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Institutional ownership and firm operating performance Evidence from India

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Abstract

We examine whether, on average, positive (negative) changes in institutional investor owner- ship result in positive (negative) changes in firm operating performance. Monitoring hypothesis predicts that changes in institutional investor ownership would be positively related to operating performance. Arguments based on short-termism also predict that increases (decreases) in own- ership will increase (decrease) in operating performance. We test this prediction by regressing large changes in firm operating performance on large changes in institutional investor ownership and other control variables. Our empirical analysis is based on firm-level data of NSE listed firms during the period 2001 to 2016. To correct for endogeneity due to selection bias (as institutional investors do not invest in firms randomly), we also use a treatment effect model. We find a positive relationship between large increases in institutional investor ownership and changes in operating performance. This result is significant across both domestic and foreign institutional investors. However, further studies are required to establish whether these improvements in operating performance are a result of a their myopic investment orientation or due to improved monitoring '.

JEL classification: D21, M21, G14, G31, G32, G34, G35

Keywords: Institutional ownership; Foreign investors; Capital market imperfections; Agency problems; Monitoring; Performance

1 Introduction

Institutional investors are becoming a potent force in emerging markets; they provide the much-needed liquidity in financial markets and are also becoming adept at shareholder activism. Therefore, in recent times, there has been increasingly great interest by both regulators and re- searchers to understand whether these investors monitor, discipline and influence promoters and corporate managers. Researchers have long argued that institutional investors could pro- vide better firm monitoring (Grossman & Hart, 1980; Shleifer & Vishny, 1986) and improve price informativeness (Lin et al., 2007). In an emerging market like India, plagued with poor capital market regulation and weak enforcement of corporate governance laws (Khanna & Palepu, 2000), the role of institutional investors could be vital in improving firm operating performance. How- ever, some argue that institutional investor ownership is not without its demerits. Few scholars (Jacobs, 1991; Porter, 1992; Laverty, 1996) have argued that institutional investors can intensify managerial myopia and thus prevent long-term value creation. These investors have also been accused of increasing stock market volatility around news and earnings announcements (Dennis & Strickland, 2002; Sias, 1996; Xu & Malkiel, 2003). Considering the merits and demerits of insti- tutional investor participation in financial markets, are they, on average, beneficial to emerging markets?. The goal of this study is to examine the dynamics of institutional investor owner- ship and its impact on changes in firm operating performance to better understand their role in emerging markets.

Multiple studies have looked at the impact of institutional holdings on firm operating perfor- mance, but have found mixed results. One of the reasons for inconclusive evidence on this topic could be the use of OLS fixed effects to estimate the relationship. Though the firm fixed effects method could address endogeneity due to unobservable heterogeneity, the lack of time variation in institutional investor ownership, in a majority of firms in the sample, could reduce the power of the test[1]. Also, small changes in institutional investor ownership are also less likely to be exogenous to firm operating performance and make minimal changes to the firms' contracting environment. Therefore, we cannot expect these changes to impact subsequent firm operating performance. Hence, we focus on large changes[2] in institutional investor ownership and ex- amine their impact on firm operating performance in the subsequent year. We use ROA as the measure of operating performance. To examine this relationship, OLS can be used to provide unbiased estimates in the absence of endogeneity. However, we do not expect it to be so. Large

[1] Zhou(2001) makes this argument regarding managerial ownership and argue that the lack of time variation in own- ership reduces the power of fixed effect regressions

[2] Himmelberg, Hubbard and Palia (1999), while studying managerial ownership, suggests that focusing on large ex- ogenous changes in ownership would be useful in examining the relationship between ownership and firm performance

changes in institutional investor ownership in emerging market firms is likely to be endogenous to firm characteristics and result in non-random treatment assignment, biasing OLS estimates. Therefore, to mitigate endogeneity concerns, we use a treatment effect model (which includes an equation to model selection) and estimate the model using the Maximum likelihood method.

The study finds that an increase (decrease) in institutional investor ownership in a year in- creases (decreases) the operating performance of the firm in the subsequent year. Additionally, we also examine whether the geographical proximity of institutional investors to their target firms influence this relationship. Proximity is argued to be an important differentiator as it could create differences with respect to barriers to capital flows, institutional restrictions and informa- tion asymmetry (Doukas & Travlos, 1988; Baik et al., 2010). We, therefore, test these relationships separately for changes in domestic and foreign institutional investor ownership. We find that in- creases in foreign institutional investor (FII) ownership and domestic institutional investor (DII) ownership have a significantly positive influence on operating performance. With regard to de- creases in ownership, only decreases in FII ownership is seen to result in a reduction in operating performance. Overall, the results suggest the interpretation that institutional investors may be improving short-term operating performance.

The rest of this article is organised as follows. Section 2 reviews the literature. Section 3 describes the research design, which includes data, methodology and variables used. The findings are discussed in Section 4, and Section 5 concludes the article.

