# Earnings quality, business group affiliation and investment efficiency

Savita Rawat* and Neeru Chaudhry

**Abstract**

This paper examines the effect of earnings quality and business group affiliation on investment decisions through theoretical channels of agency and information asymmetry. Using a dataset of 18,927 firm-year observations covering the period 1997-2021, we find that both earnings quality and business group affiliation improve investment efficiency by reducing both over- and underinvestment. The positive relation between earnings quality and investments is more pronounced for group affiliates than for standalone firms suggesting the alignment effect outreaches entrenchment effect. Business group characteristics such as size, age, group resources, and cash flow rights significantly influence the relationship between earnings quality and investment. The robustness checks conducted, using alternate measures, the effect of political connection, and endogeneity checks, further confirm our main findings. Our findings highlight the complementary role of earnings quality and business groups in mitigating agency conflicts and improving resource allocation in an emerging country setting marked by a less developed financial market and weak legal protection. The study offers novel insights with practical implications for managers, investors, and policymakers in emerging markets, highlighting the importance of transparent reporting and a unique organizational structure in driving investment efficiency.

**Keywords**: *Earnings quality; investment efficiency; business groups; internal capital market; Tunneling*

**JEL classification**: *G31; M41; D81*

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This paper examines the effect of earnings quality and business group affiliation on investment decisions through theoretical channels of agency and information asymmetry. Using a dataset of 18,927 firm-year observations covering the period 1997-2021, we find that both earnings quality and business group affiliation improve investment efficiency by reducing both over- and underinvestment. The positive relation between earnings quality and investments is more pronounced for group affiliates than for standalone firms suggesting the alignment effect outreaches entrenchment effect. Business group characteristics such as size, age, group resources, and cash flow rights significantly influence the relationship between earnings quality and investment. The robustness checks conducted, using alternate measures, the effect of political connection, and endogeneity checks, further confirm our main findings. Our findings highlight the complementary role of earnings quality and business groups in mitigating agency conflicts and improving resource allocation in an emerging country setting marked by a less developed financial market and weak legal protection. The study offers novel insights with practical implications for managers, investors, and policymakers in emerging markets, highlighting the importance of transparent reporting and a unique organizational structure in driving investment efficiency.



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## 1. Introduction

India, currently the fifth-largest economy, is poised to become the third-largest by 2027 with a projected $5 trillion GDP, surpassing advanced nations like Germany and Japan (IMF, 2023). The government has adopted a capex-led growth strategy to accelerate the country's economic development and increase private sector participation. It is reflected in a significant rise in capital investment outlay from 2.15 percent of GDP in the Union Budget 2020-21 to 3.33 percent of GDP in the Union Budget 2023-24 (PIB, 2023). Several major reforms such as Make in India scheme, Production Linked Incentive Scheme, Indian Bankruptcy Code, Goods and Service Tax, and Start-up India scheme have also been implemented to boost corporate investments. India has also become a major FDI destination, attracting $64.4 billion in 2018-19 (IMF, 2019), with a surge in domestic investor participation, as evident by a 39% year-on-year increase in demat accounts, reaching 10.6 crore in November 2022 (Economic Survey, 2022-2023). While these developments enhance the availability of investible funds, they also highlight the need to examine investment efficiency to ensure that resources are allocated productively. In light of the ongoing investment boom, studying investment efficiency becomes crucial to ensure sustainable growth and prevent wealth erosion due to poor investment decisions.

In an imperfect world, market frictions could hamper investment processes and thus, may give rise to investment inefficiencies (Jensen, 1986; Myers and Majluf, 1984). The most pervasive and significant frictions are those arising from agency conflicts and information asymmetry between managers, shareholders, and outside suppliers of capital (Stein, 2003). Agency theory describes various mechanisms to resolve these frictions to boost investment quality. One of the most popular mechanisms is earnings quality (Bushman and Smith, 2001; Ahmed and Duellman, 2007). Prior literature recognizes that high earnings quality, by mitigating moral hazard and adverse selection arising from agency and informational gaps, can

improve investment efficiency, resulting in lower under- and over-investment (Biddle et al. 2009, Chen et al. 2011; Gomariz and Ballesta 2014). However, several authors also argue that business groups, a common organizational form in emerging countries, may also serve as another mechanism to address these market frictions (Khanna and Palepu 2000; Lin and Yeh 2020). For instance, the shared resources and internal capital market can lower adverse selection by mitigating financial constraints; hence, resulting in lower underinvestment (Khanna and Palepu 2000; Almeida et al., 2015). Similarly, Stein (2003) contends that the centralized control and winner-picking of projects in group firms facilitate better managerial monitoring, reducing the risk of overinvestment. Consequently, besides earnings quality, the theoretical framework suggests that business groups can also reduce investment inefficiencies, although there is limited empirical evidence for this, particularly in relation to overinvestment and underinvestment[1].

Based on the above discussion, we aim to combine these two mechanisms and examine the impact of both earnings quality and group affiliation on a firm's investment choices in an emerging country context that serves as a good candidate for an imperfect market with a variety of informational frictions (Allen et al., 2012) and, enhancing the possibility of earnings manipulation (Orazalin and Akhmetzhanov, 2019) and distorted corporate investments. The research question becomes even more critical to investigate given an alternate strand of literature that documents the tunneling practices in these interconnected firms which may further exacerbate agency problems, leading to larger sub-optimal choices (Bertrand et al., 2002; Black et al., 2015). To illustrate, while business groups reduce principle-agent (typeI)

[1] Prior empirical studies examining the effect of the internal capital market on investment decisions use the investment-cash flow sensitivity measure. However, this method has been criticized for its inadequacies. For example, research by Chen and Chen (2012) and Malmendier and Tate (2005) suggest that the measure is often associated with managerial confidence rather than being a reliable signal of financial constraint. Lin and Yeh (2020) propose a better method to measure investment efficiency which differentiates between under-investment and over-investment.

agency problems, they give rise to principle-principle (typeII) agency conflicts due to concentrated ownership (Morck and Yeung 2003). Agency problems can be more severe in business groups as the complex pyramidal structure allows controlling shareholders to gain more control than their cash flow rights, hence, incentivizing them to expropriate wealth from minority shareholders (Bae et al., 2002; La Porta et al., 1999). These entrenched insiders may use related party transactions for resource tunneling and wealth expropriation (Bertrand et al., 2002) that may lead to myopic and risky investments, highlighting the 'dark' side of business groups. Therefore, we posit that besides earnings quality, business group affiliation may or may not be a useful mechanism to improve investment efficiency.

The dual role of business groups in the agency framework further incentivizes us to study the interaction effect of earnings quality and business groups on investment efficiency, a relationship not explored yet. We add a new dimension to the earnings quality and investment literature by exploiting the variation in organizational structure in India as a significant proportion of firms operate as members of business groups to overcome institutional voids (Khanna and Palepu 2000; Marisetty and Moturi 2023). Business groups can be seen as structures where managerial incentives are likely to differ from non-business-group firms due to the presence of inter-firm contracts like internal capital markets, shared resources, and joint ownership structures (Khanna and Rivkin 2006; Mahmood et al. 2011) that could shape financial reporting quality and can influence the investment efficiency of the individual firms within the business group. For instance, when efficient resource allocation and strong governance are in place, high earnings within a business group can enhance monitoring, ensuring more efficient capital allocation that results in higher investment efficiency (Gopalan et al. 2007; Hovakimian 2009; Biddle et al. 2009). On the other hand, if controlling shareholders dominate decision-making, then even with better earnings quality, resources will be tunneled from one affiliate to another, reducing the positive effect of earnings quality on

investment efficiency in group affiliates (Fan and Wong 2002; Morck and Yeung 2003), Hence, we contend that business groups may strengthen or weaken the linkage between earnings quality and corporate investment, contingent upon the balance between type 2 agency problems and capital market frictions.

We exploit India as an ideal setting to conduct the study because of several reasons. First, Indian firms operate in a poor governance and weak enforcement environment that makes earnings manipulation a common practice in these markets. For instance, numerous companies have been reported to engage in financial misreporting for the benefit of promoters and controlling shareholders. A survey by ICAI has reported about 1,288 Indian-listed companies involved in misrepresenting the accounting numbers.[2] The number is significant because it makes up about 26 percent of the total listed entities in the countries. The motivations behind the accounting number manipulation include tunneling and misappropriation of funds (e.g., case of Zee Entertainment)[3], securing bank loans through accounting falsification (e.g., Bhushan Power, Sterling Biotech)[4][5], inflating stock prices (e.g., Varanium Cloud, Add-shop E-retail)[6], and covering up poor performance (e.g., Satyam Computers)[7]. The occurrence of these financial frauds during our study period highlights the relevance of exploring the earnings quality and its impact on investment efficiency. They highlight the regulatory fallouts and the importance of transparent earnings, as opaque financial statements mislead the investors, shake

[2] Link to the article: https://www.livemint.com/Politics/bwMPC2vJ1kH5o7aNEQV85L/1200-listed-Indian-companies-misrepresented-facts-Icai-sur.html [Accessed on: 20th September 2024]
[3] Link to SEBI confirmatory order: https://www.sebi.gov.in/enforcement/orders/aug-2023/confirmatory-order-in-the-matter-of-zee-entertainment-enterprises-ltd-_75337.html [Accessed on: 20th September 2024]
[4] Article link: https://economictimes.indiatimes.com/industry/banking/finance/banking/punjab-sind-bank-flags-34-6-million-fraud/articleshow/70263414.cms?from=mdr [Accessed on: 20th September 2024]
[5] Article link: https://cbi.gov.in/assets/files/media/pc_20171029_1.pdf [Accessed on: 20th September 2024]
[6] Article link: https://timesofindia.indiatimes.com/business/india-business/sme-woes-sebi-flags-fraud-by-2-companies-to-pump-up-stock/articleshow/110131025.cms [Accessed on: 20th September 2024]
[7] Article link: https://economictimes.indiatimes.com/slide-shows/the-fall-and-rise-of-satyam/articleshow/5343153.cms?from=mdr [Accessed on: 20th September 2024]

market confidence, and disturb the corporate investment ecosystem essential for sustainable growth.

Second, many Indian firms are affiliated with business groups, with 60% of the top 500 firms belonging to such groups, highlighting their importance in the country's economic development (Jackling and Johl, 2009). India's family business groups have a total market capitalization exceeding $839 billion, making it the third-largest hub globally for family-owned enterprises. This places India among the world's leading examples of economies dominated by family-controlled groups (Marisetty and Moturi 2023). Unlike US conglomerates, business groups in India have concentrated ownership, typically managed by families that believe in long-term wealth maximization and transfer of wealth across generations indicating a lesser possibility of tunneling and earnings manipulation (Wadhwa and Syamala, 2022). Nonetheless, concentrated ownership may heighten the potential for minority expropriation because of the weak legal protection in India (Bertrand et al., 2002). A few studies also offer evidence of tunneling and earnings manipulation among these firms as firm managers may act for the controlling family but not for public investors, in general, leading to sub-optimal investment choices (Bertrand et al., 2002; George and Kabir, 2008).

Following prior literature, we measure earnings quality via performance-matched discretionary accruals (Kothari et al., 2005) and group affiliation through an indicator variable (Khanna and Palepu 2000; Almedia et al. 2015). To compute investment efficiency, we follow the widely used methodology employed by Biddle et al. (2009) where past sales growth is a driver of expected investment, and any difference between actual and expected investment serves as a base for constructing investment efficiency variables. Using 18927 firm-year observations for the period 1997-2021, we show that earnings quality improves investment efficiency and lowers both over-/underinvestment in a setting characterized by a poor information environment. These results are consistent with prior studies (Biddle et al. 2009;

Chen et al. 2011). Likewise, group affiliation appears to impact investment efficiency positively and is negatively associated with overinvestment and underinvestment supporting the fact that business group firms face less information asymmetry (Tan et al. 2018; Lou et al. 2021). Further, the positive interaction term highlights that the association between earnings quality and investment efficiency is more prominent among group firms relative to standalone firms implying both earnings quality and business group affiliation serve as complements in mitigating information frictions in emerging economies.

Prior empirical studies show that business group characteristics such as size may impact affiliates' performance (Khanna and Palepu 2000; George and Kabir 2008). Following these studies, we distinguish between large and small/medium-sized group firms. We observe that affiliation with both large and small/medium-sized groups lower underinvestment, but the effect is more prominent for large business group firms due to greater reputational capital and huge access to the internal capital market these firms have (Khanna and Palepu 2000 and Chu 2004). Regarding overinvestment, access to large business groups doesn't appear to lower overinvestment as indicated by a statistically insignificant coefficient but affiliation with small/medium-sized groups mitigates overinvestment due to better monitoring caused by a lesser number of layers between main group firms and affiliates firms. Further, high disclosure quality can significantly lower agency problems in large business group firms caused by complex, diversified structure, and hence, reduce overinvestment. To perform this analysis, we identify the Top 30, 50, and 100 business groups as large-sized business groups based on the total asset size of all affiliates of a business group.

Furthermore, we report that the effect of earnings quality on investment decisions varies with different business group characteristics that serve as various proxies of agency and information asymmetry (Almeida et al., 2015; Berkman et al., 2009; Cheng et al., 2022). To illustrate, the earnings quality effect on investment decisions is stronger for group firms with

low cash flow rights, young firms, firms affiliated with diversified business groups, and groups having a significant number of affiliates. The results indicate that the earnings quality effect is more prominent among affiliated firms that have access to huge internal capital markets and hence, part of less financially constrained business groups. Similarly, we find that political ties of business groups ease their financial constraint and strengthen their governance structures leading to higher earnings quality effects on investment outcomes (Wong et al. 2018; Preuss & Königsgruber 2021). In robustness checks, we employ an alternative measure of investment efficiency based on Chen et al. (2011) and three alternate earnings quality proxies based on Modified Jones (1995); Kasznik (1999), and McNichols and Stubben (2008) models and obtain the results consistent with the main findings. These results are further corroborated by endogeneity checks performed using propensity score matching and difference-in-difference analysis of exogenous shock of 2016 Ind-AS regulation, and other advanced methods like panel fixed effect, entropy balancing, and endogenous treatment effect.

Our findings contribute to the existing literature in several ways: First, we show that monitoring and signaling the role of earnings quality can be extended to the Indian context, which is particularly afflicted by Type II agency problems. This has both firm-level and macro-economic implications given the importance of corporate investments as a major determinant of firm-level returns and economic growth. Indeed, the results hold greater significance given that investors' interests are less protected in poor governance and a weak legal environment leading to a high risk of expropriation in the country (La porta et al. 1999). Second, we add to the prior literature by exploiting the variation in an organizational form that can reduce agency and informational problems in such a setting and therefore, study the moderating effect of business groups on earnings quality and investment efficiency. In this sense, the incremental value of group structure becomes even more crucial in context with high institutional voids and less developed financial markets (Khanna and Palepu 2000). Third, the positive effect of

business groups on corporate investments highlights that the alignment effect prevails over the entrenchment effect, indicating that Indian family business groups do not engage in tunneling and make long-term investments to maximize the firm value (Wadhwa and Syamala 2022). Fourth, our findings distinguishing between large and small/medium business groups highlight that the size of a business group matters, though large groups are beneficial as they significantly lower financial constraints (Khanna and Palepu 2000 and Chu 2004), but they do not appear to lower moral hazard (Bhutta et al. 2022). high-quality financial reporting is useful in controlling these possible entrenched insiders. Fifth, study of Indian business groups may have significant implications for similar business group settings e.g. Korean Chaebols, Japanese Keiretsu, and closely related family business groups setting like Taiwanese Jituanqiye. The study would also have implication for other settings where principal-principal agency conflicts is more prevalent than principal-agent conflicts due to concentrated ownership.

The remainder of the study is organized as follows. Section 2 describes the theoretical framework and develops hypotheses. Section 3 outlines the research methodology. In section 4, we present descriptive and regression results to test our hypotheses. Robustness tests are performed in section 5 to confirm our main findings followed by limitations and future research directions in section 6. Section 7 concludes.

## 2. Theoretical framework and hypotheses development

According to the neo-classical theory of investment, a firm makes optimal investments by investing until the point where the marginal product of its investments equals its marginal cost (Abel, 1983). However, the agency framework establishes that a firm may deviate from its optimal level of investment, due to market frictions caused by informational gaps and agency conflicts among managers, shareholders, and external suppliers of capital (Stein, 2003). These conflicts give rise to two major problems of moral hazard and adverse selection that may hamper the investment process by promoting overinvestment and underinvestment (Biddle and

Hilary, 2006). The moral hazard problem contends that managers, driven by their self-interest, tend to undertake sub-optimal investments by realizing negative NPV projects that are not in the best interest of shareholders and hence, promote overinvestment (Jensen and Meckling, 1976; Jensen, 1986). The adverse selection mechanism proposes that managers, being better informed about firm prospects than outsiders, are reluctant to issue new equity at lower prices as external capital providers, being cautious about firm quality, respond by rationing the capital or increasing borrowing cost, which may lead manager to pass up positive NPV investment opportunities due to fund constraint (Myers & Majluf, 1984; Stiglitz & Weiss, 1981) resulting in underinvestment.

