0.90)
*Treatment*After*	0.258	-0.016	0.024	0.013
	(0.92)	(0.17)	(0.40)	(0.22)
*Treatment*After*HAC*	-0.390	0.145	-0.004	0.001
	(1.16)	(1.06)	(0.06)	(0.01)
lnMV	1.428***	0.066	0.299***	0.307***
	(13.95)	(1.39)	(15.62)	(15.64)
Age	0.445***	0.307**	0.095**	0.095**
	(4.85)	(3.94)	(3.42)	(3.41)
Volatility	2.476	7.952***	-6.025***	-6.345***
	(1.00)	(8.35)	(8.04)	(7.81)
Leverage	0.654	0.375	0.114	0.092
	(1.72)	(1.53)	(1.04)	(0.83)
BV/MV	0.333***	0.135*	0.097***	0.095***
	(4.20)	(2.25)	(4.63)	(4.58)
Tangibility	-0.039	-0.089	-0.011	-0.007
	(0.08)	(0.29)	(0.09)	(0.05)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.506	0.094	0.526	0.536
Panel E: Max Ownership				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.608***	-3.566***	2.349***	3.028***
	(17.27)	(12.28)	(19.72)	(23.77)
Treatment	-0.155	0.188	0.074	0.078
	(0.56)	(1.34)	(1.30)	(1.40)
After	-0.417*	-0.466**	-0.061	-0.033
	(2.45)	(3.94)	(1.86)	(0.88)
*Treatment*After*	0.369	0.308**	0.080	0.075
	(1.86)	(3.76)	(1.83)	(1.66)
*Treatment*After*HAC*	-0.773**	-0.646***	-0.149*	-0.156*
	(2.92)	(4.16)	(2.49)	(2.46)
lnMV	1.441***	0.068	0.301***	0.308***
	(14.46)	(1.45)	(15.93)	(15.91)
Age	0.448***	0.304**	0.095**	0.095**
	(4.88)	(3.92)	(3.40)	(3.39)
Volatility	2.514	7.824***	-6.042***	-6.365***
	(1.01)	(8.08)	(8.06)	(7.83)
Leverage	0.711	0.390	0.120	0.098
	(1.90)	(1.61)	(1.10)	(0.88)
BV/MV	0.332***	0.134*	0.097***	0.094***
	(4.13)	(2.22)	(4.60)	(4.54)
Tangibility	-0.015	-0.084	-0.009	-0.005
	(0.03)	(0.28)	(0.07)	(0.04)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.508	0.103	0.527	0.537
Panel F: Ownership concentration				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.586***	3.547***	2.353***	3.033***
	(17.17)	(12.17)	(19.78)	(23.85)
Treatment	-0.156	0.188	0.074	0.078
	(0.57)	(1.35)	(1.30)	(1.40)
After	-0.420*	-0.469**	-0.062	-0.034
	(2.49)	(3.97)	(1.89)	(0.90)
*Treatment*After*	0.540**	0.400***	0.130**	0.127**
	(2.73)	(6.04)	(2.89)	(2.67)

*Treatment*After*HAC*	-1.252***	-0.911***	-0.287***	-0.300***
	(4.95)	(6.42)	(4.95)	(4.89)
lnMV	1.438***	0.066	0.300***	0.307***
	(14.45)	(1.41)	(15.99)	(15.96)
Age	0.452***	0.308***	0.096**	0.096**
	(4.97)	(4.00)	(3.48)	(3.46)
Volatility	2.405	7.755***	-6.070***	-6.395***
	(0.97)	(8.00)	(8.15)	(7.93)
Leverage	0.722*	0.395	0.124	0.102
	(1.97)	(1.64)	(1.16)	(0.94)
BV/MV	0.327***	0.131*	0.096***	0.093***
	(4.09)	(2.20)	(4.57)	(4.51)
Tangibility	-0.028	-0.95	-0.012	-0.007
	(0.06)	(0.31)	(0.09)	(0.06)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.512	0.113	0.531	0.541
Panel G: Free float				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.370***	-3.436***	2.398***	3.080***
	(16.15)	(11.32)	(20.07)	(24.61)
Treatment	-0.119	0.209	0.081	0.086
	(0.43)	(1.50)	(1.43)	(1.54)
After	-0.401*	-0.459**	-0.058	-0.029
	(2.35)	(3.82)	(1.75)	(0.78)
*Treatment*After*	0.844***	0.453***	0.185***	0.184***
	(4.02)	(6.97)	(4.31)	(4.13)
*Treatment*After*HAC*	-2.181***	-1.116***	-0.458***	-0.478***
	(8.92)	(7.45)	(7.60)	(7.97)
lnMV	1.403***	0.047	0.293***	0.299***
	(13.65)	(1.05)	(15.51)	(15.78)
Age	0.421***	0.291**	0.090**	0.089**
	(4.65)	(3.67)	(3.17)	(3.14)
Volatility	2.030	7.607***	-6.145***	-6.473***
	(0.84)	(8.00)	(8.41)	(8.20)
Leverage	0.582	0.314	0.093	0.070
	(1.55)	(1.26)	(0.84)	(0.62)
BV/MV	0.340***	0.39*	0.098***	0.096***
	(4.49)	(2.44)	(4.91)	(4.86)
Tangibility	0.108	-0.025	0.017	0.023
	(0.24)	(0.08)	(0.14)	(0.18)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.527	0.122	0.539	0.549
Panel H: Company transparency				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.515***	-3.588***	2.343***	3.027***
	(16.48)	(12.52)	(19.31)	(23.56)
Treatment	-0.138	0.188	0.074	0.079
	(0.49)	(1.34)	(1.29)	(1.39)
After	-0.417*	-0.468**	-0.061	-0.033
	(2.48)	(3.94)	(1.89)	(0.90)
*Treatment*After*	-0.119	0.173	0.051	0.031
	(0.42)	(1.42)	(0.96)	(0.62)
*Treatment*After*HT*	0.302	-0.192	-0.047	-0.029
	(0.67)	(1.15)	(0.47)	(0.28)
lnMV	1.424***	0.071	0.301***	0.308***
	(13.21)	(1.48)	(14.47)	(14.51)
Age	0.448***	0.306**	0.096**	0.095**
	(4.85)	(3.94)	(3.43)	(3.41)
Volatility	2.517	7.962***	-6.009***	-6.337***
	(1.04)	(8.39)	(8.03)	(7.82)
Leverage	0.659	0.3799	0.117	0.094
	(1.77)	(1.54)	(1.09)	(0.86)
BV/MV	0.331***	0.137*	0.098***	0.095***
	(4.08)	(2.29)	(4.60)	(4.54)
Tangibility	-0.013	-0.102	-0.013	-0.008
	(0.03)	(0.33)	(0.10)	(0.06)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.094	0.526	0.536

HAC equals 1 for companies identified as with high agency conflicts based on various proxies for agency conflicts and 0 otherwise; *HT* equals 1 for companies identified as having high informational environment transparency and 0 otherwise; *Treatment* equals 1 for treated companies (i.e. those with at least one blockholder OFE) and 0 for control firms; *After* takes the value of 1 for 2014-2016 and 0 for 2011-2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural

logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 6. Difference-in-Differences estimation – the moderating role of agency conflicts and informational transparency for alternative treatment variable