2 Related literature

2.1 Theoretical predictions

Extant research has identified multiple channels by which institutional investors could influence firm operating performance. One view argues that institutional investors provide better moni- toring and thereby improve firm operating performance. This argument stems from the belief that institutional investors could provide better monitoring of the firm - as they hold larger block holdings and therefore have greater incentives to monitor the firm[3] (Shleifer & Vishny, 1986; Admati et al., 1994). Research by McConnell & Servaes (1990), Nesbitt (1994), Smith (1996) and Del Guercio (1996) find that monitoring by institutional investors results in greater managerial orientation to firm operating performance and less on opportunistic self serving behaviour. Con- sistent with it, Chung et al. (2002) finds that large institutional shareholdings deter managers

[3]In Japanese corporations, banks, which have relatively larger shareholding, are observed to perform a greater role in corporate governance (Kang & Shivdasani, 1995; Kaplan & Minton, 1994)

from engaging in earnings management. In addition to direct monitoring and activism through voting, institutional investors even use media to pressure the firms‘ management (Connelly et al., 2010) and try to influence them by publicly announcing their opposition to firm decisions (David et al., 2001). Even low cost intervention strategies like the “Just vote no” campaigns (Del Guercio et al., 2008) and even non-intervention strategies, like using the ”threat of exit”[4], by institutional investors are known to discipline management and align their interests in line with shareholders. The benefits of improved monitoring by institutional investors can also accrue to firms indi- rectly by a reduction in their cost of capital. Improved monitoring can be expected to reduce agency costs (Easterbrook, 1984; Jensen, 1986) and thereby decrease the firms risk of default in bond markets. This implies that the presence of institutional investors could lower the required yield on debt capital, effectively reducing the firms’ cost of debt. Bhojraj & Sengupta (2003) provides evidence consistent with this argument and finds that firms with greater institutional investor ownership have lower bond yields and higher bond ratings on their new issues. A lower cost of capital can also be achieved by reducing the information asymmetry between the firm and the capital markets. Voluntary disclosures by firms could be a step in this direction but in some cases, it may be in the self interest of the managers not to fully disclose their private informa- tion[5]. Market intermediaries like financial analysts and rating agencies then become valuable to markets since they interact closely with corporate managers and reveal the superior information with managers (Healy & Palepu, 2001; Brennan & Subrahmanyam, 1995). Analyst following is also found to improve information dissemination (Hong et al., 2000; Brennan et al., 1993) and price efficiency (Ljungqvist et al., 2007; Boehmer & Kelley, 2009). Since analyst following is pos- itively related to institutional holdings (Brennan & Subrahmanyam, 1995; O’Brien & Bhushan, 1990), the presence of institutional holdings in a firm can be expected to improve information dissemination and also price efficiency[6]. As noted by Brennan & Tamarowski (2000), a reduction in information asymmetry would then allow a stock to improve its market liquidity, resulting in a lower required rate of return. A lower cost of capital will help the firms to expand their oppor- tunity set for investment projects, generate a greater return on invested capital and ultimately an improvement in firm operating performance. These arguments suggest that an increase (de- crease) in institutional investor ownership is likely to increase (decrease) both measures of firm operating performance.

Another view is based on the assumption that institutional investors have short investment

[4] McCahery et al. (2016) surveyed institutional investors in the US and notes that 42% of the respondents consider the ‘threat of exit’ as a tool to discipline the management

[5] This can be considered to be a manifestation of the ‘lemons problem’ as decscribed in Akerlof (1978)

[6] Institutional trades also improve price efficiency since they are better informed than individual investors (Lin et al., 2007) and also because they trade aggressively to exploit mispricing, usually around earning announcements (Boehmer & Kelley, 2009)

horizons[7]. Their short-term focus would then encourage managers to boost short-term earnings at the cost of long-term value (Jacobs, 1991; Porter, 1992; Laverty, 1996). This influence on man- agerial decision making, termed as "institutionally induced myopia", encourages managers to under-invest (Bushee, 1998) in R&D and other capital expansion projects so as to improve cur- rent earnings, thereby reducing long-term firm value[8]. These arguments suggest that an increase (decrease) in institutional investor ownership is likely to result in an increase (decrease) in the short term operating performance.

Summary of the hypotheses

	Predicted changes in Operating performance
Increase in Institutional Investor ownership	(+) Monitoring hypothesis (+) Short termism hypothesis
Decrease in Institutional Investor ownership	(-) Monitoring hypothesis (-) Short termism hypothesis

Notes: The table shows the expected association of changes in institutional investor ownership with changes in operating performance in the near term (i.e. subsequent year). The notation '+/-' indicates a positive/negative change in the variables. 'x' denotes no relationship.

[7] Lakonishok et al. (1992) finds evidence for positive feedback trading and high turnover among institutional investors

[8] However, this negative relationship can be expected to be weaker in the presence of a controlling shareholder as they have greater incentives to maximize long-run value (Demsetz & Lehn, 1985)

2.2 Empirical evidence

In this literature, prior studies have found mixed results. While some studies (McConnell & Ser- vaes, 1990; Cornett et al., 2007; Gugler et al., 2008) find a positive relation between institutional investor ownership and various measures of performance, some others (Agrawal & Knoeber, 1996; Bethel et al., 1998; Faccio & Lasfer, 2000) find no significant relation. Recent studies find a positive relationship between institutional investor ownership and firm operating performance. Cornett et al. (2007) find a significant positive relationship between operating cash flows and both the per cent of institutional investor ownership and the number of institutional stockhold- ers. Elyasiani & Jia (2010) find a positive relationship between firm operating performance and ownership stability. Gugler et al. (2008) also find a positive relationship in the USA but observe a negative impact in other Anglo-Saxon countries and Europe.