### 2.1. Earnings quality and investment efficiency

The theoretical framework recognizes that earnings quality, by mitigating agency conflicts and information asymmetry caused by adverse selection and moral hazard, may improve investment efficiency leading to reduction of overinvestment and underinvestment. Earnings quality is an important source of accounting information that improves the functioning of capital markets by alleviating market imperfections caused by adverse selection problems. Many researchers highlight that the quality of accounting information is a non-diversifiable factor and hence, priced. For instance, Easley and O'hara (2004) report that better earnings quality mitigates non-diversifiable information risk arising from informational gaps between informed and uninformed investors, leading to a lower cost of capital. Supporting this, Lambert et al. (2007) demonstrate that enhanced accrual quality lessens non-diversifiable risk by shaping investors' perceptions of cash flow distributions, thereby, affecting the cost of capital. Firms with high earnings quality have lower funding costs both cost of equity and cost of debt (Bharath et al., 2008; Francis et al., 2005). Therefore, if high earnings quality mitigates adverse selection and lowers the cost of funding, it can be linked with investment efficiency by

mitigating financial constraints, leading to less underinvestment (Chang et al., 2009; Diamond and Verrecchia, 1991).

In the same spirit, Watts and Zimmerman (1978) in Positive accounting framework contend that 'an important role assigned to accounting information is to force managers to act in the interest of shareholders.' Since managers may manipulate earnings to create the appearance of acting in shareholders' best interests while prioritizing their own gains, financial reporting can serve as a control mechanism where different stakeholders closely examine accounting decisions to minimize agency costs. In the agency framework, it is well documented that earnings quality is used for managerial monitoring (Bushman and Smith, 2001; Hope and Thomas, 2008). For instance, earnings numbers are commonly used for the development of incentive contracts, aligning managers' interests with those of shareholders, and as a crucial source of information used in governance structure to monitor managerial investment choices (Armstrong et al., 2010; Healy and Palepu, 2001). If improved earnings quality strengthens the board of directors' ability to oversee managerial investment decisions, it could serve an agency role by diminishing managers' moral hazard to invest in value-destroying investment opportunities (Houcine 2017). Biddle et al. (2009) note that better-quality earnings make negative NPV investments more noticeable to outside investors than value-enhancing investments (Biddle et al., 2009). The above discussion indicates that earnings quality makes it hard and costly for managers to engage in resource tunneling and hence, may mitigate overinvestment (Armstrong et al., 2010; Healy and Palepu, 2001). Therefore, we expect higher earnings quality to influence investment efficiency by mitigating agency problems caused by moral hazard, leading the firm to overinvest less.

Empirical research shows that better accounting quality lowers investment-cash flow sensitivity (Biddle and Hilary, 2006) and earnings management enhances overinvestment by distorting the managerial information set (McNichols and Stubben, 2008). Biddle et al. (2009)

for US firms and Chen et al. (2011) for private firms in emerging countries show that high reporting quality mitigates investment inefficiencies in both underinvestment firms and overinvestment firms. Lara et al. (2016) show that accounting conservatism aids underinvesting firms to secure funding at lower cost and reduces investment-cash flow sensitivity in overinvesting firms. In the Tunisian context, Houcine (2017) reports while reliability and smoothness attributes of earnings quality significantly improve investment efficiency; conservatism and relevance do not. Assad et al. (2023), for US firms, demonstrate that earnings manipulation via real activities leads to sub-optimal investments in the form of over- and underinvestment. Debt maturity (Gomariz et al., 2014) and Audit quality (Boubaker et al. 2018) similarly improve investment outcomes. However, the earnings quality effects vary by institutional context (Tahat et al. 2022); specialist auditor (Elaoud and Jarboui 2017), and financial constraint (Gaio et al. 2023). Recently, Huang et al. (2023) find that accounting quality also reduces investment distortions of US focal firms during strategic alliances.

While majority of prior research focuses on developed countries, where strong investor protection exists, limited studies examine emerging markets that face more institutional voids and higher information asymmetry, increasing the risk of manipulated financial statements and wealth expropriation. Therefore, to gain deeper insights, further investigation into the earnings quality-investment nexus in emerging markets is needed. Based on the above discussion, we set up the following hypothesis:

H1: Earnings quality is positively associated with investment efficiency.

### 2.2. Business group affiliation and investment efficiency

Business groups, ubiquitous across emerging counties, function as a network of legally independent firms with significant operational and financial linkages. According to the institutional void theory, business groups play a crucial role in filling gaps caused by weak

market institutions in these economies, delivering value through arrangements such as information sharing, resource transfer, risk diversification, and financing support to member firms (Buchuk et al., 2014; Gopalan et al., 2007). However, literature also highlights the dark side of business groups, with evidence of wealth expropriation and tunneling by controlling insiders (Bertrand et al., 2002; Cheng et al., 2022; Jiang et al., 2010).

A vast literature on business group provides several mechanisms through which business group can improve investment efficiency in emerging markets like India where property protection rights and contracting mechanisms are not sufficient developed. First, the resource-based view of group structure postulates that business groups can lower underinvestment by providing better access to shared resources and the internal capital market that alleviates financial constraint of affiliated firms (Gopalan et al. 2007; Tan et al. 2018; Almeida et al. 2015). For instance, Buchuk et al. (2014) show that firms receiving significant intra-group loans tend to have higher growth opportunities, leading to increased investment, and higher return on equity (ROE) compared to unaffiliated firms. The internal capital allocation is particularly beneficial in the settings where external financing is expensive or difficult to obtain (Claessens et al. 2006). Consistent with this, Almeida et al., (2015) and Wadhwa and Syamala (2022) highlight the crucial role of the internal capital market in realizing important investment projects during heightened uncertainty, a setting where managers' incentives to tunnel and expropriate got exacerbated and when external financing becomes expensive.

Second, the social network view of business groups postulates that social connections like director interlocks and broader equity connections among member firms facilitate efficient information transmission (Xing et al., 2023), that enables better evaluation of investment opportunities leading to lower underinvestment. Third, group firms also have higher reputational capital that facilitates less expensive external funding for investment projects (Khanna and Palepu 2000; Mukherjee et al. 2018; Byun et al. 2013). Fourth, the existence of

centralized control and mutual monitoring fostered by business groups can also mitigate agency problems, resulting in reduced overinvestment (Hovakimian 2009; Chen et al. 2014).

On the other hand, a strand of literature on "dark side" of business groups contends that group affiliation can also lead to inefficient investment behavior, as these structures do not ensure complete mitigation of agency conflicts and asymmetric information (Morck and Yeung, 2003). While concentrated ownership in business groups may lower principal-agent conflicts but it often exacerbates the principal-principal conflicts between controlling and minority shareholders (La Porta et al., 1999; Morck and Yeung 2003). The agency problem become more severe in group firms due to complex structure, which allow controlling shareholders to gain more control than their ownership rights would suggest (Bae et al., 2002; Khanna and Yafeh 2007). To illustrate, the pyramidal structures create significant divergence between control and cash flow rights, incentivizing controlling insiders to extract wealth from minority shareholders (Bae et al., 2002). These entrenched insiders may engage in empire-building activities or may seek negative NPV projects, resulting in overinvestment (Johnson et al., 2000). Prior literature document that controlling shareholders siphon off resources from one affiliate to other affiliate through related party transactions (Bertrand et al., 2002; Jiang et al., 2010). This practice is known as tunneling which further exacerbates the moral hazard problems, particularly for firms lower in pyramids (Morck and Yeung, 2003), thereby causing inefficient capital allocation.

Cheng et al. (2022) argue that controlling shareholders, at the expense of bondholders, tend to transfer funds from low cash flow rights to high cash flow rights firms. This tunneling practice worsens agency conflicts between controlling shareholders and bondholders, causing the latter to demand higher compensation in the form of high cost of capital. As a result, firms may reject or postpone positive NPV projects, leading to underinvestment. However, long-term reputational concerns in family-owned Indian business groups can mitigate the agency

problems and prevent them from engaging in value-destroying investment projects (Anderson and Reeb 2003; Gedajlovic and Carney, 2010). Further, the practice of "winner-picking" of projects across affiliates also enables better monitoring of managerial investment activities, thereby, reducing moral hazard and promoting smoother investment process (Almeida et al. 2015; Stein, 2003). Based on the above discussion, we formulate the following non-direction hypothesis:

H2: Affiliation with a business group influences investment efficiency.

### 2.3. Earnings quality and investment efficiency conditioned to business group affiliation

We also explore the interaction effect from theoretical lens of agency framework, a relationship not explored yet. Business groups can be visualized as complex structures where managerial incentives are likely to differ from standalone firms due to the presence of the inter-firm contracts (Khanna and Rivkin 2006). These contractual arrangements within group firms often include internal capital markets, shared resources, and joint ownership structures that could shape financial reporting quality and can influence the investment efficiency of the individual firms within the business group (Gopalan et al. 2007; Almeida et al. 2011; Mahmood et al. 2011). As discussed earlier, while group affiliation can alleviate informational problems by providing easier access to internal capital markets (Gopalan et al. 2007; Almeida et al. 2015), they can also yield agency problems, particularly those between controlling and minority shareholders (Bertrand et al. 2002; Khanna and Yafeh 2007; Jiang et al. 2010; Cheng et al. 2022). This dual nature of group structures implies that their influence on the association between earnings quality-investment nexus can be either negative or positive, contingent on the balance between the extent of agency conflicts and capital market frictions

The internal capital market argument suggests that business group could strengthen the association earnings quality-investment nexus due to presence of internal capital market and

strong governance mechanism. Gopalan et al. (2007) illustrates how internal capital markets facilitate resource allocation, particularly, during periods of financial constraints. Hovakimian (2009) finds that resources are allocated according to benefit ranking of projects ensuring that most profitable projects get the allocation. High earnings quality can improve the transparency of financial reporting, ensuring that capital is efficiently allocated to the projects with highest potential for returns within business groups (Biddle et al. 2009). This way, high quality earnings within groups can result in better monitoring, reducing the likelihood of minority expropriation. This leads to efficient resource allocation, resulting in higher investment efficiency. Alternatively, the tunnelling argument suggests that opaque structure and self-dealing internal capital market may attenuate the positive impact of earnings quality on investment decisions. When controlling shareholders exert significant influence over decision-making, even high-quality financial reporting, may not ensure the complete mitigation of agency problems inherent in these structures. In fact, despite high-quality earnings, these entrenched insiders may still engage in tunnelling activities or misallocate funds to affiliated firms (Fan and Wong 2002; Morck and Yeung 2003), undermining the beneficial impact of earnings quality on investment efficiency. Based on the above discussion, we could expect either a positive or negative interaction effect, hence, we state non-direction hypotheses:

H3: Business group affiliation moderates the relationship between earnings quality and investment efficiency.

## 3. Research Methodology

### 3.1. Data and sample

We conduct the study for non-financial Indian companies listed on Bombay Stock Exchange/ National Stock Exchange for the period 1997 to 2021. Data is extracted from the Prowess database, maintained by the Centre for Monitoring Indian Economy (CMIE). Our

initial sample consists of 114217 observations for 5112 listed firms from 1988-2021[8]. We follow various sample selection criteria to generate our final sample; these steps are outlined in Table 1. First, we drop 1105 financial firms from our sample due to the different reporting requirements and financial regulations these firms face. This results in 89,377 observations belonging to 4007 non-financial firms. In step 2, we estimate the key variables, namely, earnings quality and investment efficiency separately for the remaining non-financial firms. Here, we put two restrictions: first, since investment efficiency and earnings quality are derived measures, we exclude firm-year observations for which firm-level information is not available to compute these variables; second, estimating investment efficiency[9] and earnings quality[10] also requires a minimum of 10 and 16 industry-year observations respectively. These strict restrictions drastically reduced our sample size to 29,567 firm-year observations for 2,851 firms. Next, the observations with missing data on other control variables were also dropped generating a final sample of 18927 firm-year observations for 2160 unique firms for the period 1997-2021. All continuous variables have been winsorize at 1% and 99% levels to remove outlier effects.

### 3.2.Variable measures

#### 3.2.1. Investment efficiency measure

Investment efficiency can be defined as undertaking optimal investment or a situation when all the positive NPV projects are undertaken by the firm (Biddle and Hilary 2006). Hence, any deviation from optimal investment represents an inefficient investment process or implies the

[8] Since the Prowess database provides data on firm-level characteristics beginning from year 1988, we cover the whole universe of listed firms on the database from the year 1988 onwards.
[9] Out of 89,377 observations, complete information is available for 45,007 firm-year observations only to compute investment efficiency.
[10] Out of 89,377 observations, complete information is available for 42,122 firm-year observations only to compute earnings quality.

firm is under-/over-investing. Biddle et al. (2009) propose a model to gauge this deviation from the expected investment that would indicate investment inefficiency. The model assumes that growth opportunities (measured by sales growth) are the main driver of investment in any firm. We estimate the following equation for each industry and year with at least 10 observations:

$$Invt_{it} = \beta_0 + \beta_1 Salesgrow_{i,t-1} + \epsilon_{i,t} \quad (1)$$

where, investment (*Invt*) represents a new investment in tangible and intangible assets and expenditure on research and development less sale proceeds of Property, plant, and equipment of firm *i* in year *t*, scaled by lagged total assets while sales growth (*Salesgrow*) measures the rate of change in firm *i* sales in year *t-1*. Residuals from the above equation are taken as a firm-specific proxy to gauge the extent of over/underinvestment. A positive residual is a measure of overinvestment and implies actual investment is more than expected levels of investment. Similarly, negative residuals, a proxy for underinvestment, mean a firm is undertaking investment at a lower rate than expected based on sales growth in *t-1* year. To measure the Investment efficiency (*Invt_Effi*), we multiply the absolute residuals by -1, so a higher value implies higher investment efficiency.

[Insert Table 1]

**3.2.2. Earnings quality measures**

Earnings quality is broadly defined as "informativeness of financial reports about firms' underlying economics" (Koo et al., 2017). It indicates how well the firms adhere to accounting rules and regulations while preparing financial statements. In the study, we measure earnings quality through accrual quality. Firms' earnings consist of the effect of both accrual and non-accrual variables. To detect accruals quality, Previous literature examines the discretionary component of accrual variables (Healy 1985; Dechow et al. 1995; Kothari et al. 2005). Consistent with the previous studies, we differentiate between the discretionary and non-

discretionary components of total accruals as managers have the latitude to manipulate the discretionary component of total accruals to manage earnings.

Following prior literature, we employ discretionary accruals as a proxy of earnings quality. Our measure of earnings quality is based on Kothari et al. (2005) model, popularly known as performance-matched discretionary accruals. In this model, total accruals are regressed on firm fundamental characteristics, and unexplained portions (residuals) are used to construct earnings quality proxy. Using 2-digit NIC codes, we estimate the following regression for each industry and year with at least 16 observations –

$$ACC_{i,t} = \alpha_0 + \alpha_1\left(\frac{1}{lag\_assets}\right) + \alpha_2\left(\Delta Rev_{i,t} - \Delta AR_{i,t}\right) + \alpha_3 PPE_{i,t} + \alpha_4 ROA_{i,t} + \epsilon_{i,t} \quad (2)$$

where, $ACC_{i,t}$ is the total accruals of firm $i$ in year $t$ computed as the change in non-cash current assets less change in current non-interest-bearing liabilities less depreciation and amortization scaled by lagged total assets, $\Delta Rev_{i,t}$ and $\Delta AR_{i,t}$ stand for change in revenues and accounts receivables scaled by lagged total assets for firm $i$ in year $t$, $PPE_{i,t}$ represents property, plant, and equipment deflated by lagged total assets for firm $i$ in year $t$ and $ROA_{i,t}$ shows return on assets for firm $i$ in year $t$. Absolute values of residuals from the above equation are multiplied by -1, so that a higher value is indicative of higher earnings quality.

### 3.3. Regression model

To examine our main hypotheses, we estimate the following model to investigate the linkage between earnings quality, group affiliation, and investment efficiency-

$$Invt\_Effi_{i,t} = \beta_0 + \beta_1 EQ_{i,t} + \beta_2 BG_i + \beta_3 EQ_{i,t} * BG_i + \beta_4 Controls_{i,t} + \sum Industry\ and\ year\ effects + \epsilon_{i,t} \quad (3)$$

We expect a positive isolated effect ($\beta_1$ and $\beta_2$) of individual mechanisms on investment efficiency, however, the coefficient on interaction term can be positive or negative based on earlier discussion. Pooled OLS regression with standard errors corrected for heteroscedasticity and autocorrelation is used to estimate the above models. Following Petersen (2009), we also cluster the errors by firm and year to account for cross-sectional dependence.