Panel A: Cash holdings				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.584***	-3.506***	2.371***	3.053***
	(16.77)	(12.20)	(19.51)	(23.68)
Treatment2	-0.240	0.149	0.043	0.049
	(0.90)	(1.26)	(0.072)	(0.83)
After	-0.464**	-0.478***	-0.074*	-0.050
	(3.48)	(4.47)	(2.49)	(1.49)
*Treatment2*After*	0.189	0.038	0.013	0.009
	(0.70)	(0.40)	(0.19)	(0.11)
*Treatment2*After*HAC*	0.225	0.158	0.125	0.138
	(0.65)	(1.04)	(1.68)	(1.73)
lnMV	1.431***	0.068	0.301***	0.308***
	(14.82)	(1.52)	(16.22)	(16.33)
Age	0.447***	0.308**	0.096**	0.096**
	(4.82)	(3.88)	(3.43)	(3.41)
Volatility	2.802	7.621***	-6.126***	-6.440***
	(1.12)	(7.89)	(8.10)	(7.88)
Leverage	0.695	0.365	0.117	0.095
	(1.86)	(1.47)	(1.09)	(0.87)
BV/MV	0.333***	0.137*	0.098***	0.096***
	(4.19)	(2.27)	(4.65)	(4.60)
Tangibility	-0.024	-0.087	-0.007	-0.002
	(0.05)	(0.28)	(0.06)	(0.01)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.092	0.527	0.537
Panel B: Cash from operations				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.576***	-3.500***	2.375***	3.058***
	(16.75)	(12.16)	(19.52)	(23.72)
Treatment2	-0.239	0.150	0.044	0.050
	(0.90)	(1.27)	(0.73)	(0.84)
After	-0.464**	-0.478***	-0.074*	-0.050
	(3.47)	(4.46)	(2.50)	(1.49)
*Treatment2*After*	0.336	0.157	0.137*	0.153*
	(1.14)	(1.61)	(2.08)	(2.41)
*Treatment2*After*HAC*	-0.012	0.034	-0.072	-0.091
	(0.03)	(0.22)	(0.77)	(0.99)
lnMV	1.430***	0.068	0.301***	0.307***
	(14.79)	(1.51)	(16.27)	(16.27)
Age	0.448***	0.309**	0.097**	0.096**
	(4.84)	(3.88)	(3.44)	(3.41)
Volatility	2.804	7.625***	-6.119***	-6.431***
	(1.12)	(7.86)	(8.08)	(7.87)
Leverage	0.686	0.357	0.108	0.085
	(1.82)	(1.43)	(0.97)	(0.75)
BV/MV	0.333***	0.137*	0.098***	0.095***
	(4.19)	(2.26)	(4.65)	(4.60)
Tangibility	-0.030	-0.090	-0.006	0.000
	(0.06)	(0.29)	(0.05)	(0.00)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.092	0.526	0.536
Panel C: CAPEX volatility				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.575***	-3.499***	2.376***	3.059***
	(16.83)	(12.16)	(19.57)	(23.77)
Treatment2	-0.238	0.150	0.044	0.050
	(0.89)	(1.27)	(0.73)	(0.84)
After	-0.464**	-0.478***	-0.074*	-0.050
	(3.47)	(4.47)	(2.50)	(1.50)
*Treatment2*After*	0.501**	0.226**	0.111*	0.116*
	(3.27)	(3.33)	(2.02)	(2.28)
*Treatment2*After*HAC*	-0.374	-0.197	-0.045	-0.049
	(1.27)	(1.30)	(0.60)	(0.67)
lnMV	1.429***	0.067	0.300***	0.307***
	(14.84)	(1.49)	(16.26)	(16.26)
Age	0.448***	0.309**	0.097**	0.097**
	(4.84)	(3.90)	(3.45)	(3.43)

Volatility	2.803	7.622***	-6.125***	-6.439***
	(1.12)	(7.87)	(8.09)	(7.88)
Leverage	0.698	0.365	0.113	0.091
	(1.86)	(1.47)	(1.04)	(0.83)
BV/MV	0.331***	0.135*	0.097***	0.095***
	(4.16)	(2.25)	(4.59)	(4.54)
Tangibility	-0.014	-0.083	-0.009	-0.004
	(0.03)	(0.27)	(0.07)	(0.03)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.093	0.526	0.536
Panel D: Insider Ownership				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.541***	-3.523***	2.378***	3.060***
	(16.36)	(12.16)	(19.37)	(23.60)
Treatment2	-0.236	0.148	0.044	0.050
	(0.88)	(1.25)	(0.73)	(0.84)
After	-0.463**	-0.479**	-0.074*	-0.050
	(3.49)	(4.49)	(2.51)	(1.51)
*Treatment2*After*	0.489*	0.030	0.100	0.098
	(2.14)	(0.39)	(1.73)	(1.64)
*Treatment2*After*HAC*	-0.363	0.230	-0.021	-0.012
	(1.01)	(1.49)	(0.28)	(0.15)
lnMV	1.427***	0.070	0.300***	0.307***
	(14.56)	(1.54)	(16.08)	(16.12)
Age	0.445***	0.311**	0.097**	0.096**
	(4.81)	(3.92)	(3.44)	(3.42)
Volatility	2.742	7.682***	-6.131***	-6.442***
	(1.09)	(7.87)	(8.10)	(7.89)
Leverage	0.672	0.368	0.111	0.089
	(1.79)	(1.49)	(1.02)	(0.81)
BV/MV	0.334***	0.136*	0.098***	0.095***
	(4.22)	(2.23)	(4.64)	(4.58)
Tangibility	-0.046	-0.082	-0.012	-0.006
	(0.10)	(0.26)	(0.09)	(0.05)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.505	0.093	0.526	0.536
Panel E: Max Ownership				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.598***	-3.515***	2.372***	3.055***
	(16.88)	(12.34)	(19.54)	(23.71)
Treatment2	-0.241	0.148	0.044	0.049
	(0.91)	(1.25)	(0.72)	(0.83)
After	-0.467**	-0.480***	-0.075*	-0.051
	(3.51)	(4.51)	(2.52)	(1.52)
*Treatment2*After*	0.703***	0.388***	0.152**	0.162**
	(4.55)	(7.42)	(3.28)	(3.59)
*Treatment2*After*HAC*	-0.148**	-0.776***	-0.188**	-0.211**
	(3.95)	(5.34)	(2.69)	(2.68)
lnMV	1.431***	0.068	0.301***	0.307***
	(14.93)	(1.52)	(16.33)	(16.24)
Age	0.452***	0.312**	0.098**	0.097**
	(4.88)	(3.85)	(3.48)	(3.46)
Volatility	2.825	7.637***	-6.122***	-6.435***
	(1.13)	(7.91)	(8.08)	(7.87)
Leverage	0.739	0.395	0.121	0.100
	(1.98)	(1.60)	(1.12)	(0.91)
BV/MV	0.327***	0.133*	0.097***	0.094***
	(4.09)	(2.19)	(4.55)	(4.48)
Tangibility	0.010	-0.078	-0.008	-0.002
	(0.02)	(0.26)	(0.06)	(0.02)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.508	0.099	0.527	0.537
Panel F: Ownership concentration				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.570***	-3.496***	2.377***	3.060***
	(16.72)	(12.21)	(19.55)	(23.76)
Treatment2	-0.237	0.151	0.044	0.050
	(0.89)	(1.27)	(0.73)	(0.84)
After	-0.466**	-0.479***	-0.075*	-0.051
	(3.51)	(4.49)	(2.51)	(1.51)
*Treatment2*After*	0.738***	0.375***	0.162**	0.173**
	(5.14)	(8.22)	(3.36)	(3.59)

