Governance Through Exit: Polish Pension Fund Reform Impact on Real Earnings Management of Portfolio Companies

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Abstract

Theoretical models predict that exit threat can mitigate agency problems and force managers to undertake actions that would maximize the firm value in the long run. We examine whether the institutional blockholder exit threat curbs managerial misbehavior and short-termism reflected in real earnings management. Our study exploits a natural experiment—a Polish pension fund reform that imposed a real threat of exit on pension fund portfolio companies. Using a difference-in-differences approach, we provide evidence that the reform significantly decreased the level of real earnings management in "treated" companies, that is, companies with pension funds playing the role of blockholders. The effect was more significant for firms in a multiple blockholder setting, firms under common ownership, and firms with higher insider's stakes.

Keywords: corporate governance, exit threat, real earnings management, blockholders, institutional investors, pension funds

JEL Classification: G23; G30; G32; G34; G35

1. Introduction

Traditionally, the literature on monitoring role of blockholders focuses on the so-called "voice" channel, that is monitoring based on direct intervention (Maug, 1998; Shleifer & Vishny, 1986). Instead of pursuing direct intervention, blockholders dissatisfied with underperforming managers can "vote with their feet" and simply sell their stocks. Admati and Pfleiderer (2009), as well as Edmans (2009), provide theoretical models of monitoring through "exit," showing that, even if blockholders cannot exercise their voice and intervene directly in a company's operations, they can still govern through the "Wall Street Walk," selling their blocks and driving down the stock price, punishing managers ex post and thus inducing them to maximize value ex ante.

What really matters is the exit threat rather than the exit itself (Edmans, 2009) and the intensity of this threat rises with stock liquidity and managerial (insiders') short-term concerns (e.g., stock price related wealth) among many others (Edmans, 2014; Edmans & Holderness, 2017). Theoretical models predict that exit threat can mitigate agency problems and force managers to undertake actions that would maximize the firm value in the long run (Admati & Pfleiderer, 2009; Edmans, 2009). Exit threat can thus mitigate agency problems by inducing value-maximizing actions as well as by constraining value-destroying managerial decisions. It can be expected that it also curbs earnings manipulations (Dou, Hope, Thomas, & Zou, 2018; Edmans, 2009). We expect that exit threats affect (reduce) mostly real earnings management (REM), as this form of earnings manipulation is much more detrimental for firm value than "traditional" accrual-based earnings management (Roychowdhury, 2006; Zang, 2012).

This work tests whether the blockholder exit threat curbs managerial misbehavior and short-termism reflected in REM. Both, earnings management and exit threat are not easy to measure. For REM we employ the most commonly used proxies proposed by Roychowdhury (2006), based on the abnormal levels of operating cash flows; production costs; and selling, general, and administrative expenses. Nevertheless, even with such proxies, one can never be

sure whether the observed deviations of a firm's operations from "normal" levels (that is levels observed in other companies operating in the same industry after controlling for different factors) are not driven by the adoption of the specific business model (Gunny, 2010). That is why we conduct the suspect firm analysis, observing the relationship between exit threat and REM within firms likely to engage in earnings manipulation (firms that just meet or beat earnings targets, overvalued firms, and firms with relatively high insider trades).

Prior studies on the exit threat (Bharath, Jayaraman, & Nagar, 2013; Dou et al., 2018) utilized different proxies for the "intensity" of the threat based on the interaction between different exit "drivers" such as the number (concentration) of blockholders and stock liquidity (or an unexpected change in stock liquidity, as in Bharath et al., 2013), as it is assumed that the exit threat intensity rises with these factors (Edmans, 2009). What most differentiates our study is the way we "capture" the threat of exit. Instead of a driver-based proxy, we utilize a natural experiment—the Polish pension fund reform implemented in 2013. We follow this approach for several reasons.

First, at that time, Polish pension funds (OFE) were the most prominent group of outside blockholders in Polish listed companies. Second, the reform completely rebuilt the investment policy of open pension funds, transforming them from balance funds to equity funds. At the same time the reform substantially increased the flexibility of pension funds' investment strategies, allowing for much higher involvement in international stock markets (gradually increasing the limit from 5% to 30%) and suspending the mechanism used by the Polish market supervisor (KNF) to evaluate the performance of pension funds[1]. Before the reform, both the limit and the benchmark caused the portfolio structures of pension funds to be quite similar, with smaller funds "mimicking" the behavior of market leaders. The reform indirectly encouraged pension funds to partly replace their domestic holdings with foreign stocks and

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[1] The detailed analysis of the Polish pension fund reform and its consequences is provided in the next section.

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substantially rebalance their current portfolios of domestic companies. The latter was also forced to some extent by another change.

Before the reform, contributions to pension funds were obligatory for certain groups of Polish employees. The reform suspended the mandatory character of these contributions allowing employees to choose between two tiers of the system: private pension funds (OFE) or the pay-as-you-go system operated by a state-owned entity. This in turn extremely limited the inflow into the funds forcing them to manage their portfolios more actively. Thirdly, there was also a side effect of the reform that could be also important for other blockholders. The selling activity of pension funds increased the stock market liquidity which could trigger subsequent actions by other blockholders and thus increase the "intensity" of the exit threat. We believe that all these circumstances make the reform a perfect laboratory for studying the relation between blockholder exit threat and managerial misbehavior. Finally, exploiting natural experiments in analyzing blockholder governance mechanisms has been for many years advocated by pioneering researchers.

Using a difference-in-differences approach, we observe that our treated companies, that is, companies with at least one pension fund holding at least a 5% stake, significantly decreased real earnings management after the implementation of the reform compared with control companies. To strengthen our conclusions, we then document that the observed change in REM levels holds primarily for the companies likely to engage in earnings manipulations (suspect companies), that is those that just meet or beat earnings targets, that are overvalued, or that face high insider trades. That means that the observed deviations from "normal" levels of operations—treated as a possible signal of earnings manipulation—are likely to be intentional.

In the next step, we reveal that the observed relation holds primarily for companies with managerial short-term concerns by analyzing the group of companies with managerial wealth closely related to the stock price. This entitles us to claim that the observed change in REM is

likely to be a direct consequence of the exit threat, as theoretical models predict that a higher wealth-performance sensitivity should increase the strength of governance through the exit (Edmans, 2014).

To further strengthen our arguments towards the exit mechanism being the dirver of the observed relations, we divided our treated companies into two groups taking as a criterion the managerial entrenchment. Entrenched managers are relatively resistant to governance through voice but are still vulnerable to exit threats, especially when their wealth is related to stock price. We do in fact observe that REM levels in our treated companies with entrenched managers had decreased after the reform and this relation holds only for the subgroup of companies with higher managerial (insiders') exposure to stock price.

We run a series of robustness tests in our study. First, we repeat our regressions for a smaller sample of companies using propensity score matching finding the results qualitatively unchanged. Next, a parallel trend analysis of REM levels is conducted for our treated and control companies that confirm the primary results. We also control for alternative explanations of the observed decrease in REM for our treated companies, including a possible voice effect triggered by increased liquidity (Maug, 1998) and a substitution effect between accrual-based earnings management (AEM) and REM likely to occur after the reform. Finally, we adopt a fixed effect model and extend our basic specification with additional control variables. All these robustness tests confirmed our primary results.

We contribute to the literature on blockholder governance mechanisms, finding the results predicted by exit theory. We focus on a specific group of blockholders—pension funds— confirming that the so-called pressure-resistant institutional investors (Brickley, Lease, & Smith Jr, 1988) can effectively monitor managers using different channels. We also contribute to the literature on earnings management by providing evidence of the effectiveness of one of several possible mechanisms used to curb value-destroying earnings manipulation. To the best

of our knowledge, this paper is the first to adopt a natural experiment to test the relationship between an exit threat and real earnings management. The closest work to our study, Dou et al. (2018), reveals a positive relationship between the blockholder exit threat and the quality of financial reporting. In Dou et al., the reporting quality was measured with a combined proxy composed of various earnings management proxies (both accrual-based and real).

We find similar results using different method of measuring the exit threat. Adopting a natural experiment offers one more advantage—helping to separate the effect of increased liquidity that can trigger both the exit (Edmans, 2009) as well as the voice (Maug, 1998) mechanisms. In studies that adopt exit threat proxies based on liquidity (including the study by Dou et al., 2018), it is difficult to eliminate possible effect of increased liquidity on intervention noticed by Maug (1998). In fact, any measure of the intensity of exit threat constructed as a combined measure of liquidity and blockholder presence may capture both effects. A natural experiment, on the other hand, enables the analysis to be extended by incorporating possible intervention as a separate effect, which is the methodology we adopt.

Edmans and Holderness (2017) call for the empirical investigation of blockholder voice and exit governance mechanisms based on experiments. Moreover, among potential avenues for further research on blockholders and corporate governance, the authors explicitly encourage researchers to consider the non-U.S. background and include various interactions in a multiple-blockholder setting. Our paper directly addresses this call in all these dimensions.

The remainder of the paper is organized as follows. Section two presents the literature review and the development of the hypotheses. In section three, we describe our research design and in section four we describe our data sources and sample. In section five, we offer our baseline results. Section six extends our study by implementing additional tests increasing the likelihood of our baseline results being the consequence of exit instead of voice mechanism. In section seven, we provide a series of robustness checks. The last section concludes.

2. Existing research, institutional setting, hypothesis development

2.1 Outside blockholders and corporate governance

Outside blockholders (large shareholders other than insiders) engage in corporate governance and monitor managers (insiders) using two different channels: voice (intervention) or exit (trading). Initially, the literature on governance mechanisms used by blockholders focused on the first channel, as the higher stake held leads to higher voting power.

Shleifer and Vishny (1986) propose a model of effective monitoring by a large shareholder in a widely held company with atomistic shareholders, likely to face severe agency problems. Shleifer and Vishny argue that in corporations with dispersed ownership only large (outside) shareholders have sufficient incentives and abilities to act as monitors because the monitoring costs are borne solely by the monitor, but the benefits (increased wealth) are shared among all investors, which creates the well-known free-rider problem. In their model, a sufficiently large shareholder can monitor managers directly (intervention) or indirectly by facilitating third-party takeovers (a threat to incumbent managers) and splitting the substantial gains on their shares with the bidder. Such behavior would be inefficient for investors holding small stakes due to the relatively high costs of monitoring and a relatively low threat of ousting managers. Larger blocks reduce the free-rider problem and increase the incentives to intervene.

Institutional blockholders' intervention may take different forms from direct observable actions as shareholders proposals, voting against managers' proposals, or publicly expressed critique of the managers' actions (Denes, Karpoff, & McWilliams, 2016; Gillan & Starks, 2000; McNulty & Nordberg, 2016) to the unobservable private negotiations "behind the scenes" (McCahery, Sautner, & Starks, 2016).

Instead of pursuing direct intervention, investors dissatisfied with underperforming managers can vote with their feet and sell their stocks. Admati and Pfleiderer (2009) and Edmans (2009) provide first theoretical models showing that, even if a blockholder cannot intervene, she can still govern through the "Wall Street Walk," selling her block and driving

down the stock price, punishing the manager ex post and thus inducing him to maximize value ex ante. Moreover, what really matters is the threat of exit, not necessarily the exit itself. "The threat of selling may be sufficient to induce the manager to maximize value, so that the actual act is not necessary" (Edmans, 2014, p. 25).

The strength of the exit channel as possible governance mechanism depends on different factors (Edmans & Holderness, 2017), but presumably mostly on the manager's short-term concerns (such as stock price-related wealth, managerial reputation or a takeover threat) and on the stock market liquidity. According to Edmans (2009; 2014) sensitivity of managers' wealth on stock price is crucial for the exit to be effective governance mechanism. "When the manager is more concerned with the stock price, he is more concerned with the effect of blockholder selling if he shirks" (Edmans & Holderness, 2017, p. 577).