Consistent with prior studies of Biddle et al. (2009) and Chen et al. (2011), we also consider other idiosyncratic variables known to influence the firm's investment policy. To illustrate, $SIZE_{jt}$ and $LN(AGE_{jt})$ represent firm size and age. Prior studies show that larger and mature firms have stable and huge amount of cash flows that enhance their access to external capital market to finance their investments and, thus, tend to be more investment efficient (Whited and Wu 2006). However, Watts and Zimmerman (1978) suggest that firm size is often indicative of its political visibility, with larger firms typically subject to heightened exposure to political pressures. They tend to invest in value destroying or value reducing projects and hence, negatively affect investment efficiency. We also include firm leverage *($LEV_{jt}$)* as the agency framework recognizes leverage as crucial monitoring mechanism which limits the opportunistic behavior of management (Jensen and Meckling 1976). Similarly, firms with greater tangible assets are also expected to have more visibility than firms with lower amount of tangible assets making it harder for former's management to over- and under-invest (Himmelberg et al. 1999). Further, we account for growth prospects of the firm by controlling Tobin's Q *($TOBINQ_{jt}$)* as firms with varying levels of growth choose different investment strategies (Beatty et al., 2010). $DIV_{jt}$ captures firm's dividend paying status. Previous study shows that under asymmetric information, dividend policy has constraining effect on firm's investment choices as moral hazard and adverse selection limit firm's access to external funds. This may force firms to forgo profitable investments to maintain dividend payments (Brav et al., 2005). Altman's Z-score *($Z\_Score_{jt}$)* which captures the financial strength, is expected to

be positively related to investment efficiency as financially strong firms tend to command greater resources which aids in timely realization of investment opportunities. Similarly, firms operating in different phases of the business cycle may experience variations in (discretionary) accruals, stemming from differences in their business models that are not linked to earnings management practices (Dechow, 1994; Dechow and Dichev 2002). We thus control the length of the operating cycle *($Opcycle_{jt}$)*. In addition, following prior studies, we also control idiosyncratic variables that may influence investment efficiency. These idiosyncratic controls are loss, volatility of sales and cash flow and financial slack measured as ratio of cash flow to total assets (Liu and Wysocki, 2007; Biddle et al. 2006). Further, we also control industry and year effects to account for unobserved industry heterogeneity and change in macroeconomic conditions over time. Table A defines variables and their measurement.

Further, we also examine the effect of earnings quality and group affiliation on sub-optimal investment decisions of under- and over-investment as estimated by the following equation-

$$Underinvest_{i\,t}/Overinvest_{i,t} = \gamma_0 + \gamma_1 EQ_{i,t} + \gamma_2 BG_i + \gamma_3 EQ_{i,t} * BG_i + \gamma_4 Controls_{i,t} + \sum Industry\ and\ year\ effects + \epsilon_{i,t} \quad (4)$$

where, $\gamma_1$ and $\gamma_2$ explain the effect of earnings quality and group affiliation on over-/underinvestment. We predict $\gamma_1$ to be negative as prior research offer evidence of earnings quality serving as a useful mechanism for monitoring managers' activities and resolving financial constraints faced by firms. Likewise, we also expect that $\gamma_2$ to have a negative value as group-affiliated firms face less informational problems. As discussed earlier, easy access to internal as well as external capital markets makes these firms less financially constrained and facilitates easier access to funds, leading to reduced underinvestment. Moreover, since these firms are family-owned and controlled, this leads to reduced moral hazard and enhanced managerial monitoring. Nevertheless, group affiliation might promote tunneling (Cheng et al.,

2022; George and Kabir, 2008) and hence, may lead to sub-optimal decisions but prior research finds positive effects of group affiliation outweigh its negative effects. Based on the above argument, group-affiliated firms are expected to reduce the wastage of resources on value-reducing investments and hence, lower overinvestment. $\gamma_3$, the coefficient on interaction term, can be positive or negative depending upon whether the relation between earnings quality and over-/underinvestment is increasing or declining in group affiliated firms. Equation (4) controls all idiosyncratic variables considered in the main model.

## 4. Results

### 4.1. Descriptive statistics

Table 2 presents sample distribution by industry for both standalone and group-affiliated firms. Our sample consists of firms from eleven different industries with most firms falling in the manufacturing industry. For group-affiliated firms, the mean value of investment efficiency is maximum for the Construction industry (-0.378) and minimum for Human health and social work activities (-1.883). For standalone or non-group affiliated firms, Accommodation and food service activities (-1.910) report a minimum value of investment efficiency while the Construction industry (-0.442) has the highest investment efficiency. Further, the average earnings quality is highest for Mining and quarrying industry for a group affiliated (-0.785) and for human health and social work activities in the case of standalone firms (-1.051). However, it is lowest for Administrative and support service activities (-2.111) for group firms and Wholesale and retail trade activities (-1.727) for standalone firms.

[Insert Table 2]

Table 3, Panel (A) shows descriptive statistics for all variables used in the study. Investment efficiency has a mean value of -0.998 with a standard deviation of 1.886. While 45% of firms pertain to overinvestment group, a majority of sample firms (55%) belong to underinvestment

group, implying that firms in developing countries, due to their difficulty in securing external financing, are more likely to face underinvestment issues than overinvestment. These levels are comparable to the ones reported in Chen et al. (2011) and Houcine (2017) studies for emerging markets. Overinvestment assumes a mean value of 1.133 with underinvestment taking an average value of 0.886. Mean earnings quality stands at -1.549 with a standard deviation of 2.550. A significant proportion (40%) of our sample firms are group-affiliated firms highlighting their crucial role in the Indian corporate landscape. Panel (B) presents the Pearson correlation coefficients for different variables used in the study. The variable EQ is positively associated with investment efficiency and negatively associated with both overinvestment and underinvestment. This evidence is consistent with the hypothesis that high earnings quality promotes the efficiency of investment decisions. Business group affiliation is negatively associated with investment efficiency.

We also conduct mean difference analysis to discover the significance of mean differences of key variables across business group and non-business-group firms. Panel (C) draws a comparison between statistics of key variables for these firms and reports the results at 1%, 5% and 10% level of significance. We use t-test to check the mean differences and Wilcoxon rank sum test to check median differences of key variables across business group and non-business-group firms. The univariate analysis reveals that the mean earnings quality is not significantly different across these two groups of firms. However, the median earnings quality is higher for business group firms than for standalone firms. Business group firms are less investment efficient and more prone to over- and underinvestment. Additionally, it reveals that group firms are bigger in size, have more years of existence and higher volume of tangible assets, are dividend payers, have higher growth opportunities, and lower z-value, sales, and cash flow volatility relative to non-group firms. The univariate analysis highlights the discrepancy between group and non-group firms that may drive our empirical results. To address this issue,

we also perform entropy balancing to address this self-selection bias that may drive our results (Hainmueller 2012).

[Insert Table 3]

### 4.2. Empirical results

Table 4 presents the regression results for isolated and combined effects of earnings quality and business group affiliation on investment decisions. Column (1) shows that higher earnings quality promotes investment efficiency as indicated by a positive coefficient, statistically significant at 1% level. These results are consistent with the prior studies (Biddle et al. 2009; Chen et al. 2011) and confirm our hypothesis that earnings quality improves investment efficiency. Further, we study how earnings quality affects two alternative investment scenarios of overinvestment and underinvestment. Results in Columns (3) and (5) reveal that higher earnings quality is negatively associated with both overinvestment and underinvestment as indicated by negative coefficients, significant at 1% level. Such results are consistent with previous research (Biddle et al. 2009; Chen et al. 2011; Shahzad et al. 2018; Huang et al. 2023) which reports a significantly negative association between earnings quality and both sub-optimal investment outcomes. Our findings confirm that better quality earnings can enhance investment efficiency by avoiding large positive or negative deviations from the expected level of investment, hence, helping firms to move towards their optimal investment strategy. However, the results slightly oppose the evidence of Gomariz and Ballesta (2014), and Elaoud and Jarboui (2017) who reported a statistically positive association between earnings quality and underinvestment suggesting that for those firms with a lower than expected level of investment, better financial reporting may not be effective mechanism in shifting investment towards its optimal level. Our findings also contradict the findings of Houcine (2017) which report that in the overinvestment sample, earnings quality do not serve as a useful mechanism for controlling the myopic and risky investment activities.

[Insert Table 4]

Given both 'bright' and 'dark' side of business groups, we examine the impact of business groups on investment efficiency and two sub-optimal investment outcomes in a setting characterized by poor governance and weak institutional mechanisms. We predict a positive association if affiliation with a business group promote investment efficiency by reducing moral hazard and financial frictions. On the other hand, the negative coefficient will indicate that higher agency problems, caused by complex structure and tunneling practices, within business groups that might give rise to investment inefficiencies resulting in overinvestment and underinvestment. We present empirical results in Col (2), (4) and (6) of Table 4. The results demonstrate that firms affiliated with business groups are more investment efficient compared to standalone firms as shown by the positive coefficient on variable *BG* in Column (2). Further, group affiliation also helps in alleviating overinvestment and underinvestment problems as indicated by negative coefficients in Columns (4) and (6). These results are statistically significant at 1% level and consistent with H2 hypothesis. The findings confirm that despite typeII agency problems, affiliation with a business group can play an important role in efficient resource allocation which positively affect the investment efficiency (Tan et al. 2018; Lou et al. 2021). Overall, our results are consistent with the prior studies that highlight the positive side of business groups and suggest that in emerging economies like India with weak legal protection and less developed financial markets, benefits of group structures can significantly outweigh their agency costs (Khanna and Rivkin 2000; Khanna and Palepu 2000).

Additionally, we further extend the analysis by examining whether business group affiliation increases or decreases the effect of earnings quality on investment efficiency. For this purpose, we interact *EQ* and *BG* variables, we show that the relation between earnings quality and investment efficiency is more pronounced for business group affiliates than standalone firms as shown by the positive interaction coefficient (significant at 1% level) in

Column (2). To illustrate, for standalone firms, the coefficient of earnings quality is 0.263 ($p<0.01$), whereas, for group affiliates, the earnings quality effect is higher ($\beta_3 > 0$) and the impact is given by $\beta_1 + \beta_3 = 0.340$. We further study the effect of the combined mechanism on two sub-optimal investment choices. In Column (4), our results show that, for group-affiliated firms, the earnings quality effect on overinvestment is given by $\beta_1 + \beta_3 = -0.353$ with ($\beta_3 < 0$) whereas, for standalone firms, the earnings quality effect is negative and significant (-0.273). Moreover, regarding the earnings quality effect, for firms that underinvest and have affiliation with a business group, the earnings quality effect is significant and negative (-0.326) and higher than its effect for the non-group affiliated firm that underinvest (-0.255). These results show that earnings quality and group affiliation have a complementary relation as the earnings quality effect is more pronounced for business group firms than non-business-group firms. Our findings reveal that transparent earnings make this resource allocation more efficient and thereby, leading to further improvement in investment efficiency of member firms.

In terms of idiosyncratic controls, our findings reveal that higher tangibility and size negatively affect investment efficiency by promoting both over-and under-investment whereas financial strength, captured by *Z*, promotes investment efficiency by mitigating overinvestment. Both Age and financial slack variables are found to improve investment efficiency by reducing overinvestment, whereas dividend payouts reduce investment efficiency by enhancing underinvestment. Further, leverage, loss, sales volatility, and CFO volatility also significantly influence investment choices. optimal investment level.

To summarize, our findings are in line with the key notion of agency and information asymmetry theories. We find that both earnings quality and business group affiliation are crucial mechanisms to mitigate agency conflicts and informational problems in Indian context and hence positively influence a firm investment strategy. Further, the positive interaction highlights that that alignment affect outreaches entrenchment effect in case of Indian family-

owned business groups that believe in long-term wealth maximization rather than undertaking value-reducing or value-destroying investments (Wadhwa and Syamala 2022). These findings contrast with earlier research, which highlights the entrenchment effect of controlling shareholders in Indian firms (Bertrand et al. 2002, Kali and Sarkar 2011) indicating entrenched insiders can prioritize personal control and interests over the welfare of the firm.

### 4.3. Additional analysis

As a part of additional analysis, we further investigate whether the earnings quality effect on investment efficiency is similar for both large and small/medium-sized business groups or if there exist some significant differences between the earnings quality effects of these groups due to heterogeneity of their resources, information asymmetries, and agency problems they face (Cestone and Fumagalli, 2005; Liu et al., 2021). Prior empirical studies document the significant differences exist across the size of business group that may influence the performance of their member firms (Khanna and Palepu 2000; George and Kabir 2008). While some suggest that affiliation with large business group is beneficial (Chu 2004; Khanna and Palepu 2000), while others claim the opposite (George and Kabir 2008; Bhutta et al. 2022).

For instance, Cestone and Fumagalli (2005) show that firms associated with wealthy business groups tend to incur higher Research and Development and Advertising expenditure due to lower financial constraints and hence, enjoy significantly higher competitive advantage over standalone firms. Besides, the large group also imposes a significant external financial constraint on non-affiliated firms operating within their affiliates' industries (Liu et al. 2021). This leads to non-business-group firms (both standalone and small business group firms) suffering more from inefficient investment while operating in an industry where group affiliates are associated with large business groups. Similarly, Tirole (2010) contends that non-group firms face lower profits due to strong competition from financially strong business group affiliates leading to a reduction in their accessible income and worsening challenges faced in

external funding. Hence, it can be stated that firms affiliated with large wealthy business groups tend to have more resources, greater reputation, and easier access to external funds that significantly lower their financial constraint and therefore, might lower underinvestment.

In contrast, compared to small groups, large groups face more severe agency conflicts due to significant wedge between control and cash flow rights driven by more layers between main group firm and affiliates as the size of business groups rises (Bae et al., 2002; Morck and Yeung, 2003). Following Bae et al. (2002) and Liu et al. (2021), we use the total asset size of all members of a business group for identification of Top 30, 50, and 100 business groups and analyze any differences in the association between earnings quality and investment efficiency for these large group firms and other firms. This is based on the premise that the size of a business group is determined by the size of total assets controlled by its member firms. It is noteworthy to mention that as we move away from the Top 30 to Top 50 or Top 100 largest business groups, the resources under their control are not as large as those of the Top 30 business groups.

The results for Top 30, 50, and100 business groups are presented in Columns (1)-(3), (4)-(6) and (7)-(9) of Table 5 respectively. In line with the previous results, we report that earnings quality improves investment efficiency by reducing over- and underinvestment for all three cases. However, with regard to group affiliation, large business groups, and small/medium-sized groups differ in terms of their effect on investment decisions. Though both large and small/medium-sized group affiliation enhances investment efficiency, the effect of large-sized groups is higher than those of small/medium-sized group affiliation and standalones as depicted in Columns (1), (4), and (7) of Table 5. Going further, small/medium-sized business groups are found to negatively affect both over- and underinvestment, whereas affiliation with large business groups promotes investment efficiency only by reducing underinvestment. It implies that access to large-size business groups does not seem to reduce overinvestment as indicated

by the insignificant coefficient in all three cases. We also examine the earnings quality effect on investment efficiency for these group firms. We observe that high-quality earnings play a significant role in lowering overinvestment for both large (*Top50* and *Top100* only) and small/medium-sized group firms (*Top30* and *Top100* only). Regarding the underinvestment scenario, earnings quality reduces underinvestment for both large (all three cases) and small/medium-sized group firms (*Top30* only), but the effect is higher for large business group firms. These results are significant at 1%, 5% and 10% levels.

[Insert Table 5]

To summarize, consistent with prior studies (Khanna and palepu 2000; Chu 2004; George and Kabir 2008), we also observe different effects of business group size. We find that large business groups are beneficial in terms of their impact on underinvestment due to existence of large internal capital market and higher reputation (Khanna and Palepu 2000 and Chu 2004), but they play no role in lowering overinvestment, indicating the possibility of entrenchment due to pyramidal structures (Bertrand et al. 2002; Bhutta et al. 2022). Further, small/medium groups reduce overinvestment problems due to better monitoring caused by lesser number of layers between main group firms and affiliates firms, we observe a weaker effect of small and medium business groups on underinvestment consistent with the fact that these groups have immature internal capital market and lack of expertise to support their affiliates, resulting in underperformance (Bhutta et al. 2022). Further, high disclosure quality can significantly lower agency problems in large business group firms caused by complex, diversified structure, and hence, reduce overinvestment.

### 4.4. Heterogeneity analysis

In this sub-section, we study how the earnings quality effect on investment decisions varies with different business group characteristics. These characteristics measure the extent to which

a group-affiliated firm is prone to agency conflicts and informational problems. To illustrate, access to a huge internal capital market reduces firms' financial constraints and ensure fundraising at lower costs and hence, leads to reduced informational problems (Almeida et al., 2015; Gopalan et al., 2014). In contrast, firms prone to tunneling exhibit high information asymmetry (Berkman et al., 2009; Cheng et al., 2022).

To examine the effect of different business group characteristics on the relationship between earnings quality and investments, we divide our sample based on cash flow rights, firm age, group resources measured by no. of affiliates of a business group, and level of diversification into two groups above or below the median. While *CFR* and *Age* measure the extent of tunneling, *Diversify,* and *Affiliates_no.* variables are used to capture the size of the internal capital market following Cheng et al. (2022). *CFR* measures promoters' ownership in group affiliated firms, *Age* captures the difference between the incorporation year and the current year, *Diversify* measures the level of diversification based on the number of industries a business group is operating, and *Affiliates_no.* indicates the number of affiliates controlled by a business group.

We divide the sample into two subsamples and estimate the regression for these subsamples separately. We include the control variables of the main regression model, but the coefficient on earnings quality is only reported for brevity. Table 6 displays the results of the heterogeneity analysis. If tunneling exists, we expect to observe a lower magnitude of coefficients for low CFR and Young firms as high information problems in these firms reduce the earnings quality effect on investment decisions, and on the other hand, insignificant results or opposite results indicate no tunneling. Further, if the internal capital market argument holds, higher coefficients are observed for firms that are part of highly diversified business groups, and which have a significant number of affiliates. This implies a stronger earnings quality effect on investment decisions for group firms with relatively lower financial constraints and easy access to funds.