In the Indian context, studies find evidence for only foreign institutional investor (FII) owner- ship in improving firm value. Sarkar & Sarkar (2000) evaluate Indian firms and find no evidence of institutional investors, especially mutual funds, being active in governance. However, they find that foreign equity ownership has a beneficial effect on firm value. Another study by Pati- bandla (2006), in the Indian context, also find that foreign institutional investors have a positive effect on corporate profitability. Douma et al. (2006) also study the effect of institutional investor ownership on firm operating performance and find differing results, for different performance measures. When they use ROA as the performance measure, they find that domestic institu- tional investors have a positive impact whereas when they use Tobin's Q as the performance measure, they find that only foreign institutional investor ownership have a postiive impact. In a cross-country study spanning 27 countries, including India, Ferreira & Matos (2008) find that firms with higher ownership by foreign and independent institutional investors have higher firm valuations and better operating performance.

3 Research design

3.1 Data

Our sample consists of all non-financial firms listed on the National Stock Exchange (NSE)[9] from 2001 to 2016. The data is obtained from the CMIE's ProwessIQ database which provides balance sheet, income statement and ownership information.

To select the final sample, we further adopt the following criteria. Firstly, we remove min- ing, and electricity firms from the sample as these are highly regulated in India. Secondly, we remove government-owned firms (where the central or state governments have more than 50% direct ownership stake) as priorities of government firms may not always be profit maximisation. Thirdly, to make sure our results are not driven by small stocks, we remove firms with total assets less than Rs.100 million. Fourthly, to remove the effect of distressed firms, we remove all firms with non-positive net worth. Fifthly, we drop those firm-years observations from the sample if they lack the corresponding data on ownership or if the data is missing for any of the variables required for the study. Also, to control for the influence of outliers, we winsorise all variables at the 1% and 99% levels. Thus, we are left with a final sample of 10,650 firm-year observations (from 1,049 distinct firms) for the analysis. Table 1 provides information on the number of firms removed at each stage of sample restriction.

[Insert Table 1 here]

3.2 Methodology

To understand the impact of institutional investor ownership on firm operating performance, we regress changes in firm operating performance on lagged changes in institutional investor own- ership and other control variables. We measure firm operating performance using ROA. Also, we use lagged changes in institutional investor ownership as it takes time for them to influence firm decisions. Similar justification for using a lagged ownership variable in the specification was made by Cornett et al. (2007) and Grinstein & Michaely (2005).

Equation (1) shows the main equation we use to examine the relationship. Here, ΔROA_{it+1} denotes the change in firm operating performance. The explanatory variable of interest is the

[9]The National Stock Exchange (NSE) is the twelfth largest exchange in the world in terms of market capitalization as of March 2016. According to WFE statistics for the year ended 2012, NSE is also the largest exchange in terms of turnover in equity shares globally.

change in institutional investor ownership, denoted as $\Delta Ownership_{it}$ (it will be further denoted as Δk_{it} for brevity). ΔZ_{it} denotes the vector of covariates (control variables) used to explain changes in firm operating performance and ϵ is the error term.

$$\Delta ROA_{it+1} = \alpha + \beta \Delta Ownership_{it} + \lambda \Delta Z_{it} + \epsilon_{it+1} \quad (1)$$

Though equation (1) can be estimated using OLS, it can provide biased estimates in the pres- ence of endogeneity. In this estimation, we expect endogeneity to be present due to selection bias, induced by non-random treatment assignment; the 'treatment' being the change in institutional investor ownership in a firm. Extant research has shown that this is infact true. Institutional investors, especially in emerging markets, do not select their portfolio firms at random. They have a strong preference for large firms and for firms with good governance (Ferreira & Matos, 2008). Studying the investment preferences of actively managed US mutual funds in emerging markets, Aggarwal et al. (2003) also finds that these funds allocate more of their assets to large growth firms with high analyst following and low leverage. Patnaik & Shah (2013), studying the investment of foreign institutional investors (FIIs) in Indian equity market also note similar preferences. They find that FIIs favor firms with low promoter (insider) holdings, high beta, low volatility and low age. Institutional investors are also known to engage in herding and positive feedback trading. Nofsinger & Sias (1999) and Froot et al. (2001) finds evidence consistent with positive feedback trading by international investors in emerging markets.