Potential exits are easier if stock market liquidity is high. It is a common belief that market liquidity lowers blockholders' monitoring by discouraging intervention (Edmans & Holderness, 2017). Conversely, illiquid market "forces" large shareholders to hold their stock (the so-called lock-in effect) and to influence the management to achieve better returns as there is no real option of "cut and run" without extra costs. Nevertheless, in Maug's (1998) model, higher liquidity can—under certain circumstances—also encourage blockholder intervention.

The effectiveness of exit mechanism rises also with: (1) the size of a block which makes the possible exit more harmful for managers; (2) number of blockholders, as the competition between blockholders in a multiple-blockholder setting results in more information being impounded into prices and thus the strength of a possible exit signal (Cvijanović, Dasgupta, & Zachariadis, 2022; Edmans & Manso, 2011); (3) blockholder common ownership, because owning multiple blocks gives the blockholder the choice of which firms to sell upon a liquidity shock (Edmans, Levit, & Reilly, 2019).

2.2 The agency perspective of real earnings management

Managers typically use two different types of earnings manipulations: accrual-based earnings management that is reflected in discretionary (unexpected) accruals stemming from "accounting choices" and real earnings management stemming from actual operational decisions such as cuts in research and development (R&D) spending, price discounts accelerating sales, overproduction decreasing the cost of goods sold, or cuts in selling, general, and administrative expenses. Managers use these techniques mainly to inflate current earnings to avoid presenting losses or to meet or beat earnings targets (Burgstahler & Dichev, 1997; Dechow & Skinner, 2000; Degeorge, Patel, & Zeckhauser, 1999).

Most academics regard earnings management as detrimental because it helps managers obtain some private gains at the cost of shareholders. In that sense, earnings management is an example of agency costs. Moreover, a consensus among researchers indicates that REM is much more detrimental because it represents a departure from optimal operational decisions, thus destroying a company's long-term ability to generate earnings (Badertscher, 2011; Cohen & Zarowin, 2010; Roychowdhury, 2006). However, earnings management can also be used to convey forward-looking, value-relevant information by removing some of the noise in a truth-telling report of short-term earnings (Gunny, 2010; Ronen & Yaari, 2008). Habib, Ranasinghe, Wu, Biswas, and Ahmad (2022) refer in a systematic review paper to these two perspectives of REM as agency-based "opportunistic REM" and "efficient REM", respectively.

Various mechanisms can be used by shareholders to curb managerial misbehavior reflected in "opportunistic" earnings management.[2] Many studies confirm that companies involve in less accrual-based earnings management with the increase of independent board members, the presence of audit committees and severe scrutiny from auditors and institutional

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[2] For an in-depth analysis of different mechanisms used to curb opportunistic earnings management see Ronen and Yari's (2008) chapter devoted to the so-called gatekeepers that provide monitoring or Habib et al.'s (2022) systematic review paper on real earnings management.

investors. On the other hand, blockholders can prevent managers from engaging in real earnings management. Edmans (2009) suggests that also blockholders can deter earnings manipulation because they can "see through" the numbers and will sell if high earnings are not backed up by strong fundamentals. In fact, there is evidence that companies engage in less earnings management when there are outside blockholders in their ownership structure (Dechow, Sloan, & Sweeny, 1996). Nevertheless, the role of different outside blockholders as potential monitors may differ, as they do not form a homogeneous group and differ much in their investment horizons, investment strategies and connections with portfolio companies which determines their motivation for monitoring.

2.3 Outside blockholders and earnings management

Substantial evidence describes the relationship between ownership structure and earnings management (Dechow et al., 1996; Roychowdhury, 2006; Sakaki, Jackson, & Jory, 2017 Wang, 2014; Zang, 2012) . Many studies confirm negative association between outside blockholder (institutional) ownership and earnings manipulation. Analyzing a group of listed U.S. firms targeted by the SEC for allegedly overstating earnings Dechow et al. (1996) find that those firms are less likely to have the outside blockholder. Roychowdhury (2006) finds strong evidence of a negative correlation between the measures of real activities manipulation and institutional ownership. Similarly, Zang (2012) provides evidence that institutional investors exert more pressure on firms to constrain real activities manipulation than accrual-based earnings management. All of these studies, however, don't examine the specific role of various groups of outside blockholders (institutional investors). Ronen and Yaari (2008, p. 231) point out that the importance of earnings and the demand for earnings management are sensitive to differences in blockholders' investment horizons.

The impact of a diverse group of outside blockholders (particularly institutional investors) on earnings management can have an opposite effect. Bushee (1998) tests whether institutional

investors create or reduce incentives for corporate managers to cut investment in R&D to meet short-term earnings targets. He shows that managers do not cut R&D expenditures when institutional ownership is high. Nevertheless, the higher the proportion of "transient" institutional investors (short-term investors with highly diversified portfolios) in corporate ownership, the higher the probability that managers reduce R&D activities to boost current earnings, which supports the view that the short-termism of some institutional investor groups pressures managers to behave myopically. Koh (2007) finds that long-term institutional investors constrain accruals management among firms that manage earnings to "meet or beat" earnings benchmarks. On the other hand, "transient" institutional ownership is positively associated with income-increasing accruals management among these firms.

Sakaki et al. (2017) find that the higher the ownership stability of pressure-insensitive institutional investors, that is investors with no direct business ties with their portfolio companies such as mutual funds or pension funds, the lower the firm's ability to engage in REM. Similar results were obtained by Kałdoński, Jewartowski, and Mizerka (2020) for companies listed on the Warsaw Stock Exchange (WSE) but only in the subsample of firms subject to capital market pressure, that is firms that have only single-class shares outstanding and no entrenched managers. No such relationship exists for less value-destroying accrual based earnings management, which strengthens the monitoring role of stable institutional investors such as pension funds. Amin and Cumming (2021) investigate the relations between blockholders and real earnings management in a multiple blockholder setting in eight Asian emerging markets. They observe that the presence of institutional blockholder as the 2nd largest blockholder (in family-controlled companies) prevent managers from engaging in REM.

Recent studies began focusing on the channel used by outside blockholders to monitor managers and curb earnings management. Dou et al. (2018) provide evidence that financial reporting quality – measured with earnings management proxies (with higher values of EM

representing lower values of reporting quality – increases with the increase in blockholder exit threat. In their study the exit threat increases with the increase of blockholder dispersion or competition (measured as an inverse of Herfindahl–Hirschman Index) as well as the stock liquidity that strengthens the threat of exit (Edmans, 2009).

Surprising results were obtained by Chung, Hwang, Kim, and Liu (2018), who analyzed relations between the total ownership stake of institutional investors that differ in their investment horizons (measured with portfolio turnovers). Accrual-based earnings management decreases with the increase of the stake held by short-term (especially domestic) institutional investors, contrary to many findings on U.S. markets (e.g., Koh, 2007). In Chung et al. (2018), the authors claim a positive role of blockholder exit threat on reducing accrual-based earnings management in the Korean stock market, where active monitoring by voice is highly unlikely due to the predominant role of family-oriented *cheabols*. The authors interpret the results as a sign of a "passive monitoring," that is, monitoring by the threat of exit, as they claim that "blockholders with higher turnovers are more likely to credibly signal to the managers of their portfolio firms a potential sell-off when firm fundamentals deteriorate, prompting them to focus on shareholder value" (Chung et al., 2018, p. 275). The authors, however, do not provide evidence on the value-destroying role of accrual-based earnings management in Korea.

2.4 Institutional setting—Polish pension fund reform

In 1999, Poland substantially changed its pension system by replacing the former defined benefit pay-as-you-go (PAYG) system with a notional defined contribution PAYG pillar, still managed by a government agency, the *Zaklad Ubezpieczen Spolecznych* (ZUS) [Social Insurance Institution]. Additionally, a second pillar was introduced based on fully funded defined contributions managed by a group of private asset management companies—*otwarte fundusze emerytalne* (OFE) [open pension funds]. A third pillar was based on voluntary contributions with tax benefits, but it was never popular.

Since the primary reform, the total employee's obligatory contribution (19.52% of their taxable income) has been distributed between the first two pillars. Initially, ZUS had been transferring 7.3% of taxable salaries to individual accounts managed by OFE, but in 2011, this share was cut to 2.3%, causing a huge drop in regular inflows for OFE. Much more severe changes for OFE were implemented in 2013.

Changes affecting investment policy

The changes implemented in 2013 completely remodeled the investment policy of OFE.[3] When introduced in 1999, OFE were forced to invest mostly in safe instruments, mainly Polish treasury bonds, as the pensioners' safety was perceived the most important issue. Investing in stocks was limited, especially from foreign markets (Zalewska, 2006). Pension funds were allowed to invest up to 40% of their portfolio in shares traded in the domestic regulated market (Warsaw Stock Exchange). Moreover, a 5% limit was imposed on any foreign investments (not only stocks from regulated markets but also foreign treasury bonds). One of the most important changes implemented in 2013 was a ban on investments in treasury bonds, which amounted to approximately half of the aggregated OFE portfolio at the end of 2013. All Polish treasury bonds held by OFE at the end of 2013 were redeemed and their cash equivalent was converted into IOUs and transferred to the first pillar.[4] These changes transformed OFE in one day from relatively passive balanced funds into equity funds.

To avoid a rapid sell-off of shares, pension funds were forced to hold at least 75% in shares in the first year after the reform (2014). The lower bound was gradually reduced to 55% in 2015, 35% in 2016, and 15% in 2017%. Starting from 2018, neither lower nor upper limits are placed on investing in stocks listed on the domestic regulated market. Simultaneously, the upper limit for foreign investment was gradually increased from 10% in 2014 to 30% in 2016.

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[3] The Polish government's intention was to stimulate OFE to invest more in the "real economy" and thus boost Poland's GDP.

[4] It is a common belief that the main intention for that move was lowering the public debt-to-GDP ratio, as there was real threat of reaching the constitutional limit of 60%.

These changes completely rebalanced pension fund portfolios as well as their investment policies, forcing them to invest mostly in shares and encouraging them to invest abroad.[5]

Changes affecting internal competition

Since 1999, the performance of OFE was assessed by the Polish financial market supervisor (KNF) in a very specific way. A minimum rate of return was required equal to the half of the average 3-year returns of all open pension funds and underperforming funds were penalized. They had to cover the deficit (the difference between the minimum required return and the actual one) for all its members. That solution was criticized as it limited the flexibility of OFE, forcing smaller funds to simply mimic the market leaders. Consequently, the portfolio structures—and thus the returns of all OFE—were similar. In 2013, this mechanism was eliminated to increase internal competition among OFEs. Moreover, they were no longer allowed to use marketing tools to attract new members. As a consequence, OFE could rely only on the results they would generate to induce new inflows.

Changes affecting inflows, outflows and liquidity

Starting from 2014, the second pillar of the Polish pension system (OFE) was no longer considered obligatory for young new workers. Their contributions (still 19.52%) were being transferred in the first place to the first pillar unless they applied for a further retransferring of a portion of their contribution (slightly increased from 2.3% to 2.92%) to OFE. Moreover, the second pillar stopped being mandatory for current workers, who needed to submit an application if they wanted their contribution (2.92%) to continue being retransferred to OFE (opt-in).[6] That change almost eliminated new flows into OFE.

Another significant change was connected with future pensioners' safety. To avoid the risk of "unfortunate timing" of retiring in a period with bearish stock markets that would hardly

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[5] In 2013, the percentage of equities in aggregated pension fund portfolios accounted for approximately 37.6% (with 1.3% of equities listed abroad). In 2014, it was 86.6% (with 4.3% invested abroad).
[6] Only about 15% of OFE members declared that they wanted their contributions to continue being transferred to OFE.

affect pensioner's future benefits, funds were obliged to gradually shift accumulated savings to the first pillar starting 10 years before planned retirement of a given member. The change meant that OFE was required to transfer 1/10 of savings annually to all members who were going to reach retirement age within 10 years. The mechanism, called a "slider" (or "zipper"), should be neutral in the long run, but it caused a substantial immediate on-time above-average outflows in 2014. We conjecture that changes limiting pension funds' inflows, increasing their outflows or lowering their liquidity altogether increase the exit threat for their portfolio companies.