Our results show that the positive effect of earnings quality on investment efficiency is stronger for group-affiliated firms with high cash flow rights, young firms, highly diversified firms, and firms having superior resources due to a higher number of member affiliates. These results lead us to conclude that the positive effect of earnings quality on investment efficiency is more pronounced among affiliated firms with greater access to internal capital markets. Further, there is no evidence of tunneling.

[Insert Table 6]

These results are in contrast with prior studies such as Bertrand et al. (2002) and Kali and Sarkar (2011) that document the evidence of tunnelling in Indian business groups and show that controlling shareholders prioritize their own benefits over firm welfare. Our findings complement the findings of Wadhwa and Syamala (2023) and Gopalan et al. (2007) suggesting that internal capital markets play a positive role in mitigation of information problems for firms affiliated with Indian family business groups, distinguishing them from independent firms.

## 5. Robustness checks

### 5.1. Alternative measures of investment efficiency and earnings quality

To prove robustness of our findings, we reestimate investment efficiency following the methodology adopted by Chen et al. (2011). Since the association between investment and sales growth could be different depending upon positive or negative growth, the model includes an additional indicator variable as shown below:

$$invt_{it} = \beta_0 + \beta_1 NegGrow_{i,t-1} + \beta_2 Salesgrow_{i,t-1} + \beta_3 NegGrow_{it-1} * Salesgrow_{i,t-1} + \epsilon_{i,t} \quad (5)$$

where, $NegGrow_{i,t-1}$ is an indicator variable that assumes value 1 for negative growth and else 0 and the remaining variables are defined as earlier.

The results, estimated using the alternative proxy, are in line with the results reported earlier, as shown in Table 7. Higher earnings quality is positively associated with investment efficiency and negatively associated with two sub-optimal choices of over-/underinvestment. Likewise, group affiliation enhances investment efficiency by alleviating both over-/underinvestment. Further, the earnings quality effect is stronger for group-affiliated firms than for standalone firms.

[Insert Table 7]

To assess the robustness of our results obtained with Kothari et al. (2005) model, we use three alternative earnings quality proxies based on McNichols and Stubben (2008), Kasznik (1999) and Modified jones model (1995). These extensively used models are estimated cross-sectionally with a minimum of 16 industry-year observations: -

$$\Delta AR_{i,t} = \alpha_0 + \alpha_1 \Delta Rev_{i,t} + + \epsilon_{i,t} \quad (6)$$

$$ACC_{i,t} = \alpha_0 + \alpha_1 \Delta Rev_{i,t} + PPE_{i,t} + \Delta CFO_{it,} + \epsilon_{i,t} \quad (7)$$

$$ACC_{i,t} = \alpha_0 + \alpha_1 \left(\frac{1}{lag\_assets}\right) + \alpha_2 (\Delta Rev_{i,t} - \Delta AR_{i,t}) + \alpha_3 PPE_{i,t} + \epsilon_{i,t} \quad (8)$$

where, $\Delta CFO_{i,t}$ stands for the annual change in cash flow from operations for firm $i$ and year $t$ and the rest of the variables are defined as earlier.

Estimation results based on three alternative earnings quality proxies are displayed in Table 8, Columns (1) to (9). These results confirm a positive association between investment efficiency and earnings quality for all three measures and negative relation between two sub-optimal investment choices and earnings quality and therefore, reiterate our previous findings that higher earnings quality enhances investment efficiency and alleviates over-/underinvestment by mitigating the informational problems.

[Insert Table 8]

Further, the interaction between the business group dummy variable and the three alternative earnings quality proxies is positive and statistically significant for investment efficiency as shown in Columns (1), (4), and (7) of Table 8. In the overinvestment scenario, we find a significant negative interaction coefficient only for the third proxy, however, two other proxies also report a negative interaction coefficient though non-significant as indicated in Columns (2), (5), and (8). For the underinvestment case, the results reveal a statistically significant negative interaction coefficient for all the proxies as shown in Columns (3), (6), and (9). These results are qualitatively similar to those reported earlier.

### 5.2.Impact of Political connections

In India, the ties between politicians and businesses have deep roots and have become more pronounced in recent times. Several popular Indian conglomerates like Adani, Birla, Bajaj and Tata have long maintained close connections with major political parties and influential leaders. Following the economic reforms of the early 1990s, corporate donations to political parties have also surged, with mechanisms such as direct funding, electoral bonds and electoral trusts gaining traction.

As a robustness checks, we analyze how political affinity can influence the earnings quality-investment decisions of business and non-business group firms. To construct the proxy for political connections, we mainly rely on political contributions, the data for which is extracted from the Election Commission of India website and Association for Democratic Reforms website.[11] Since independence, BJP and INC have been two major ruling parties in the country, therefore, we consider corporate donations made to these two national parties only. Following prior literature, we assume that a firm is assumed to be politically connected and hence, set

[11] Data on political donations was collected from https://myneta.info/party/ , a platform maintained by Association for Democratic reforms and political contributions made via purchase of electoral bond are documented on https://www.eci.gov.in/disclosure-of-electoral-bonds

equal to one if the firm itself, or at least one of its promoters or top investors has made political contributions to these two national political parties (Cooper, Gulen, and Ovtchinnikov 2010).

In Table 9, We observe a strong positive interaction between earnings quality and business group (*EQ*BG*) for politically connected firms, significantly enhancing investment efficiency by mitigating both overinvestment and underinvestment. However, we do not observe significant interaction results for non-politically connected firms. These findings are consistent with resource-based view, which contends that political connections provide group firms with access to exclusive resources, such as concessions, favorable lending terms and regulatory environments, enabling value-relevant investments (Wong et al. 2018; Joni et al. 2020). Also, political ties strengthen the governance structures of business groups due to high media scrutiny and regulatory attention, enabling more efficient resource allocation and better monitoring of managerial investment activities (Dyck and Zingales 2002; Preuss & Königsgruber (2021).

To further support the findings, we construct an alternative proxy that also considers the possibility of firms receiving government projects (Faccio 2006) and report similar findings in Panel B of Table 9. It can be inferred that political connections help group affiliated firm obtain exclusive resources that strengthen the competitive advantage and also facilitate better monitoring, enabling firm to realize value-relevant investments than engaging in sub-optimal or distortive investments.

[Insert Table 9]

### 5.3. Endogeneity tests

To address the endogeneity concern, we exploit the exogenous shock of Indian accounting standards (Ind-AS) adoption in the year 2016 which is believed to improve the earnings quality of Indian firms and hence, offers an important natural experiment to examine the causal effect of earnings quality on investment efficiency. Our identification strategy is based on using

propensity score matching (PSM) and performing difference-in-difference (DiD) analysis to establish the causal link. While the aim of Ind AS adoption is to improve earnings quality, empirical research shows that all firms do not experience positive change in earnings quality in response to these converged standards (Adhikari et al., 2021). As a result, for our analysis, we construct a dummy Treatment variable assuming value 1 (0) for firms having earnings quality change above (below) the industry median in the Ind-AS adoption year.

For analysis, we use a two-step process. First, using a logit model, we predict the probability of a firm being a high-quality firm with a Treatment dummy as the dependent variable and include explanatory variables such as size, leverage, dividend, sales growth, return on assets, operating cash flows, equity issues, and debt issues following prior studies (Ball and Shivakumar, 2005; Daske et al., 2008). Then, each treatment firm is matched to a control firm using the propensity score within a caliper of 10%, without replacement, yielding 65 matched pairs. We retain only those pairs that have observations both in pre- and post-treatment years, forming a sample for the DiD analysis. In the next step, we replace *EQ* with *Treatment*, *Post,* and *Treatment*Post* variables in the main model where *Post* assumes value 1 for the post-treatment year and 0 for pre-treatment year and estimate the model.

[Insert Table 10]

Table 10 Panel (A) shows that there is no significant difference between covariates of treatment and matched control firms after performing matching. The result of DiD analysis reports the positive coefficient (statistically significant at the 1%-level) on interaction term *(Treatment*Post)* in Column (1) of Panel B, suggesting investment efficiency for treatment firms has increased more post Ind-AS adoption compared to that for control firms. Similarly, compared to control firms, we find reduced under/overinvestment for treated firms post new regulation as shown by a significant negative interaction coefficient in Columns (2) and (3).

We further test the linkage for group affiliated firms through triple interaction (*Treatment*Post*BG)* in Columns (4) to (6). The triple interaction indicates stronger results for the underinvestment variable only at a 10% level of significance. These results imply a significant fall in excess underinvestment in response to an exogenous change in the earnings quality of group firms relative to standalone firms around new regulation. Overall, these results establish a positive causal link between earnings quality and investment decisions.

Even after performing difference-in-difference analysis, our results still could be driven by other sources of endogeneity. For this purpose, we perform various tests to address residual endogeneity. First, we run fixed effect panel regression to address unobserved heterogeneity bias. Second, we perform entropy balancing to address any self-selection bias (Hainmueller 2012) there exists significant differences between business group affiliates and non-group firms. We match group firms (treatment group) with non-group firms (control group) based on idiosyncratic controls included in the main equation. To ensure the covariate balance between these two groups, the technique reweights the observation in the control group. Hence, both groups become identical in terms of mean, variance, and skewness. We then re-estimate our main equation using different entropy-balancing weights. Further, we employ endogenous treatment effects to model the situations where an unobserved variable may affect both the treatment and the outcome. The results from these tests are reported in Table 11. These results are consistent with our main findings.

[Insert Table 11]

## 6. Limitations and future research directions

While the research provides useful insights by exploring the link between earnings quality, business group affiliation, and investment efficiency, there are some limitations that should be acknowledged. First, while the study uses a sample from India, where business

groups are prominent (Khanna and Palepu 2000; Khanna and Yafeh 2005), this setting limits the broader applicability of the results given different institutional environments in other settings in terms of legal protections, governance standards, enforcement, and capital market development that may impact the functioning of business groups (Khanna and Yafeh 2007). This creates a limitation in generalizing the findings to other settings without incorporating these factors, thus warranting caution when interpretating these results beyond the Indian context. Thus, we recommend a cross-country study that examines the behavior of business groups operating in different institutional environments to draw more comprehensive understanding. Second, though the study employs widely used performance-matched discretionary accruals as the primary measure for earnings quality, it might not fully capture earnings quality variations across different industries or firm structures. Besides accruals quality, future research could explore alternative measures of earnings quality like earnings persistence, value relevance, accounting conservatism, real earnings management and smoothness to explore the interplay between earnings quality, business group, and investments. A recent study by Marisetty and Moturi (2023) also highlight the growing tendency among group affiliates to manipulate earnings via real activities than undertaking accrual manipulation.

Third, Though the study focuses on agency framework to examine the investment behavior of business groups, a more nuanced approach using social network analysis would provide deeper insights as group firms have personal social ties in form of director interlocks and broader inter-group equity ties that may impact investment decisions (Xing et al. 2023). Fourth, while our sales-growth-driven measure of investment efficiency captures the deviation from optimal investment, it ignores other dimensions of investment decisions like investment timing or project selection quality (Wadhwa and Syamala 2023). To illustrate, managers might undertake investments at right level but in wrong projects or they may postpone investments

that would have been more profitable if made earlier. Hence, future study considering a more comprehensive measure of investment efficiency can provide a fuller picture of investment behavior. Fifth while we employ different methods like fixed effects, instrumental variable regression, entropy balancing, and an endogenous treatment model, potential endogeneity issues may still exist. Time-varying unobserved factors or measurement errors in key variables such as earnings quality and investment efficiency could still introduce bias.

Sixth, our treatment of business group as binary variable, though supported by both prior studies (Khanna and Palepu 2000; Almeida et al. 2015), it may oversimplify the relationship between group characteristics, earnings quality and investment decisions. These groups vary widely in terms of management, structure, and governance, which can impact our analysis. Though we try to analyze this linkage conditioned on business group size and other group characteristics like age, cash flow rights and group resources, a more granular approach considering governance, management and other intra-firm variations would facilitate a more comprehensive understanding. Similarly, future studies can incorporate the effect of macroeconomic shocks like Covid-19 pandemic to draw a more comprehensive picture. These limitations underscore the need for further research to enhance the robustness and applicability of the results.

## 7. Conclusion

Using theoretical lenses of agency and information asymmetry theory, we investigate the effect of earnings quality and business group affiliation on investment efficiency, using a representative sample of listed Indian firms for the period 1997–2021. The results show that higher earnings quality, by mitigating agency and information asymmetry, increase investment efficiency, leading to lower under- and overinvestment. These results are in line with prior studies (Biddle et al. 2009, Chen et al. 2011). Moreover, group affiliation is a useful mechanism that contributes positively to improving investment efficiency in both scenarios. We obtain

empirical evidence that earnings quality and group affiliation have a complementary relationship in improving investment efficiency: in those firms with affiliation to a business group, the earnings quality effect on investment efficiency is higher than for those firms not affiliated with any business group. This suggests that besides earnings quality, group affiliation also acts as a useful mechanism that is employed to control managers' behavior and lower financial constraints in a setting, characterized by less developed financial market and weak legal protection.

Extended analysis shows that affiliation with large business groups is highly beneficial as it reduces underinvestment by mitigating financial constraints. However, it does not impact overinvestment indicating signs of entrenched insiders that may prioritize their own goals over firm value. In contrast, firms affiliated with small/medium-sized business groups face lower overinvestment with a smaller effect on underinvestment. Further, earnings quality plays a crucial role in the investment decisions of large business group firms relative to small/medium-sized business group firms. The results of heterogeneity analysis reveal that the earnings quality effect is stronger for affiliated firms with larger internal capital markets and superior resources.

These results contribute to the literature showing that, in a context where there is a higher possibility of fabricated financial statements, quality financial reporting and group affiliation play a complementary role in reducing information asymmetries. Our results also have significant theoretical and practical implications for different stakeholders since they aid in understanding the economic consequences of corporate finance and accounting strategies in investment decisions. Theoretically, by studying the interaction effect, we add a new dimension to the literature by exploiting the variation in organization structure prevalent in India. From a practical perspective, managers should focus on enhancing earnings quality, given its strong influence on investment efficiency. Transparent and high-quality financial reporting can help secure better financial terms, lowering funding cost and improving investment outcomes.

Additionally, managers of group firms must strike a balance between leveraging group affiliation benefits and avoiding risk associated with over-reliance on the internal capital markets. While business groups ease financial constraint, it becomes crucial to control for the potential misuse of resources or tunneling to prevent inefficiencies.

Our findings also offer practical insights for regulators and investors. Regulators can assess the quality of financial information in order to determine whether group firms are involved in expropriation activities through accrual earnings management. In this context, regulatory bodies must revisit their policies on minority shareholders rights and related party disclosures to better monitor the group structures, leading to reduced risks of tunneling and inefficient capital allocation. Similarly, investor monitoring will be more effective in case of transparent accounting information, allowing for more accurate risk assessments between business group and non-group firms. Further, the insights about the effects of business group size aids investors in evaluating the risk profiles of these firms. Similarly, Institutional investors should differentiate between standalone and group-affiliated firms, focusing on those with high earnings quality, especially within large business groups, to better manage investment risks and optimize returns.

## References


Abel, A. B. (1983). Optimal investment under uncertainty. *The American Economic Review*, *73*(1), 228–233.

Adhikari, A., Bansal, M., and Kumar, A. (2021). IFRS convergence and accounting quality: India a case study. *Journal of International Accounting, Auditing and Taxation*, *45*, 100430.

Ahmed, A. S., and Duellman, S. (2007). Accounting conservatism and board of director characteristics: An empirical analysis. *Journal of Accounting and Economics*, *43*(2–3), 411–437.

Allen, F., Chakrabarti, R., De, S., and Qian, M. (2012). Financing firms in India. *Journal of Financial Intermediation*, *21*(3), 409–445.

Almeida, H., Park, S. Y., Subrahmanyam, M. G., & Wolfenzon, D. (2011). The structure and formation of business groups: Evidence from Korean chaebols. *Journal of Financial Economics*, *99*(2), 447-475.

Almeida, H., Kim, C., and Kim, H. B. (2015). Internal capital markets in business groups: Evidence from the Asian financial crisis. *The Journal of Finance*, *70*(6), 2539–2586.

Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003). Founding family ownership and the agency cost of debt. *Journal of Financial economics*, *68*(2), 263-285.

Armstrong, C. S., Guay, W. R., and Weber, J. P. (2010). The role of information and financial reporting in corporate governance and debt contracting. *Journal of Accounting and Economics*, *50*(2–3), 179–234.

Assad, N., Jaafar, A., & Zervopoulos, P. D. (2023). The interplay of real earnings management and investment efficiency: Evidence from the US. *Cogent Business & Management*, *10*(2), 2237174.

Bae, K., Kang, J., and Kim, J. (2002). Tunneling or value added? Evidence from mergers by Korean business groups. *The Journal of Finance*, *57*(6), 2695–2740.

