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By *Kais Bouslah, Jose M. Liñares-Zegarra, and Ahmed Marhfor*

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Stakeholder Orientation and Investment Efficiency: Disentangling the Effect on Intangible and Tangible Investments

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Abstract

This paper investigates the impact of firm stakeholder orientation, as measured by the enactment of state-level constituency statutes (CS) in the US, on intangible investment efficiency using a large sample of non-financial US companies between 1975 and 2019. Our findings show that the enactment of CS practices leads to a significant decrease in investment efficiency. This effect is primarily driven by intangible investments, particularly investments in intangible knowledge, while no significant impact is observed for investments in tangible assets. The findings suggest that stakeholder orientation distorts the firm-level capital allocation efficiency of intangible investments.

JEL classifications: G30, G32, M14

Keywords: Stakeholder orientation, Investment efficiency, Intangible investment, Agency costs, Capital allocation, Corporate governance

1. INTRODUCTION

Since 1984, several US states have enacted Constituency Statutes (CS hereafter) that allow the board of directors to consider the interests of different *nonfinancial stakeholders, such as employees, customers, social and environmental groups,* in decision making.[1] CS enactment has been widely used in the finance literature as an exogenous shock (a kind of quasi-natural experiment) to make causal inferences on firm decisions.[2] The purpose of these studies is to understand the impact of the departure from the traditional firm's governance model, where the board of directors should only consider the interests of shareholders, to a stakeholder-oriented model. In this respect, stakeholder orientation is viewed in the economic and finance literature as a multi-fiduciary approach of corporate governance that allows managers to maximise the welfare of various stakeholders, including shareholders (Tirole, 2001).[3]

Previous literature suggests two opposing views regarding the impact of stakeholder orientation on a firm's decisions and outcomes. The first view, which is based on stakeholder theory, considers stakeholder-friendly activities to resolve conflicts among stakeholders, including shareholders (Miles, 2017). The second view considers stakeholder orientation as a manifestation of agency problems. In this respect, Jensen (2002) argues that many constraints may arise from the multidimensional characteristics of stakeholder orientation. For example,

[1] The concept of nonfinancial stakeholder is commonly defined in the strategy literature as any individual orgroup who can affect (or is affected by) the firm's decisions and outcomes (see e.g., Freeman (2010)). It is also referred to as stakeholder orientation, corporate social responsibility (CSR), corporate sustainability and more recently stakeholder capitalism. Non-financial stakeholders typically include employees, suppliers, customers, government, and communities, but also bondholders.

[2] Stakeholder orientation has been linked to firm innovation (Atanassov, 2013; Flammer & Kacperczyk, 2015), accounting conservatism (Radhakrishnan, Wang, & Wang, 2018), cost of debt (H. Gao, Li, & Ma, 2021), bank risk (Leung, Song, & Chen, 2019) and earnings management (Ni, 2020)

[3] For instance, Sacconi (2012) considers stakeholder orientation as: "*a model of extended corporategovernance whereby those who run the firms have responsibilities that range from the fulfilment of their fiduciary duties towards the owners to the fulfilment of analogous fiduciary duties towards all the firm's stakeholders*". Tirole (2001) suggests that through stakeholder orientation: "*management should aim at maximizing the sum of the various stakeholders' surpluses; and, if management is not naturally inclined to do so, incentives should be designed that induce management to account for the externalities imposed on allstakeholders*".

when managers pursue multiple tasks, the absence of focus on a specific task can be costly (Jensen, 2002; Tirole, 2001). Jensen (2002) argues that "*purposeful behaviour requires the existence of a single-valued objective function.*" Furthermore, Tirole (2001) conjectures that multitasking can give rise to unclear mandates that will further reduce managers' incentives and provide an opportunity for them to exercise their own preferences when using the firm's limited resources (the managerial opportunism theory).

The main purpose of this paper is to examine the potential impact of stakeholder orientation on intangible investment efficiency. Specifically, we examine whether stakeholder orientation affects investment efficiency differently in intangible assets *versus* tangible assets. We argue that the impact of stakeholder orientation on investment efficiency is different based on the nature of firm assets (tangibles versus intangibles). Previous research has focused on tangible investments when testing the potential link between stakeholder orientation and investment efficiency (Benlemlih & Bitar, 2018; Bhandari & Javakhadze, 2017; H. Gao, et al., 2021; Lin, Li, Cheng, & Lam, 2021). For instance, Gu and Zhang (2022) find that managers of firms with strong stakeholder engagement convey valuable private information to stakeholders, leading to higher investment efficiency and a firm's success. Benlemlih and Bitar (2018) find a positive relationship between Corporate Social Responsibility (CSR) performance (as a proxy for stakeholder orientation) and investment efficiency. Z. Gao, Li, and Lu (2021) find that firms located in US counties with a high level of social capital have higher investment efficiency. In contrast, Bhandari and Javakhadze (2017) find that stakeholder orientation leads to less efficient use of corporate resources. All these studies are limited to the efficiency of capital allocation to *tangible* (or physical) investments, leaving the role of *intangible* investments mostly unexplored. This contrasts withthe increasing relevance of intangible investments for firm growth and value creation (Eisfeldt & Papanikolaou, 2013; Horsch, Longoni, & Oesch, 2021; Lev & Sougiannis, 1996; Surroca, Tribó, & Waddock, 2010;

Zingales, 2000) and raises the question of whether there is a differential impact of stakeholder orientation based on the nature of a firm's investments (tangible versus intangible investments).