*Treatment2*After*HAC*	-1.439***	-0.851***	-0.250**	-0.280**
	(5.43)	(5.81)	(3.13)	(3.06)
lnMV	0.451***	0.065	0.300***	0.306***
	(14.78)	(1.47)	(16.21)	(16.13)
Age	0.451***	0.311**	0.097**	0.097**
	(4.88)	(3.93)	(3.47)	(3.45)
Volatility	2.765	7.600***	-6.132***	-6.446***
	(1.11)	(7.88)	(8.13)	(7.93)
Leverage	0.734	0.387	0.120	0.099
	(1.97)	(1.57)	(1.11)	(0.90)
BV/MV	0.326***	0.133*	0.096***	0.094***
	(4.07)	(2.19)	(4.53)	(4.46)
Tangibility	-0.014	-0.082	-0.008	-0.003
	(0.03)	(0.27)	(0.06)	(0.02)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.510	0.100	0.528	0.538
Panel G: Free float				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.501***	-3.466***	2.391***	3.075***
	(16.32)	(11.96)	(19.62)	(23.98)
Treatment2	-0.225	0.156	0.047	0.053
	(0.84)	(1.32)	(0.77)	(0.89)
After	-0.456**	-0.474***	-0.072*	-0.048
	(3.41)	(4.39)	(2.43)	(1.44)
*Treatment2*After*	0.674***	0.293***	0.161**	0.169**
	(4.12)	(6.25)	(3.16)	(3.36)
*Treatment2*After*HAC*	-1.329***	-0.606**	-0.273**	-0.290**
	(4.66)	(3.64)	(3.17)	(3.32)
lnMV	1.420***	0.063	0.298***	0.305***
	(14.46)	(1.41)	(16.05)	(16.21)
Age	0.433***	0.302**	0.094**	0.093**
	(4.67)	(3.77)	(3.32)	(3.28)
Volatility	2.624	7.541***	-6.162***	-6.478***
	(1.08)	(7.89)	(8.27)	(8.08)
Leverage	0.674	0.353	0.110	0.087
	(1.80)	(1.42)	(1.01)	(0.79)
BV/MV	0.335***	0.138*	0.098***	0.096***
	(4.24)	(2.29)	(4.68)	(4.63)
Tangibility	0.014	-0.072	-0.001	-0.004
	(0.03)	(0.23)	(0.01)	(0.03)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.509	0.096	0.528	0.538
Panel H: Company transparency				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.519***	-3.524***	2.375***	3.059***
	(16.32)	(12.29)	(19.32)	(23.53)
Treatment2	-0.230	0.146	0.044	0.050
	(0.86)	(1.23)	(0.73)	(0.84)
After	-0.464**	-0.478***	-0.074*	-0.050
	(3.51)	(4.47)	(2.51)	(1.50)
*Treatment2*After*	-0.068	0.301**	0.101	0.090
	(0.24)	(2.88)	(1.46)	(1.35)
*Treatment2*After*HT*	0.548	-0.230	-0.015	0.004
	(1.35)	(1.31)	(0.15)	(0.04)
lnMV	1.421***	0.071	0.301***	0.307***
	(14.27)	(1.56)	(15.77)	(15.83)
Age	0.447***	0.309**	0.097**	0.096**
	(4.83)	(3.90)	(3.45)	(3.42)
Volatility	2.719	7.658***	-6.123***	-6.440***
	(1.10)	(7.92)	(8.08)	(7.88)
Leverage	0.669	0.366	0.113	0.090
	(1.78)	(1.47)	(1.03)	(0.81)
BV/MV	0.331***	0.137*	0.098***	0.095***
	(4.16)	(2.27)	(4.61)	(4.56)
Tangibility	-0.021	-0.096	-0.011	-0.006
	(0.04)	(0.31)	(0.09)	(0.05)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.506	0.093	0.526	0.536

HAC equals 1 for companies identified as with high agency conflicts based on various proxies for agency conflicts and 0 otherwise; *HT* equals 1 for companies identified as having high informational environment transparency and 0 otherwise; *Treatment2* equals 1 for treated companies (i.e. those with at least two blockholder OFE) and 0 for control firms; *After* takes the value of 1 for 2014-2016 and 0 for 2011-2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the

natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 7. Descriptive statistics for the full sample of companies at the end of 2013

Variable	Mean	Std.Dev.	Skewness	Kurtosis	5th percentile	Median	95th percentile
Treatment	0.431	0.496	0.279	-1.922	0.000	0.000	1.000
ILLIQ	65.652	193.27	5.801	41.574	0.007	5.121	328.64
Turn	0.349	0.747	8.938	109.36	0.008	0.160	1.179
PQCS	0.039	0.059	4.684	27.726	0.006	0.022	0.130
PECS	0.020	0.034	4.861	29.454	0.003	0.011	0.072
InstOwn	26.259	22.560	0.831	0.123	0.000	23.464	70.489
InsOwn	24.803	27.564	0.829	-0.608	0.000	12.390	78.821
SOE	0.066	0.249	3.495	10.214	0.000	0.000	1.000
MaxOwn	40.444	20.775	0.400	-0.606	11.938	38.455	80.074
HHI_5	2482.1	1819.3	1.149	1.345	335.67	2031.3	6627.7
HHI_1	2508.9	1810.0	1.153	1.357	384.09	2051.5	6651.5
lnMV	5.108	1.778	0.248	0.430	2.384	4.933	8.408
Age	1.878	0.775	-0.365	-0.850	0.463	1.931	2.925
Volatility	0.073	0.052	3.815	20.223	0.035	0.059	0.167
Leverage	0.315	1.747	3.091	96.229	0.000	0.234	0.752
BV/MV	2.049	7.213	7.485	65.796	0.040	0.801	6.655
ROA	0.019	0.216	2.254	49.710	-0.222	0.031	0.194
ROE	0.098	0.894	13.346	211.86	-0.507	0.061	0.403

The table presents the descriptive statistics for all considered variables in the pre-match sample and covers only the pre-treatment period. *OFE* is a dummy variable which equals 1 if the company has at least one OFE as a shareholder and 0 otherwise; *ILLIQ* is the Amihud illiquidity ratio; *Turn* is the turnover ratio; *PQCS* is the Percent Quoted Closing Spread; *PECS* is the Percent Effective Closing Spread; *InstOwn* denotes the percent of shares outstanding held by institutional investors; *InsOwn* denotes the percent of shares outstanding held by insiders; *SOE* is a dummy variable that equals 1 if one of the company's ultimate owners is the state treasury; *MaxOwn* is the percent of shares held by the largest shareholder; *HHI_5* (*HHI_1*) denote Herfindahl-Hirschmann index of shares owned by investors owning more that 5% (1%) of equity; *lnMV* denotes the natural logarithm of market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *ROA* (*ROE)* denote return on assets (equity).