Baek, J. S., Kang, J. K., & Lee, I. (2006). Business groups and tunneling: Evidence from private securities offerings by Korean chaebols. *The journal of finance*, *61*(5), 2415-2449.

Ball, R., and Shivakumar, L. (2005). Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics*, *39*(1), 83–128.

Beatty, A., Liao, S., & Weber, J. (2009). The effect of private information and monitoring on the role of accounting quality in investment decisions. Joseph Peter, The Effect of Private Information and Monitoring on the Role of Accounting Quality in Investment Decisions (June 30, 2009).

Bertrand, M., Mehta, P., and Mullainathan, S. (2002). Ferreting out tunneling: An application to Indian business groups. *The Quarterly Journal of Economics*, *117*(1), 121–148.

Bharath, S. T., Sunder, J., and Sunder, S. V. (2008). Accounting quality and debt contracting. *The Accounting Review*, *83*(1), 1–28.

Bhutta, A. I., Sultan, J., Sheikh, M. F., Sajid, M., & Mushtaq, R. (2023). The performance of business groups during institutional transition and economic downturn in a developing country. *International Journal of Emerging Markets*.

Biddle, G. C., and Hilary, G. (2006). Accounting quality and firm-level capital investment. *The Accounting Review*, *81*(5), 963–982.

Biddle, G. C., Hilary, G., and Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics*, *48*(2–3), 112–131.

Black, B. S., Kim, W., Jang, H., and Park, K.-S. (2015). How corporate governance affect firm value? Evidence on a self-dealing channel from a natural experiment in Korea. *Journal of Banking and Finance*, *51*, 131–150.

Boubaker, S., Houcine, A., Ftiti, Z., & Masri, H. (2018). Does audit quality affect firms' investment efficiency?. *Journal of the Operational Research Society*, *69*(10), 1688-1699.

Brav, A., Graham, J. R., Harvey, C. R., & Michaely, R. (2005). Payout policy in the 21st century. Journal of financial economics, 77(3), 483-527.

Buchuk, D., Larrain, B., Muñoz, F., and Urzúa, F. (2014). The internal capital markets of business groups: Evidence from intra-group loans. *Journal of Financial Economics*, *112*(2), 190–212.

Bushman, R. M., and Smith, A. J. (2001). Financial accounting information and corporate governance. *Journal of Accounting and Economics*, *32*(1–3), 237–333.

Byun, H.-Y., Choi, S., Hwang, L.-S., and Kim, R. G. (2013). Business group affiliation, ownership structure, and the cost of debt. *Journal of Corporate Finance*, *23*, 311–331.

Cestone, G., and Fumagalli, C. (2005). The strategic impact of resource flexibility in business groups. *RAND Journal of Economics*, 193–214.

Chang, X., Dasgupta, S., and Hilary, G. (2009). The effect of auditor quality on financing decisions. *The Accounting Review*, *84*(4), 1085–1117.

Chen, F., Hope, O.-K., Li, Q., and Wang, X. (2011). Financial reporting quality and investment efficiency of private firms in emerging markets. *The Accounting Review*, *86*(4), 1255–1288.

Chen, H. J., & Chen, S. J. (2012). Investment-cash flow sensitivity cannot be a good measure of financial constraints: Evidence from the time series. *Journal of Financial Economics*, *103*(2), 393-410.
Cheng, L., Chen, Y., and Zhang, Y. (2022). Business groups and corporate bond costs: Evidence from China. *Pacific-Basin Finance Journal*, *75*, 101846.
Chen, S., Wang, K., & Ma, H. (2014). Does the internal capital allocation in the business group alleviate overinvestment. *Accounting Research (In Chinese)*, *3*, 49-55.
Chu, W. (2004). Are group-affiliated firms really more profitable than nonaffiliated?. *Small Business Economics*, *22*, 391-405.
Claessens, S., Fan, J. P., & Lang, L. H. (2006). The benefits and costs of group affiliation: Evidence from East Asia. *Emerging Markets Review*, *7*(1), 1-26.
Cooper, M. J., Gulen, H., & Ovtchinnikov, A. V. (2010). Corporate political contributions and stock returns. *The Journal of Finance*, *65*(2), 687-724.
Daske, H., Hail, L., Leuz, C., and Verdi, R. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research*, *46*(5), 1085–1142.
Dechow, P., 1994. Accounting earnings and cash flows as measures of firm performance: the role of accounting accruals. Journal of Accounting and Economics 18, 3–42
Dechow, P. M., Sloan, R. G., and Sweeney, A. P. (1995). Detecting earnings management. *Accounting Review*, 193–225.
Dechow, P., Dichev, I., 2002. The quality of accruals and earnings: the role of accrual estimation errors. The Accounting Review 77, 35–59
Diamond, D. W., and Verrecchia, R. E. (1991). Disclosure, liquidity, and the cost of capital. *The Journal of Finance*, *46*(4), 1325–1359.
Dyck, A., & Zingales, L. (2002). The corporate governance role of the media. In: NBER Working Paper 9309.
Easley, D., & O'hara, M. (2004). Information and the cost of capital. The Journal of Finance, 59(4), 1553–1583.
Economic Survey, 2022-2023, Retrieved on 1 August 2024 from https://static.pib.gov.in/WriteReadData/userfiles/file/EconomicSurvey2023Q44O.pdf
Elaoud, A., and Jarboui, A. (2017). Auditor specialization, accounting information quality, and investment efficiency. *Research in International Business and Finance*, *42*, 616–629.
Faccio, M., Masulis, R. W., & McConnell, J. J. (2006). Political connections and corporate bailouts. *The journal of Finance*, *61*(6), 2597-2635.
Francis, J., LaFondb, R., Olssona, P., and Schipperc, K. (2005). The market pricing of accruals quality$. *Journal of Accounting and Economics*, *39*, 295–327.
Gaio, C., Gonçalves, T. C., & Cardoso, J. (2023). Investment efficiency and earnings quality: European evidence. *Journal of Risk and Financial Management*, *16*(4), 224.
Gedajlovic, E., and Carney, M. (2010). Markets, hierarchies, and families: Toward a transaction cost theory of the family firm. *Entrepreneurship Theory and Practice*, *34*(6), 1145–1172.
George, R., and Kabir, R. (2008). Business groups and profit redistribution: A boon or bane for firms? *Journal of Business Research*, *61*(9), 1004–1014.
Gomariz, M. F. C., and Ballesta, J. P. S. (2014). Financial reporting quality, debt maturity and investment efficiency. *Journal of Banking and Finance*, *40*, 494–506.
Gopalan, R., Nanda, V., and Seru, A. (2007). Affiliated firms and financial support: Evidence from Indian business groups. *Journal of Financial Economics*, *86*(3), 759–795.
Gopalan, R., Nanda, V., and Seru, A. (2014). Internal capital market and dividend policies: Evidence from business groups. *The Review of Financial Studies*, *27*(4), 1102–1142.
Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political analysis*, *20*(1), 25-46.
He, J., Mao, X., Rui, O. M., and Zha, X. (2013). Business groups in China. *Journal of Corporate Finance*, *22*, 166–192.
Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of accounting and economics*, *7*(1-3), 85-107.
Healy, P. M., and Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, *31*(1–3), 405–440.
Himmelberg, C.P., Hubbard, R.G. and Palia, D. (1999), "Understanding the determinants of managerial ownership and the link between ownership and performance", Journal of Financial Economics, Vol. 53 No. 3, pp. 353-384.
Hope, O., and Thomas, W. B. (2008). Managerial empire building and firm disclosure. *Journal of Accounting Research*, *46*(3), 591–626.
Houcine, A. (2017). The effect of financial reporting quality on corporate investment efficiency: Evidence from the Tunisian stock market. *Research in International Business and Finance*, *42*, 321–337.

Houqe, M. N., Ahmed, K., and Van Zijl, T. (2017). Audit quality, earnings management, and cost of equity capital: Evidence from India. *International Journal of Auditing*, *21*(2), 177–189.

Hovakimian, G. (2009). Determinants of investment cash flow sensitivity. *Financial management*, *38*(1), 161-183.

Huang, H., Weinbaum, D., & Yehuda, N. (2023). Financial reporting quality and investment efficiency: The role of strategic alliances. *Journal of Contemporary Accounting & Economics*, *19*(3), 100377.

International Monetary Fund, *World Economic Outlook Report*, April 2019. https://www.imf.org/en/Publications/WEO/Issues/2019/03/28/world-economicoutlook-april-2019.

International Monetary Fund, *World Economic Outlook Report*, April 2023. https://www.imf.org/en/Publications/WEO/Issues/2023/04/11/world-economic-outlook-april-2023

Jackling, B., and Johl, S. (2009). Board structure and firm performance: Evidence from India's top companies. *Corporate Governance: An International Review*, *17*(4), 492–509.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, *76*(2), 323–329.

Jensen, M. C., and Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Jiang, G., Lee, C. M., and Yue, H. (2010). Tunneling through intercorporate loans: The China experience. *Journal of Financial Economics*, *98*(1), 1–20.

Johnson, S., La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. (2000). Tunneling. *American Economic Review*, *90*(2), 22–27.

Joni, J., Ahmed, K., & Hamilton, J. (2020). Politically connected boards, family and business group affiliations, and cost of capital: Evidence from Indonesia. *The British Accounting Review*, *52*(3), 100878.

Kali, R., & Sarkar, J. (2011). Diversification and tunneling: Evidence from Indian business groups. *Journal of Comparative Economics*, *39*(3), 349-367.

Kasznik, R. (1999). On the association between voluntary disclosure and earnings management. *Journal of Accounting Research*, *37*(1), 57–81.

Khanna, T., and Palepu, K. (2000). Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *The Journal of Finance*, *55*(2), 867–891.

Khanna, T., & Rivkin, J. W. (2001). Estimating the performance effects of business groups in emerging markets. *Strategic management journal*, *22*(1), 45-74.

Khanna, T., & Rivkin, J. W. (2006). Interorganizational ties and business group boundaries: Evidence from an emerging economy. *Organization science*, *17*(3), 333-352.

Khanna, T., and Yafeh, Y. (2005). Business groups and risk sharing around the world. *The Journal of Business*, *78*(1), 301–340.

Khanna, T., and Yafeh, Y. (2007). Business groups in emerging markets: Paragons or parasites? *Journal of Economic Literature*, *45*(2), 331–372.

Koo, D. S., Ramalingegowda, S., & Yu, Y. (2017). The effect of financial reporting quality on corporate dividend policy. *Review of Accounting studies*, *22*, 753-790.

Kothari, S. P., Leone, A. J., and Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, *39*(1), 163–197.

La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance*, *54*(2), 471–517.

Lambert, R., Leuz, C., & Verrecchia, R. E. (2007). Accounting information, disclosure, and
the cost of capital. Journal of Accounting Research, 45(2), 385–420

Lara, J. M. G., Osma, B. G., and Penalva, F. (2016). Accounting conservatism and firm investment efficiency. *Journal of Accounting and Economics*, *61*(1), 221–238.

Le, H. T. T., Vo, X. V., and Vo, T. T. (2021). Accruals quality and the cost of debt: Evidence from Vietnam. *International Review of Financial Analysis*, *76*, 101726.

Lin, J. J., and Yeh, Y.-H. (2020). Internal capital markets, ownership structure, and investment efficiency: Evidence from Taiwanese business groups. *Pacific-Basin Finance Journal*, *60*, 101284.

Liu, Y., Kim, W., and Sung, T. (2021). Investment efficiency of firms outside the business group. *Journal of Corporate Finance*, *71*, 102105.

Liu, M., Wysocki, P., 2007. Cross-sectional determinants of information quality proxies and cost of capital measures. Working Paper, MIT.

Lou, Z., Chen, S., Jia, Y., & Yu, X. (2021). Business group affiliation and R&D investment: evidence from China. *Emerging Markets Finance and Trade*, *57*(8), 2307-2322.

Mahmood, I. P., Zhu, H., & Zajac, E. J. (2011). Where can capabilities come from? Network ties and capability acquisition in business groups. *Strategic Management Journal*, *32*(8), 820-848.

Masulis, R. W., Pham, P. K., and Zein, J. (2011). Family business groups around the world: Financing advantages, control motivations, and organizational choices. *The Review of Financial Studies*, *24*(11), 3556–3600.

Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *The journal of finance*, *60*(6), 2661-2700.

Marisetty, V. B., & Moturi, S. (2023). Boundaries of the firm and real earnings management. *Journal of International Accounting, Auditing and Taxation*, *52*, 100567.

McNichols, M. F., and Stubben, S. R. (2008). Does earnings management affect firms' investment decisions? *The Accounting Review*, *83*(6), 1571–1603.

Morck, R., and Yeung, B. (2003). Agency problems in large family business groups. *Entrepreneurship Theory and Practice*, *27*(4), 367–382.

Mukherjee, D., Makarius, E. E., & Stevens, C. E. (2018). Business group reputation and affiliates' internationalization strategies. *Journal of World Business*, *53*(2), 93-103.

Myers, S. C., and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221.

Orazalin, N., and Akhmetzhanov, R. (2019). Earnings management, audit quality, and cost of debt: Evidence from a Central Asian economy. *Managerial Auditing Journal*.

Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies*, *22*(1), 435–480.

Press Information Bureau, Government of India (2023). Roadmap to making India a $5 trillion economy Retrieved August 20, 2024, from https://pib.gov.in/Pressreleaseshare.aspx?PRID=1944734

Preuss, S., & Königsgruber, R. (2021). How do corporate political connections influence financial reporting? A synthesis of the literature. *Journal of Accounting and Public Policy*, *40*(1), 106802.

Shahzad, F., Rehman, I. U., Colombage, S., & Nawaz, F. (2019). Financial reporting quality,
family ownership, and investment efficiency: An empirical investigation. Managerial Finance.

Stein, J. C. (2003). Agency, information and corporate investment. *Handbook of the Economics of Finance*, *1*, 111–165.

Stiglitz, J. E., and Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, *71*(3), 393–410.

Tahat, Y. A., Ahmed, A. H., and Power, D. (2022). Earnings quality and investment efficiency: The role of the institutional settings. *Review of Quantitative Finance and Accounting*, *58*(3), 1277–1306.

Tan, W., Yu, S., and Ma, Z. (2018). The impact of business groups on investment efficiency: Does capital allocation matter? *Emerging Markets Finance and Trade*, *54*(15), 3539–3551.

Tirole, J. (2010). *The theory of corporate finance*. Princeton university press.

Wadhwa, K., and Syamala, S. R. (2022). Are business groups different from other family firms? Evidence from corporate investments during political uncertainty. *Emerging Markets Review*, 100947.

Watts, R. and Zimmerman, J. (1978), "Towards a positive theory of the determination of accounting "standards", The Accounting Review, Vol. 53, pp. 112-134.

Whited T M., and G. J. Wu. 2006. Financial constraints risk. Review of Financial Studies 19 (2): 531–59.

Wong, W. Y., & Hooy, C. W. (2018). Do types of political connection affect firm performance differently?. *Pacific-Basin Finance Journal*, *51*, 297-317.

Xiang, X. (2023). How does the internal capital market influence RandD spending? New evidence. *International Journal of Emerging Markets*, *18*(4), 886–907.

Xing, F., Hai, M., & Cai, J. (2023). Network centrality and technology acquisitions: Evidence from China's listed business groups. *Economic Modelling*, *120*, 106181.

**Table 1**

Sample selection criteria.

| Criteria | Number of firms | Total observations |
|---|---|---|
| Initial Sample from Prowess database (1988-2021) | 5112 | 114,217 |
| (-) Firms operating in the financial sector | (1105) | (24,845) |
| Firms operating in the non-financial sector only | 4007 | 89,377 |
| (-) Dropping observation with missing investment efficiency variable | | (44,370) |
| (-) Dropping observation with missing earnings quality variable | | (15,440) |
| Non-financial firms with complete information on investment efficiency and earnings quality | 2,851 | 29,567 |
| (-) Missing information on other control variables | | (10,640) |
| Final sample (1997 to 2021) | 2160 | 18,927 |

Note: This table presents several sample selection criteria that have been employed to derive final sample.