We hypothesize that the impact of stakeholder orientation could differ based on the properties of firm assets. To motivate our hypothesis, we first explain the properties of intangible assets that make them different from tangible assets. For instance, we consider that intangible investments are associated with a lack of separability and a lack of transferability. In this respect, the lack of physical presence for many intangible assets (e.g., organizational capital, human knowledge) could lead to a lack of separability and transferability, especially for intangibles that are firm-specific or characterised by tacit (not codified) knowledge. As a result, investors will not be able to use such assets as collateral (Andrews & Serres, 2012; Crouzet, Eberly, Eisfeldt, & Papanikolaou, 2022), which may reduce firms' debt capacity and lead them to hold more cash. Intangible assets are also associated with high imitation risk and limited excludability. For instance, the owners of organizational capital and employers of skilled workers do not have full control over such assets (partial excludability). Talented employees can be hired away. Special relationships with customers, efficient distribution systems, and innovative organization structures could be imitated by repeating ideas, word of mouth, and learning information.

Then, we explain how such properties could create complex trade-offs between the benefits and costs arising from stakeholder orientation, which ultimately lead to distortions in intangible investment efficiency. We argue that agency costs and information asymmetry between managers and shareholders can influence investment expenditures and explain intangible investment inefficiencies (Jensen, 1986; Myers & Majluf, 1984). In this paper, we show that differences in firms' assets (tangibles versus intangibles) lead to differences in firms' financial structures and ultimately to differences in agency costs. More specifically, our sample

data indicates that firms with high levels of intangibles hold more cash even when facing low financial constraints. The data also shows that high cash holdings for such firms are not justified by higher investment opportunities or cash flow volatility. Hence, a plausible explanation for the higher cash holdings for firms with high levels of intangibles is provided by the free cash flow theory. Managers of these firms could use cash to invest in inefficient projects that allow their firms to grow beyond their optimal size (Jensen, 1986). Furthermore, firms with high levels of intangibles exhibit low leverage ratios, suggesting managers' willingness to be less monitored by lenders. The concern is that stakeholder-friendly initiatives combined with "inefficient financial structures" may provide an opportunity for some managers to pursue whatever objective they wish and exercise their own preferences (Jensen, 2002; Tirole, 2001), which is not the case for firms with high levels of tangibles. Indeed, for such firms, high debt servicing reduces available cash for use due to interest payments. Furthermore, low cash holdings and high debt may also signal managers' willingness to spend cash optimally or to be monitored by lenders (Jensen, 1986). Ultimately, managerial opportunism should be less of a concern for firms with high levels of tangible investments.

Several papers (e.g., Benlemlih and Bitar (2018)) show that higher stakeholder orientation leads to high social disclosure (low information asymmetry), which can help firms make efficient investment decisions. This empirical fact does not make the distinction between tangible and intangible investments. We argue that high social disclosure (low information asymmetry) when combined with some characteristics that are specific to intangible assets (e.g., high imitation risk and limited excludability) could lead to inefficiencies, particularly for intangible investments. In fact, with high social disclosure, competitors should learn more about the firm's intangibles, raising the imitation risk. As a result, stakeholder orientation could provide wider benefits and indirectly increase productivity in other firms, making intangible investments less (more) sensitive to a firm's

growth opportunities (to the ability of competitors to extractrents from intangible assets). Our findings suggest that protecting non-financial stakeholders without establishing clear property rights, protecting ownership of intangibles, and protecting firms from imitation risk could lead to inefficient levels of firms' intangible investments.

To test our hypothesis, we follow Peters and Taylor (2017) and consider intangible investment as the sum of knowledge capital (R&D) and organizational capital (human capital, brand, customers and suppliers' relationships, distribution systems, etc.). We also rely on the neoclassical theory of investment to test whether stakeholder orientation affects investment efficiency in intangible and tangible assets differently. According to this theory, corporate investments should be made only when companies have profitable investment opportunities. In the absence of market frictions (e.g., agency costs and information asymmetry), the theory predicts a positive and significant association between investment and a firm's growth opportunities (proxied by Tobin's Q).[4] In fact, when investment opportunities improve (worsen), the investment should increase (decrease). Consequently, a higher and positive link between Investment and Q (investment sensitivity to Q) suggests that firms' resources are used in the most efficient way. In this paper, we argue that the adoption of CS has a moderating effect on investment efficiency (i.e., investment sensitivity to Q) and the effect differs for intangible and tangible investments. More precisely, we expect that stakeholder orientation distorts the investment efficiency in intangible investments by weakening their sensitivity to Q.

Endogeneity is an empirical challenge when studying the causal impact of stakeholder orientation on firm investment decisions (Atanassov, 2013; Flammer & Kacperczyk, 2015). There are at least two reasons for the endogeneity of stakeholder orientation (Flammer &

[4] The ratio of capital's market value to its replacement cost (Tobin's Q) captures firm's growth opportunities (Erickson & Whited, 2000; Hayashi, 1982; Peters & Taylor, 2017; Tobin, 1969).

Kacperczyk, 2015). First, unobservable firm characteristics (e.g., managerial ability) can affect both a firm's investment decisions and stakeholder orientation. Second, there is also the possibility of reverse causality. For instance, higher investment efficiency can generate more resources (e.g., past profits or retained earnings) that can help managers engage in stakeholder-friendly initiatives.

To address these endogeneity issues, we follow previous literature and use the quasi-natural experiment provided by the enactments of CS in several US states as a proxy for stakeholder orientation (Atanassov, 2013; Flammer & Kacperczyk, 2015; H. Gao, et al., 2021; Leung, et al., 2019; Ni, 2020; Radhakrishnan, et al., 2018). Although the laws differ across US states, they share a common motive: they allow managers to consider the impact of various important corporate decisions (e.g., mergers, liquidations, restructuring) on an expanded set of stakeholders (Leung, et al., 2019). The adoption of CS in different states at different points in time can be seen as an exogenous shock to the stakeholder orientation because this regulation introduces heterogeneity between firms and over time with respect to the stakeholder orientation, while extending the scope of the board of directors' roles and duties to engage in stakeholder-friendly initiatives. Furthermore, such regulatory shock can also mitigate reverse causality, knowing that a firm's investment efficiency is less likely to impact CS adoption.