2.5 Hypotheses development

Polish pension funds at the time of the 2013 reform where the most important group of outside blockholders holding approximately 28% of WSE capitalization[7]. After the implementation of the reform OFE became active equity funds competing with each other and the new regulations imposed a substantial exit threat on their portfolio companies. This natural experiment created perfect laboratory to test the relations between exit threat and managerial misbehavior.

Exit threats might induce managers to take actions tending to maximize long-term firm value (Admati & Pfleiderer, 2009; Edmans, 2009) and eliminate departures from optimal operational decisions such as real earnings management. Based on these arguments, we formulate the main hypothesis:

H1: Institutional blockholders' exit threat is negatively associated with real earnings management

Because the strength of exit threat is mainly determined by manager's short-term concerns (Edmans, 2014; Edmans & Holderness, 2017) we formulate an additional hypothesis:

H2. The effect of institutional blockholders' exit threat on real earnings management is stronger in firms with higher insiders' sensitivity to stock price

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[7] Equity holdings of the pension funds represented approximately 27% of all equity under free float in 2013.

To test both hypotheses by implementing a difference-in-differences approach using a natural experiment in the form of the Polish pension fund reform.

3. Research design

We employ difference-in-differences design to test whether the increase in exit threat stemming from pension funds reform has differential effects on real earnings management (*REM*) for treated firms and corresponding control firms.

We estimate the following difference-in-differences regression specification:

$$REM_{i,t} = \alpha + \beta_1 TREAT_{i,t} + \beta_2 TREAT_{i,t} \times POST_{i,t} + \sum \beta_j CONTROLS_{i,t} + \alpha_t + \alpha_s + \varepsilon_{i,t} \tag{1}$$

A firm is classified as a treated (*TREAT*) if it has at least one pension fund (OFE) holding at least the 5% of the firm's shares outstanding in the year immediately before the reform (i.e., 2013). The *POST* indicator takes the value of 1 from 2014 to 2016, and 0 from 2011 to 2013. *CONTROLS* are general control variables, with α representing the intercept, α_t year fixed effects, α_s industry (sector) fixed effects, and $\varepsilon_{i,t}$ representing the error term. We do not include *POST* indicators separately because we include year fixed effects.

Firms can manage earnings through operational activities that include (Roychowdhury, 2006):

- − Sales manipulation, that is, accelerating the timing of sales and/or generating additional unsustainable sales through increased price discounts or more lenient credit terms. Such manipulation may cause a temporary increase in sales but also can lead to the drop in operating cash flow (OCF),
- − Reduction of discretionary expenditures: firms can reduce, for instance, selling and general expenses (SGE) and thus increase reported earnings,
- − Overproduction: increasing the production volume causes the allocation of fixed production costs to more units, which lowers the cost of goods sold (COGS).

Following previous research, we calculate abnormal operating cash flows (ABOCF), abnormal discretionary expenses (ABSGE),[8] and abnormal production costs (ABPROD) as

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[8] Due to the lack of data, we exclude R&D expenses from discretionary expenses.

proxies for deviations in real operations from industry-year "norms" indicating REM. Abnormal levels are calculated as residuals from models proposed by Roychowdhury (2006):

$$\frac{OCF_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \times \frac{1}{A_{i,t-1}} + \beta_1 \times \frac{S_{i,t}}{A_{i,t-1}} + \beta_2 \times \frac{\Delta S_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \tag{3}$$

$$\frac{SGE_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \times \frac{1}{A_{i,t-1}} + \beta \times \frac{S_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \tag{4}$$

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \times \frac{1}{A_{i,t-1}} + \beta_1 \times \frac{S_{i,t}}{A_{i,t-1}} + \beta_2 \times \frac{\Delta S_{i,t}}{A_{i,t-1}} + + \beta_3 \times \frac{\Delta S_{i,t-1}}{A_{i,t-1}} \varepsilon_{i,t} \tag{5}$$

In line with previous research, we multiply ABOCF and ABSGE by –1 so that higher proxies indicate higher REM. Finally, we sum the proxies to obtain the overall measure of REM.

We include several control variables used in prior research on real earnings management and institutional investors monitoring. We control for general firm characteristics, which existing literature (e.g., Achleitner, Günther, Kaserer, & Siciliano, 2014; Gopalan & Jayaraman, 2012) have proven to be related to real earnings management in insider based economies. These variables include company size, profitability, sales growth and debt level. Following   we also control for institutional ownership. In some specifications, we additionally include institutional investors characteristics representing their motivation and skills for monitoring. We control for institutional ownership concentration, portfolio turnover, portfolio weight and multiple blockholding.

4. Data and sample overview

Our study is based on a sample of non-financial companies listed on the Warsaw Stock Exchange in 2011–2016. We begin the sample selection process by obtaining institutional ownership characteristics on all nonfinancial companies listed on the Warsaw Stock Exchange over the research period. Our analyses were restricted to three years before (2011–2013) and three years after the reform (2014–2016) to limit concerns about the potential effect of

confounding events over longer horizons. We required that each firm exist both before and after the event. In addition, we require that each firm-year observation has the variables necessary to calculate our measures of real earnings management.[9] Finally, we required the availability of data necessary to construct our control variables. Most data were derived from three data sources: S&P Capital IQ database, Notoria Serwis (a Polish data provider), and the Amadeus database (Bureau Van Dijk – A Moody's Analytics Company). The few missing data points on insider ownership were hand-collected.

INSERT TABLE 1 HERE

Our base sample includes 187 non-financial companies listed on the main market of WSE over the period 2011–2016 (1,122 firm-year observations). Table 1 presents the distribution of our sample by industry. The sample spans seven industries, although there is some concentration in Capital Goods. We classify approximately 48% of firm-years as treated firms. The summary statistics are presented in Table 2. The mean (median) firm in our sample has an ROA of 3.5% (3.4%), total assets of $102.6 (95.6) million and institutional ownership of 25.4% (22.2%).

INSERT TABLE 2 HERE

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

INSERT TABLE 3 HERE

5. Primary findings
5.1 Changes in REM around Pension Funds Reform 2013

Figure 1 shows the mean real earnings management (REM) over the sample period. We plot REM separately for the treatment firms, the control firms, and their difference. The figure

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[9] Following previous research, we required at least 15 observations for each industry-year to estimate REM.

shows that REM of firms in the treatment group follows almost a similar trend to firms in the control group in the pretreatment (pre-reform) period but shows a markedly downward turn in the post-treatment (post-reform) period. This provides initial support that parallel-trend assumption holds and indicates that our results are unlikely driven by time trends.

INSERT FIGURE 1 HERE

We start our analysis by examining whether the Pension Funds Reform led to any significant reduction in real earnings management (H1). Table 4 displays the estimation results for Equation (1) using REM as a dependent variable.

INSERT TABLE 4 HERE

In Model 1, the coefficient on the interaction term TREAT × POST is −0.041 and significant at the 5% level (t-statistic 1.98). This finding indicates that the treatment firms experience a statistically significant decrease in REM after the reform relative to control firms. Moreover, the economic significance is also meaningful. The decrease in REM of 4.1 percentage points for treatment firms represents 17.3% of one standard deviation of the full sample REM (23.7 percentage points).

Models 2 and 3 substitute the indicator variable with continuous variable to capture the treatment effect. Exit theory predicts that the threat of disciplinary selling is stronger for the firms under the multiple-blockholder structure (Edmans & Manso, 2011) and for the firms under common ownership (Edmans et al., 2019). That is why we also use two continuous variables to capture the treatment effect. Because the competition between the blockholders enhances the exit threat by impounding more information into prices we use the logarithm of the number of pension funds' blockholders who hold at least 5% of firms' shares in year 2013 (*Num_OFE*). Finally, to gauge the importance of flexibility over which assets to sell upon a liquidity shock, motivated by existing literature on common ownership (He & Huang, 2017)

we use the logarithm of the number of same-industry peers block-held by the average cross-holding pension fund (*OFE_AvgNum*) in the year preceding the reform.

In line with the results from Model 1, the results in Model 2, reveal a negative and significant (t-statistic −2.01) coefficient on Num_OFE × POST. Increasing the number of pension funds' blockholders from the 25th to the 75th percentile is associated with a larger decrease in post-reform REM of 3.80 percentage points (i.e., −0.038 × 1.000). Model 3 substitutes the number of pension funds' blockholders with the number of same-industry peers block-held by the average cross-holding pension fund. The association becomes negative after the reform, as seen by the negative and significant coefficient on OFE_AvgNum × POST.

Of the control variables, only two are statistically significant, and their signs are in line with our expectations. Larger (SIZE) and more profitable (ROA) firms are less likely to engage in real earnings management. The coefficient on IO is negative and in line with a monitoring-based explanation but not significant.

However, the results of Models (1)–(3) show significant treatment effects consistent with exit theory it is still possible that our findings capture information contained in other institutional monitoring proxies. To examine whether our primary results are driven by institutional investors' incentives and monitoring skills, in the regression analyses we control for additional institutional investment characteristics suggested by existing research.

Shleifer and Vishny (1986) argue that large and concentrated (institutional) holdings result in better monitoring, as they make the monitoring less costly and more beneficial. Moreover, Hartzell and Starks (2003) claim that more concentrated holdings lower coordination costs among investors and result in better monitoring. Consequently, we augment the regression model using the Hirschman–Herfindahl share concentration index (HHI_IO). The incentives for and effectiveness in monitoring management also differ with institutional shareholders' investment horizon (Bushee, 1998; Chen, Harford, & Li, 2007). That result is why we add to

the Equation (1) the investors' portfolio turnover (TURNOVER). The institutional shareholder's portfolio weight in the sample firm is also included (PORTFWEIGHT). Fich, Harford, and Tran (2015) provide evidence that institutional shareholders have stronger monitoring incentives when firm's stocks account for a larger percentage of their portfolios. We also control for institutions' number of blockholdings (MULTIBLOCK), as information advantages and governance experience obtained from multiple blockholdings improve monitoring efficiency (Kang, Luo, & Na, 2018).

The results controlling for additional institutional monitoring proxies, are reported in Models (4)–(6). We obtained similar results as for our primary specification for all treatment effects measures. The results suggest a negative and significant association between all interaction variables and real earnings management.

Overall, the results reported in Table 4 indicate that Pension Funds Reform led to meaningful decrease in REM at firms with pension funds' blockholding relative to other firms and provide support for exit threat as a governance mechanism mitigating real earnings management (*H1*).

5.2 Suspect firms analysis

Our findings so far indicate that exit threat mitigates real earnings management. However, to bolster the validity of our research results, in this section we take a conservative approach and do not equate firms' deviation in real operations from industry norms with RM. Instead, we refer to them as RM only when managers' incentives of manipulating earnings are present. We do this because we acknowledge that some firms can adopt a unique business model to strategically differentiate itself from industry peers, which mechanically creates deviations in real operations.

To examine whether the effect of institutional blockholders' exit threat on real earnings management is stronger in firms in which insiders have greater incentives to report better

financial performance we estimate a multiple treatment effects variant model of Equation (1). In particular, we interacted the treatment dummy with dummies indicating whether the insiders have incentives to meet or beat earnings targets, as well as incentives arising from overvalued equity or from insider selling. The results of these splits are reported in Table 5.

Previous research shows earnings management is more severe in firm-years with reported earnings marginally above earnings targets (Burgstahler & Dichev, 1997; Degeorge et al., 1999). Moreover, results of other studies (Bushee, 1998; Gunny, 2010; Roychowdhury, 2006) suggest that benchmark beating firms engage more in real operations manipulation than others. For this reason, we concentrate on these firm-years to increase the power of our tests, for which abnormal real operations are earnings-target-oriented.