**Table 2**

Summary statistics by industry.

| Industry | *NON-BG* firms | | | | | *BG* firms | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Invt_effi* | | *EQ* | | | *Invt_effi* | | *EQ* | |
| | *N* | *Mean* | *Median* | *Mean* | *Median* | *N* | *Mean* | *Median* | *Mean* | *Median* |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Agriculture, forestry and fishing | 132 | -0.974 | -0.537 | -1.118 | -0.700 | 39 | -0.908 | -0.447 | -1.181 | -0.748 |
| Mining and quarrying | 92 | -1.587 | -0.841 | -1.239 | -0.847 | 11 | -0.688 | -0.500 | -0.785 | -0.868 |
| Manufacturing | 8239 | -1.003 | -0.401 | -1.583 | -0.765 | 5766 | -1.152 | -0.466 | -1.554 | -0.736 |
| Construction | 594 | -0.442 | -0.162 | -1.578 | -0.816 | 627 | -0.378 | -0.147 | -1.460 | -0.740 |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | 1279 | -0.652 | -0.199 | -1.727 | -0.750 | 606 | -0.760 | -0.245 | -1.576 | -0.732 |
| Transportation and storage | 51 | -0.955 | -0.389 | -1.242 | -0.477 | 29 | -0.891 | -0.425 | -0.836 | -0.502 |
| Accommodation and Food service activities | 144 | -1.940 | -0.767 | -1.169 | -0.652 | 114 | -1.559 | -0.731 | -1.233 | -0.655 |
| Information and communication | 290 | -1.051 | -0.371 | -1.134 | -0.716 | 210 | -1.012 | -0.402 | -1.066 | -0.590 |
| Administrative and support service activities | 80 | -1.168 | -0.494 | -1.213 | -0.591 | 35 | -1.258 | -0.525 | -2.111 | -1.181 |
| Human health and social work activities | 93 | -1.501 | -0.758 | -1.051 | -0.560 | 26 | -1.883 | -0.769 | -0.962 | -0.435 |
| Diversified | 299 | -1.029 | -0.423 | -1.674 | -0.977 | 171 | -1.126 | -0.417 | -1.438 | -0.864 |

Note: This table displays industry-wise sample distribution. Col (1) – (5) displays summary statistics for investment efficiency (*Invt_effi*) and earnings quality (*EQ*) variable for *NON-BG* firms. Col (6)-(10) reports summary statistics for investment efficiency (*Invt_effi*) and earnings quality (*EQ*) variable for *BG* firms. *NON-BG* firms are standalone firms or firms which are not affiliated with any business groups. *BG* firms are firms having affiliation with a business group.

**Table 3**

Descriptive statistics.

Panel A: This panel presents summary statistics for the variables used in this study.

| | N | mean | median | p25 | p75 | sd |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Invt_effi* | 18927 | -0.998 | -0.383 | -0.893 | -0.162 | 1.886 |
| *Overinvest* | 8609 | 1.133 | 0.477 | 0.179 | 1.120 | 1.954 |
| *Underinvest* | 10318 | 0.886 | 0.330 | 0.152 | 0.713 | 1.819 |
| *EQ* | 18927 | -1.549 | -0.748 | -1.626 | -0.322 | 2.550 |
| *BG* | 18927 | 0.403 | 0.000 | 0.000 | 1.000 | 0.491 |
| *SIZE* | 18927 | 7.797 | 7.657 | 6.469 | 8.986 | 1.797 |
| *LN(AGE)* | 18927 | 3.313 | 3.332 | 2.996 | 3.664 | 0.589 |
| *TANG* | 18927 | 0.534 | 0.510 | 0.300 | 0.724 | 0.317 |
| *LEV* | 18927 | 0.305 | 0.296 | 0.169 | 0.426 | 0.179 |
| *OpCycle* | 18927 | 5.183 | 5.152 | 4.771 | 5.534 | 0.799 |
| *Loss* | 18927 | 0.193 | 0.000 | 0.000 | 0.000 | 0.395 |
| *SLACK* | 18927 | 0.027 | 0.010 | 0.002 | 0.029 | 0.051 |
| *DIVIDEND* | 18927 | 0.542 | 1.000 | 0.000 | 1.000 | 0.498 |
| *TOBINQ* | 18927 | 1.816 | 0.980 | 0.500 | 2.030 | 2.673 |
| *Z* | 18927 | 1.248 | 1.022 | 0.673 | 1.449 | 1.454 |
| *VolaSales* | 18927 | 0.174 | 0.116 | 0.060 | 0.212 | 0.202 |
| *VolaCFO* | 18927 | 0.071 | 0.052 | 0.029 | 0.088 | 0.069 |

Panel B: This panel presents Pearson correlation coefficients. Statistical significance at the 1, 5, and 10 % level is indicated by ***, **, and *, respectively.

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Invt_effi* | 1 | | | | | | | | | | | | | | |
| *EQ* | 0.392*** | 1 | | | | | | | | | | | | | |
| *BG* | -0.026*** | 0.009 | 1 | | | | | | | | | | | | |
| *SIZE* | 0.013* | 0.026*** | 0.434*** | 1 | | | | | | | | | | | |
| *LN(AGE)* | 0.006 | -0.013* | 0.247*** | 0.315*** | 1 | | | | | | | | | | |
| *TANG* | -0.191*** | -0.034*** | 0.057*** | -0.160*** | 0.067*** | 1 | | | | | | | | | |
| *LEV* | -0.043*** | -0.026*** | 0.002 | -0.01 | -0.091*** | 0.209*** | 1 | | | | | | | | |
| *OpCycle* | 0.061*** | -0.020*** | -0.009 | 0.062*** | 0.033*** | -0.271*** | 0.040*** | 1 | | | | | | | |
| *Loss* | -0.038*** | -0.048*** | 0.043*** | -0.038*** | 0.035*** | 0.120*** | 0.231*** | 0.175*** | 1 | | | | | | |
| *SLACK* | 0.048*** | -0.006 | -0.082*** | 0.018** | 0.038*** | -0.150*** | -0.208*** | -0.048*** | -0.075*** | 1 | | | | | |
| *DIVIDEND* | -0.013* | 0.059*** | 0.207*** | 0.336*** | 0.188*** | -0.044*** | -0.170*** | -0.108*** | -0.375*** | 0.017** | 1 | | | | |
| *TOBINQ* | 0.035*** | 0.036*** | 0.041*** | 0.190*** | 0.091*** | -0.092*** | -0.087*** | -0.082*** | -0.061*** | 0.093*** | 0.100*** | 1 | | | |
| *Z* | 0.030*** | 0 | -0.045*** | -0.038*** | -0.003 | -0.045*** | -0.170*** | -0.284*** | -0.139*** | 0.088*** | 0.069*** | 0.202*** | 1 | | |
| *VolaSales* | 0.030*** | -0.005 | -0.123*** | -0.185*** | -0.177*** | -0.109*** | 0.019*** | -0.167*** | -0.032*** | 0.054*** | -0.099*** | 0.019*** | 0.197*** | 1 | |
| *VolaCFO* | 0.049*** | -0.011 | -0.121*** | -0.159*** | -0.174*** | -0.159*** | -0.001 | -0.019*** | -0.042*** | 0.080*** | -0.062*** | 0.042*** | 0.072*** | 0.343*** | 1 |

Panel C: This panel presents the results from tests of difference in means and medians for the NON-BG firms and BG firms. The BG (NON-BG) firms are those firms with

| | Non-BG | | BG | | difference in mean | difference in median |
|---|---|---|---|---|---|---|
| | mean | median | mean | median | | |
| | (1) | (2) | (3) | (4) | *(5)=(3)-(1)* | *(6)=(4)-(2)* |
| *Invt_effi* | -0.957 | -0.364 | -1.059 | -0.411 | -0.102*** | -0.046*** |
| *Overinvest* | 1.097 | 0.454 | 1.185 | 0.511 | 0.088** | 0.057*** |
| *Underinvest* | 0.846 | 0.319 | 0.947 | 0.351 | 0.102** | 0.032** |
| *EQ* | -1.568 | -0.763 | -1.522 | -0.734 | 0.046 | 0.029* |
| *SIZE* | 7.156 | 7.001 | 8.746 | 8.665 | 1.590*** | 1.664*** |
| *LN(AGE)* | 3.193 | 3.219 | 3.490 | 3.526 | 0.297*** | 0.307*** |
| *TANG* | 0.519 | 0.487 | 0.556 | 0.545 | 0.037*** | 0.057*** |
| *LEVERAGE* | 0.305 | 0.292 | 0.306 | 0.302 | 0.001 | 0.009 |
| *OpCycle* | 5.189 | 5.167 | 5.174 | 5.130 | -0.015 | -0.038*** |
| *Loss* | 0.179 | 0.000 | 0.214 | 0.000 | 0.034*** | 000*** |
| *SLACK* | 0.030 | 0.012 | 0.022 | 0.008 | -0.008*** | -0.004*** |
| *DIVIDEND* | 0.457 | 0.000 | 0.667 | 1.000 | 0.210*** | 1.000*** |
| *TOBINQ* | 1.725 | 0.910 | 1.949 | 1.085 | 0.223*** | 0.175*** |
| *Z* | 1.302 | 1.084 | 1.168 | 0.936 | -0.133*** | -0.148*** |
| *VolaSales* | 0.195 | 0.129 | 0.144 | 0.100 | -0.051*** | -0.029*** |
| *VolaCFO* | 0.078 | 0.057 | 0.061 | 0.046 | -0.017*** | -0.012*** |

Note: This table presents summary statistics for the variables used in this study. *Invt_effi* stands for investment efficiency computed using Biddle et al. (2009), *Overinvest* represents positive residuals obtained by regressing investment on past year sales growth, *Underinvest* shows negative residuals multiplied by (-1) where residuals are obtained from regression of investment on past year sales growth, *EQ* is earnings quality calculated based on Kothari et al. (2005) model, *BG* is a dummy variable which assumes value 1 for group affiliated firms and 0 else, *SIZE* is the natural logarithm of the book value of total assets, *LN(AGE)* is log of difference between current and incorporation year, *TANG* is ratio of property plants and equipment to total assets, *LEV* is long term borrowing scaled by total assets, *OpCycle* is log of operating cycle, Loss is binary variable that assumes value 1 if firm reports a loss, else 0, *SLACK* is ratio of cash to total assets, *DIVIDEND* is a binary variable that assumes value 1 for dividend payer firm, otherwise 0, *TOBINQ* is the ratio of market value of equity and debt over total assets, *Z* is a measure of financial strength, *VolaSales* and *VolaCFO* stand for standard deviation of sales and cash flow from operations from t-2 to t years. The sample period for this study is from 1997 to 2021.

**Table 4**

Regression of investment efficiency on earnings quality, group affiliation, and interaction.

| | *Invt_effi* | | *Overinvest* | | *Underinvest* | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *EQ* | 0.292*** | 0.263*** | -0.306*** | -0.273*** | -0.281*** | -0.255*** |
| | (0.018) | (0.019) | (0.021) | (0.026) | (0.025) | (0.025) |
| *BG* | | 0.158*** | | -0.179*** | | -0.124** |
| | | (0.043) | | (0.064) | | (0.051) |
| *EQ*BG* | | 0.077*** | | -0.080** | | -0.071** |
| | | (0.027) | | (0.039) | | (0.033) |
| *SIZE* | -0.043*** | -0.048*** | 0.047** | 0.054** | 0.040*** | 0.042*** |
| | (0.011) | (0.012) | (0.021) | (0.023) | (0.012) | (0.012) |
| *LN(AGE)* | 0.066*** | 0.064*** | -0.090** | -0.083** | -0.043 | -0.045 |
| | (0.023) | (0.022) | (0.042) | (0.039) | (0.034) | (0.034) |
| *TANG* | -0.957*** | -0.965*** | 1.217*** | 1.228*** | 0.760*** | 0.763*** |
| | (0.074) | (0.074) | (0.091) | (0.093) | (0.084) | (0.083) |
| *LEV* | 0.083 | 0.094 | -0.331** | -0.341** | 0.032 | 0.023 |
| | (0.113) | (0.112) | (0.157) | (0.156) | (0.132) | (0.132) |
| *OpCycle* | 0.032 | 0.032 | -0.019 | -0.019 | -0.028 | -0.028 |
| | (0.021) | (0.021) | (0.037) | (0.037) | (0.025) | (0.025) |
| *Loss* | -0.033 | -0.034 | 0.136** | 0.141** | 0.010 | 0.008 |
| | (0.042) | (0.041) | (0.068) | (0.066) | (0.047) | (0.047) |
| *SLACK* | 0.452*** | 0.417** | -0.958*** | -0.904*** | -0.145 | -0.119 |
| | (0.165) | (0.159) | (0.313) | (0.323) | (0.199) | (0.195) |
| *DIV* | -0.099** | -0.099** | 0.077 | 0.078 | 0.105** | 0.104** |
| | (0.046) | (0.046) | (0.070) | (0.069) | (0.046) | (0.046) |
| *TOBINQ* | 0.001 | 0.001 | -0.010 | -0.010 | 0.002 | 0.002 |
| | (0.004) | (0.004) | (0.009) | (0.008) | (0.005) | (0.005) |
| *Z* | 0.025*** | 0.024*** | -0.032*** | -0.031*** | -0.016 | -0.016 |
| | (0.008) | (0.008) | (0.010) | (0.011) | (0.010) | (0.010) |
| *VolSales* | -0.095 | -0.094 | 0.327** | 0.327** | -0.019 | -0.020 |
| | (0.076) | (0.078) | (0.161) | (0.161) | (0.071) | (0.072) |
| *VolCFO* | 0.449** | 0.461** | -0.473 | -0.505 | -0.418** | -0.418** |
| | (0.188) | (0.189) | (0.407) | (0.410) | (0.176) | (0.175) |
| *Constant* | -0.694*** | -0.712*** | 0.791** | 0.795** | 0.430 | 0.465* |
| | (0.246) | (0.245) | (0.377) | (0.364) | (0.265) | (0.268) |
| *INDUSTRY FE* | Yes | Yes | Yes | Yes | Yes | Yes |
| *YEAR FE* | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 18,927 | 18,927 | 8,609 | 8,609 | 10,318 | 10,318 |
| *AdjR2* | 0.208 | 0.210 | 0.203 | 0.205 | 0.214 | 0.216 |

Note: This table provides pooled OLS regression results for dependent variables- investment efficiency, overinvestment, and underinvestment. EQ represents earnings quality based on Kothari (2005) model. BG assumes value 1 for group-affiliated firms and 0 for non-group firms. For the remaining variables, see Table A in appendix. Standard errors clustered at the firm and year level (Peterson, 2009) robust both to heteroscedasticity and within firm serial correlation are given in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

**Table 5**

Large business groups vs small/medium business groups.

| | *TOP30* | | | *TOP50* | | | *TOP100* | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* |
| | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* | *(6)* | *(7)* | *(8)* | *(9)* |
| *EQ* | 0.263*** | -0.273*** | -0.255*** | 0.261*** | -0.273*** | -0.253*** | 0.261*** | -0.273*** | -0.253*** |
| | (0.019) | (0.026) | (0.025) | (0.019) | (0.026) | (0.026) | (0.019) | (0.025) | (0.026) |
| *LBG* | 0.266*** | -0.113 | -0.377*** | 0.261*** | -0.122 | -0.359*** | 0.215*** | -0.146 | -0.265*** |
| | (0.069) | (0.111) | (0.087) | (0.061) | (0.102) | (0.072) | (0.057) | (0.092) | (0.059) |
| *SMBG* | 0.148*** | -0.187*** | -0.096* | 0.140*** | -0.186*** | -0.082 | 0.141*** | -0.202*** | -0.078 |
| | (0.043) | (0.062) | (0.052) | (0.047) | (0.066) | (0.055) | (0.050) | (0.072) | (0.059) |
| *EQ*LBG* | 0.103** | -0.071 | -0.134* | 0.121*** | -0.103** | -0.135** | 0.122*** | -0.067* | -0.177*** |
| | (0.048) | (0.054) | (0.077) | (0.037) | (0.047) | (0.057) | (0.027) | (0.039) | (0.045) |
| *EQ*SMBG* | 0.073** | -0.082** | -0.063* | 0.068** | -0.073 | -0.061 | 0.058* | -0.088* | -0.032 |
| | (0.028) | (0.040) | (0.035) | (0.032) | (0.045) | (0.037) | (0.035) | (0.050) | (0.036) |
| *SIZE* | -0.052*** | 0.052** | 0.050*** | -0.051*** | 0.050** | 0.051*** | -0.049*** | 0.053** | 0.044*** |
| | (0.012) | (0.023) | (0.013) | (0.013) | (0.023) | (0.014) | (0.013) | (0.024) | (0.013) |
| *LN(AGE)* | 0.063*** | -0.082** | -0.043 | 0.063*** | -0.082** | -0.043 | 0.064*** | -0.083** | -0.047 |
| | (0.022) | (0.039) | (0.035) | (0.022) | (0.039) | (0.035) | (0.022) | (0.039) | (0.034) |
| *TANG* | -0.965*** | 1.227*** | 0.763*** | -0.962*** | 1.231*** | 0.754*** | -0.964*** | 1.228*** | 0.755*** |
| | (0.074) | (0.092) | (0.084) | (0.075) | (0.093) | (0.085) | (0.075) | (0.093) | (0.086) |
| *LEV* | 0.097 | -0.337** | 0.018 | 0.093 | -0.339** | 0.023 | 0.094 | -0.341** | 0.017 |
| | (0.113) | (0.157) | (0.133) | (0.113) | (0.156) | (0.134) | (0.113) | (0.156) | (0.133) |
| *OpCycle* | 0.032 | -0.019 | -0.028 | 0.033 | -0.019 | -0.031 | 0.033 | -0.019 | -0.029 |
| | (0.020) | (0.037) | (0.025) | (0.020) | (0.037) | (0.025) | (0.020) | (0.037) | (0.025) |
| *Loss* | -0.034 | 0.141** | 0.007 | -0.035 | 0.140** | 0.008 | -0.036 | 0.143** | 0.012 |
| | (0.041) | (0.066) | (0.047) | (0.041) | (0.066) | (0.047) | (0.041) | (0.066) | (0.047) |
| *SLACK* | 0.420*** | -0.901*** | -0.129 | 0.416** | -0.891*** | -0.129 | 0.410** | -0.896*** | -0.115 |
| | (0.160) | (0.324) | (0.198) | (0.162) | (0.322) | (0.198) | (0.161) | (0.322) | (0.194) |
| *DIV* | -0.098** | 0.079 | 0.101** | -0.098** | 0.080 | 0.100** | -0.099** | 0.079 | 0.105** |
| | (0.045) | (0.069) | (0.045) | (0.045) | (0.069) | (0.045) | (0.046) | (0.070) | (0.045) |
| *TOBINQ* | 0.001 | -0.010 | 0.003 | 0.002 | -0.010 | 0.002 | 0.002 | -0.010 | 0.001 |
| | (0.004) | (0.008) | (0.005) | (0.004) | (0.008) | (0.006) | (0.004) | (0.008) | (0.006) |
| *Z* | 0.025*** | -0.031*** | -0.017 | 0.024*** | -0.030*** | -0.017 | 0.024*** | -0.031*** | -0.016 |
| | (0.008) | (0.010) | (0.010) | (0.008) | (0.011) | (0.010) | (0.008) | (0.011) | (0.010) |
| *VolSales* | -0.093 | 0.327** | -0.022 | -0.094 | 0.326** | -0.022 | -0.094 | 0.325** | -0.022 |
| | (0.078) | (0.161) | (0.072) | (0.078) | (0.160) | (0.073) | (0.078) | (0.162) | (0.072) |
| *VolCFO* | 0.465** | -0.502 | -0.421** | 0.469** | -0.515 | -0.421** | 0.468** | -0.500 | -0.414** |
| | (0.189) | (0.407) | (0.175) | (0.191) | (0.411) | (0.176) | (0.191) | (0.413) | (0.174) |
| *Constant* | -0.701*** | 0.801** | 0.440 | -0.708*** | 0.814** | 0.454 | -0.717*** | 0.802** | 0.474* |
| | (0.244) | (0.362) | (0.272) | (0.247) | (0.361) | (0.274) | (0.250) | (0.361) | (0.276) |
| *INDUSTRY FE* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *YEAR FE* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 18,927 | 8,609 | 10,318 | 18,927 | 8,609 | 10,318 | 18,927 | 8,609 | 10,318 |
| *AdjR2* | 0.210 | 0.205 | 0.217 | 0.211 | 0.206 | 0.218 | 0.211 | 0.205 | 0.220 |