We tested our hypothesis on a sample that included all US companies from Compustat during the 1975-2019 period, as well as a new proxy for Tobin's Q that accounts for intangible capital (Peters & Taylor, 2017). This contrasts with the standard Q (i.e., the market-to-book ratio), which has been commonly used in previous studies. Our results indicate that the enactment of CS leads to a significant decrease in intangible investment efficiency. In contrast, stakeholder orientation has no effect on tangible investment efficiency. In contrast to Bhandari and Javakhadze (2017), who find that higher corporate social responsibility (a

proxy of stakeholder orientation) leads to *tangible* investment inefficiency, we find that stakeholder orientation leads to *intangible* investment inefficiency. Both findings are consistent with the managerial opportunism hypothesis (Tirole, 2001), suggesting that stakeholder orientation leads to less efficient use of corporate resources.

Our paper makes several contributions to the literature. First, it contributes to the growing literature examining the impact of CS on a variety of firms' decisions and outcomes. For example, Flammer and Kacperczyk (2015) find a positive association between the passage of such laws and the innovation of the firm, measured by the number of patents. CS has also been associated with a significant decrease in the cost of debt (H. Gao, et al., 2021), bank risk taking (Leung, et al., 2019), earnings management (Ni, 2020), accounting conservatism (Radhakrishnan, et al., 2018), and a significant increase in shareholder value (Cremers, Guernsey, & Sepe, 2019). Our study complements this literature by examining the impact of CS on firms' investment policies, in particular, intangible investment efficiency.

Second, our paper complements previous studies examining the potential link between stakeholder orientation and investment efficiency (Benlemlih & Bitar, 2018; Bhandari & Javakhadze, 2017; H. Gao, et al., 2021; Gu & Zhang, 2022; Lin, et al., 2021).These studies focused on tangible investment efficiency and used different proxies for stakeholder orientation, such as measures of corporate social responsibility, social performance, or social capital. The empirical findings of these studies are not consistent, as some studies report a positive association (e.g., Benlemlih and Bitar (2018)), whereas others find a negative association (e.g., Bhandari and Javakhadze (2017)) between stakeholder orientation and tangible investment efficiency. We complement these studies by exploring whether there is a differential impact of stakeholder orientation based on the nature of the firm's investments (tangible versus intangible investments). Furthermore, we exploit a quasi-natural experiment provided by the enactment of CS laws. Unlike previous studies that use firm-level data (e.g.,

MSCI ESG KLD Stats Data) to measure stakeholder orientation, enacting CS laws provides a unique exogenous shock in stakeholder protection and thus allows us to examine the causal effect of stakeholder orientation on a firm's investment efficiency.

Third, we use Peters and Taylor (2017) proxy for Tobin's Q (Total Q) that accounts for tangible and intangible investments, where investment is a function of cash flows and Tobin's Q (Baker, Stein, & Wurgler, 2003). Recent research suggests that Total Q is capable of capturing both financial and non-financial aspects of CSR on firm value (Cho & Lee, 2019). Therefore, Total Q is expected to be more aligned with the true (but unobserved) Q and less affected by measurement errors with respect to the standard Q measure (e.g., market-to-book asset ratio).

The paper proceeds as follows. Section 2 presents a review of the literature on CS as well as on the unique features of intangible investments. Section 3 presents our theoretical framework that explains the differential effect of CS on intangible investment efficiency. Section 4 describes the data and key variables we use to capture intangible investments. Section 5 presents the main results, and Section 6 concludes.

2. REVIEW OF LITERATURE

2.1 Constituency Statutes

The passage of CS in 35 US states between 1984 and 2007 has been widely used as a quasi-exogenous shock to proxy for an increase in stakeholder protection (Flammer & Kacperczyk, 2015). Table A1 in the appendix presents the enactment dates of the constituency statutes for the 35 US states. The first enactments of these laws began after the hostile takeover wave in the 1980s that imposed substantial costs on many stakeholders (e.g., employees, customers, and communities) while benefiting target firm shareholders. The inability of corporate laws to protect stakeholders' interests amidst the hostile takeover wave

led to the development of CS laws (Leung, et al., 2019). Their main purpose was to enable corporate officers and directors to consider the interests of non-financial stakeholders when making business decisions (Atanassov, 2013; Flammer & Kacperczyk, 2015; Leung, et al., 2019). The implications of such laws are not limited to the takeover context (Leung *et al.* 2019) but are also related to the wider debate that opposes the proponents of the "stakeholder" view (Dodd, 1932) to the proponents of the "shareholder" view (Friedman, 1970) of corporations. The existing literature suggests that the passage of CS laws has greatly influenced firm decisions and benefited firm stakeholders. For example, Atanassov (2013) found that firms incorporated in states that passed the laws have a higher number of stakeholder-friendly policies. Flammer and Kacperczyk (2015) show that such enactments spark firms' innovation by promoting a secure work environment and increasing the satisfaction of various stakeholders (e.g., employees and customers). Luoma and Goodstein (1999) found that the laws are linked to a greater representation of stakeholders on boards. According to Leung, et al. (2019), constituency laws have been applied in many cases by courts to defend the interests of stakeholders. Cremers, et al. (2019) find that such laws improve the commitment toward stakeholders and reduce contracting costs. The findings of other studies indicate that the passage of CS had a significant impact on banks' risk taking (Leung, et al., 2019), firms' cost of debt (H. Gao, et al., 2021), earnings management (Ni, 2020), and accounting conservatism (Radhakrishnan, et al., 2018).