Three earnings benchmarks (targets) commonly adopted by management are zero earnings, previous year's earnings and analysts' earnings forecasts consensus. Hence, we identify treated firm-years suspected of managing earnings and create a dummy variable, BENCHBEAT, and setting the variable BENCHBEAT equal to 1 if either net income divided by total assets is between 0 and 0.01, or the change in net income divided by total assets between year $t-1$ and year t is between 0 and 0.01, or the firm just meets or beats analyst EPS forecast consensus. Otherwise, the dummy variable is coded as 0. Consistent with our expectations, we find in Model (1) of Table 5, that the coefficient on TREAT × POST × 1 {BENCHBEAT=1} is negative and significant, with p-value less than 0.10. We note that the coefficient on TREAT × POST × 1 {BENCHBEAT=0}, which is not significantly different from zero. That is, the exogenous shock induced by Pension Fund Reform decreases REM only in firms with short-term incentives to meet or beat earnings targets.

INSERT TABLE 5 HERE

To increase the power of our test we also consider whether overvaluation-based incentives moderate the effect of exit threat on real earnings management. Several papers

examine the association between overvaluation and earnings management and indicate that highly overvalued firms engage more in earnings management practices (Badertscher, 2011; Chi & Gupta, 2009). Moreover, other findings confirm that overvaluation intensifies earnings management activities among companies listed on the WSE, suggesting that external monitoring by an institutional investor limits the level of real earnings management at overvalued companies.

To identify overvalued firms, we use a methodology proposed by Rhodes–Kropf, Robinson, and Viswanathan (2005). First, we decompose M/B ratio into three components: firm-specific error, industry-level error and long-run valuation error (LR_VB) which captures growth opportunities. In the next step we sum the first two components to achieve total valuation error (TOT_ERR) which captures misvaluation and we classify firm-years as having overvalued equity if TOT_ERR is positive. Badertscher (2011) suggests that the longer a firm is overvalued, the more likely it is to engage in real earnings management. Therefore, we construct a dummy variable OVERVALUED coded as one if TOT_ERR for treated firm is positive in at least three consecutive years and 0 otherwise.

The results are presented in Model (2) of Table 5, which displays the average treatment effect of Pension Fund Reform on real earnings management for firms with overvalued equity (OVERVALUED=1) and non-overvalued firms (OVERVALUED=0). In line with our predictions, the coefficient on TREAT × POST × 1 {OVERVALUED=1} is negative and significant (t-statistic 2.40). However, in the absence of overvalued equity, firms with pension funds' blockholdings are not affected by the reform and do not decrease REM.

Furthermore, we test whether Pension Fund Reform induced REM decrease vary with insider selling. Park and Park (2004) suggest that managers inflate earnings before they sell their shares. We split our treatment sample into two groups and define an indicator variable that is equal to 1 depending on whether yearly insider sales are greater than insider purchases

{INSIDERNETSELL=1} or not {INSIDERNETSELL=0}. Consistent with our previous findings on insiders' incentives, the negative estimated treatment effect on REM is statistically significant only for treated firm-years with INSIDERNETSELL dummy equal to one. This finding shows that effects of Pension Fund Reform decreasing REM are present when insiders have strong incentives to report better financial performance in order to sell their own shares at inflated prices.

To sum up, the results reported in Table 5 show that insiders' incentives to meet or beat earnings targets, as well as incentives arising from overvalued equity or from insider selling, significantly negatively moderate the effect of Pension Funds Reform on real earnings management. Thus, consistent with our main hypothesis, the threat of exit improves corporate decision making and limits insiders misbehavior.

6. Exit versus voice
6.1 Insiders' sensitivity to stock price

Exit theory predicts that exit threats will be more effective when insiders' wealth is more sensitive to the stock price (Edmans, 2009). To test this prediction, most existing research uses two measures reflecting manager's interest in the stock price: "wealth-performance sensitivity" proposed by Edmans, Gabaix, and Landier (2009) and "pay-performance sensitivity" computed using the methodology in Core and Guay (2002).

However, stock-based compensation schemes are not common in Poland, stock prices are still important for insiders. The predominant ownership structure model in Poland is the one with a large controlling investor (a family or an individual), which is often an active shareholder involved in the firm (Aminadav & Papaioannou, 2020; Gugler, Ivanova, & Zechner, 2014. In the majority of sample firms, management board members and supervisory board members[10]

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[10] In the "two-tier" board structure, popular in many civil law countries, a supervisory board oversees an executive board and often has a significant impact on the manner in which the company is run.

are either large owners[11] or act as a representative of large owners. To partition our sample firms

by insiders' wealth sensitivity in the year immediately before the reform, our tests use the three

following variables: two continuous variables representing the percentage of equity owned by

all members of the management board (MB_OWNERSHIP), as well by all members of the

management board and the supervisory board (MB&SB_OWNERSHIP), and an indicator

variable for firms using stock based compensation schemes (STOCK_COMP).

As before, to examine whether the effect of institutional blockholders' exit threat on REM

is stronger in firms with higher insiders' sensitivity to stock price we estimate a multiple

treatment effects variant model of Equation (1). In particular, we interacted the treatment

dummy with dummies indicating whether the firm insider sensitivity to stock prices is high or

low. The results of these splits into firms with high and low firm insider sensitivity to stock

price are reported in Table 6.

<div align="center">INSERT TABLE 6 HERE</div>

First, we consider management board ownership. We classify treatment firm-year

observations as highly sensitive to stock price (MB_OWNERSHIP_HIGH=1 and

MB_OWNERSHIP_HIGH=0) if the observation is above the treated sample median in the year

immediately before the reform. The other treated firm-year observations are classified as firms

with low insiders' stock related sensitivity. We then estimate our baseline model, allowing the

treated effect to differ among these two groups. As Model (1) of Table 6 indicates, the estimated

effect of Pension Fund Reform on REM is concentrated among firms with high pre-reform

insider sensitivity to stock price. For this group, the estimated DiD coefficient (TREAT ×

POST × 1 {MB_OWNERSHIP_HIGH=1}) is negative and statistically significant at the 1%

level. This evidence is in line with our expectations and supports the conjecture that

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[11]As reported in Table 2, the mean (median) firm in our sample has managerial ownership of 15.3% (0%). Total insider ownership—including both management and supervisory board members—is equal to 28.6% (24.1%). Of the sample firms, fewer than 10% use stock-based compensation schemes.

effectiveness of exit threat as governance mechanism reducing REM is stronger if the insiders' wealth is more tied to the stock price.

In Model (2), which includes shareholdings of supervisory board members, we substitute management board ownership with all insider ownership. As before, we split our treatment sample into two groups (MB&SB_OWNERSHIP_HIGH=1 and MB&SB_OWNERSHIP _HIGH=0) using pre-reform median among treated firms. The estimated treatment effect on REM is negative and only statistically significant for treated firm-years with the MB&SB_OWNERSHIP_HIGH dummy equal to one. Next, in Model (3), we consider using stock-based compensation schemes as another proxy for insiders' sensitivity to the stock price proxy. Our results basically remain unchanged, however the statistical significance is much lower than for previous model specifications (the coefficient on TREAT $\times$ POST $\times$ 1 {STOCK_COMP =1}) is negative and significant at the 10% level (t-statistic 1.70). Overall, our results reported in Table 5 provide evidence that consistent with our prediction the effect of exit threat on real earnings management is stronger in firms with higher insider sensitivity to stock price, which supports our second hypothesis.

6.2 Insiders' entrenchment

Exit theory states that non-controlling blockholders can improve corporate performance even it they are unable to intervene through "voice" (Edmans, 2009). Existing research provide evidence that in CEE countries firms controlled by large individuals very often use various control-enhancing mechanisms (CEMs), including pyramids and dual-class shares(Gugler et al., 2014) . [12] Using CEMs grants insiders the power to resist monitoring through intervention (Gompers, Ishii, & Metrick, 2009); however, exit is likely to hold even among entrenched firms (Bharath et al., 2013). Thus, we attempt to use insider entrenchment to test whether governance

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[12]As reported in Table 2, 23% of the sample firms use dual-class shares.

through exit is operational in our sample. In particular, we predict that the effect of Pension Funds Reform on REM is stronger in firms using dual-class shares.

To test this presumption, we split our treatment sample into two groups and define an indicator variable that is equal to 1 depending on whether the firm uses dual-class shares (DUALCLASS = 1) or not (DUALCLASS = 0). We then estimate our baseline model, allowing the treated effect to differ among these two groups. The results of this investigation are presented in Model (1) of Table 7.

INSERT TABLE 7 HERE

As Model (1) of Table 7 shows, a negative and significant coefficient on interactive variable TREAT × POST × 1 {DUALCLASS = 1} indicates that pension funds exit threat mitigates REM at dual-class companies. This is not the case for the treated subgroup adopting single-class shares. Those findings are in line with our expectations, however, we recognize that lower REM in dual-class firms could be an effect of institutional blockholders' coalition which can make intervention more successful even in entrenched firms (Amin & Cumming, 2021).

To further assess the exit-threat-based interpretation of our results, we test whether the reported treatment effect for firms using dual-class shares is more pronounced in firms with higher insiders exposure to stock price. We classify a firm as being high exposed to the stock price if it has above-median management board ownership in the year immediately before the reform.

The results of these splits into firms with high and low insider exposure to stock price are reported in Models (2)–(3) of Table 7. Consistent with our expectation, we find a negative and significant coefficient on TREAT × POST × 1 {DUALCLASS = 1} only in the stock-price-sensitive firm subsample (Model 2). The difference in coefficients on TREAT × POST × 1 {DUALCLASS = 1} between subsamples (Models 2–3) is significant at the 1% level.

Taken together, the results reported in Table 7 support our presumption that governance through exit mitigates REM even in entrenched firms that are considered to be subject to less scrutiny from shareholders.

7. Robustness and additional tests
7.1 Propensity score matching

As the focus of our study is on the relationship between pension fund ownership and REM, we have to consider a potential endogenous matching (selection) of pension funds and companies. Previous research suggests that investment decisions of institutions may be based on a clientele preference or regulations. If, for example, pension funds are a subject to strict fiduciary restrictions and prefer to invest in large and liquid companies which are often well governed, any observed relationship between certain pension funds' ownership characteristics and real earnings management could be a result of differences in institutions' investment strategy rather than exit threat outcome. In other words, pension funds' ownership can mitigate REM activities, but the negative association between OFE blockholdings and REM can also occur when institutional investors choose to invest in certain type firms exhibiting less managerial misbehavior (e.g., REM).

Thus, one of the major challenges of our identification strategy is the nonrandom assignment of firms to the treatment and control groups. Anything that attracts pension funds or discourages them to concentrate their shareholdings before Pension Funds Reform, which also affects REM after the reform, may bias our results. To address this concern, we use propensity score matching (PSM).

We match the treatment and control firms in year 2013 (i.e., last year of the pre-reform period) based on the firm characteristics affecting the allocation decisions of institutional investors. Accordingly, following Bushee (2001), we employ a set of variables associated with institutional ownership. We use the firm size (MCAP) because some institutions may prefer or

may be constrained to invest in large companies. Due to liquidity preferences of institutional investors, we include a share volume turnover variable (SHARETURN). We also use the dividend yield (DYIELD) to reflect institutions' preferences for firms paying dividends.

A dummy variable (WIG20) controls for institutional investors' preferences for "blue-chip stocks" included in the WIG20 index, which contains stocks of the 20 largest and most liquid companies listed on the WSE. We include firms' three-year average sales growth rates (SGR3Y) to control for investors' preferences for growing firms. Regarding firm performance, we employ a market-adjusted rate of return (BHAR1Y) and a dummy variable (DPROF), which equals 1 for firms with a positive income and 0 otherwise. Lastly, we control for risk using a beta coefficient (BETA2Y),[13] the standard deviation of weekly lognormal price returns (TRISK), and leverage (LEV).

We conduct one-to-one matching without replacement and require a minimum caliper distance of 0.01. PSM results in 516 firm-years of matched treatment and control firms. The results of PSM are presented in Table 8. Panel A reports the mean values of firm characteristics for the treatment and control groups, as well as *p*-values from t-tests of differences. No significant difference in overall propensity score indicates successful matching. Among individual firm characteristics only TRISK is different at the 5% level between both groups of firms.