Note: This table provides pooled OLS regression results for dependent variable- investment efficiency, overinvestment and underinvestment for large and small/medium business group affiliated firms. *EQ* represents earnings quality based on Kothari (2005) model. *TOP30, TOP50* and *TOP100* are Top 30, 50 and 100 business group identified based on total asset size of all member firms of a business group. LBG stands for large-sized business groups which assumes value 1 for firms affiliated to large sized business groups (*TOP30)* in Columns (1)-(3), *TOP50* for Columns (4)-(6), *TOP100* in Columns (7)-(9)) and 0 otherwise. similarly, SMBG stands for small and medium sized business groups which takes value 1 for firms affiliated to small and medium sized groups and 0 otherwise. Standard errors clustered at the firm and year level (Peterson, 2009) robust both to heteroscedasticity and within firm serial correlation are given in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

**Table 6**

Heterogeneity analysis: business group characteristics.

| | *Invt_effi* | | *Overinvest* | | *Underinvest* | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Panel A: low vs high CFR group firms | | | | | | |
| | *lowCFR* | *highCFR* | *lowCFR* | *highCFR* | *lowCFR* | *highCFR* |
| *EQ* | 0.335*** | 0.320*** | -0.363*** | -0.336*** | -0.313*** | -0.302*** |
| | (0.033) | (0.044) | (0.053) | (0.038) | (0.032) | (0.066) |
| *Controls* | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 3,130 | 3,160 | 1,432 | 1,482 | 1,698 | 1,678 |
| *AdjR2* | 0.246 | 0.241 | 0.241 | 0.246 | 0.251 | 0.227 |
| Panel B: Young vs Old group firms | | | | | | |
| | *Young* | *Old* | *Young* | *Old* | *Young* | *Old* |
| *EQ* | 0.360*** | 0.333*** | -0.362*** | -0.355*** | -0.365*** | -0.314*** |
| | (0.037) | (0.044) | (0.054) | (0.051) | (0.052) | (0.051) |
| *Controls* | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 2,432 | 4,830 | 1,151 | 2,267 | 1,281 | 2,563 |
| *AdjR2* | 0.275 | 0.225 | 0.278 | 0.238 | 0.279 | 0.212 |
| Panel C: Group firms with low and high level of diversification | | | | | | |
| | *lowDiversify* | *HighDiversify* | lowDiversify | HighDiversify | lowDiversify | HighDiversify |
| *EQ* | 0.328*** | 0.361*** | -0.354*** | -0.345*** | -0.312*** | -0.379*** |
| | (0.045) | (0.047) | (0.053) | (0.032) | (0.053) | (0.079) |
| *Controls* | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 3,321 | 3,381 | 1,542 | 1,595 | 1,779 | 1,786 |
| *AdjR2* | 0.226 | 0.272 | 0.238 | 0.266 | 0.228 | 0.284 |
| Panel D: Group firms with low and high number of affiliates | | | | | | |
| | *lowAffiliates* | *highAffiliates* | *lowAffiliates* | *highAffiliates* | *lowAffiliates* | *highAffiliates* |
| *EQ* | 0.327*** | 0.347*** | -0.343*** | -0.369*** | -0.318*** | -0.326*** |
| | (0.045) | (0.046) | (0.055) | (0.037) | (0.053) | (0.073) |
| *Controls* | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 3,531 | 3,540 | 1,635 | 1,669 | 1,896 | 1,871 |
| *AdjR2* | 0.228 | 0.258 | 0.225 | 0.278 | 0.238 | 0.245 |

Note: This table displays pooled OLS regression results for dependent variable- investment efficiency, and two sub-optimal investment choices. The analysis is conducted for group affiliated firms only. *EQ* represents earnings quality based on Kothari (2005) model. The sample is divided into two subsamples based on different business group characteristics and the separate regressions are estimated for these two subsamples. These business group characteristics include cash flow rights, age, diversification level and number of affiliates of a business group. *CFR* stands for cash flow rights measured by promoters' ownership in group affiliated firm. *lowCFR vs HighCFR* show subsamples of firms where promoters have cash flow rights below and above median value within a business group. *Young vs Old* firms shows firms falling below industry median and above industry median. Similarly, *lowDiversify vs highDiversify* indicates 0 for firms affiliated to a business group operating in no. of industries lower than industry median and 1 for firms that are part of business groups operating in no. of industries above the industry median. *lowAffiliates vs highAffiliates* represents sub-samples of firms that are part of business groups having no. of affiliates below and above the industry median. All idiosyncratic controls of main regression models are also included in subsample analysis. Standard errors clustered at the firm and year level (Peterson, 2009) robust both to heteroscedasticity and within firm serial correlation are given in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

**Table 7**

Alternate measure of investment efficiency.

| | *Invt_effi* | *Overinvest* | *Underinvest* |
|---|---|---|---|
| | (1) | (2) | (3) |
| *EQ* | 0.257*** | -0.265*** | -0.252*** |
| | (0.018) | (0.023) | (0.023) |
| *BG* | 0.147*** | -0.178*** | -0.111* |
| | (0.044) | (0.055) | (0.058) |
| *EQ*BG* | 0.075*** | -0.087** | -0.061* |
| | (0.027) | (0.034) | (0.034) |
| *SIZE* | -0.046*** | 0.046** | 0.042*** |
| | (0.012) | (0.021) | (0.012) |
| *LN(AGE)* | 0.056*** | -0.067* | -0.042 |
| | (0.021) | (0.037) | (0.032) |
| *TANG* | -0.912*** | 1.098*** | 0.762*** |
| | (0.071) | (0.101) | (0.081) |
| *LEV* | 0.065 | -0.251* | 0.052 |
| | (0.103) | (0.137) | (0.144) |
| *OpCycle* | 0.028 | -0.027 | -0.021 |
| | (0.020) | (0.032) | (0.027) |
| *Loss* | -0.035 | 0.097 | 0.019 |
| | (0.043) | (0.059) | (0.046) |
| *SLACK* | 0.360** | -0.678** | -0.119 |
| | (0.155) | (0.302) | (0.218) |
| *DIV* | -0.093** | 0.078 | 0.103** |
| | (0.043) | (0.065) | (0.050) |
| *TOBINQ* | 0.001 | -0.007 | 0.003 |
| | (0.004) | (0.007) | (0.005) |
| *Z* | 0.021** | -0.028*** | -0.013 |
| | (0.008) | (0.010) | (0.010) |
| *VolSales* | -0.082 | 0.216 | -0.007 |
| | (0.073) | (0.139) | (0.084) |
| *VolCFO* | 0.457** | -0.464 | -0.449*** |
| | (0.181) | (0.357) | (0.169) |
| *Constant* | -0.702*** | 0.807** | 0.502* |
| | (0.238) | (0.357) | (0.278) |
| *INDUSTRY FE* | Yes | Yes | Yes |
| *YEAR FE* | Yes | Yes | Yes |
| *N* | 18,927 | 8,847 | 10,076 |
| *AdjR2* | 0.209 | 0.207 | 0.213 |

Note: This table shows pooled OLS regression results for dependent variable- investment efficiency, and two sub-optimal investment choices constructed following the methodology adopted by Chen et al. (2011). *EQ* represents earnings quality based on Kothari (2005) model. *BG* assumes value 1 for group affiliated firms and 0 for non-group firms. For the remaining variables see Table 1. Standard errors clustered at the firm and year level (Peterson, 2009) robust both to heteroscedasticity and within firm serial correlation are given in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

**Table 8**

Alternate measures of earnings quality.

| | McNichols and Stubben's (2008) | | | Ksaznik (1999) | | | Modified Jones (1995) | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| *EQ* | 0.560*** | -0.612*** | -0.519*** | 0.291*** | -0.319*** | -0.271*** | 0.269*** | -0.287*** | -0.255*** |
| | (0.037) | (0.055) | (0.046) | (0.022) | (0.034) | (0.026) | (0.020) | (0.027) | (0.025) |
| *BG* | 0.155*** | -0.114** | -0.175*** | 0.130*** | -0.139** | -0.099** | 0.157*** | -0.152** | -0.144*** |
| | (0.034) | (0.048) | (0.048) | (0.040) | (0.059) | (0.045) | (0.044) | (0.062) | (0.052) |
| *EQ*BG* | 0.165*** | -0.091 | -0.226*** | 0.069*** | -0.060 | -0.068*** | 0.075*** | -0.064* | -0.081*** |
| | (0.042) | (0.070) | (0.053) | (0.019) | (0.037) | (0.023) | (0.024) | (0.035) | (0.030) |
| *SIZE* | -0.081*** | 0.090*** | 0.074*** | -0.048*** | 0.053** | 0.043*** | -0.049*** | 0.054** | 0.044*** |
| | (0.012) | (0.020) | (0.013) | (0.012) | (0.023) | (0.012) | (0.012) | (0.023) | (0.012) |
| *LN(AGE)* | 0.053** | -0.085* | -0.027 | 0.071*** | -0.091** | -0.052 | 0.067*** | -0.087** | -0.048 |
| | (0.021) | (0.043) | (0.027) | (0.023) | (0.046) | (0.036) | (0.021) | (0.038) | (0.035) |
| *TANG* | -1.009*** | 1.270*** | 0.809*** | -0.966*** | 1.255*** | 0.754*** | -0.943*** | 1.200*** | 0.750*** |
| | (0.079) | (0.095) | (0.083) | (0.081) | (0.097) | (0.089) | (0.074) | (0.093) | (0.082) |
| *LEV* | 0.013 | -0.269* | 0.109 | 0.107 | -0.356** | 0.017 | 0.089 | -0.315** | 0.021 |
| | (0.104) | (0.153) | (0.107) | (0.109) | (0.155) | (0.129) | (0.110) | (0.149) | (0.133) |
| *OpCycle* | 0.066*** | -0.039 | -0.068*** | 0.035* | -0.015 | -0.035 | 0.035 | -0.022 | -0.031 |
| | (0.019) | (0.030) | (0.022) | (0.021) | (0.035) | (0.026) | (0.022) | (0.038) | (0.025) |
| *Loss* | -0.063* | 0.134** | 0.056 | -0.024 | 0.120 | 0.006 | -0.028 | 0.120* | 0.006 |
| | (0.036) | (0.054) | (0.051) | (0.043) | (0.076) | (0.046) | (0.040) | (0.062) | (0.046) |
| *SLACK* | 0.403*** | -0.931*** | -0.104 | 0.179 | -0.560 | 0.059 | 0.456*** | -0.816*** | -0.222 |
| | (0.141) | (0.253) | (0.200) | (0.165) | (0.342) | (0.212) | (0.144) | (0.302) | (0.194) |
| *DIV* | -0.108*** | 0.062 | 0.127*** | -0.109** | 0.097 | 0.109** | -0.105** | 0.082 | 0.112** |
| | (0.038) | (0.061) | (0.039) | (0.045) | (0.067) | (0.046) | (0.045) | (0.069) | (0.045) |
| *TOBINQ* | 0.001 | -0.007 | 0.002 | 0.002 | -0.009 | 0.000 | 0.000 | -0.008 | 0.003 |
| | (0.005) | (0.008) | (0.005) | (0.004) | (0.008) | (0.005) | (0.004) | (0.009) | (0.005) |
| *Z* | 0.024*** | -0.033*** | -0.015 | 0.020** | -0.029*** | -0.011 | 0.022** | -0.028** | -0.015 |
| | (0.009) | (0.010) | (0.010) | (0.008) | (0.009) | (0.011) | (0.008) | (0.011) | (0.011) |
| *VolSales* | 0.060 | 0.075 | -0.123 | -0.034 | 0.289* | -0.089 | -0.072 | 0.251* | -0.012 |
| | (0.073) | (0.130) | (0.099) | (0.074) | (0.153) | (0.080) | (0.077) | (0.149) | (0.077) |
| *VolCFO* | 0.345** | -0.152 | -0.406** | 0.558*** | -0.472 | -0.594*** | 0.481*** | -0.517 | -0.438** |
| | (0.148) | (0.256) | (0.171) | (0.191) | (0.346) | (0.191) | (0.175) | (0.352) | (0.171) |
| *Constant* | -0.454* | 0.457 | 0.262 | -0.727** | 0.727* | 0.532* | -0.698*** | 0.771** | 0.465* |
| | (0.254) | (0.343) | (0.284) | (0.285) | (0.427) | (0.275) | (0.246) | (0.358) | (0.269) |
| *INDUSTRY FE* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 18,835 | 8,560 | 10,275 | 18,476 | 8,406 | 10,070 | 18,925 | 8,608 | 10,317 |
| *AdjR2* | 0.291 | 0.290 | 0.296 | 0.226 | 0.232 | 0.223 | 0.236 | 0.236 | 0.237 |

Note: This table presents pooled OLS regression results for dependent variable- investment efficiency, and two sub-optimal investment choices. *EQ* represents three alternate earnings quality proxies based on McNichols and Stubben (2008), Ksaznik (1999) and Modified Jones (1995) models. *BG* assumes value 1 for group affiliated firms and 0 for non-group firms. For the remaining variables see Table 1. Standard errors clustered at the firm and year level (Peterson, 2009) robust both to heteroscedasticity and within firm serial correlation are given in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

**Table 9**

Political connections.