In the presence of non-random treatment assignment, the 'treatment' variable ($\Delta Ownership$) would be correlated with the error term ϵ. One solution to this endogeneity problem is to use an instrumental variable i.e. to find a variable that is not correlated with ϵ but, highly correlated with $\Delta Ownership$ and to solve the equation using a least squares estimator. However, in practice, finding such an instrument is not easy. It is for this reason that we use a 'treatment effect model', which models the selection (non-random assignment) process. The treatment effect model is expressed using two equations - a regression equation (equation 1) and a selection equation (equation 2). Here, ΔW_{it} is the vector of covariates used to model the treatment assignment (i.e.
change in institutional investor ownership). ΔZ_{it} and ΔW_{it} are assumed to be unrelated to the error terms i.e. they are considered to be exogeneous.

$$\Delta k^*_{it} = \varphi + \gamma \Delta W_{it} + \upsilon_{it}$$

$$\text{where } \Delta k_{it} = \begin{cases} 1 & \text{if } \Delta k^*_{it} > 0; \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

.

The model expressed by equations (1) and (2) is a switching regression. If we substitute

equation 2 in equation (1), we get two different equations of the outcome regression. This is similar to Quandt (1958, 1972) form of switching regression model which states that there are two regimes: treatment and non-treatment. To obtain unbiased estimates, we correct for selection bias induced by non-random treatment assignment by jointly estimating equation (1) and equation

(2) using the Maximum Likelihood method[10].

In the equations, *ROA* measures operating performance and is calculated as PBDITA scaled by total assets. In our estimations, we distinguish between increases and decreases in insti- tutional investor ownership and estimate them separately as they can have a different impact on firm operating performance. $\Delta Ownership_{it}$ is a dummy variable which takes a value of 1 if $|\Delta Ownership| \geq$ threshold and 0 otherwise. The variable $\Delta Ownership_{it}$ (*increase*) will take a value of 1 if *Ownership* $\geq$ threshold (and 0 otherwise) and the variable $\Delta Ownership_{it}$ (*decrease*) will take a value of 1 if *Ownership* $\leq$ threshold (and 0 otherwise). The thresholds chosen are 1% and 2.5%. We use lagged changes in institutional investor ownership and examine their impact on changes in firm operating performance. We lag our variable of interest and other explana- tory variables by a period as it takes time for institutional investors to influence firm decisions. Similar justification for using lagged ownership in the model specification was made by Cornett et al. (2007) and Grinstein & Michaely (2005). Z and W stands for vectors of firm characteristics (control variables). ϵ and υ are the stochastic error terms in these equations.

3.2.1 Other sources of endogeneity

Another source of endogeneity in studies in empirical corporate finance is from simultaneity. However, in our estimations, we do not expect it to be a concern as the explanatory variables are lagged by a period. Firm operating performance in the period $t + 1$ is unlikely to influence changes in ownership and control variables in the period t. However, Bellemare et al. (2017) cautions researchers in using lagged explanatory variables for identification. The authors argue that "lagging explanatory variables as a response to endogeneity moves the channel through which endogeneity biases parameter estimates". They argue that if the lagged dependent variable is part of the data generating process and if it is correlated to the explanatory variables, then endogeneity would still be present. Keele & Kelly (2006) also makes a similar argument and writes that not including a lagged term, when it is correctly the part of the data generating process, OLS would be biased due to an omitted variable, with the bias worsening as the value of autoregressive coefficient increases.

[10]The likelihood function for the model is provided on page 122 of Maddala (1986). We estimate the equations using the *etregress* in *Stata*

3.3 Variable definitions

Our measure of firm performance is the operating cash flow return on assets (ROA). Cornett et al. (2007) argues that this is a better measure as it is a focused measure of current performance, as it does not reflect future growth opportunities. It is measured as profits before depreciation, interest, tax and amortisation (PBDITA) divided by the book value of total assets.

The main variable of interest is change in institutional investor ownership in a firm. We mea- sure ownership as the shares held by investor categories as a percentage of the total number of shares outstanding at the end of the year. The institutional investor ownership as on year *t* is defined as the total institutional investor ownership as of March 31st of that year. If the holding data is found missing in the last quarter of each year, the missing value is replaced by a non-missing value in any of the four quarters preceding that quarter. If the data is found missing even after such a correction, the firm-year data is removed from the analysis. We also classify institutional investor ownership into two categories based on their geographic origin - domestic and foreign investors. Domestic institutional investor ownership is calculated by aggre- gating the percentage holdings held by mutual funds, banks, financial institutions and insurance companies. Foreign institutional investor ownership is the percentage of holdings held by for- eign portfolio investors[11], which includes university funds, endowments, foundations, charitable trusts and charitable societies which have a track record of 5 years and which are registered with a statutory authority in their country of incorporation or establishment.

[Insert Table 2 here]

3.3.1 Control variables

Table 2 provides the definitions of all the variables used in this study. When the 'Change in ROA' (ΔROA) is used as the measure of change in firm operating performance, we use the following controls in the main equation. Following Cornett et al. (2007); Yuan et al. (2008); Elyasiani & Jia (2010), we include firm size (proxied by total sales and total assets), leverage, investment, tangi- bility and market adjusted returns to impact measures of firm operating performance. Therefore, when ΔROA is used as the dependent variable, we use lagged measures of sales growth, market adjusted returns, changes in log of total assets, changes in leverage, changes in investment and changes in tangibility as controls in our main equation. In the selection equation, in addition to all the variables we have used in the main equation, we also include changes in Q, changes

[11] SEBI FII Regulations - http://www.sebi.gov.in/cms/sebi data/commondocs/pt1b5 h.html

in idiosyncratic volatility, changes in turnover, changes in beta and changes in cash holdings as additional variables determining the changes in institutional investor ownership in a firm, fol- lowing Ferreira & Matos (2008).