INSERT TABLE 8 HERE

After we ensure covariate balance along almost all firm characteristics, we validate our primary analysis using the matched sample. The results of this investigation are shown in Panel B of Table 8. The coefficients on all interactive variables are negative and statistically

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[13] Unusually low levels of beta coefficient reported for the overall sample are a consequence of the benchmark used. We derived data on betas from Capital IQ, where betas for stocks listed on WSE are calculated by referring stock returns to the MSCI Emerging Markets index. As returns on Polish stocks are relatively less vulnerable to changes in the MSCI EM index, betas calculated by Capital IQ are much lower than betas based on WSE indexes. Nevertheless, as we want to show only the possible differences in betas between groups of companies, we ignore the levels.

significant. The treatment effects obtained using this sample are in line with that reported in Table 4, implying that differences in firm characteristics are not likely to drive our findings on REM changes affected by Pension Funds Reform.

7.2 Parallel trends assumption

The key identifying assumption of difference-in-differences framework is that, in the absence of a treatment, the treatment and control firms would have followed the parallel patterns. To validate this parallel trend assumption, we ran a difference-in-differences regression analysis by interacting TREAT with an indicator variable for each year to examine the dynamics of the treatment effect. Table 9 reports the results of this examination.

INSERT TABLE 9 HERE

The benchmark year is year 2011 (that is the year $t - 2$). Compared to the benchmark period, we do not find significant treatment effects for years $t - 1$ to $t = 0$. The coefficients on TREAT × BEFORE ($t = -1$) and TREAT × BEFORE ($t = 0$) are not significantly different from zero. The difference between treatment and control groups appears in the year after the reform ($t = 1$) and continue to be significant in year 3. Both coefficients on TREAT × AFTER ($t = 1$) and TREAT × AFTER ($t = 3$) are negative and significant at least at the 5% level. Additionally, to assess whether the parallel trends assumption may be violated, we run the regression analysis of REM on all control variables from Equation (1) and compute residual REM. In Figure 2, we plot the changes in residual RM in year t relative to the benchmark year (that is, year 2011).

INSERT FIGURE 2 HERE

Although, the level of real earnings management is substantially lower for the treatment group before the reform, the trend from 2012 to 2013 is nearly similar. In 2014, the groups began to differ, meaning that the results of our graphical analysis are consistent with those from parallel trend regression.

We also employ a placebo test to examine whether the parallel assumption holds. Maintaining the same treatment and control groups, we use 2014 as a placebo event and reestimate Equation 1. The unreported results of this test indicate that there is no treatment effect of the placebo event in 2014. The placebo test, together with parallel trends regression and graphical analysis, support a causal relation between Pension Funds Reform related exit threat and reduction in real earnings management.

7.3 Alternative explanations

A necessary condition to make exit theory credible is stock liquidity (Edmans, 2009). However, previous studies suggest that liquidity affects both the decision to acquire block and the choice of governance mechanism. Maug (1998) proposes that liquidity induces new block formation and new blockholders are incentivized to engage more in monitoring through "voice." On the other hand, empirical study by Edmans, Fang, and Zur (2013) shows that liquidity driven block formation reduces the likelihood of governing through intervention (voice).

In line with existing literature, we also find that liquidity increase induced by Pension Funds Reform is associated with new block formation. After the reform, 22% of the treatment sample firms have block formation in new pension funds. To ensure that our results are not driven by the channel proposed by Maug (1988), we remove all firms from the sample with new block formation after the reform and replicate our primary analysis. We report the results of this investigation in Model 1 of Table 10. We obtained similar results. The significance and sign of the coefficient on TREAT × POST remain the same as in Table 4, confirming that our primary findings on treatment effects are less likely to be driven by enhanced intervention associated with new block formation by pension funds.

INSERT TABLE 10 HERE

Furthermore, Boone and White (2015) claim that to minimize the transaction and monitoring costs, quasi-indexing institutions that are actively managed (e.g., pension funds) can prefer stocks with greater public information production. Quasi-indexers demand greater analyst coverage and promote richer information production by them. At the same time, other studies suggest that analyst following affects using real earnings management to meet earnings targets. Irani and Oesch (2016) show that a reduction in analyst coverage leads managers to use less real earnings manipulation . Moreover, the loss of coverage results in greater accrual-based earnings management, indicating that analysts influence managers' preferred mix of accrual and real activities manipulation. Hence, another alternative explanation for our results is that the reform in 2013 could substantially change the investment and trading strategies of pension funds resulting in more private information-gathering and less reliance on analyst services.

To address the concern that varying preferences for public versus private information-production may be driving our results, we augment Eq. (1) with two additional controlling variables. To investigate whether our findings on treatment effects might be biased by lesser demand for analyst services, we use analyst coverage (ANALYST) calculated as the natural logarithm of the total number of financial analysts following a firm. Furthermore, to control whether our findings are driven by substitution effect between two earnings management methods, we follow Kothari, Leone, and Wasley (2005) and compute abnormal accruals (AEM) using the performance-adjusted modified Jones model. After controlling for ANALYST (Model 2 in Table 10) and AEM (Model 3 in Table 10), we obtain the same results as in our primary analysis. The estimated DiD coefficient (TREAT × POST) remains negative and statistically significant. Hence, it is unlikely that lesser analyst coverage or earnings management methods mix affects our results.

Another concern to our identification strategy is that most of treatment firms are family-controlled. Achleitner et al. (2014) documents that family firms use earnings management

strategically and avoid this method of boosting earnings that destroys the firm's long-term value (i.e., REM). Therefore, to control for the potential effect of the family control on our findings on treatment effect, we add to the Eq. (1) a family firm dummy (FF). Our results (Model 4) and inferences, however, do not change.

Our tests have controlled for many firm characteristics likely to affect REM. However, we acknowledge that the observed treatment effect may still arise because of omitted unobservable firm characteristics. To address this endogeneity concern, we also employ fixed effects model (Model 5 in Table 10). This approach does not change our inferences.

8. Conclusions

Recent studies on institutional investors monitoring provide evidence that outside blockholders can still govern even if they cannot exercise their voice and intervene directly in company's operations. Threat of share price decline arising from dissatisfied investors' exit motivates management to constrain their value-destroying behavior and meet investor demand for maximazing value. The threat of exit by institutional investors has drawn increased attention in the US setting. However, the literature on exit as governance mechanism for other markets is rather scarce.

In this study, we exploit the natural experiment created by a Polish pension fund reform implemented in 2013 to examine whether blockholder exit threat curbs managerial misbehavior and short-termism reflected in real earnings management. Pension fund reform of 2013 offers a unique setting, which, among other things, imposed the real threat of exit of the most prominent group of outside blockholders on companies listed on the Warsaw Stock Exchange.

Using difference-in-differences research design we provide evidence that the reform significantly decreased the level of real earnings management in "treated" companies, that is companies with pension funds playing the role of blockholders. Moreover, consistent with the exit theory the effect was more significant for firms with multiple blockholder setting, firms

under common ownership and firms with insiders' wealth closely related to the stock price. Our results are robust to alternative explanations of the observed effect such as the incentives to engage in earnings management by the pension fund portfolio firms or the possible impact of the "voice" channel used due to a new block formation enabled by the reform-induced increased liquidity. Our conclusions also hold for propensity score matched sample and are robust to different choices of model specifications. Overall, our results indicate that outside blockholder exit threats have a governance role also in the Polish setting.

The findings of our study have several implications for managers, investors, and market regulators. First, even on markets where ownership is typically highly concentrated, managers should take into account the possible feedback from informed outside blockholder trading when making decision about misreporting. Second, non-blockholding (small) investors that rely more on public information such as reported earnings can make better investment analyses and decisions when they evaluate the impact of institutional blockholders on reporting quality and firm performance. Third, policy makers should be aware that reforms affecting pension funds' investment policy, their internal competition and liquidity can also have significant impact on channels through which institutions exert governance in their portfolio companies.

References

Achleitner, A.-K., Günther, N., Kaserer, C., & Siciliano, G. (2014). Real earnings management and accrual-based earnings management in family firms. *European Accounting Review*, *23*(3), 431–461.

Admati, A. R., & Pfleiderer, P. (2009). The "Wall Street Walk" and Shareholder Activism: Exit as a Form of Voice. *Review of Financial Studies*, *22*(7), 2645–2685. https://doi.org/10.1093/rfs/hhp037

Amin, Q. A., & Cumming, D. (2021). Blockholders and real earnings management-the emerging markets context. *Journal of International Financial Markets, Institutions and Money*, *75*, 101434. https://doi.org/10.1016/j.intfin.2021.101434

Aminadav, G., & Papaioannou, E. (2020). Corporate Control around the World. *The Journal of Finance*, *75*(3), 1191–1246. https://doi.org/10.1111/jofi.12889

Badertscher, B. A. (2011). Overvaluation and the Choice of Alternative Earnings Management Mechanisms. *The Accounting Review*, *86*(5), 1491–1518. https://doi.org/10.2308/accr-10092

Bharath, S. T., Jayaraman, S., & Nagar, V. (2013). Exit as governance: An empirical analysis. *The Journal of Finance*, *68*(6), 2515–2547.

Boone, A. L., & White, J. T. (2015). The effect of institutional ownership on firm transparency and information production. *Journal of Financial Economics*, *117*(3), 508–533. https://doi.org/10.1016/j.jfineco.2015.05.008

Brickley, J. A., Lease, R. C., & Smith Jr, C. W. (1988). Ownership structure and voting on antitakeover amendments. *Journal of Financial Economics*, *20*, 267–291.

Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics*, *24*(1), 99–126.

Bushee, B. J. (1998). The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review*, *73*(3), 305–333.

Bushee, B. J. (2001). Do institutional investors prefer near-term earnings over long-run value? *Contemporary Accounting Research*, *18*(2), 207–246.

Chen, X., Harford, J., & Li, K. (2007). Monitoring: Which institutions matter? *Journal of Financial Economics*, *86*(2), 279–305. https://doi.org/10.1016/j.jfineco.2006.09.005

Chi, J., & Gupta, M. (2009). Overvaluation and earnings management. *Journal of Banking & Finance*, *33*(9), 1652–1663. https://doi.org/10.1016/j.jbankfin.2009.03.014

Chung, C. Y., Hwang, J. H., Kim, D., & Liu, C. (2018). When institutions passively curb earnings management: Evidence from the Korean market. *Finance Research Letters*, *25*, 274–279. https://doi.org/10.1016/j.frl.2018.02.033

Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, *50*(1), 2–19.

Core, J., & Guay, W. (2002). Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility. *Journal of Accounting Research*, *40*(3), 613–630. https://doi.org/10.1111/1475-679X.00064

Cvijanović, D., Dasgupta, A., & Zachariadis, K. E. (2022). The Wall Street stampede: Exit as governance with interacting blockholders. *Journal of Financial Economics*, *144*(2), 433–455. https://doi.org/10.1016/j.jfineco.2022.02.005

Dechow, P. M., & Skinner, D. J. (2000). Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators. *Accounting Horizons*, *14*(2), 235–250. https://doi.org/10.2308/acch.2000.14.2.235

Dechow, P. M., Sloan, R. G., & Sweeny, A. P. (1996). Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC. *Contemporary Accounting Research*, *13*(1), 1–36. https://doi.org/10.1111/j.1911-3846.1996.tb00489.x

Degeorge, F., Patel, J. S., & Zeckhauser, R. J. (1999). Earnings Management to Exceed Thresholds. *Journal of Business Finance & Accounting*, *72*(1), 1-33.

Denes, M. R., Karpoff, J. M., & McWilliams, V. B. (2016). Thirty years of shareholder activism: A survey of empirical research. *Journal of Corporate Finance*, *44*, 405–424. https://doi.org/10.1016/j.jcorpfin.2016.03.005

Dou, Y., Hope, O.-K., Thomas, W. B., & Zou, Y. (2018). Blockholder Exit Threats and Financial Reporting Quality. *Contemporary Accounting Research*, *35*(2), 1004–1028. https://doi.org/10.1111/1911-3846.12404

Edmans, A. (2009). Blockholder trading, market efficiency, and managerial myopia. *The Journal of Finance*, *64*(6), 2481–2513.