Table 8. Correlation matrix among variables in the full sample of companies at the end of 2013

Variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*	*InstOwn*	*InsOwn*	*SOE*	*MaxOwn*	*HHI_5*	*HHI_1*	*lnMV*	*Age*	*Volatility*	*Leverage*	*BV/MV*	*ROA*	*ROE*
Treatment	**-0.237**	-0.101	**-0.290**	**-0.281**	**0.510**	**-0.156**	-0.001	**-0.242**	**-0.285**	**-0.281**	**0.421**	**0.187**	**-0.328**	-0.032	**-0.150**	**0.135**	-0.013
ILLIQ		**-0.117**	**0.687**	**0.669**	**-0.260**	**0.116**	-0.067	0.081	**0.142**	**0.139**	**-0.432**	**-0.235**	**0.469**	**0.262**	0.042	-0.331	-0.087
Turn			**-0.121**	-0.102	-0.092	-0.065	-0.014	**-0.175**	**-0.206**	**-0.208**	**-0.094**	**0.173**	**0.225**	0.050	0.057	0.001	0.007
PQCS				**0.969**	**-0.297**	**0.120**	-0.102	0.018	0.082	0.079	**-0.494**	**-0.201**	**0.631**	0.062	0.069	**-0.229**	-0.049
PECS					**-0.299**	0.100	-0.097	-0.019	0.043	0.040	**-0.467**	**-0.177**	**0.703**	0.070	0.067	**-0.214**	-0.043
InstOwn						**-0.294**	-0.046	**-0.299**	**-0.309**	**-0.303**	**0.358**	**0.161**	**-0.334**	-0.043	**-0.114**	**0.145**	0.006
InsOwn							**-0.197**	-0.046	-0.017	-0.019	**-0.264**	**-0.174**	0.036	0.046	0.039	0.004	0.021
SOE								0.109	0.091	0.090	**0.309**	0.038	-0.109	-0.012	-0.026	0.009	-0.024
MaxOwn									**0.959**	**0.960**	0.079	**-0.112**	-0.057	0.015	-0.021	-0.035	0.035
HHI_5										**0.999**	0.027	**-0.153**	-0.036	0.037	-0.010	-0.030	0.039
HHI_1											0.031	**-0.152**	-0.040	0.036	-0.012	-0.028	0.039
lnMV												**0.219**	**-0.519**	**-0.117**	**-0.250**	**0.273**	0.022
Age													-0.071	0.005	0.040	0.091	0.013
Volatility														0.132	**0.129**	**-0.222**	0.084
Leverage															-0.043	**-0.178**	-0.035
BV/MV																**-0.171**	-0.055
ROA																	**0.663**

The table presents the correlations among all considered variables in the pre-match sample and covers only the pre-treatment period. *OFE* is a dummy variable which equals 1 if the company has at least one OFE as a shareholder and 0 otherwise; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *InstOwn* denotes the percent of shares outstanding held by institutional investors; *InsOwn* denotes the percent of shares outstanding held by insiders; *SOE* is a dummy variable that equals 1 if one of the company's ultimate owners is the state treasury; *MaxOwn* is the percent of shares held by the largest shareholder; *HHI_5* (*HHI_1*) denote Herfindahl-Hirschmann index of shares owned by investors owning more that 5% (1%) of equity; *lnMV* denotes the natural logarithm of market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *ROA* (*ROE)* denote return on assets (equity). Values statistically significant at the 5% level are in bold.

Table 9. Propensity Score Matching

Panel A: Pre-match and post-match propensity

Variable	Pre-match	Post-match
Const	-1.125*	0.728
	(1.80)	(0.75)
PQCS	-6.137	-4.169
	(1.33)	(0.46)
InstOwn	0.029***	-0.002
	(6.28)	(0.27)
InsOwn	0.003	-0.006
	(0.71)	(0.94)
lnMV	0.124*	-0.028
	(1.85)	(0.26)
Age	0.161	-0.151
	(1.36)	(0.80)
Volatility	-9.645**	0.949
	(2.43)	(0.15)
BV/MV	-0.090*	-0.045
	(1.83)	(0.44)
ROA	0.422	-0.121
	(0.60)	(0.08)
Number of observations	318	94
p-value of χ^2	0.000	0.976
Mc-Fadden R-squared	0.324	0.017

Panel B: Post-matching differences

Variable	Treatment	Control	Difference	t-Statistic
ILLIQ	20.395	18.025	2.369	0.283
Turn	0.316	0.372	-0.057	0.500
PQCS	0.021	0.024	-0.003	0.705
PECS	0.010	0.012	-0.001	0.617
InstOwn	29.743	30.661	-0.918	0.225
SOE	0.085	0.106	-0.021	0.324
InsOwn	18.210	22.405	-4.196	0.783
MaxOwn	37.914	42.946	-5.032	1.165
HHI_5	2113.747	2661.675	-547.929	1.490
HHI_1	2147.229	2687.450	-540.221	1.475
lnMV	5.566	5.475	0.091	0.262
Age	1.931	2.002	-0.071	0.415
Volatility	0.060	0.060	0.000	0.002
Leverage	0.293	0.242	0.051	0.827
BV/MV	1.017	1.237	-0.220	0.650
ROA	0.042	0.045	-0.003	0.141
ROE	0.055	0.114	-0.059	0.945

Panel A presents the diagnostic of the propensity score matching, Panel B presents the differences in means between treatment and control group in the post-matched sample, In Panel A dependent variable is a dummy variable that equals 1 if a firm belongs to the treatment group (has at least one OFE as a blockholder) and 0 otherwise; *ILLIQ* is the Amihud illiquidity ratio; *Turn* is the turnover ratio; *PQCS* is the Percent Quoted Closing Spread; *PECS* is the Percent Effective Closing Spread; *InstOwn* denotes the percent of shares outstanding held by institutional investors; *InsOwn* denotes the percent of shares outstanding held by insiders; *SOE* is a dummy variable that equals 1 if one of the company's ultimate owners is the state treasury; *MaxOwn* is the percent of shares held by the largest shareholder; *HHI_5* (*HHI_1*) denote Herfindahl-Hirschmann index of shares owned by investors owning more that 5% (1%) of equity; *lnMV* denotes the natural logarithm of market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *ROA* (*ROE)* denote return on assets (equity). z-statistics are given in parentheses and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 10. Difference-in-Differences estimation – PSM matched sample

Panel A: No control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-0.270	-1.999***	4.027***	4.727***
	(0.59)	(11.11)	(38.67)	(45.22)
Treatment	-0.315	0.197	-0.047	-0.043
	(0.58)	(0.91)	(0.38)	(0.35)
After	0.083	-0.012	0.053*	0.075**
	(1.94)	(0.41)	(2.48)	(3.72)
*Treatment*After*	-0.131	-0.349***	-0.027	-0.046
	(1.15)	(7.56)	(0.93)	(1.53)
No. of observations	540	540	540	540
Adj. R^2	-0.002	0.003	-0.003	-0.003
Panel B: Control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-10.819***	-4.065***	2.206***	2.896***
	(11.26)	(9.30)	(8.56)	(10.64)
Treatment	-0.415	0.198	-0.079	-0.074
	(1.09)	(0.89)	(0.94)	(0.89)
After	-0.379	-0.099	-0.057	-0.037
	(1.76)	(1.27)	(1.85)	(1.05)
*Treatment*After*	0.036	-0.279***	-0.006	-0.025
	(0.11)	(3.13)	(0.11)	(0.42)
lnMV	1.477***	0.098	0.310***	0.314***
	(9.51)	(1.36)	(8.83)	(9.22)
Age	0.682**	0.292**	0.109*	0.114*
	(3.41)	(2.68)	(2.19)	(2.31)
Volatility	19.729**	17.381***	-1.749	-1.750
	(3.18)	(5.19)	(0.79)	(0.72)
Leverage	0.906	0.125	0.313	0.272
	(1.19)	(0.21)	(1.54)	(1.37)
BV/MV	0.119	0.045	0.036	0.032
	(0.80)	(0.35)	(0.90)	(0.85)
Tangibility	0.456	-0.115	-0.013	-0.019
	(0.46)	(0.24)	(0.05)	(0.08)
No. of observations	540	540	540	540
Adj. R^2	0.486	0.117	0.418	0.421

Panel A presents the DiD regression without control variables and in Panel B the results of the DiD estimation with control variables are presented. *Treatment* equals 1 for matched treated companies and 0 for matched control firms; *After* takes the value of 1 for 2014 and 0 for 2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. . t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 11. Propensity Score Matching – alternative treatment variable