[Insert Table 3 here]

Table 3 presents the summary statistics for the sample. The sample contains 10,650 firm-year observations, from 1049 firms over the years 2001 to 2016. The average change in ROA across the sample period has been -0.4%. The institutional investor ownership dummy measures provide us with information as to how many firms had large changes in Ownership. Across the sample period, we find that on average 22.9% of the firms experienced greater than 1% increase in in- stitutional investor ownership and 14.3% experienced increases greater than 2.5%. With regard to decreases in ownership, we find that on average 27.4% of the firms experienced decreases in ownership more than 1% and 16.7% experienced decreases larger than 2.5%. Across investor categories, there are greater instances of 1% and 2.5% increases in FII ownership as compared to DII ownership. The average change in promoter ownership is positive during the sample period and is equal to 21.7%. Table 5.3 shows the correlation matrix between all the variables.

[Insert Table 4 here]

4 Results & discussion

This section provides the results from the estimations. Table 4 reports the results of the OLS estimation of equation (1) i.e. regression of the change in ROA from period t to $t + 1$ on changes in institutional investor ownership from year t-1 to t and changes in other control variables. The change in ownership variable is an indicator variable which denote changes in institutional investor ownership from year t-1 to t. In all the regressions, changes in institutional investor ownership are decomposed into positive and negative changes and included separately, i.e. we allow different slopes for positive changes and negative changes. In columns (1) & (2), the indicator variable for changes in institutional ownership takes a value of 1 if the change is greater than 1% and zero otherwise. In columns (3) & (4), the indicator variable takes a value of 1 if the change is greater than 2.5% and zeroes otherwise. To elaborate, the variable 'change in institutional ownership (increase)' will take a value of 1 if the change is greater than the threshold (be it 1% or 2.5%) and the 'change in institutional ownership (decrease)' will take a value of 1

if the change is less than threshold (be it -1% or -2.5%). Also note that in columns (2) & (4), the changes in total institutional investor ownership is decomposed separately into changes in domestic and foreign institutional investor categories. All explanatory variables are calculated as
changes from year $t-1$ to year t. Note that a negative coefficient on ownership (decrease) means that a decrease in ownership results in a decrease in ROA.

The results in coloumn (1) show that large decreases in institutional investor ownership (greater than 2.5%) results in a decrease in ROA in the subsequent year. Across investor cat- egories, results from coloumn (2) show that large decreases in FII ownership results i a decrease in ROA in the subsequent year. Results from coloumn (3) show that large increases (decrease) in institutional ownership (greater than 2.5%) results in a decrease (increase) in ROA in the sub- sequent year. Across investor categories, results from coloumn (4) show that this relationship is significant for FIIs. However, we do not find evidence that large increases or decreases in DII impact changes in operationg performance. Overall, the results seems to indicate that large changes in institutional ownership result in large changes in operating performance.

The results from the OLS estimation are supportive of our predictions that an increase (de- crease) in institutional investor ownership would increase (decrease) the operating performance. However, as discussed earlier, the results from the OLS estimation could be biased in the presence of a non-random treatment assignment. Therefore, we use a treatment effect model, wherein we include a selection equation to model the non-random assignment and then estimate the two equations jointly using the Maximum Likelihood method.

[Insert Table 5 here]

Table 5 and 6 reports the results from using the treatment effect model. In table 5, the changes in ROA are regressed on lagged changes in institutional investor ownership at the 1% threshold. The main equation and selection equation follow the specification as in equation (1) and (2). In these regressions, increases and decreases in ownership are estimated using separate equations as the selection equation would be different for each. The coefficient estimates from each of the estimations are shown across columns (1) to (5). The results show that an increase (decrease) in institutional investor ownership results in an increase (decrease) in operating performance and these are significant as well. Note that a negative coefficient on the variable 'ownership (decrease)' means that a decrease in ownership results in a decrease in ROA. Across investor categories, the results are similar and significant for changes in foreign institutional investor ownership. However, for changes in domestic institutional investor ownership, the results are found to be significant only for increases in ownership. In table 6, the changes in ROA are re-

gressed on changes in institutional investor ownership at the 2.5% threshold. In these regressions also, increases and decreases in ownership are estimated using separate equations as the selec- tion equation used is different for each. Here, we find that an increase in institutional investor ownership has a positive impact on change in operating performance and the results are statis- tically significant as well. Across investor categories, the results are similar and are significant for changes in foreign institutional investor ownership. However, for changes in domestic insti- tutional investor ownership, these are significant only for increases in ownership.