2.2 Tangible and Intangible Investments

To test the association between stakeholder orientation and investment efficiency, previous literature has focused on tangible investments (proxied by the growth in property, plant and equipment or capital expenditures (CAPEX), plus R&D spending). The absence of work that investigates the potential impact of greater stakeholder engagement on firm's

intangible assets contrasts with the increasing relevance of intangibles for firm's growth and value creation (Eisfeldt & Papanikolaou, 2013; Horsch, et al., 2021; Lev & Sougiannis, 1996; Surroca, et al., 2010; Zingales, 2000). R&D expenditures represent an imperfect proxy for a firm's intangibles and could also have strong sectoral bias (Andrews & Serres, 2012). Several studies suggest that a firm's intangibles should include not only R&D but also investments in human capital, brand, customers and suppliers' relationships,distribution systems, and efficient organization structures (Andrews & Serres, 2012; Crouzet, et al., 2022; Peters & Taylor, 2017). Therefore, the main purpose of our research is to fill this gap by examining whether the effect of stakeholder orientation is the same for tangible and intangible investment efficiency.

We argue that the impact of stakeholder orientation on investment efficiency should be different based on the nature of firm assets (tangibles versus intangibles), mainly because of the distinguishing features of intangible assets as opposed to tangible assets. As stressed by Lev (2005), Thum-Thysen, Voigt, Bilbao-Osorio, Maier, and Ognyanova (2019) and Crouzet, et al. (2022); the owners of intangible assets and employers of skilled/trained personnel do not have full control over such assets (partial excludability). For instance, while an owner of tangible assets (e.g., commercial building, machinery, and equipment) can fully exclude non-owners from sharing the returns of his tangible investment, employers of skilled/trained personnel cannot fully appropriate all the benefits from the investment made in human capital when trained employees leave the firm. In addition, knowledge spillovers (e.g., by repeating ideas, word of mouth, learning information, imitation, etc.) are also common forintangible assets (Crouzet, et al., 2022; Thum-Thysen, et al., 2019). Limited excludability and knowledge diffusion that are specific to intangibles should help firms' competitors appropriate some of the returns, which reduces cash flows, control rights, and rents from intangible investments (Crouzet, et al., 2022; Lev, 2005; Thum-Thysen, et al.,

2019).

In the same line of reasoning, when intangibles are "stored" in key talent and organizational capital, it should be difficult for outside investors to evaluate such assets (Lev, 2005). In many cases, only a firm's managers and skilled employees can assess the value of these assets. As suggested by Lev (2005), developers of new drugs, software, algorithms, and innovative business models know much more about such assets than other stakeholders. Lev (2005) considers that differences in knowledge about intangibles between "buyers" and "sellers", combined with partial excludability (incomplete property rights), are two important factors that explain why most intangibles are not traded in active and transparent markets (non-tradability issue) in comparison to tangible assets (e.g., car dealerships). Consequently, if managers/skilled employees keep the intangible closely held, outside investors should be subject to the potential hold-up problem (incomplete contracts theory) and information asymmetry (Crouzet, et al., 2022; Lev, 2005). The non-tradability of intangibles should cause valuation problems for outside investors (e.g., mispricing) and increase the risk of owning intangibles (Lev, 2005). Other specific characteristics of intangibles (e.g., high uncertainty, low ex ante verifiability, high sunk costs, lack of separability, and transferability) also tend to hold back investments in intangible assets.

In conclusion, investing in intangible assets may not always be beneficial, particularly for firms with high stakeholder orientation. For instance, our theoretical framework suggests that such firms must carefully balance the benefits of high social disclosure (high transparency) against the risks of increased appropriation by competitors (high imitation risk). Additionally, they must ensure that their managers use discretion effectively when allocating the firm's limited resources to avoid distortions in their intangible investments.

3. THEORETICAL FRAMEWORK

This section discusses three mechanisms through which stakeholder orientation could differentially affect investment efficiency for intangible and tangible investments.

Impact of stakeholder orientation on investment efficiency

The impact of stakeholder orientation on investment efficiency has been largely studied in academic literature. Stakeholder orientation is a corporate governance approach that emphasizes considering the interests of all stakeholders, including employees, customers, suppliers, and the community, rather than focusing solely on shareholder value. While some argue that a stakeholder-friendly approach can lead to better management practices and improved information quality (Benlemlih & Bitar, 2018), others contend that it can result in a distortion of firm investments (Bhandari & Javakhadze, 2017). The traditional view, based on agency theory, considers stakeholder orientation as a manifestation of agency problems leading to firm-level inefficiencies (Cornell & Shapiro, 2021; Edmans, 2021; Jensen, 2002; Karpoff, 2021; Tirole, 2001). Advocates of this view argue that protecting stakeholder interests can lead to excessive managerial discretion and reduced accountability, limiting the benefits of stakeholder-friendly investments (Karpoff, 2021). Bhandari and Javakhadze (2017) provide evidence that stakeholder orientation distorts investment sensitivity to Q.

Distortionary effect of stakeholder orientation on intangible investment efficiency

Previous research has predominantly focused on tangible investments when examining the link between stakeholder orientation and investment efficiency (Benlemlih & Bitar, 2018; Bhandari & Javakhadze, 2017; Gu & Zhang, 2022; Lin, et al., 2021). For instance, Gu and Zhang (2022) find that managers of firms with strong stakeholder

engagement convey valuable private information to stakeholders, leading to higher investment efficiency and firm success. Similarly, Benlemlih and Bitar (2018) find a positive relationship between Corporate Social Responsibility (CSR) performance (as a proxy for stakeholder orientation) and investment efficiency. Z. Gao, et al. (2021) report that firms located in US counties with high levels of social capital exhibit higher investment efficiency. In contrast, Bhandari and Javakhadze (2017) find that stakeholder orientation leads to less efficient use of corporate resources. These studies primarily examine the efficiency of capital allocation to tangible investments, leaving the role of intangible investments largely unexplored. This is significant given the increasing relevance of intangible investments for firm growth and value creation (Eisfeldt & Papanikolaou, 2013; Horsch, et al., 2021; Lev & Sougiannis, 1996; Surroca, et al., 2010; Zingales, 2000).