Edmans, A. (2014). Blockholders and Corporate Governance. *Annual Review of Financial Economics*, *6*(1), 23–50. https://doi.org/10.1146/annurev-financial-110613-034455

Edmans, A., Fang, V. W., & Zur, E. (2013). The Effect of Liquidity on Governance. *Review of Financial Studies*, *26*(6), 1443–1482. https://doi.org/10.1093/rfs/hht012

Edmans, A., Gabaix, X., & Landier, A. (2009). A Multiplicative Model of Optimal CEO Incentives in Market Equilibrium. *Review of Financial Studies*, *22*(12), 4881–4917.

Edmans, A., & Holderness, C. G. (2017). Blockholders: A survey of theory and evidence. In *The handbook of the economics of corporate governance* (Vol. 1, pp. 541–636). Elsevier.

Edmans, A., Levit, D., & Reilly, D. (2019). Governance Under Common Ownership. *The Review of Financial Studies*, *32*(7), 2673–2719. https://doi.org/10.1093/rfs/hhy108

Edmans, A., & Manso, G. (2011). Governance Through Trading and Intervention: A Theory of Multiple Blockholders. *Review of Financial Studies*, *24*(7), 2395–2428. https://doi.org/10.1093/rfs/hhq145

Fich, E. M., Harford, J., & Tran, A. L. (2015). Motivated monitors: The importance of institutional investors' portfolio weights. *Journal of Financial Economics*, *118*(1), 21–48. https://doi.org/10.1016/j.jfineco.2015.06.014

Gillan, S. L., & Starks, L. T. (2000). Corporate governance proposals and shareholder activism: the role of institutional investors. *Journal of Financial Economics*, *57*, 375-305.

Gompers, P. A., Ishii, J., & Metrick, A. (2009). Extreme governance: An analysis of dual-class firms in the United States. *Review of Financial Studies*, *23*(3), 1051–1088.

Gopalan, R., & Jayaraman, S. (2012). Private Control Benefits and Earnings Management: Evidence from Insider Controlled Firms. *Journal of Accounting Research*, *50*(1), 117–157.

Gugler, K., Ivanova, N., & Zechner, J. (2014). Ownership and control in Central and Eastern Europe. *Journal of Corporate Finance*, *26*, 145–163. https://doi.org/10.1016/j.jcorpfin.2014.03.001

Gunny, K. A. (2010). The Relation Between Earnings Management Using Real Activities Manipulation and Future Performance: Evidence from Meeting Earnings Benchmarks *Contemporary Accounting Research*, *27*(3), 855–888. https://doi.org/10.1111/j.1911-3846.2010.01029.x

Habib, A., Ranasinghe, D., Wu, J. Y., Biswas, P. K., & Ahmad, F. (2022). Real earnings management: A review of the international literature. *Accounting & Finance.* Advance online publication. https://doi.org/10.1111/acfi.12968

Hartzell, J. C., & Starks, L. T. (2003). Institutional Investors and Executive Compensation. *The Journal of Finance*, *58*(6), 2351–2374. https://doi.org/10.1046/j.1540-6261.2003.00608.x

He, J., & Huang, J. (2017). Product Market Competition in a World of Cross-Ownership: Evidence from Institutional Blockholdings. *The Review of Financial Studies*, *30*(8), 2674–2718. https://doi.org/10.1093/rfs/hhx028

Irani, R. M., & Oesch, D. (2016). Analyst Coverage and Real Earnings Management: Quasi-Experimental Evidence. *Journal of Financial and Quantitative Analysis*, *51*(2), 589–627. https://doi.org/10.1017/S0022109016000156

Kałdoński, M., Jewartowski, T., & Mizerka, J. (2020). Capital market pressure, real earnings management, and institutional ownership stability - Evidence from Poland. *International Review of Financial Analysis*, *71*, 101315. https://doi.org/10.1016/j.irfa.2019.01.009

Kang, J.-K., Luo, J., & Na, H. S. (2018). Are institutional investors with multiple blockholdings effective monitors? *Journal of Financial Economics*, *128*(3), 576–602. https://doi.org/10.1016/j.jfineco.2018.03.005

Koh, P.-S. (2007). Institutional investor type, earnings management and benchmark beaters. *Journal of Accounting and Public Policy*, *26*(3), 267–299. https://doi.org/10.1016/j.jaccpubpol.2006.10.001

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, *39*(1), 163–197. https://doi.org/10.1016/j.jacceco.2004.11.002

Maug, E. (1998). Large shareholders as monitors: Is there a trade-off between liquidity and control? *The Journal of Finance*, *53*(1), 65–98.

McCahery, J. A., Sautner, Z., & Starks, L. T. (2016). Behind the Scenes: The Corporate Governance Preferences of Institutional Investors. *The Journal of Finance*, *71*(6), 2905–2932. https://doi.org/10.1111/jofi.12393

McNulty, T., & Nordberg, D. (2016). Ownership, Activism and Engagement: Institutional Investors as Active Owners. *Corporate Governance: An International Review*, *24*(3), 346–358. https://doi.org/10.1111/corg.12143

Park, M. S., & Park, T. (2004). Insider sales and earnings management. *Journal of Accounting and Public Policy*, *23*(5), 381–411. https://doi.org/10.1016/j.jaccpubpol.2004.07.003

Rhodes–Kropf, M., Robinson, D. T., & Viswanathan, S. (2005). Valuation waves and merger activity: The empirical evidence. *Journal of Financial Economics*, *77*(3), 561–603. https://doi.org/10.1016/j.jfineco.2004.06.015

Ronen, J., & Yaari, V. (2008). *Earnings management: Emerging insights in theory, practice, and research. Springer series in accounting scholarship*. New York: Springer.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, *42*(3), 335–370. https://doi.org/10.1016/j.jacceco.2006.01.002

Sakaki, H., Jackson, D., & Jory, S. (2017). Institutional ownership stability and real earnings management. *Review of Quantitative Finance and Accounting*, *49*(1), 227–244. https://doi.org/10.1007/s11156-016-0588-7

Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *The Journal of Political Economy*, *94*(3), 461–488.

Wang, M. (2014). Which Types of Institutional Investors Constrain Abnormal Accruals? *Corporate Governance: An International Review*, *22*(1), 43–67. https://doi.org/10.1111/corg.12044

Zalewska, A. (2006). Is locking domestic funds into the local market beneficial? Evidence from the Polish pension reforms. *Emerging Markets Review*, *7*(4), 339–360. https://doi.org/10.1016/j.ememar.2006.09.007

Zang, A. Y. (2012). Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management. *The Accounting Review*, *87*(2), 675–703. https://doi.org/10.2308/accr-10196

Appendix—Variable Definitions

Variable	Variable Definition
Real Earnings Management Variables	
RM	amount of real earnings management, which is the sum of ABSGE, ABOCF, and ABPROD for year *t*. SGE equals selling, general, and administrative expenses. CFO equals cash flow from operations. PROD is the sum of cost of goods sold and the change in inventory during the year. Each component of RM is estimated for each 4-digit GICS industry and year group. Prior to summing, ABSGE, ABOCF are multiplied by −1 so that higher levels of the variables proxy for higher levels of RM. The larger the amount of RM, the more likely the firm is engaging in real earnings management. See Roychowdhury et al. (2006) for complete details.
ABSGE	abnormal discretionary expenses for year *t*, measured as the product of negative one and the deviations from the predicted values of the corresponding industry-year regression model.
ABOCF	abnormal cash flow from operations for year *t*, measured as the product of negative one and deviations from the predicted values of the corresponding industry-year regression model
ABPROD	abnormal production cost for year *t*, measured as the deviations from the predicted values of the corresponding industry-year regression model.
RM_1	amount of real earnings management, which is the sum of ABOCF and ABSGE for year *t*. CFO equals cash flow from operations. SGE equals selling, general, and administrative expenses. Each component of RM is estimated for each 4-digit GICS industry and year group. Prior to summing, ABOCF and ABSGE are multiplied by −1 so that higher levels of the variables proxy for higher levels of RM_1. The larger the amount of RM_1, the more likely the firm is engaging in real earnings management. See Roychowdhury et al. (2006) for complete details.
RM_2	amount of real earnings management, which is the sum of ABSGE and ABPROD for year *t*. SGE equals selling, general, and administrative expenses. PROD is the sum of cost of goods sold and the change in inventory during the year. Each component of RM is estimated for each 4-digit GICS industry and year group. Prior to summing, ABSGE is multiplied by −1 so that higher levels of the variables proxy for higher levels of RM_2. The larger the amount of RM_2, the more likely the firm is engaging in real earnings management. See Roychowdhury et al. (2006) for complete details.
Institutional Investor Exit Threat Variables	
TREAT	indicator variable coded as one if the firm has at least one pension fund ("OFE") blockholder in year 2013, where blockholder is defined as holding at least the 5 % of the firm's shares outstanding.
Num_OFE	natural logarithm of one plus the number of pension funds' ("OFE") blockholders in year 2013.
OFE_AvgNum	natural logarithm of one plus the number of same-industry peers block-held by the average cross-holding pension fund ("OFE") in year 2013. See He and Huang (2017) for complete details.
POST	indicator variable coded as one for the years after the announcement of the pension funds reform in year 2013.
General Control Variables	
SIZE	natural logarithm of total assets for year t
ROA	return on assets for year t computed as net income before extraordinary items for year t scaled by total assets in year $t-1$.
LOSS	indicator variable coded as one if net income before extraordinary items for year t is less than zero.
GROWTH	annual percentage change in sales for year *t*.
LEV	leverage ratio (long-term debt in year t, scaled by total assets in year $t-1$).
IO	aggregate institutional ownership for year *t*.
Institutional Investor Monitoring Variables	
HHI_IO	Hirschman-Herfindahl institutional ownership concentration index. calculated as the sum (over all institutional investors) of the squared percentage owned of the firm's shares outstanding in year *t*.
TURNOVER	firm-level weighted average three-year portfolio turnover rate by institutional investors for year *t*. Portfolio turnover is computed as the fraction of the investor's portfolio that is no longer held at the end of the three-year period. See Derrien et al. (2013) for computing investor portfolio turnover.
PORTFWEIGHT	firm-level weighted average weight of the value of the equity investment in a firm in the institutional shareholder's portfolio for year *t*.

MULTIBLOCK	firm-level weighted average multiple blockholding residual for year t, where residual is calculated from the regression of ln (1 + raw blockholding number) on the value of total equity holdings of the institutional investor. See Kang et al. (2018) for complete details.

Insiders' Wealth Sensitivity to Stock Prices Variables

STOCK_COMP	indicator variable coded as one if the firm uses stock-based compensation (options, restricted stock etc.) in year 2013.
MB_OWNERSHIP	percentage of equity owned by all members of the management board, as well their families in year 2013.
MB_OWNERSHIP_HIGH	indicator variable coded as one if the percentage of equity owned by all members of the management board, as well their families in year 2013 is above sample median
MB_OWNERSHIP_LOW	indicator variable coded as one if the percentage of equity owned by all members of the management board, as well their families in year 2013 is below sample median
MB&SB_OWNERSHIP	percentage of equity owned by all members of the management board and the supervisory board, as well their families in year 2013.
MB&SB_OWNERSHIP_HIGH	indicator variable coded as one if the percentage of equity owned by all members of the management board and the supervisory board, as well their families in year 2013 is above sample median
MB&SB_OWNERSHIP_LOW	indicator variable coded as one if the percentage of equity owned by all members of the management board and the supervisory board, as well their families in year 2013 is below sample median

Insiders' Entrenchment Variables

DUALCLASS	indicator variable coded as one if the firm uses dual-class shares in year 2013.