[Insert Table 6 here]

The tables also provide the results of the test of independence (likelihood ratio test) between the main equation and the selection equation. This is necessary because the treatment effect model assumes a non-zero correlation between the error term of the main equation and the selection equation. Therefore we test for "H0: ρ=0", where ρ is the estimated correlation between
ϵ_{it}, the error term in the main equation, and ε_{it}, the error term in the selection equation. If we are able to reject this hypothesis at a significant level and prove that ρ is different from zero, then we are justified in using a treatment effect model. If ρ=0, then even OLS estimates are unbiased and can be used to make inferences. In table 5, we find that for the equation estimated
in column (6), we cannot reject the hypothesis that ρ is different from zero. Therefore, we can consider the results from the OLS estimation to be valid for examining the impact of changes in domestic institutional investor ownership (at 1% threshold) on changes in firm operating performance. However, for decreases in domestic institutional investor ownership, we find that the coefficients from the OLS estimation are also not significant. In table 6, we find that for the equations estimated in columns (2) and (6), ρ is not significantly different from zero and that OLS estimates are unbiased and valid. The results from the OLS estimation show that a decrease in all institutional investor ownership results in a decrease in operating performance and that this relationship is significant at the 1% level. Decreases in domestic institutional investor ownership are also observed to result in a decrease in performance, but this relationship is not significant.

To summarize, we find that increases (decreases) in total institutional investor ownership results in increases (decreases) in operating performance. Across investor categories, these re- sults hold for ownership changes (both increases and decreases) in foreign institutional investor ownership and for increases in ownership by domestic institutional investors. These results are consistent with both the monitoring hypothesis and the short termism hypothesis.

5 Conclusion

This study investigates whether, on average, institutional investor ownership improves or de- grades firm operating performance. We examine large changes in institutional investor own- ership and examine their influence on firm operating performance. Since institutional investor ownership in a firm is not random, we use a treatment effect model to mitigate endogeneity concerns due to non-random assignment of treatment effect and estimate using the maximum likelihood method.

We find that changes in institutional investor ownership positively and significantly affects operating performance. Across investor categories, FIIs and DIIs also show similar results for large increases in ownership. The results highlight the importance of institutional investors in capital markets and their impact on firm operating performance. However, further studies are required to establish whether these improvements in short-term operating performance is a result of a myopic investment orientation or due to improved monitoring of the firm.

One potential limitation of this study is that there can be unobserved (time-varying) variables that are good predictors of future operating performance. If so, then the positive relationship we observe between changes in institutional investor ownership and changes in operating perfor- mance could be driven by the stock picking abilities of institutional investors. Considering the imperfect proxies in empirical corporate finance research, there could be some firm characteristic that we have failed to control and that could be driving the results. Further insights into the portfolio selection process of institutional investors in emerging markets is needed to delineate such an effect.

Table 1: Sample selection criteria

Criteria	Firm year observations
Initial sample	17,754
Less: utility and Mining firms	(458)
Less: government-owned firms	(390)
Less: firms with less than 100 million in Total Assets	(33)
Less: firms with negative net worth	(984)
Less: firms with missing ownership data	(493)
Less: firms with missing financial and control variables data	(4746)
Total firm-year observations for analysis	10,650

Table 2: Variable definitions

Name	Definition
Q	Market value of the firm divided by the book value of total assets, where market value of the firm is measured as book value of assets minus net worth plus the market value of equity
ROA	PBDITA divided by the book value of total assets
All Inst Ownership	The percentage of shares held by Institutional Investors
DII Ownership	The percentage of shares held by Domestic Institutional
Investors FII Ownership	The percentage of shares held by Foreign Institutional
Investors Promoter Ownership	The percentage of shares held by the promoter of the
firm Log(TA)	Logarithm of total assets
Log(TA) squared	Square of the logarithm of total assets
Sales growth	The percentage change in total sales over the previous year
Leverage	Book value of total assets minus net worth, scaled by total
assets	
Investment	Change in gross fixed assets, scaled by total assets
Tangibility	Gross fixed assets, scaled by total assets
Returns	Excess return (monthly) over the CNX 500 diversified index
Turnover	Daily turnover, averaged across the number of days on which the firm was traded on the National Stock Exchange (NSE)
Dividend Yield	Dividend per share divided by the market price of the share
Beta	Computed by regressing the weekly returns obtained on a stock against the weekly returns obtained on the COSPI (CMIE Overall Share Price Index). Weekly returns of the observations in the past five years are used in the computation. The data is obtained directly from Prowess IQ database
Cash holding	Cash and Cash equivalents held by the firm, scaled by total
assets Volatility	Idiosyncratic stock return volatility, obtained from the market
model	
	regression i.e. regression of monthly stock returns of each firm over the past five years on the monthly returns of the market index (CNX500) over the same period. We use (1-R squared) from the regressions as the measure of firm specific risk. Since (1-R Squared) is bounded, we use a logistic transformation of it. Our measure is Log[(1-R squared)/R squared]. We adopt this definition from Ferreira & Laux (2007)

All stock variables are measured as of the end of the financial year i.e. as of March 31st

Table 3: Summary statistics

This table reports the summary statistics for the year-on-year change in the main variables used in our study for the period 2001-2016. Variable definitions are provided in Table 2.