Panel A: Pre-match and post-match propensity

Variable	Pre-match	Post-match
Const	-2.231***	0.550
	(2.75)	(0.41)
PQCS	-9.234	-7.004
	(1.19)	(0.53)
InstOwn	0.038***	0.000
	(7.09)	(0.01)
InsOwn	0.003	0.003
	(0.559)	(0.33)
lnMV	0.134*	0.007
	(1.67)	(0.05)
Age	0.068	-0.191
	(0.49)	(0.96)
Volatility	-6.517	-0.261
	(1.23)	(0.029)
BV/MV	-0.096	0.052
	(1.39)	(0.53)
ROA	-0.664	-3.369
	(0.52)	(1.15)
Number of observations	318	72
p-value of χ^2	0.000	0.943
Mc-Fadden R-squared	0.364	0.029

Panel B: Post-matching differences

Variable	Treatment	Control	Difference	t-Statistic
ILLIQ	13.217	13.433	-0.217	0.036
Turn	0.186	0.376	-0.190	1.659
PQCS	0.020	0.021	-0.000	0.083
PECS	0.010	0.010	0.000	0.187
InstOwn	41.447	40.442	1.005	0.237
SOE	0.056	0.056	0.000	0.000
InsOwn	17.701	18.267	-0.566	0.132
MaxOwn	34.502	40.173	-5.671	1.358
HHI_5	1893.705	2418.034	-524.329	1.475
HHI_1	1928.417	2454.532	-526.115	1.491
lnMV	5.720	5.750	-0.030	0.090
Age	1.969	2.070	-0.101	0.566
Volatility	0.055	0.054	0.001	0.163
Leverage	0.238	0.236	0.002	0.036
BV/MV	0.936	0.545	0.391	0.669
ROA	0.034	0.053	-0.019	1.209
ROE	0.056	0.085	-0.029	0.589

Panel A presents the diagnostic of the propensity score matching, Panel B presents the differences in means between treatment and control group in the post-matched sample, In Panel A dependent variable is a dummy variable that equals 1 if a firm belongs to the treatment group (has at least two OFE as a blockholder) and 0 otherwise; *ILLIQ* is the Amihud illiquidity ratio; *Turn* is the turnover ratio; *PQCS* is the Percent Quoted Closing Spread; *PECS* is the Percent Effective Closing Spread; *InstOwn* denotes the percent of shares outstanding held by institutional investors; *InsOwn* denotes the percent of shares outstanding held by insiders; *SOE* is a dummy variable that equals 1 if one of the company's ultimate owners is the state treasury; *MaxOwn* is the percent of shares held by the largest shareholder; *HHI_5* (*HHI_1*) denote Herfindahl-Hirschmann index of shares owned by investors owning more that 5% (1%) of equity; *lnMV* denotes the natural logarithm of market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *ROA* (*ROE)* denote return on assets (equity). z-statistics are given in parentheses and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 12. Difference-in-Differences estimation – PSM matched sample and alternative treatment variable

Panel A: No control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-0.095	-1.872***	4.097***	4.795***
	(0.20)	(11.10)	(35.37)	(41.61)
Treatment2	-0.587	-0.104	-0.089	-0.083
	(0.95)	(0.54)	(0.63)	(0.60)
After	-0.338***	-0.390***	-0.028	0.003
	(3.99)	(8.10)	(1.62)	(0.21)
*Treatment2*After*	0.374**	0.244***	0.152***	0.146***
	(2.98)	(4.72)	(6.59)	(5.97)
No. of observations	413	413	413	413
Adj. R^2	-0.002	0.009	-0.003	-0.002
Panel B: Control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-11.546***	-4.078***	2.039***	2.741***
	(10.91)	(6.92)	(6.73)	(10.27)
Treatment2	-0.723*	-0.082	-0.124	-0.116
	(2.55)	(0.47)	(1.67)	(1.59)
After	-0.518**	-0.418***	-0.081**	-0.054
	(3.22)	(5.41)	(2.65)	(1.34)
*Treatment2*After*	0.372	0.240**	0.130***	0.122**
	(1.56)	(2.78)	(4.15)	(3.25)
lnMV	1.702***	0.181*	0.330***	0.332***
	(9.64)	(2.31)	(8.02)	(8.65)
Age	0.392*	0.176	0.077	0.088*
	(2.56)	(1.80)	(1.94)	(2.30)
Volatility	10.316	12.542*	-3.629	-3.964
	(1.78)	(2.37)	(1.31)	(1.53)
Leverage	2.091*	0.811	0.747**	0.707**
	(2.28)	(1.65)	(3.17)	(3.14)
BV/MV	0.392*	0.068	0.092*	0.090*
	(2.02)	(0.51)	(2.37)	(2.26)
Tangibility	-0.242	-0.166	0.123	0.100
	(0.28)	(0.40)	(0.66)	(0.53)
No. of observations	413	413	413	413
Adj. R^2	0.583	0.131	0.520	0.533

Panel A presents the DiD regression without control variables and in Panel B the results of the DiD estimation with control variables are presented. *Treatment* equals 1 for matched treated companies and 0 for matched control firms; *After* takes the value of 1 for 2014 and 0 for 2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. . t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 13. Moments of distributions in an entropy-balanced sample

Group	Treatment			Control		
Variable	*Mean*	*Variance*	*Skewness*	*Mean*	*Variance*	*Skewness*
lnMV	5.751	1.977	0.302	5.751	1.977	0.302
Age	1.963	0.736	-1.349	1.963	0.736	-1.349
Volatility	0.051	0.0004	2.538	0.051	0.0004	2.568
Leverage	0.256	0.037	0.811	0.256	0.037	0.811
BV/MV	1.065	0.720	1.014	1.065	0.720	1.014
Tangibility	0.301	0.044	0.438	0.301	0.044	0.438

The table presents the moments of control variables' distributions in a treatment and an entropy-balanced control groups of companies. *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets.

Table 14. Difference-in-Differences estimation – entropy-balanced sample

Panel A: No control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	0.069	2.052***	4.051***	4.751***
	(0.24)	(11.54)	(61.19)	(68.11)
Treatment	-0.224	0.224	0.048	0.048
	(0.62)	(1.29)	(0.57)	(0.55)
After	-0.382**	-0.304**	0.063	0.086
	(3.89)	(3.23)	(1.62)	(1.90)
*Treatment*After*	0.446***	-0.008	0.023	0.023
	(8.96)	(0.14)	(0.63)	(0.59)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.0002	0.018	0.003	0.004
Panel B: Control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-11.465***	-4.194***	2.176***	2.825***
	(15.41)	(10.36)	(12.67)	(15.73)
Treatment	-0.098	0.258	0.063	0.063
	(0.36)	(1.60)	(1.12)	(1.12)
After	-0.475*	-0.299**	-0.009	0.012
	(2.05)	(2.39)	(0.16)	(0.18)
*Treatment*After*	0.189	-0.074	-0.014	-0.015
	(0.71)	(0.82)	(0.23)	(0.23)
lnMV	1.523***	0.101*	0.287***	0.297***
	(12.84)	(2.13)	(13.30)	(13.59)
Age	0.522***	0.313***	0.120***	0.122***
	(4.82)	(4.14)	(4.78)	(4.94)
Volatility	21.390***	16.259***	-1.713	-1.808
	(4.20)	(4.36)	(1.03)	(1.01)
Leverage	0.768	0.146	0.036	0.015
	(1.39)	(0.44)	(0.30)	(0.12)
BV/MV	0.395**	0.125	0.083**	0.084**
	(3.63)	(1.60)	(3.38)	(3.42)
Tangibility	0.360	-0.162	0.067	0.065
	(0.59)	(0.45)	(0.47)	(0.44)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.458	0.106	0.373	0.382