Incentives to Engage in Earnings Manipulation

BENCHBEAT	indicator variable coded as one if the firm just meets or beats zero earnings or last – year earnings or analyst EPS forecast consensus in year t, 0 otherwise. Just beating/meeting the zero benchmark (the last year earnings) are firm-years with net income before extraordinary items over lagged total assets between 0 and 1.0 percent (are firm-years with the change in the return of assets ratio is between 0 and 1 percentage point)
OVERVALUED	indicator variable coded as one if the total valuation error (TOT_ERR) that captures misvaluation is positive in at least three consecutive years. TOT_ERR is computed by decomposing MB ratio into firm-specific error, industry-level error, and long-run valuation error (LR_VB) that captures growth opportunities. Each component is estimated for each 4-digit GICS industry and year group. TOT_ERR is the sum of the first two components. See Rhodes-Kropf et al. (2005) for complete details.
INSIDERNETSELL	indicator variable coded as one if insiders' sales are greater than insiders purchases in year t, 0 otherwise.

Other Firm Characteristics

ANALYST	natural log of 1 plus the number of analysts following the firm in year t
AEM	abnormal accruals derived from the performance-adjusted modified Jones model for year t. The modified Jones model is estimated for each 4-digit GICS industry and year group. See Kothari et al. (2005) for complete details.
FF	indicator variable coded as one if the firm is family controlled at the 25% threshold of control in year 2013.

Selection Equation Variables

MCAP	natural logarithm of market capitalization in year t.
SHARETURN	natural logarithm of the share volume turnover in year t. Share volume turnover is the ratio of total number of shares traded to number of shares outstanding.
DYIELD	value of dividends paid in year t per share of stock held divided by value of one share of stock in year t.
WIG20	indicator variable coded as one if the firm is included in the WIG20 index in year t.
SGR3Y	average sales growth over the prior three years in year t.
BHAR1Y	buy-and-hold market adjusted one-year rate of return in year t.
DPROF	indicator variable coded as one if the net income is positive in year t.
BETA2Y	market model beta estimated with up to 24 prior monthly returns in year t.
TRISK	standard deviation of weekly log-normal price returns over the past two years in year t.

Table 1. Sample Distribution by Industry

INDUSTRY	4 GICS CODE	ALL FIRMS		TREATED FIRMS	% of TREATED FIRMS
		No	**%**	**No**	**%**
Materials	1510	222	20%	84	38%
Capital Goods	2010	366	33%	192	52%
Consumer Durables & Apparel	2520	150	13%	78	52%
Food, Beverage & Tobacco	3020	132	12%	72	55%
Software & Services	4510	108	10%	48	44%
Technology Hardware & Equipment	4520	78	7%	48	62%
Real Estate	6010	66	6%	18	27%
Total		**1,122**	**100%**	**540**	**48%**

Note: The table reports the sample distribution by industry classified on the basis of 4-digit Global Industry Classification System (GICS). The industry distribution is presented separately for the whole sample and for subsample of treated firms.

Table 2. Summary statistics

VARIABLES	No	Mean	Std	25th	Median	75th
Real Earnings Management Characteristics						
REM	1,122	-0.183	0.237	-0.302	-0.163	-0.035
ABOCF	1,122	-0.075	0.051	-0.093	-0.075	-0.042
ABPROD	1,122	-0.020	0.131	-0.094	-0.020	0.059
ABSGE	1,122	-0.087	0.140	-0.143	-0.066	-0.015
Institutional Investor Exit Threat Variables						
TREAT	1,122	0.481	0.500	0.000	0.000	1.000
Num_OFE (number)	1,122	0.856	1.159	0.000	0.000	1.000
OFE_AvgNum (number)	1,122	3.683	5.566	0.000	0.000	5.000
POST	1,122	0.500	0.500	0.000	0.500	1.000
General Control Variables						
SIZE (Mio USD)	1,122	102.611	4.012	35.332	95.592	265.067
ROA	1,122	0.035	0.083	0.007	0.034	0.070
LOSS	1,122	0.194	0.396	0.000	0.000	0.000
GROWTH	1,122	0.020	0.291	-0.131	-0.010	0.126
LEV	1,122	0.121	0.119	0.029	0.094	0.170
IO	1,122	0.254	0.227	0.054	0.222	0.366
Institutional Investor Monitoring Variables						
HHI_IO	1,122	0.032	0.064	0.002	0.013	0.033
TURNOVER	1,122	0.315	0.204	0.207	0.300	0.426
PORTFWEIGHT	1,122	0.051	0.159	0.001	0.003	0.012
MULTIBLOCK	1,122	1.575	0.914	0.994	1.840	2.262
Earnings Management Incentives						
BENCHBEAT	1,122	0.326	0.469	0.000	0.000	1.000
OVERVALUED	1,080	0.410	0.492	0.000	0.000	1.000
INSIDERNETSELL	1,074	0.369	0.483	0.000	0.000	1.000
Insiders' Wealth Sensitivity to Stock Price Variables						
MB_OWNERSHIP	1,122	0.153	0.238	0.000	0.000	0.283
MB&SB_OWNERSHIP	1,122	0.286	0.281	0.000	0.241	0.567
STOCK_COMP	1,122	0.088	0.284	0.000	0.000	0.000
Insiders' Entrenchment Variables						
DUALCLASS	1,122	0.230	0.421	0.000	0.000	0.000

Table 3. Pearson Correlations Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*REM*	1.00														
2	*TREAT*	0.01	1.00													
3	*Num_OFE*	-0.03	**0.76**	1.00												
4	*OFE_AvgNum*	0.03	**0.69**	**0.53**	1.00											
5	*POST*	0.04	0.00	0.00	0.00	1.00										
6	*SIZE*	**-0.11**	**0.24**	**0.25**	**0.14**	-0.03	1,00									
7	*ROA*	**-0.25**	**0.12**	**0.09**	0.00	**-0.07**	0,05	1.00								
8	*LOSS*	**0.10**	**-0.08**	**-0.08**	-0.01	0.01	**-0,06**	**-0.65**	1.00							
9	*GROWTH*	**-0.09**	0.03	0.03	-0.01	**-0.26**	0,05	**0.38**	**-0.26**	1.00						
10	*LEV*	**-0.06**	-0.04	-0.02	**-0.11**	-0.03	**0,28**	-0.02	0.03	**0.09**	1.00					
11	*IO*	**-0.06**	**0.50**	**0.59**	**0.38**	0.01	**0,27**	0.03	-0.02	0.03	**0.08**	1.00				
12	*HHI_IO*	0.03	**0.16**	**0.22**	**0.10**	0.02	**0,07**	-0.03	0.00	0.02	**0.06**	**0.72**	1.00			
13	*TURNOVER*	**-0.07**	**-0.12**	**-0.14**	**-0.08**	-0.04	**-0,08**	-0.02	0.03	0.02	-0.03	**0.09**	0.04	1.00		
14	*PORTFWEIGHT*	0.04	**-0.05**	-0.02	**-0.05**	-0.02	**0,06**	**-0.07**	0.04	0.01	**0.17**	**0.29**	**0.50**	**-0.11**	1.00	
15	*MULTIBLOCK*	**-0.08**	**0.48**	**0.38**	**0.41**	0.03	**0,33**	**0.09**	**-0.11**	0.00	**-0.07**	**0.22**	**-0.13**	**0.24**	**-0.38**	1.00

Note: Bolded coefficients are statistically significant at least at the 10% level.

Table 4. Blockholder exit threat and real earnings management

	REM					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Intercept	−0.125*	−0.126*	−0.126*	−0.109*	−0.104	−0.102
	(-1.96)	(-1.96)	(-1.96)	(-1.52)	(-1.45)	(-1.42)
Treatment Effects						
TREAT	0.061*	X	X	0.079**	X	X
	(1.76)	X	X	(2.11)	X	X
TREAT x POST	−0.041**	X	X	−0.040*	X	X
	(-1.98)	X	X	(-1.89)	X	X
Num_OFE	X	0.040	X	X	0.053	X
	X	(1.10)	X	X	(1.36)	X
Num_OFE x POST	X	−0.038**	X	X	−0.039**	X
	X	(-2.01)	X	X	(-2.04)	X
OFE_AvgNum	X	X	0.018	X	X	0.022
	X	X	(1.14)	X	X	(1.30)
OFE_AvgNum x POST	X	X	−0.016**	X	X	−0.015*
	X	X	(-2.09)	X	X	(-1.91)
General Control Variables						
$SIZE_{t-1}$	−0.022**	−0.021*	−0.021**	−0.018	−0.019*	−0.019
	(-2.05)	(-1.96)	(-1.99)	(-1.58)	(-1.66)	(-1.64)
ROA_{t-1}	−0.889***	−0.875***	−0.871***	−0.862***	−0.847***	−0.843***
	(-4.30)	(-4.23)	(-4.16)	(-4.26)	(-4.17)	(-4.08)
$LOSS_{t-1}$	−0.038	−0.039	−0.038	−0.037	−0.036	−0.035
	(-1.40)	(-1.40)	(-1.36)	(-1.33)	(-1.30)	(-1.27)
$GROWTH_{t-1}$	0.011	0.010	0.012	0.009	0.009	0.012
	(0.37)	(0.33)	(0.41)	(0.33)	(0.31)	(0.41)
LEV_{t-1}	0.125	0.118	0.118	0.114	0.109	0.109
	(1.16)	(1.07)	(1.08)	(1.03)	(0.97)	(0.97)
IO_{t-1}	−0.064	−0.050	−0.043	−0.195	−0.177	−0.155
	(−0.97)	(−0.70)	(−0.66)	(−1.95)	(−1.65)	(−1.53)
Institutional Investors Monitoring Control Variables						
HHI_IO_{t-1}	X	X	X	0.582**	0.560**	0.529**
	X	X	X	(2.56)	(2.44)	(2.32)
$TURNOVER_{t-1}$	X	X	X	−0.058	−0.071	−0.074
	X	X	X	(−1.15)	(−1.42)	(−1.40)
$PORTFWEIGHT_{t-1}$	X	X	X	−0.015	−0.011	−0.018
	X	X	X	(−0.23)	(−0.17)	(−0.28)
$MULTIBLOCK_{t-1}$	X	X	X	−0.007	−0.000	−0.001
	X	X	X	(−0.39)	(−0.02)	(−0.82)
Industry Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Obs.	1,122	1,122	1,122	1,122	1,122	1,122
Adjusted R^2	0.128	0.125	0.125	0.141	0.135	0.134

Note: The table presents the results of pooled OLS regressions of changes in firm's real earnings management following pension funds reform in 2013 with fixed industry and year effects. TREAT is and indicator variable coded as one if the firm has at least one pension fund ("OFE") blockholder in year 2013, where blockholder is defined as holding at least the 5% of the firm's shares outstanding. Num_OFE and OFE_AvgNum are both OFE blockholding characteristics. A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table 5. Blockholder exit threat and real earnings management – controlling for incentives to engage in earnings manipulation

	REM		
	(1)	**(2)**	**(3)**
Intercept	−0.128**	−0.133**	−0.124*
	(-2.01)	(-2.03)	(-1.94)
Treatment Effects			
TREAT	0.060*	0.062*	0.059*
	(1.72)	(1.76)	(1.69)
TREAT x POST x 1 {BENCHBEAT =1}	−0.069**	X	X
	(-2.57)	X	X
TREAT x POST x 1 {BENCHBEAT =0}	−0.023	X	X
	(-0.99)	X	X
TREAT x POST x 1 {OVERVALUED=1}	X	−0.066**	X
	X	(-2.40)	X
TREAT x POST x 1 { OVERVALUED=0}	X	0.005	X
	X	(0.17)	X
TREAT x POST x 1 {INSIDERNETSELL=1}	X	X	−0.076***
	X	X	(-2.66)
TREAT x POST x 1 { INSIDERNETSELL =0}	X	X	−0.020
	X	X	(-0.83)
General Control Variables	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Obs.	1,122	1,080	1,074
Adjusted R^2	0.130	0.131	0.131

Note: The table presents the results of pooled OLS regressions of changes in firm's real earnings management following pension funds reform in 2013 with the treatment effect interacted with incentives to engage in earnings manipulation and including fixed industry and year effects. A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table 6. Blockholder exit threat and real earnings management - the effect of insiders' wealth sensitivity (IWS) to stock prices