	N	Mean	Median	P25	P75	S.D.
Change in All Inst Ownership (1% increase) Dummy	10650	0.229	0.000	0.000	0.000	0.420
Change in All Inst Ownership (2.5% increase) Dummy	10650	0.143	0.000	0.000	0.000	0.350
Change in All Inst Ownership (1% decrease) Dummy	10650	0.274	0.000	0.000	1.000	0.446
Change in All Inst Ownership (2.5% decrease) Dummy	10650	0.167	0.000	0.000	0.000	0.373
Change in FII Ownership (1% increase) Dummy	10650	0.203	0.000	0.000	0.000	0.402
Change in FII Ownership (2.5% increase) Dummy	10650	0.126	0.000	0.000	0.000	0.332
Change in FII Ownership (1% decrease) Dummy	10650	0.182	0.000	0.000	0.000	0.386
Change in FII Ownership (2.5% decrease) Dummy	10650	0.110	0.000	0.000	0.000	0.313
Change in DII Ownership (1% increase) Dummy	10650	0.156	0.000	0.000	0.000	0.363
Change in DII Ownership (2.5% increase) Dummy	10650	0.083	0.000	0.000	0.000	0.276
Change in DII Ownership (1% decrease) Dummy	10650	0.238	0.000	0.000	0.000	0.426
Change in DII Ownership (2.5% decrease) Dummy	10650	0.122	0.000	0.000	0.000	0.327
Change in Promoter Ownership	10650	0.217	0.000	-0.020	0.440	5.141
Change in Log(TA)	10650	0.097	0.079	0.000	0.179	0.172
Change in Log(TA) Squared	10650	0.039	0.011	0.002	0.038	0.079
Change in ROA	10650	-0.004	-0.002	-0.028	0.022	0.061
Change in Q	10650	0.042	0.011	-0.129	0.176	0.606
Sales growth	10650	0.117	0.100	-0.014	0.224	0.308
Change in Leverage	10650	0.003	0.001	-0.030	0.036	0.074
Change in CapEx	10650	-0.006	-0.002	-0.037	0.026	0.127
Change in Tangibility	10650	0.004	0.000	-0.031	0.038	0.086
Returns	10650	18.864	-2.075	-28.520	37.330	93.545
Change in Turnover	10650	3.449	0.030	-2.290	3.910	174.259
Change in Volatility	10650	0.027	-0.011	-0.250	0.242	0.675
Change in Dividend Yield	10650	-0.003	0.000	-0.007	0.002	0.046
Change in Beta	10650	0.021	0.000	-0.050	0.090	0.157
Change in Cash holding	10650	0.005	-0.000	-0.002	0.004	0.052

All values in Millions

Table 4: Changes in ROA and changes in ownership (1% & 2.5% thresholds)

The table reports coefficients from regressions of changes in ROA on lagged institutional ownership changes and changes in other control variables. The dependent variable is the change in ROA from year *t* to *t*+1. In coloumns (1) & (2), the indicator variable takes a value of 1 if the change is greater than 1% and zero otherwise. In coloumns (3) & (4), it takes a value of 1 if the change is greater than 2.5% and zero otherwise. The variables definitions are provided in Table

2. Standard errors are corrected for heteroskedasticity and firm-level clustering. *t* statistics are given in parentheses. * $p < 0.05$, ** $p < 0.01$

	$\Delta Ownership_t$ (1% threshold)		$\Delta Ownership_t$ (2.5% threshold)	
Dependent variable - ΔROA_{it+1}	(1)	(2)	(3)	(4)
ΔAll Inst Ownership$_{it}$ (increase)	0.00281		0.00537**	
	(1.82)		(3.23)	
ΔAll Inst Ownership$_{it}$ (decrease)	-0.00430**		-0.00399*	
	(-2.92)		(-2.22)	
ΔFII Ownership$_{it}$ (increase)		0.00192		0.00365*
		(1.22)		(1.97)
ΔFII Ownership$_{it}$ (decrease)		-0.00672**		-0.00655**
		(-4.07)		(-3.26)
ΔDII Ownership$_{it}$ (increase)		0.00103		0.000812
		(0.60)		(0.36)
ΔDII Ownership$_{it}$ (decrease)		-0.00156		-0.00104
		(-1.09)		(-0.54)
ΔLog(TA)$_{it}$	-0.0381**	-0.0364**	-0.0386**	-0.0371**
	(-3.85)	(-3.70)	(-3.94)	(-3.79)
ΔLog(TA) squared$_{it}$	0.00889	0.00828	0.00887	0.00840
	(0.56)	(0.52)	(0.56)	(0.53)
Sales growth$_{it}$	-0.00103	-0.00120	-0.00104	-0.00104
	(-0.33)	(-0.38)	(-0.33)	(-0.33)
ΔLeverage$_{it}$	0.200**	0.199**	0.201**	0.200**
	(12.69)	(12.65)	(12.72)	(12.69)
ΔInvestment$_{it}$	0.000816	0.000375	0.000881	0.000182
	(0.13)	(0.06)	(0.14)	(0.03)
ΔTangibility$_{it}$	0.0694**	0.0701**	0.0691**	0.0700**
	(5.51)	(5.58)	(5.50)	(5.58)
Returns$_{it}$	0.0000113	0.0000104	0.0000112	0.0000108
	(1.33)	(1.23)	(1.32)	(1.28)
Constant	0.00912**	0.00886**	0.00840**	0.00833**
	(2.90)	(2.84)	(2.72)	(2.67)
Controls	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes
Observations	9062	9062	9062	9062
Adjusted R^2	0.070	0.071	0.070	0.070