| | Measure 1 | | | | | | Measure 2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Non-political* | | | *Political* | | | *Non-political* | | | *Political* | | |
| | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| *EQ* | 0.254*** | -0.261*** | -0.248*** | 0.269*** | -0.279*** | -0.261*** | 0.255*** | -0.251*** | -0.258*** | 0.267*** | -0.284*** | -0.256*** |
| | (0.025) | (0.047) | (0.033) | (0.020) | (0.029) | (0.029) | (0.022) | (0.044) | (0.035) | (0.022) | (0.030) | (0.029) |
| *BG* | 0.067 | -0.164 | 0.007 | 0.206*** | -0.186** | -0.210*** | 0.062 | -0.131 | -0.025 | 0.194*** | -0.190*** | -0.179*** |
| | (0.074) | (0.118) | (0.078) | (0.054) | (0.071) | (0.066) | (0.078) | (0.124) | (0.084) | (0.051) | (0.069) | (0.061) |
| *EQ*BG* | 0.035 | -0.066 | -0.011 | 0.099*** | -0.082* | -0.110*** | 0.047 | -0.103 | -0.005 | 0.087*** | -0.065 | -0.102*** |
| | (0.050) | (0.059) | (0.060) | (0.022) | (0.042) | (0.033) | (0.054) | (0.064) | (0.060) | (0.024) | (0.041) | (0.032) |
| *SIZE* | -0.040** | 0.051 | 0.034* | -0.057*** | 0.057** | 0.056*** | -0.039* | 0.033 | 0.052** | -0.057*** | 0.065** | 0.050*** |
| | (0.019) | (0.036) | (0.019) | (0.015) | (0.026) | (0.015) | (0.022) | (0.034) | (0.025) | (0.015) | (0.027) | (0.013) |
| *LN(AGE)* | 0.048 | -0.097 | -0.006 | 0.066** | -0.060 | -0.063 | 0.052 | -0.126 | -0.001 | 0.061** | -0.051 | -0.064 |
| | (0.040) | (0.076) | (0.061) | (0.032) | (0.045) | (0.049) | (0.041) | (0.078) | (0.060) | (0.028) | (0.047) | (0.042) |
| *TANG* | -0.922*** | 1.137*** | 0.745*** | -1.012*** | 1.315*** | 0.781*** | -0.908*** | 1.118*** | 0.750*** | -1.012*** | 1.324*** | 0.776*** |
| | (0.121) | (0.146) | (0.134) | (0.090) | (0.124) | (0.091) | (0.120) | (0.155) | (0.136) | (0.090) | (0.127) | (0.089) |
| *LEV* | 0.148 | -0.458* | 0.017 | 0.070 | -0.294 | 0.017 | 0.104 | -0.345 | 0.014 | 0.078 | -0.317 | 0.023 |
| | (0.163) | (0.251) | (0.229) | (0.116) | (0.208) | (0.115) | (0.165) | (0.233) | (0.232) | (0.120) | (0.219) | (0.118) |
| *OpCycle* | 0.053 | -0.048 | -0.048 | 0.020 | -0.005 | -0.016 | 0.031 | -0.027 | -0.024 | 0.035 | -0.022 | -0.031 |
| | (0.037) | (0.067) | (0.045) | (0.030) | (0.044) | (0.037) | (0.040) | (0.061) | (0.055) | (0.030) | (0.041) | (0.034) |
| *Loss* | -0.085 | 0.252* | 0.024 | -0.007 | 0.075 | 0.001 | -0.087 | 0.301** | 0.000 | -0.010 | 0.060 | 0.011 |
| | (0.076) | (0.134) | (0.097) | (0.048) | (0.077) | (0.048) | (0.083) | (0.150) | (0.106) | (0.047) | (0.073) | (0.052) |
| *SLACK* | -0.183 | -0.454 | 0.575 | 0.774*** | -1.170*** | -0.488 | -0.203 | -0.426 | 0.612 | 0.758*** | -1.215*** | -0.447 |
| | (0.354) | (0.577) | (0.437) | (0.215) | (0.364) | (0.304) | (0.354) | (0.661) | (0.478) | (0.203) | (0.387) | (0.287) |
| *DIVIDEND* | -0.154** | 0.188* | 0.128 | -0.061 | 0.010 | 0.082 | -0.176*** | 0.213** | 0.149* | -0.054 | 0.004 | 0.075 |
| | (0.060) | (0.099) | (0.079) | (0.054) | (0.084) | (0.063) | (0.059) | (0.101) | (0.079) | (0.054) | (0.080) | (0.061) |
| *TOBINQ* | 0.006 | -0.011 | -0.003 | -0.002 | -0.005 | 0.006 | 0.008 | -0.010 | -0.008 | -0.002 | -0.007 | 0.008 |
| | (0.009) | (0.015) | (0.011) | (0.008) | (0.015) | (0.006) | (0.010) | (0.016) | (0.011) | (0.007) | (0.014) | (0.005) |
| *Z* | 0.017 | -0.025 | -0.012 | 0.026*** | -0.029** | -0.016 | 0.012 | -0.017 | -0.011 | 0.028*** | -0.032** | -0.018 |
| | (0.011) | (0.017) | (0.015) | (0.010) | (0.012) | (0.016) | (0.014) | (0.018) | (0.020) | (0.010) | (0.012) | (0.013) |
| *VolaSales* | 0.025 | 0.410 | -0.178* | -0.178** | 0.266 | 0.120 | 0.006 | 0.410 | -0.140 | -0.151* | 0.272 | 0.075 |
| | (0.126) | (0.266) | (0.101) | (0.085) | (0.165) | (0.091) | (0.125) | (0.286) | (0.102) | (0.086) | (0.167) | (0.090) |
| *VolaCFO* | 0.098 | -0.285 | -0.046 | 0.662*** | -0.607 | -0.658* | 0.086 | -0.262 | -0.088 | 0.616** | -0.591 | -0.600* |
| | (0.313) | (0.672) | (0.284) | (0.246) | (0.420) | (0.341) | (0.336) | (0.700) | (0.302) | (0.236) | (0.415) | (0.306) |
| *Constant* | -0.844*** | 0.700 | 0.816** | -0.564* | 0.793 | 0.203 | -0.649** | 0.630 | 0.537 | -0.666** | 0.826 | 0.369 |
| | (0.303) | (0.459) | (0.399) | (0.333) | (0.490) | (0.361) | (0.321) | (0.478) | (0.433) | (0.318) | (0.500) | (0.340) |
| *Fixed effects* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 6,996 | 3,095 | 3,901 | 11,931 | 5,514 | 6,417 | 6,282 | 2,803 | 3,479 | 12,645 | 5,806 | 6,839 |
| *Adj R-sq* | 0.176 | 0.180 | 0.173 | 0.235 | 0.221 | 0.250 | 0.172 | 0.180 | 0.170 | 0.232 | 0.221 | 0.244 |

Note: The sample is divided into two subsamples based on different political vs non-political connections and the separate regressions are estimated for these two subsamples. For Measure 1, A firm is assumed to be politically connected and hence, set equal to one if the firm itself, or at least one of its promoters or top investors has made political contributions to national political parties – BJP and INC (Cooper, Gulen, and Ovtchinnikov 2010). We construct an alternative proxy (Measure 2) that also considers the possibility of firms receiving government projects (Faccio 2006). *Non-political vs*

*Politcal* show subsamples of firms without and with political ties. All idiosyncratic controls of main regression models are also included in subsample analysis. Standard errors clustered at the firm and year level (Peterson, 2009) robust both to heteroscedasticity and within firm serial correlation are given in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

**Table 10**

Endogeneity test.

Panel A: Test on matched pairs

| | Control group | | Treatment group | | Diff in mean | t-stats |
|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | (Treatment-Control) | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Size* | 10.444 | 10.416 | 10.711 | 10.581 | 0.266 | 1.449 |
| *Lev* | 0.254 | 0.280 | 0.250 | 0.222 | -0.004 | -0.137 |
| *Div* | 0.012 | 0.009 | 0.014 | 0.007 | 0.002 | 0.746 |
| *Sales_grow* | 0.134 | 0.022 | 0.089 | 0.050 | -0.046 | -0.535 |
| *ROA* | 0.229 | 0.211 | 0.184 | 0.261 | -0.045 | -0.093 |
| *CFO_TA* | 0.079 | 0.067 | 0.065 | 0.053 | -0.014 | -1.051 |
| *EISSUE* | 0.066 | 0.000 | 0.051 | 0.000 | -0.016 | -0.351 |
| *DISSUE* | 0.120 | 0.037 | 0.226 | 0.065 | 0.106 | 0.711 |

Panel B: Difference-in-difference analysis

| | *Invt_effi* | *Overinvest* | *Underinvest* | *Invt_effi* | *Overinvest* | *Underinvest* |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Treatment* | -0.952*** | 0.663** | 1.079 | -0.502 | 0.296 | -0.090 |
| | (0.326) | (0.326) | (0.696) | (0.467) | (0.249) | (1.015) |
| *Post* | -0.836*** | 0.934** | 1.043** | -0.508 | 1.677 | -0.560 |
| | (0.296) | (0.412) | (0.462) | (0.607) | (1.044) | (0.678) |
| *BG* | 0.060 | -0.429 | 0.588 | 0.404 | -0.356 | -0.635 |
| | (0.310) | (0.406) | (0.450) | (0.298) | (0.263) | (0.674) |
| *Treatment*Post* | 1.896*** | -1.282*** | -2.604*** | 1.281* | -1.774* | -0.639 |
| | (0.465) | (0.470) | (0.851) | (0.738) | (0.989) | (1.251) |
| *Post*BG* | | | | -0.483 | -1.017 | 2.196** |
| | | | | (0.701) | (1.028) | (0.865) |
| *Treatment*BG* | | | | -0.667 | 0.601 | 1.573 |
| | | | | (0.610) | (0.497) | (1.200) |
| *Treatment*Post*BG* | | | | 0.918 | 0.822 | -2.714* |
| | | | | (0.949) | (1.250) | (1.516) |
| *SIZE* | -0.169 | 0.164** | 0.138 | -0.168 | 0.148* | 0.137 |
| | (0.128) | (0.081) | (0.212) | (0.130) | (0.082) | (0.212) |
| *LN(AGE)* | -0.001 | 0.405 | -0.457 | 0.016 | 0.324 | -0.544* |
| | (0.169) | (0.258) | (0.293) | (0.163) | (0.235) | (0.303) |
| *TANG* | -0.533 | 1.496** | -0.731 | -0.537 | 1.427** | -0.662 |
| | (0.535) | (0.695) | (1.133) | (0.544) | (0.650) | (1.094) |
| *LEV* | -0.093 | 0.170 | 0.826 | -0.042 | 0.157 | 0.745 |
| | (0.825) | (0.871) | (1.690) | (0.796) | (0.872) | (1.602) |
| *OpCycle* | 0.323** | -0.140 | -0.441** | 0.330** | -0.174 | -0.428* |
| | (0.136) | (0.209) | (0.203) | (0.134) | (0.212) | (0.219) |
| *Loss* | 0.516* | -0.588 | -0.348 | 0.518* | -0.631* | -0.183 |
| | (0.294) | (0.355) | (0.490) | (0.309) | (0.370) | (0.462) |
| *SLACK* | 2.571** | -1.704 | -5.817*** | 2.696*** | -1.056 | -5.310*** |
| | (1.001) | (1.191) | (1.902) | (0.975) | (0.988) | (1.830) |
| *DIV* | 0.527 | 0.519 | -1.116 | 0.552 | 0.668* | -1.124 |
| | (0.458) | (0.318) | (0.733) | (0.485) | (0.385) | (0.722) |
| *TOBINQ* | 0.040 | -0.007 | -0.138* | 0.039 | 0.001 | -0.146* |
| | (0.033) | (0.040) | (0.081) | (0.033) | (0.037) | (0.078) |
| *Z* | -0.000 | -0.063** | 0.728* | -0.001 | -0.079** | 0.788** |
| | (0.033) | (0.029) | (0.393) | (0.037) | (0.034) | (0.397) |
| *VolSales* | 1.787** | 0.852 | -3.316* | 1.776** | -0.045 | -2.975* |
| | (0.875) | (1.525) | (1.724) | (0.849) | (1.425) | (1.572) |
| *VolCFO* | -0.774 | 0.198 | 2.938 | -0.549 | 0.716 | 2.859 |
| | (0.823) | (0.919) | (2.441) | (0.829) | (1.005) | (2.375) |
| *Constant* | -1.073 | -2.785 | 3.803 | -1.455 | -2.303 | 4.892* |
| | (1.593) | (1.935) | (2.528) | (1.690) | (1.968) | (2.675) |
| *N* | 260 | 131 | 129 | 260 | 131 | 129 |
| *AdjR2* | 0.067 | 0.079 | 0.136 | 0.060 | 0.097 | 0.142 |

Note: This table presents results for propensity score matching and difference-in-difference analysis performed to mitigate endogeneity concerns. Panel A reports univariate analysis for treatment and control firms. It shows the differences in mean

value of covariates of Treatment and Control firms. Panel B presents the results for Difference-in-difference analysis for matched pairs of control and treatment sample formed based on propensity scores. *Treatment* assumes value 1 (0) for firms reporting EQ change more (less) than industry median value in Ind AS year. *Post* is a dummy variable with value 1 for post-treatment year and 0 for pre-treatment year. For the remaining variables see Table 1. Robust standard errors (Peterson, 2009) are given in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

**Table 11:**

Other endogeneity checks.

| | Fixed effect regression | Entropy balancing | Treatment effect model | |
|---|---|---|---|---|
| | | | First-stage | Second-stage |
| | (1) | (2) | (3) | (4) |
| *EQ* | 0.275*** | 0.280*** | | |
| | (0.014) | (0.026) | | |
| *EQ*BG* | 0.066*** | 0.058* | | |
| | (0.024) | (0.033) | | |
| *Treated* | | | | 1.098*** |
| | | | | (0.051) |
| *Treated*bus_grp* | | | | 0.134*** |
| | | | | (0.027) |
| *BG* | | 0.128*** | -0.037 | -0.219*** |
| | | (0.044) | (0.022) | (0.079) |
| *SIZE* | -0.196*** | -0.044*** | 0.032*** | -0.055*** |
| | (0.036) | (0.014) | (0.006) | (0.010) |
| *LN(AGE)* | 0.314** | 0.036 | | 0.068*** |
| | (0.135) | (0.034) | | (0.026) |
| *TANG* | -1.178*** | -0.936*** | | -0.929*** |
| | (0.101) | (0.085) | | (0.053) |
| *LEV* | 0.031 | 0.007 | 0.014 | 0.039 |
| | (0.132) | (0.131) | (0.055) | (0.082) |
| *OpCycle* | 0.022 | 0.069*** | -0.028** | 0.026 |
| | (0.032) | (0.024) | (0.013) | (0.020) |
| *Loss* | -0.077* | -0.085 | | -0.016 |
| | (0.044) | (0.053) | | (0.040) |
| *SLACK* | 0.252 | 0.588* | | 0.441* |
| | (0.309) | (0.326) | | (0.231) |
| *DIVIDEND* | -0.117*** | -0.112** | 0.143*** | -0.092*** |
| | (0.042) | (0.045) | (0.021) | (0.032) |
| *TOBINQ* | 0.003 | 0.008 | | 0.003 |
| | (0.007) | (0.006) | | (0.005) |
| *Z* | 0.010 | 0.013 | | 0.023*** |
| | (0.007) | (0.010) | | (0.006) |
| *VolaSales* | -0.237*** | -0.153 | | -0.073 |
| | (0.091) | (0.119) | | (0.067) |
| *VolaCFO* | 0.028 | 0.822** | | 0.419** |
| | (0.236) | (0.321) | | (0.185) |
| *ROA_w* | | | -0.003 | |
| | | | (0.004) | |
| *CFO_TA_w* | | | -0.756*** | |
| | | | (0.115) | |
| *Constant* | 0.032 | -0.574** | 0.454*** | -1.485*** |
| | (0.462) | (0.282) | (0.080) | (0.225) |
| *INDUSTRY FE* | Yes | Yes | Yes | Yes |
| *YEAR FE* | Yes | Yes | Yes | Yes |
| *N* | 18,927 | 18,927 | 18,743 | 18,743 |
| *AdjR2* | 0.195 | 0.218 | - | - |

Note: This table reports regression results for fixed effect regression model to account for ubobserved heterogeneity, entropy balancing for self-selection bias and endogenous treatment effect to account for unobserved variable effect.

## Appendix

## Table A: Variable specification and measurement

| Variable | Measurement |
|---|---|
| Investment *(Invt)* | Summation of investment in tangible and intangible assets, research and development expenditure subtract sale proceeds of PPE, deflated by lagged total assets |
| Sales growth *(Salesgrow)* | Growth in sales in *t-1* period |
| Investment Efficiency *(Invt_effi)* | $Invt_{it} = \beta_0 + \beta_1 Salesgrow_{i,t-1} + \epsilon_{i,t}$ (1)<br>Absolute values of residuals from above equation are multiplied by -1, so that higher value indicates higher level of investment efficiency |
| Overinvestment *(Overinvest)* | Positive residuals from equation (1) |
| Underinvestment *(Underinvest)* | Negative residuals from equation (1) multiplied by (-1) |
| **Earnings quality proxies** | |
| Kothari model *(EQ)* | $ACC_{it} = \alpha_0 + \alpha_1 \left(\frac{1}{lag\_assets}\right) + \alpha_2 (\Delta Rev_{i,t} - \Delta AR_{i,t}) + \alpha_3 PPE_{i,t} + \alpha_4 ROA_{i,t} + \epsilon_{i,t}$<br>Absolute value of residuals from above equation multiplied by -1, so that higher value is indicative of better earnings quality. |
| **Business group proxy** | |
| Business group firms *(BG)* | Dummy variable that assumes value 1 for group affiliated firms and 0 for standalone firms |
| **Control variables** | |
| Firm size *(SIZE)* | Natural log of total assets |
| Firm age *(LN(AGE))* | Log of difference between current year and incorporation year |
| Tangibility *(TANG)* | Ratio of property, plant, and equipment to total assets |
| CFO volatility (*VolCfo)* | Standard deviation of Cash flow from operations from t-2 to t years |
| Sales volatility *(VolSales)* | Standard deviation of sales from t-2 to t years |
| Leverage *(LEV)* | Long term borrowing scaled by total assets |
| Z-score *(Z*) | Financial strength measured using following formula "0.012(working capital/total assets) +0.014(retained earnings/total assets) +0.033(Earnings before interest and taxes/total assets) +0.006(market value of equity/book value of debt) +0.999(sales/total assets)" |
| Operating cycle *(OpCycle)* | Log of operating cycle |
| Loss *(Loss)* | Binary variable that assumes value 1 if firm reports a loss, otherwise 0 |
| Fin slack *(SLACK)* | Cash divided by total assets |
| Dividend *(DIV)* | Binary variable that assumes value 1 for dividend payer firm, otherwise 0 |
| Tobin's Q *(TOBINQ)* | Market value of equity and debt over total assets |