Panel A presents the DiD regression on an entropy-balanced sample without control variables, and in Panel B the results of the DiD estimation with control variables are presented. *Treatment* equals 1 for treated companies (i.e. those with at least one blockholder OFE) and 0 for control firms; *After* takes the value of 1 for 2014 and 0 for 2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 15. Moments of distributions in an entropy-balanced sample – an alternative treatment variable

Group	Treatment			Control		
Variable	*Mean*	*Variance*	*Skewness*	*Mean*	*Variance*	*Skewness*
lnMV	5.992	1.747	0.211	5.991	1.746	0.208
Age	2.002	0.711	-1.418	2.002	0.710	-1.417
Volatility	0.049	0.0003	1.962	0.049	0.0003	2.203
Leverage	0.257	0.038	0.894	0.257	0.038	0.895
BV/MV	0.988	0.531	0.849	0.988	0.531	0.845
Tangibility	0.292	0.049	0.479	0.292	0.049	0.480

The table presents the moments of control variables' distributions in a treatment and an entropy-balanced control groups of companies with an alternative treatment variable (*Treatment2*). *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets.

Table 16. Difference-in-Differences estimation – entropy-balanced sample and alternative treatment variable

Panel A: No control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	0.333	-2.007***	4.142***	4.844***
	(1.34)	(14.31)	(86.36)	(95.91)
Treatment2	-0.237	0.199	0.035	0.038
	(0.68)	(1.52)	(0.46)	(0.49)
After	-0.611***	-0.458**	-0.036	-0.014
	(6.32)	(3.47)	(1.62)	(0.52)
*Treatment2*After*	0.847***	0.220**	0.167***	0.174***
	(13.43)	(3.23)	(16.90)	(15.54)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.005	0.036	0.011	0.013
Panel B: Control variables				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-11.755***	-3.795***	2.128***	2.753***
	(12.79)	(7.73)	(9.68)	(12.90)
Treatment2	-0.117	0.230	0.052	0.055
	(0.42)	(1.83)	(0.92)	(0.99)
After	-0.637**	-0.433**	-0.079*	-0.057
	(3.63)	(2.94)	(2.33)	(1.53)
*Treatment2*After*	0.607**	0.165	0.127**	0.133**
	(3.18)	(1.79)	(3.06)	(3.14)
lnMV	1.617***	0.122*	0.299***	0.309***
	(11.84)	(2.55)	(11.21)	(11.67)
Age	0.362**	0.176**	0.085**	0.089**
	(2.95)	(2.74)	(2.76)	(2.89)
Volatility	20.270**	11.715*	1.011	-0.795
	(3.24)	(2.57)	(0.51)	(0.40)
Leverage	0.562	-0.044	0.033	0.013
	(0.96)	(0.14)	(0.24)	(0.10)
BV/MV	0.570***	0.207*	0.121**	0.123**
	(4.11)	(2.15)	(3.53)	(3.58)
Tangibility	-0.031	-0.258	0.001	-0.006
	(0.05)	(0.80)	(0.01)	(0.04)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.465	0.091	0.374	0.384

Panel A presents the DiD regression on an entropy-balanced sample without control variables, and in Panel B the results of the DiD estimation with control variables are presented. *Treatment2* equals 1 for treated companies (i.e. those with at least two blockholder OFEs) and 0 for control firms; *After* takes the value of 1 for 2014 and 0 for 2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 17. Difference-in-Differences estimation - placebo test

Panel A: Basic treatment variable				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.662***	-3.631***	2.335***	3.023***
	(16.64)	(12.02)	(18.58)	(23.08)
Treatment	-0.158	0.216	0.077	0.079
	(0.61)	(1.58)	(1.40)	(1.43)
After2	-0.392*	-0.456***	-0.033	-0.016
	(2.55)	(4.63)	(0.87)	(0.40)
*Treatment*After2*	0.151	0.036	0.034	0.027
	(1.18)	(1.04)	(1.02)	(0.72)
lnMV	1.437***	0.065	0.300***	0.307***
	(14.20)	91.37)	(15.65)	(15.02)
Age	0.434***	0.296**	0.090**	0.092**
	(4.76)	(3.74)	(3.23)	(3.30)
Volatility	2.648	7.893***	-6.006***	-0.6332***
	(1.09)	(8.51)	(8.05)	(7.79)
Leverage	0.677	0.363	0.113	0.091
	(1.81)	(1.48)	(1.03)	(0.82)
BV/MV	0.342***	0.144*	0.098***	0.095***
	(4.19)	(2.27)	(4.57)	(4.56)
Tangibility	-0.023	-0.095	-0.008	-0.005
	(0.05)	(0.31)	(0.06)	(0.04)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.506	0.092	0.528	0.538
Panel B: Alternative treatment variable				
Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.679***	-3.587***	2.352***	3.041***
	(16.10)	(11.88)	(18.24)	(22.70)
Treatment2	-0.159	0.188	0.069	0.076
	(0.62)	(1.54)	(1.15)	(1.27)
After2	-0.388**	-0.468***	-0.035	-0.020
	(2.66)	(4.86)	(1.67)	(0.52)
*Treatment2*After2*	0.277*	0.107**	0.067	0.066
	(2.55)	(3.92)	(1.67)	(1.54)
lnMV	1.433***	0.069	0.301***	0.308***
	(14.65)	(1.52)	(16.11)	(16.17)
Age	0.431***	0.299**	0.091**	0.093**
	(4.71)	(3.74)	(3.25)	(3.30)
Volatility	2.816	7.606***	-6.114***	-6.431***
	(1.15)	(8.14)	(8.16)	(7.93)
Leverage	0.678	0.355	0.110	0.088
	(1.81)	(1.44)	(1.00)	(0.79)
BV/MV	0.341***	0.146*	0.099***	0.096***
	(4.20)	(2.26)	(4.60)	(4.58)
Tangibility	-0.024	-0.093	-0.007	-0.003
	(0.05)	(0.30)	(0.05)	(0.02)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.504	0.091	0.528	0.536

Treatment equals 1 for companies with at least one blockholder OFE and 0 otherwise; *Treatment2* equals 1 for companies with at least two blockholder OFEs and 0 otherwise; *After2* takes the value of 1 for 2015-2016 and 0 for 2011-2014; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. . t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 18. Difference-in-Differences estimation – parallel trends analysis

Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.581***	-3.535***	2.354***	3.034***
	(17.19)	(12.05)	(19.84)	(23.91)
Treatment	-0.222	0.327	0.058	0.056
	(0.89)	(1.86)	(1.20)	(1.12)
After	-0.416*	-0.470**	-0.060	-0.032
	(2.33)	(3.77)	(1.84)	(0.85)
*Treatment*Before(t=-1)*	-0.049	-0.227***	-0.024	-0.021
	(0.76)	(18.38)	(1.57)	(1.23)
*Treatment*Before(t=0)*	0.260***	-0.155***	0.072***	0.090***
	(5.10)	(9.24)	(6.19)	(6.98)
*Treatment*After(t=+1)*	0.125	0.082	0.003	0.006
	(0.92)	(0.67)	(0.09)	(0.18)
*Treatment*After(t=+2)*	0.179	-0.096	0.066	0.059
	(1.20)	(0.72)	(1.97)	(1.59)
*Treatment*After(t=+3)*	0.120	-0.213	0.048	0.049
	(0.79)	(1.52)	(1.43)	(1.30)
lnMV	1.436***	0.061	0.300***	0.307***
	(14.15)	(1.23)	(15.80)	(15.79)
Age	0.446***	0.309**	0.094**	0.094**
	(4.77)	(3.82)	(3.34)	(3.32)
Volatility	2.610	7.830***	-6.016***	-6.339***
	(1.05)	(8.31)	(7.99)	(7.75)
Leverage	0.686	0.372	0.115	0.093
	(1.81)	(1.51)	(1.04)	(0.82)
BV/MV	0.332***	0.140*	0.097***	0.094***
	(4.08)	(2.17)	(4.52)	(4.47)
Tangibility	-0.024	-0.100	-0.010	-0.006
	(0.05)	(0.32)	(0.08)	(0.04)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.504	0.094	0.526	0.535