Table 5: Changes in ROA and changes in ownership (1% threshold) - Treatment effect model

The table reports the results from the estimation of the Treatment Effect model. Here, changes in ROA are regressed on lagged changes in institutional ownership and changes in other control variables. In the main equation, the dependent variable is the change in ROA from year *t* to *t*+1. The explanatory variables are indicator variables which denote changes in institutional ownership from year *t*-1 to *t*. The indicator variable takes a value of 1 if the change is greater than 1% and zero otherwise. In the selection equation, the indicator variable for institutional ownership is regressed on changes in explanatory variables. The main equation and the selection equation are jointly estimated using the Maximum Likelihood method. In all the regressions, changes in institutional ownership are decomposed into positive and negative changes and estimated separately. *Q* is the market value of the firm divided by the book value of total assets. *ROA* is PBDITA divided by the book value of total assets. *All Inst Ownership* is the % of shares held by Institutional Investors. *DII Ownership* and *FII Ownership* is the % of shares held by Domestic and Foreign Institutional Investors respectively. Standard errors are corrected for heteroskedasticity and firm-level clustering. *z* statistics are given in parentheses. * $p < 0.05$, ** $p < 0.01$

	(1)	(2)	(3)	(4)	(5)	(6)
ΔAll Inst Ownership$_{it}$ (increase)	0.0485**					
	(8.02)					
ΔAll Inst Ownership$_{it}$ (decrease)		-0.0394**				
		(-3.01)				
ΔFII Ownership$_{it}$ (increase)			0.0461**			
			(6.23)			
ΔFII Ownership$_{it}$ (decrease)				-0.0498**		
				(-6.61)		
ΔDII Ownership$_{it}$ (increase)					0.0469**	
					(7.48)	
ΔDII Ownership$_{it}$ (decrease)						0.00270
						(0.11)
Constant	-0.00597**	0.0128**	-0.00187	0.0152**	-0.00497*	0.00346
	(-2.70)	(3.60)	(-0.92)	(6.04)	(-2.31)	(0.95)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9062	9062	9062	9062	9062	9062
LR test of indep. eqns. ρ=0 (p-value)	0.00	0.01	0.00	0.00	0.00	0.86

Table 6: Changes in ROA and changes in ownership (2.5% threshold) - Treatment effect model

The table reports the results from the estimation of the Treatment Effect model. Here, changes in ROA are regressed on lagged changes in institutional ownership and changes in other control variables. In the main equation, the dependent variable is the change in ROA from year *t* to *t*+1. The explanatory variables are indicator variables which denote changes in institutional ownership from year *t*-1 to *t*. The indicator variable takes a value of 1 if the change is greater than 2.5% and zero otherwise. In the selection equation, the indicator variable for institutional ownership is regressed on changes in explanatory variables. The main equation and the selection equation are jointly estimated using the Maximum Likelihood method. In all the regressions, changes in institutional ownership are decomposed into positive and negative changes and estimated separately. *Q* is the market value of the firm divided by the book value of total assets. *ROA* is PBDITA divided by the book value of total assets. *All Inst Ownership* is the % of shares held by Institutional Investors. *DII Ownership* and *FII Ownership* is the % of shares held by Domestic and Foreign Institutional Investors respectively. Standard errors are corrected for heteroskedasticity and firm-level clustering. *z* statistics are given in parentheses. * $p < 0.05$, ** $p < 0.01$

	(1)	(2)	(3)	(4)	(5)	(6)
ΔAll Inst Ownership$_{it}$ (increase)	0.0456**					
	(8.45)					
ΔAll Inst Ownership$_{it}$ (decrease)		-0.0186				
		(-1.61)				
ΔFII Ownership$_{it}$ (increase)			0.0373**			
			(4.44)			
ΔFII Ownership$_{it}$ (decrease)				-0.0451**		
				(-4.65)		
ΔDII Ownership$_{it}$ (increase)					0.0346**	
					(4.75)	
ΔDII Ownership$_{it}$ (decrease)						-0.0002
						(-0.03)
Constant	-0.00210	0.00610**	0.00151	0.00979**	0.000340	0.00383*
	(-1.09)	(2.75)	(0.82)	(4.50)	(0.18)	(2.13)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9062	9062	9062	9062	9062	9062
LR test of indep. eqns. ρ=0 (p-value)	0.00	0.23	0.00	0.00	0.00	0.93

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