Intangible investments differ from tangible investments due to properties such as lack of separability, lack of transferability, high imitation risk, and limited excludability. The lack of physical presence for many intangible assets (e.g., organizational capital, human knowledge) leads to difficulties in establishing clear property rights and protecting ownership (Thum-Thysen, et al., 2019). For example, talented employees trained by a company can be hired away, and proprietary technologies can be imitated, reducing the competitive advantage of the original creator (Crouzet, et al., 2022).

In this sense, the inherent characteristics of intangible assets make them more vulnerable to the inefficiencies introduced by stakeholder orientation. Intangible assets lack physical presence, making them difficult to separate and transfer, and are often characterized by high imitation risks and limited excludability. This makes it challenging to protect ownership and maintain a competitive advantage (Crouzet, et al., 2022; Thum-Thysen, et al., 2019).

Agency costs and information asymmetry between managers and shareholders significantly influence investment expenditures and explain intangible investment inefficiencies (Jensen, 1986; Myers & Majluf, 1984). Firms with high levels of intangible assets tend to hold more cash, even when facing low financial constraints. This higher cash holding is not justified by higher investment opportunities or cash flow volatility, suggesting potential managerial opportunism (Jensen, 1986). High cash reserves can lead to inefficient investments, excessive managerial pay, and perks, thereby growing the firm beyond its optimal size (Frésard & Salva, 2010). Conversely, firms with high levels of tangible assets exhibit lower leverage ratios and higher debt servicing, reducing the available cash for use and signalling managers' willingness to be monitored by lenders, thus curbing managerial opportunism (Jensen, 1986).

Therefore, it could be argued that stakeholder orientation increases agency costs, especially for firms with high levels of intangible assets. The tendency of these firms to hold more cash, despite low financial constraints, aligns with the free cash flow theory, suggesting that managers might expropriate these reserves for personal benefits (Frésard & Salva, 2010; Jensen, 1986). This risk is exacerbated in intangible-intensive firms, where high cash reserves lead to less efficient investments and increased managerial discretion.

Complexity and valuation challenges of stakeholder interests

Valuation challenges combined with complex and ill-defined stakeholder claims make it harder for managers to cater to competing interests. Karpoff (2021) argues that the multidimensional, difficult-to-measure, and frequently conflicting nature of stakeholder interests decreases accountability and increases managerial discretion, allowing for managerial mischief and private benefits. Managers of intangible-intensive firms are not well-equipped to internalize complex externalities linked to intangible investments, leading

to further inefficiencies.

Some studies (e.g., Benlemlih and Bitar (2018)) show that higher stakeholder orientation leads to high social disclosure, reducing information asymmetry and aiding in efficient investment decisions. However, high social disclosure, when combined with the characteristics of intangible assets (e.g., high imitation risk and limited excludability), can lead to inefficiencies, particularly for intangible investments. Competitors can learn more about a firm's intangibles, raising the imitation risk and enabling them to appropriate returns from intangible investments, making these investments less responsive to the firm's growth opportunities.

In this sense, it can be argued that the complexity and valuation challenges associated with intangible assets amplify the inefficiencies introduced by stakeholder orientation. The difficulty in valuing intangible assets, combined with the need to balance diverse stakeholder interests, leads to suboptimal investment decisions.

In summary, we argue that stakeholder orientation significantly reduces intangible investment efficiency for three main reasons. Higher social disclosure increases the risks of knowledge spillovers, imitation, and appropriation by competitors. Additionally, excessive cash holdings in firms with low financial constraints exacerbate agency problems, leading to inefficient intangible investments. Furthermore, valuation challenges and complex stakeholder claims hinder managers' ability to effectively assess and balance stakeholders' interests. Based on these arguments, we propose the following hypothesis:

Hypothesis: Stakeholder orientation should weaken investment efficiency (intangible investment-Q sensitivity) mainly for intangible investments compared to tangible investments.

4. DATA AND EMPIRICAL METHODOLOGY

4.1 Sample selection

Our initial sample covers all Compustat firms during the 1975-2019 period. Following Peters and Taylor (2017), we exclude firms with missing or non-positive book value of assets or sales, and firms with less than $5 million in physical capital measured in 1990 dollars. We also exclude the following industries in line with the standard practice in the finance literature: regulated utilities (SIC codes 4900-4999), financial firms (SIC codes 6000-6999), and firms categorised as public service, international affairs, or non-operating establishments (SIC codes 9000+). Then, we merge the resulting sample with data on intangible capital and Total Q from Peters and Taylor (2017). Our final sample consists of 139,089 firm-year observations corresponding to 11,416 firms, of which 2634 treated firms are located in states that passed the CS. All the continuous variables are winsorized at the 1% and 99% by year.