Treatment equals 1 for treated companies (i.e. those with at least one blockholder OFE) and 0 for control firms; *Before(t=-1), Before(t=0), After(t=+1), After(t=+2)* and *After(t=+3)* takes the value of 1 for 2012, 2013, 2014, 2015 and 2016, respectively and 0 otherwise; *After* takes the value of 1 for 2014-2016 and 0 for 2011-2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

Table 19. Difference-in-Differences estimation – parallel trends analysis for alternative treatment variable

Model	(1)	(2)	(3)	(4)
Dependent variable	*ILLIQ*	*Turn*	*PQCS*	*PECS*
const	-9.575***	-3.495***	2.376***	3.059***
	(16.76)	(12.11)	(19.56)	(23.72)
Treatment2	-0.359	0.297*	0.009	0.008
	(1.54)	(2.01)	(0.18)	(0.15)
After	-0.463**	-0.479***	-0.074*	-0.050
	(3.26)	(4.10)	(2.35)	(1.40)
*Treatment2*Before(t=-1)*	0.017	-0.262***	-0.012	-0.008
	(0.27)	(9.17)	(0.83)	(0.42)
*Treatment2*Before(t=0)*	0.328***	-0.164***	0.112***	0.128***
	(6.76)	(9.07)	(10.75)	(10.36)
*Treatment2*After(t=+1)*	0.471***	0.135	-0.103***	0.119***
	(5.08)	(1.37)	(4.91)	(5.38)
*Treatment2*After(t=+2)*	0.446***	-0.047	0.132***	0.135***
	(4.25)	(0.44)	(5.52)	(5.40)
*Treatment2*After(t=+3)*	0.429***	-0.122	0.142***	0.152***
	(4.57)	(1.02)	(6.40)	(6.13)
lnMV	1.431***	0.066	0.301***	0.307***
	(14.75)	(1.40)	(16.29)	(16.40)
Age	0.446***	0.310**	0.096**	0.095**
	(4.78)	(3.76)	(3.37)	(3.35)
Volatility	2.801	7.582***	-6.125***	-6.440***
	(1.12)	(7.88)	(8.07)	(7.85)
Leverage	0.689	0.365	0.112	0.090
	(1.83)	(1.47)	(1.02)	(0.81)
BV/MV	0.333***	0.139*	0.098***	0.095***
	(4.13)	(2.18)	(4.56)	(4.51)
Tangibility	-0.030	-0.091	-0.011	-0.006
	(0.06)	(0.29)	(0.09)	(0.05)
No. of observations	1,806	1,806	1,806	1,806
Adj. R^2	0.508	0.092	0.529	0.539

Treatment2 equals 1 for treated companies (i.e. those with at least two blockholder OFE) and 0 for control firms; *Before(t=-1), Before(t=0), After (t=+1), After(t=+2)* and *After(t=+3)* takes the value of 1 for 2012, 2013, 2014, 2015 and 2016, respectively and 0 otherwise; *After* takes the value of 1 for 2014-2016 and 0 for 2011-2013; *ILLIQ* is the natural logarithm of the Amihud illiquidity ratio; *Turn* is the natural logarithm of the turnover ratio; *PQCS* is the natural logarithm of the Percent Quoted Closing Spread; *PECS* is the natural logarithm of the Percent Effective Closing Spread; *lnMV* denotes the natural logarithm of the market value of equity; *Age* is the logarithm of the number of years since first listing; *Volatility* is a standard deviation of weekly log returns; *Leverage* is total debt scaled by total capital; *BV/MV* is a book-to-market ratio; *Tangibility* is net property, plant and equipment scaled by total assets. t-statistics with standard errors clustered by a firm and by year are given in parentheses, and asterisks denote the statistical significance at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

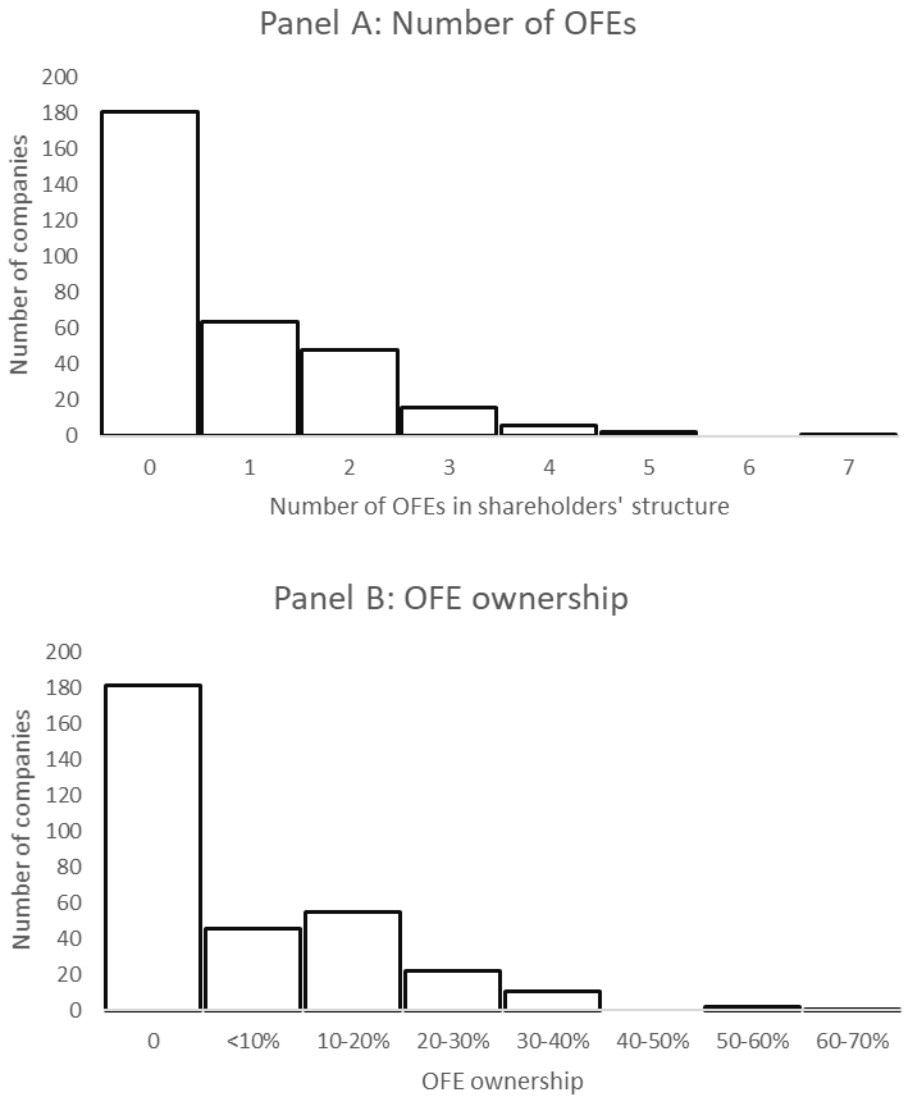

Figure 1. The distributions of OFEs in shareholders' structure in the pre-match sample
Note: The figure illustrates the distribution of the number of OFEs (Panel A) and OFEs ownership (Panel B) among the initial sample of companies.