	REM		
	(1)	**(2)**	**(3)**
Intercept	−0.124*	−0.128*	−0.131**
	(-1.95)	(-1.87)	(-2.06)
Treatment Effects			
TREAT	0.063*	0.065*	0.059*
	(1.81)	(1.87)	(1.70)
TREAT x POST x 1 {MB_OWNERSHIP_HIGH=1}	−0.123***	X	X
	(-3.98)	X	X
TREAT x POST x 1 {MB_OWNERSHIP_HIGH=0}	0.019	X	X
	(0.66)	X	X
TREAT x POST x 1 {MB&SB_OWNERSHIP_HIGH=1}	X	−0.110***	X
	X	(-4.02)	X
TREAT x POST x 1 {MB&SB_OWNERSHIP_HIGH=0}	X	0.020	X
	X	(0.62)	X
TREAT x POST x 1 {STOCK_COMP =1}	X	X	−0.102*
	X	X	(-1.70)
TREAT x POST x 1 {STOCK_COMP =0}	X	X	−0.033
	X	X	(-1.43)
General Control Variables	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Obs.	1,122	1,122	1,122
Adjusted R^2	0.149	0.145	0.130

Note: The table presents the results of pooled OLS regressions of changes in firm's real earnings management following pension funds reform in 2013 with the treatment effect interacted with insiders' wealth sensitivity to stock prices and including fixed industry and year effects. A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table 7. Blockholder exit threat, managerial entrenchment and real earnings management

	REM		
	Full Sample	**High IWS**	**Low IWS**
	(1)	**(2)**	**(3)**
Intercept	−0.129**	0.009	−0.199**
	(-2.03)	(0.09)	(-2.48)
Treatment Effects			
TREAT	0.060*	0.037	0.090*
	(1.72)	(0.67)	(1.92)
TREAT x POST x 1 {DUALCLASS = 1}	−0.106**	−0.165***	0.048
	(-2.03)	(-3.37)	(0.67)
TREAT x POST x 1 {DUALCLASS = 0}	−0.022	−0.046	−0.003
	(-0.89)	(-1.35)	(-0.11)
General Control Variables	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Obs.	1,122	552	570
Adjusted R^2	0.133	0.224	0.121
CHOW-test:			
Difference in coefficient on TREAT x POST x 1 {DUALCLASS = 1} (HIGH – LOW)			−2,946

Note: The table presents the results of pooled OLS regressions of changes in firm's real earnings management following pension funds reform in 2013 with the treatment effect interacted with insiders' entrenchment and including fixed industry and year effects. Model (2) shows results for subsample of firms with high (above sample median) insiders' wealth sensitivity to stock prices and model (3) for subsample of firms with low insiders' wealth sensitivity level, respectively.

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

Table 8. Blockholder exit threat and real earnings management after Propensity Score Matching (PSM)

Panel A - Univariate Test of Differences of Subsamples in the Year Before the Reform (2013)

	PSM TREATEMENT SAMPLE		PSM CONTROL SAMPLE		MATCHING QUALITY	
	Obs.	Mean	Obs.	Mean	Mean diff.	p-value
Covariates from Selection Equation						
MCAP	43	0.016	43	0.019	0.003	0.65
SHARETURN	43	-7.235	43	-6.980	0.255	0.33
DYIELD	43	0.013	43	0.019	0.006	0.35
WIG20	43	0.000	43	0.023	0.023	0.32
SGR3Y	43	0.100	43	0.103	0.003	0.95
BHAR1Y	43	0.374	43	0.361	-0.013	0.93
DPROF	43	0.791	43	0.837	0.047	0.53
BETA2Y	43	0.442	43	0.508	0.066	0.41
TRISK	43	0.008	43	0.010	0.002	0.02
PROPENSITY SCORE	43	0.449	43	0.449	0.000	0.55
Real Earnings Management						
REM	43	-0.188	43	-0.276	-0.089	0.14
OFE Blockholding Characteristics						
Num_OFE (number)	43	1.814	43	0.000	-1.814	0.00
OFE_AvgNum(number)	43	5.833	43	0.000	-5.833	0.00

Panel B – Multivariate analysis for PSM sample

	REM		
	(1)	(2)	(3)
Intercept	−0.077	−0.057	−0.063
	(-1.03)	(-0.79)	(-0.86)
Treatment Effects			
TREAT	0.138***	X	X
	(2.69)	X	X
TREAT x POST	−0.069*	X	X
	(-1.85)	X	X
Num_OFE	X	0.102**	X
	X	(1.99)	X
Num_OFE x POST	X	−0.070**	X
	X	(-2.42)	X
OFE_AvgNum	X	X	0.049*
	X	X	(1.91)
OFE_AvgNum x POST	X	X	−0.037**
	X	X	(-2.22)
General Control Variables	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Obs.	516	516	516
Adjusted R^2	0.122	0.102	0.098

Note: Panel A gauges matching quality of the basic dependent and independent variables for the propensity score matched treatment and control samples. The table in panel B presents the results of pooled OLS regressions of changes in firm's real earnings management following pension funds reform in 2013 using this propensity score matched sample.

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

Table 9. Blockholder exit threat and real earnings management: parallel trends analysis

	REM
	(1)
Intercept	−0.125*
	(-1.92)
Treatment Effects	
TREAT	0.081**
	(2.42)
TREAT x BEFORE (t = - 1)	−0.034
	(-1.59)
TREAT x BEFORE (t = 0)	−0.023
	(-1.01)
TREAT x AFTER (t = 1)	−0.085***
	(-3.10)
TREAT x AFTER (t = 2)	−0.036
	(-1.64)
TREAT x AFTER (t = 3)	−0.060**
	(-2.18)
General Control Variables	YES
Industry Fixed Effects	YES
Year Fixed Effects	YES
Obs.	1,122
Adjusted R^2	0.127

Note: The table presents the results of pooled OLS regressions of changes in firm's real earnings management in individuals years including fixed industry and year effects. A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table 10. Blockholder exit threat and real earnings management – alternative explanations and estimation method

	NEW BLOCK FORMATION	ANALYST FOLLOWING DECREASE	EM METHODS MIX	FAMILY CONTROL	FIXED EFFECTS
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Intercept	−0.044	−0.149**	−0.102	−0.111*	−0.064
	(-0.62)	(-2.02)	(-1.60)	(-1.69)	(-0.60)
Treatment Effects					
TREAT	0.070*	0.062*	0.062*	0.060*	X
	(1.74)	(1.78)	(1.81)	(1.71)	X
TREAT x POST	−0.057***	−0.041**	−0.039*	−0.041**	−0.037*
	(-2.76)	(-1.99)	(-1.95)	(-1.98)	(-1.88)
ANALYST	X	−0.018	X	X	X
	X	(-0.46)	X	X	X
AM	X	X	0.327***	X	X
	X	X	(4.76)	X	X
FF	X	X	X	−0.032	X
	X	X	X	(-0.95)	X
General Control Variables	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Obs.	912	1,122	1,122	1,122	1,122
Adjusted R^2	0.128	0.129	0.145	0.131	0.060

Note: The table presents the results of pooled OLS regressions of changes in firm's real earnings management following pension funds reform in 2013 with fixed industry and year effects using alternative model specifications and estimation method. A detailed description of the variables can be found in the Appendix. We estimate t-statistics (in parentheses) using robust standard errors clustered at the firm level. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.
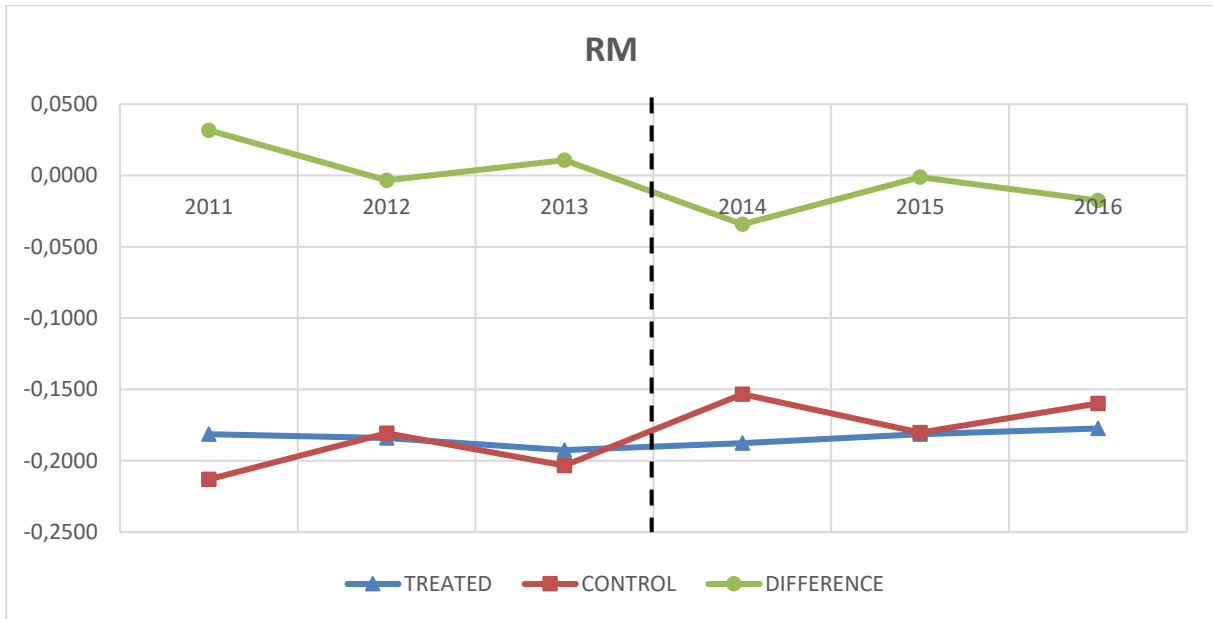
Figure 1. The real earnings management evolution around 2013 Pension Funds Reform
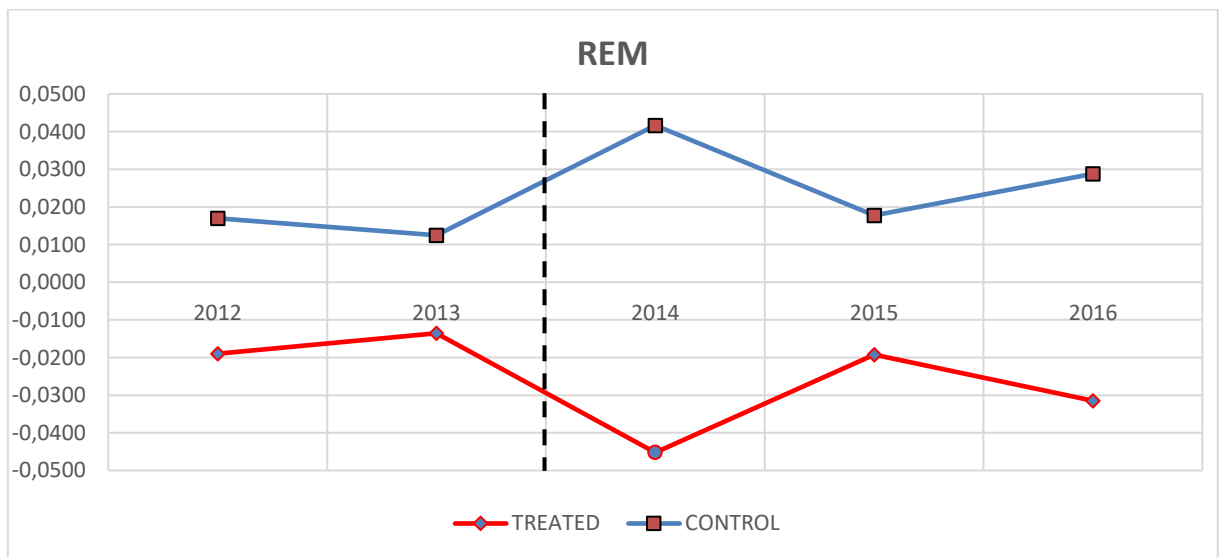
Figure 2. The real earnings management and parallel trend assumption. This figure plots the changes in REM in current year relative to 2011. The plotted REM is residual REM from the regression of REM on all control variables and fixed effects in Equation (1)