4.2 Model specification

We adapt the empirical methodology suggested by Bhandari and Javakhadze (2017) to model the relationship between a firm's investment efficiency and stakeholder orientation. The empirical model follows the classical literature on corporate investment (Baker, et al., 2003) and include both Tobin's Q and cash flow as explanatory variables. More specifically, we estimate the following model:

$$\frac{Investment_{i,t}}{K_{i,t-1}^{tot}} = \beta_0 + \beta_1 CS_{s,t} + \beta_2 Total\_Q_{i,t-1} + \beta_3 Total\_Q_{i,t-1} * CS_{s,t} + \beta_4 \frac{CF_{i,t-1}^{tot}}{K_{i,t-1}^{tot}} + \theta X_{i,t-1} + \gamma_i + \vartheta_t + \gamma_i * \rho_h + \varepsilon \quad (1)$$

where i indexes firm, s indexes state of incorporation, and t indexes year. The dependent variable *Investment* is based on Peters and Taylor (2017) and captures five different measures of investments: Physical Investment (I^{phy}), Intangible Investment (I^{int}), Total Investment

rate (I^{tot}), Intangible Knowledge Investment (I^{int_know}), and Intangible Organizational Investment (I^{int_org}). Total capital (K^{tot}) equals physical capital plus intangible capital. The variable *Total_Q*, measured following Peters and Taylor (2017), is a proxy for firm growth opportunities that accounts for intangible capital. We also follow the standard investment literature and include firm cash flows (*CF*), which serve as a proxy for the availability of internal funds for investment. A detailed explanation of the construction and measurement of these key variables is provided in Section 4.3 below. Definitions are also provided in Table A2 in the Appendix.

The variable CS (Constituency Statutes) represents our proxy of stakeholder orientation. CS is a dummy variable equal to one if a firm is incorporated in a state that has enacted CS in year *t* and zero otherwise. $X_{i,t-1}$ is a vector of control variables that affect a firm's investment decisions: firm size, profitability (ROA), leverage, risk (Z-score and cash flow volatility), turnover, sales growth, and an indicator variable for dividend cuts. Definitions of these variables are provided in Table A2 in the Appendix. θ is the vector of the associated coefficients. The model also controls for unobservable firm characteristics using firm fixed effects (γ_i), year fixed effects (ϑ_t) to control for the overall economic or market conditions, and a firm's headquarters state by year fixed effects ($\gamma_i * \rho_h$) to account for time-varying local shocks that may affect a firm's investment decisions. We cluster standard errors at the state of incorporation level when estimating our models to account for correlations between firms located in the same state of incorporation.

Since our measure of capital allocation efficiency is the sensitivity of investments (tangible and intangible) to growth opportunities, the coefficient of interest corresponds to the interaction term of Total Q and CS (β_3). If stakeholder orientation distorts capital allocation efficiency of the firm (i.e., reduces the investment sensitivity to Q), we should expect a

negative and significant coefficient ($\beta_3 < 0$).

4.3 Measurement of Variables

Measuring Total Capital (K^{tot})

Peters and Taylor (2017) define a firm's total capital as the sum of physical capital and intangible capital ($K^{tot} = K^{phy} + K^{int}$).[5] Physical capital stock (K^{phy}) equals the replacement cost of physical capital and is measured as the book value of property, plant, and equipment (Compustat item $PPEGT$). The intangible capital stock (K^{int}) is estimated by accumulating past spending in research and development (*R&D*) and selling, general and administrative (*SG&A*) spending using the perpetual inventory method. More specifically, the replacement cost of intangible capital (K^{int}) is defined as the sum of externally purchased intangible capital (intangible capital from the balance sheet proxied by the Compustat item *ITAN*) and internally created intangible capital (off-balance sheet intangible capital or K^{int_obs}).[6] The latter is the sum of knowledge capital (K^{int_know}) and organization capital (K^{int_org}). Knowledge capital is the replacement cost of the firm's knowledge capital, measured as the portion of intangible capital that comes from *R&D*. Organization capital is the replacement cost of the firm's organization capital, which is the portion of intangible capital that comes from *SG&A*.

The above discussion illustrates how the denominator of our dependent variables is calculated: a firm's Total Capital ($K^{tot} = K^{phy} + K^{int}$). Figure 1 presents median values for intangible intensity ($K^{int}/\ K^{tot}$), the firm's stock of intangible capital divided by its total

[5] All K variables are measured in nominal millions of dollars. We follow the advice from Peters and Taylor (2017) about their measures of intangible Capital and exclude observations: (1) before 1975, (2) for firms with missing or non-positive book value of assets or sales, or (3) for firms with less than $5 million in physical capital measured in 1990 dollars.

[6] Off-balance sheet intangibles (K^{int_obs}) is derived from Peters and Taylor (2017) and measures internally created intangible assets.

capital stock during the sample period. The median intangible intensity increased steadily during the sample period to reach more than 60% before the 2008 financial crisis, then it decreased slightly afterward before increasing again above pre-crisis level toward the end of the sample period.

[Insert Figure 1 about here]

Measuring investment rates ($Investments/K^{tot}$)

We can now define our five dependent investment variables, namely Physical Investment rate ($i^{phy} = I^{phy}/K_{t-1}^{tot}$), Intangible Investment rate $i^{int} = I^{int}/K_{t-1}^{tot}$), Total Investment rate ($i^{tot} = I^{tot}/K_{t-1}^{tot}$), Intangible Knowledge Investment rate $i^{int\_know} = I^{int\_know}/K_{t-1}^{tot}$), and Intangible Organizational Investment rate ($i^{int\_org} = I^{int\_org}/K_{t-1}^{tot}$). Physical Investment rate (i^{phy}) is calculated as capital expenditures ($I^{phy} = CAPEX$) scaled by the lagged value of the total capital of the firm. Intangible Investment rate (i^{int}) is calculated as the sum of research and development spending ($R\&D$) plus a fraction of selling, general and administrative spending ($0.3 * SG\&A$), scaled by the lagged value of the total capital of the firm. Total Investment rate ($i^{tot} = i^{phy} + i^{int}$) is calculated as the sum of Physical Investment rate and the Intangible Investment rates. Figure 2 presents the median values for the Physical Investment rate (i^{phy}) and Intangible Investment rate (i^{int}) over the sample period. It shows a clear decline in the physical investment rate over the years from a maximum of 9% at the start of the sample period to slightly above 2% at the end of the sample period. On the contrary, the intangible investment rate remained stable between 8 and 10% throughout the sample period, with a slight decline after the dot-com bubble in the early 2000s and the 2008 financial crisis.