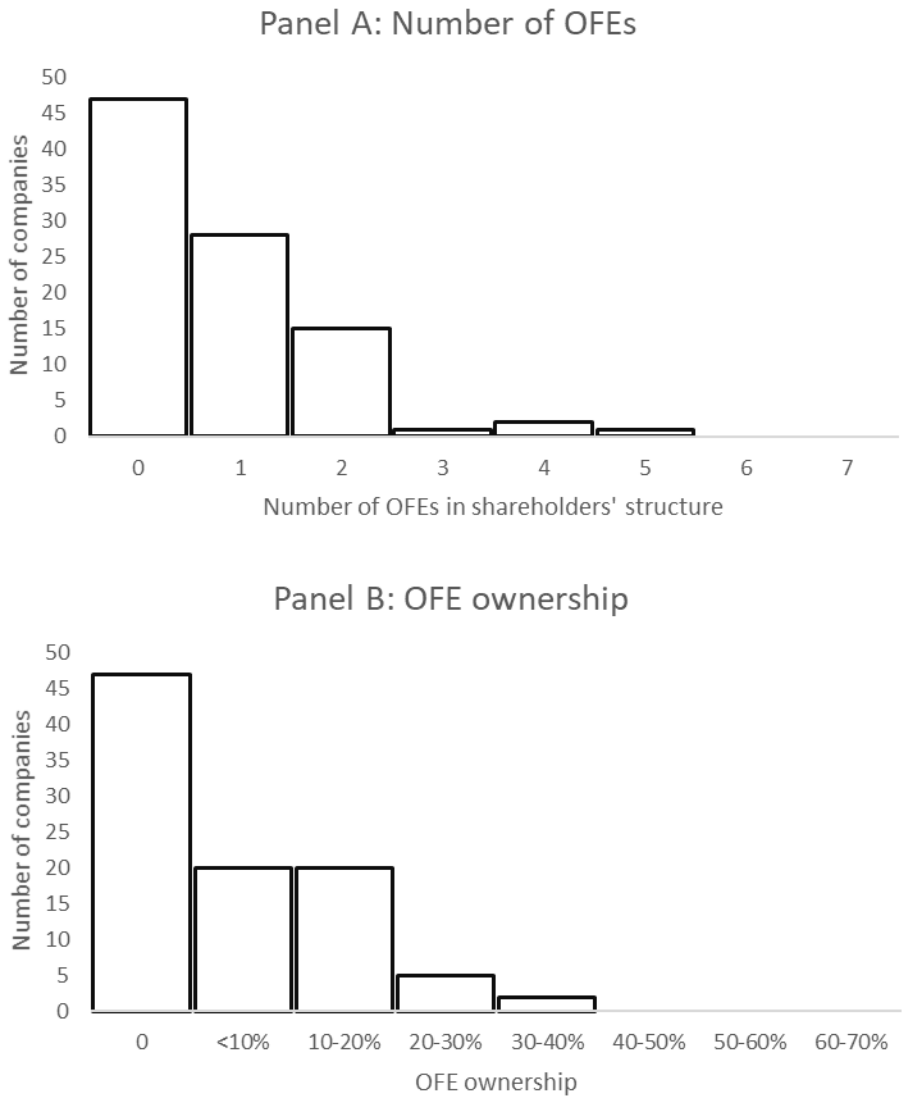

Figure 2. The distributions of OFEs in shareholders' structure in the post-match sample

Note: The figure illustrates the distribution of the number of OFEs (Panel A) and OFEs ownership (Panel B) among the post-match sample of companies.

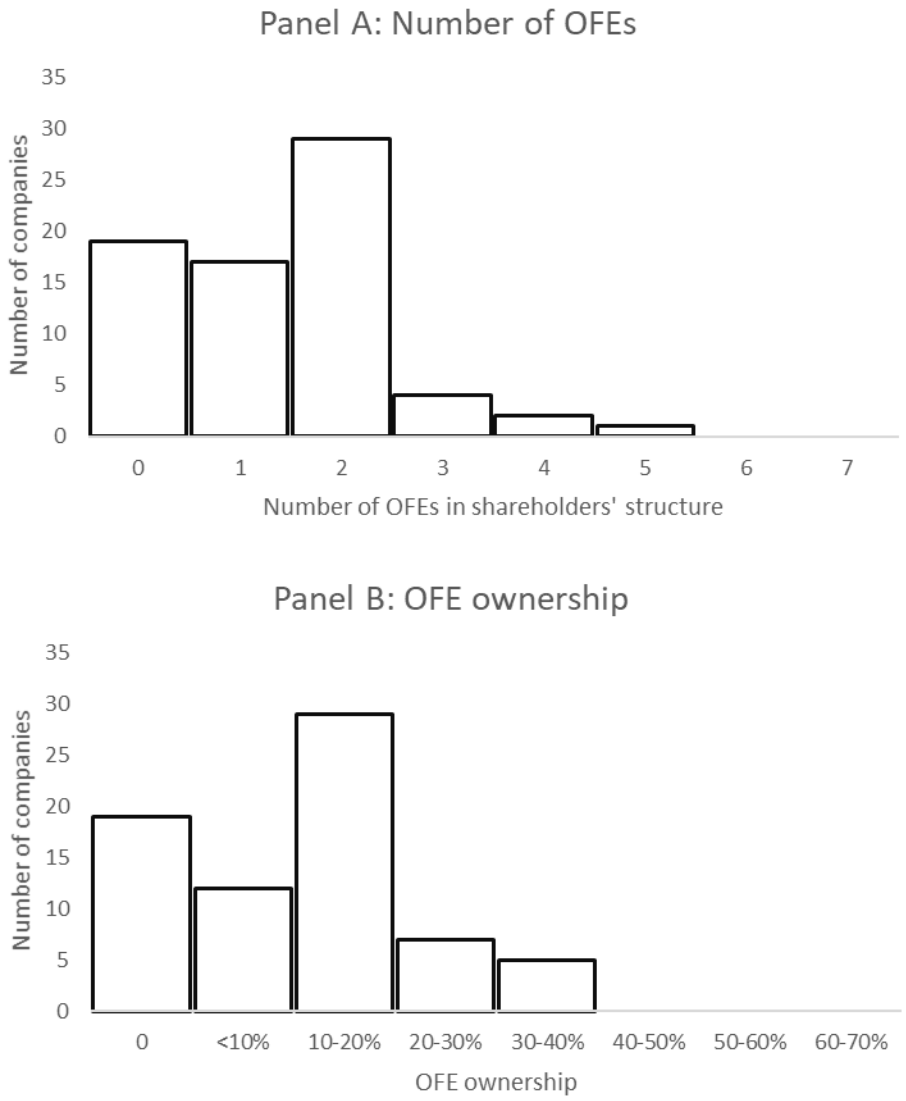

Figure 3. The distributions of OFEs in shareholders' structure in the post-match sample (companies with multiple blockholder OFE considered as treated)

Note: The figure illustrates the distribution of the number of OFEs (Panel A) and OFEs ownership (Panel B) among the post-match sample of companies among which only companies with multiple blockholder OFE considered as treated.