[Insert Figure 2 about here]

The intangible knowledge investment rate (i^{int_know}) is computed as R&D spending scaled

by the lagged value of the firm's total capital. Intangible Organizational Investment rate (i^{int_org}) is computed as 30% of SG&A (0.3 * SG&A) scaled by the lagged value of the firm's total capital. R&D spending helps firms develop *knowledge capital* (e.g., knowledge, patents, or software), while part of SG&A spending (e.g., advertising, employee training, spending on distribution systems) allows firms to develop *organization capital* such as human capital, brand capital and customers' relationships (Peters and Taylor, 2017).

Measuring Q and Cash Flows

We follow Peters and Taylor (2017) in calculating *Total Q* (q^{tot}) and Total CF (c^{tot}). *Total Q* is calculated as the firm value (V) divided by firm's Total Capital ($K^{tot} = K^{phy} + K^{int}$). The firm value is calculated as the market value of the outstanding equity, plus the book value of the debt, minus current assets. We also compute the standard Tobin Q as firm value (V) divided by the physical capital stock (K^{phy}).[7] Figure 3 presents median values for the standard Tobin's Q and Total Q (q^{tot}) over the sample period. It shows that while both are highly correlated, their levels differ. Total Q seems much higher in recent years. Peters and Taylor (2017) show that Total Q captures better firm investment opportunities in an economy increasingly dominated by intangible capital.

[Insert Figure 3 about here]

We also follow the standard investment literature and control for firm cash flows (*CF*) which serves as a proxy for the availability of internal funds for investment. CF may impact firm investments because of the cost advantage of internal funds suggested by the pecking order theory of capital structure (Fazzari, Hubbard, Petersen, Blinder, & Poterba, 1988; Kaplan & Zingales, 1997). Total CF (c^{tot}) is calculated as the sum of income before

[7] The ratio of capital's market value to its replacement cost (Tobin's Q) captures firm's growth opportunities (e.g., Erickson and Whited (2000); Hayashi (1982); Peters and Taylor (2017); Tobin (1969)).

extraordinary items, depreciation expense, and Intangible Investment (I^{int}) net of tax adjustment, divided by the lagged value of the total capital of the firm. This definition of CF treats R&D and SG&A as investments, not operating expenses (Peters & Taylor, 2017).

Control Variables

Finally, we control for several firm characteristics that could affect firm investment: firm size, profitability, leverage, risk, stock liquidity, sales growth, and dividend payments. Firm size (size) is measured as the natural logarithm of the total assets. Profitability is represented by the return on assets (*ROA*), which is calculated as earnings before interest and tax (EBIT) to total assets. Leverage (*BLEVERAGE*) is measured as long-term debt plus debt in current liabilities minus cash and marketable securities, divided by total assets. We use two proxies for risk. First, we measure the volatility of the CF (*CF_vol*) as the standard deviation of the total CF (c^{tot}) over the previous five years. Second, we use the Altman Z-Score as a proxy for default risk. We control for stock liquidity using Turnover, measured as the natural logarithm of common shares traded divided by the number of shares outstanding. Finally, we control for sales growth and dividend cut, which is a dummy variable equal to one if there is a reduction in annual dividend, and zero otherwise. Table A2 in the Appendix shows variable definitions and their measurement.

Table 1 presents descriptive statistics for all variables included in this study. The mean (median) value of the physical investment rate, the intangible investment rate, and the total investment rate are 8.71% (4.97%), 11.84% (9.29%) and 20.77% (15.95%), respectively. These figures show that intangible investment is not negligible, which in turn motivates further our study. The mean (median) value of the intangible knowledge investment rate is 3.61% (0), while the corresponding value for intangible organizational investment rate is 8.13% (6.33%). The mean (median) value of Total Q is 1.12 (0.59). On average, the typical firm in our sample

has a ROA of 4%, 16% total CF, a leverage ratio of 12% and 10% sales growth. Furthermore, the typical firm has a CF volatility of 9% and a Z-score of 4.06.

[Insert Table 1 about here]

Table 2 presents the pairwise correlations among all variables. The Z-score is positively correlated with Total Q (0.65), and the total cash flow is positively correlated with ROA (0.55). The absolute values of all other correlations between control variables are generally low, suggesting that multicollinearity would not affect our results.

[Insert Table 2 about here]

5 RESULTS

This section presents the findings of the multivariate analysis of the impact of stakeholder orientation on firm's investment efficiency. Table 3 shows the empirical results of the estimation variants of equation (1) using the physical investment rate as the dependent variable. In our baseline specification (model 1), we use CS, total Q, total CF, and the interaction between CS and total Q as explanatory variables to capture investment efficiency. In models (2-3), we introduce additional control variables that are expected to affect firm investments. Model (4) is a full model with all control variables in addition to lagged investment rates computed at the state-level and year, but excluding firm *i*. This variable accounts for regional spillovers of investment. Consistent with previous studies (e.g., Bhandari and Javakhadze (2017); Peters and Taylor (2017), total Q is positively and significantly associated with investment expenditures. Furthermore, physical investment is positively and significantly associated with CF, CF volatility, ROA, turnover, sales growth, and negatively and significantly associated with firm size, book leverage ratio, Z-score, and dividend cut. To test whether CS (our proxy of stakeholder orientation) increases or reduces investment-Q sensitivity (our proxy for investment efficiency), we rely on the estimated coefficient of the

interaction between CS and total Q. The findings from all specifications indicate a neutral association between stakeholder orientation and physical investment efficiency (e.g., β_3 is positive and statistically insignificant in all models). The findings suggest that stakeholder-friendly initiatives do not distort physical investment.

[Insert Table 3 about here]

Table 4 presents the findings of the estimations using the intangible investment rate as the dependent variable. Again, intangible investment is positively correlated with Total Q, CF, CF volatility, turnover, sales growth, and negatively correlated with firm size and leverage ratio. In contrast to the results reported in Table 3, intangible investment becomes negatively linked to ROA and positively correlated with Z-score and dividend cut. Table 4 also shows that our coefficient of interest (β_3) becomes negative and significant (at the 1% level) in all four specifications. This result suggests that stakeholder orientation distorts intangible investment efficiency.

[Insert Table 4 about here]

The results for the total investment rate are presented in Table 5. Again, our coefficient of interest is negative and statistically significant in all specifications. These results suggest that the negative effect of stakeholder orientation on firm investment efficiency is driven by distortions in intangible investments. Because higher stakeholder orientation for intangible-intensive firms could lead to low information asymmetry, competitors could learn more about a firm's intangibles, increasing the imitation risk. If competitors can appropriate more returns because of a better information environment (higher social disclosure), a firm's investments should be more sensitive to the ability of competitors to extract rents from intangible assets and less sensitive to the firm's growth opportunities. In the same line of reasoning, if intangible assets are associated with high levels of cash reserves, low leverage and low financial

constraints, higher stakeholder orientation could increase managerial discretion and self-serving behaviour because cash should increase resources under managers control instead of helping firms better cope with financial shocks when access to external capital is costly. Furthermore, the lack of debt funding should lower the disciplinary forces of external capital markets, making agency problems more severe for intangible-intensive firms. The mix of the above factors suggests that stakeholder orientation makes a firm's intangible investments less efficient.

We argue that the exchange of complex and ill-defined implicit claims between a firm and its stakeholders should make it more difficult for firm managers to identify and pursue positive NPV projects. As an important fraction of intangible capital is linked to implicit claims, we conjecture that stakeholder orientation should lead to more inefficiencies in intangible investments compared to physical investments. This may explain why stakeholder orientation distorts a firm's intangible investment sensitivity to total Q and has no effect on firm's physical investment sensitivity to total Q. Because intangible investments are more complex to assess and their payoffs depend on too many future states of the world that the firm's stakeholders cannot foresee when they started, this may provide an opportunity for some managers to pursue whatever objective they wish and exercise their own preferences when using firm's limited resources. Again, we should expect managerial opportunism to lead to more inefficiencies in intangible investments in comparison to physical investments.

[Insert Table 5 about here]

Next, we examine the impact of CS on the intangible knowledge investment-Q association (Table 6) and intangible organizational investment-Q association (Table 7). Our results show that the coefficient of interest remains negative and significant (at the 1% level) for all specifications. These additional findings suggest that intangible investments drive the negative association between stakeholder orientation and investment efficiency, and the effect is

stronger for knowledge-intangible investment.

[Insert Tables 6 and 7 about here]

In summary, our findings suggest that the sensitivity of firm intangible investment to Q is lower for firms with higher stakeholder orientation, and this is driven mainly by intangible knowledge investment. Our findings are consistent with those reported by Bhandari and Javakhadze (2017) who also show that corporate social responsibility (a proxy of stakeholder orientation) distorts investment sensitivity to Q. However, their analysis differs from our study in two important ways: i) it uses firm-level data to measure stakeholder orientation (MSCI ESG KLD stats), while our paper uses a quasi-natural experiment that addresses the empirical challenge linked to endogeneity, and ii) their measures of firm investment do not make a distinction between physical and intangible investment. In this respect, investment is computed as either the yearly growth in PP&E plus R&D spending, scaled by the lagged book value of total assets or CAPEX, scaled by the lagged book value of total assets. Moreover, our sample covers all US firms, whereas their sample covers only US firms covered by the MSCI ESG KLD stats database. Our findings suggest that it is important to distinguish between physical investment and intangible investment when investigating the effect of stakeholder orientation on capital allocation efficiency.

Robustness checks

We perform a battery of robustness checks of the main findings. The results of the robustness checks are reported in Table 8 and show only estimated coefficients for the interaction term between CS and Total Q, using the full Model 4 reported in Tables 3-7.

[Insert Table 8 about here]

First, given that more than half of the sample firms are incorporated in Delaware and could

be overrepresenting our control group (Delaware is one of the few states that did not adopt CS laws); results in Panel A of Table 8 exclude firms incorporated in Delaware. Second, in panel B, we include a dummy variable for the years 2007-2008 to account for the potential effect of the financial crisis on the firm's investment decisions. Third, in Panel C of Table 8, we restrict the sample to 1976-2000 to exclude the effect of the Sarbanes-Oxley Act in 2002 and the 2007-2008 financial crisis. Fourth, we exclude firms incorporated in Arizona, Indiana, Massachusetts, Minnesota and Pennsylvania, as Karpoff and Wittry (2018) show that several firms lobbied for the enactment of CS laws in these five states. The coefficient of the interaction between CS and Total Q, reported in panel D of Table 8, is still negative and significant in all regressions where the dependent variable is either intangible investment or intangible knowledge investment. Fifth, in Panel E, we exclude California and Washington from the analysis due to their significant roles as major tech hubs, which heavily influence intangible investments. Despite this exclusion, the results remain consistent with previous findings and are similar to those reported in Panel B.

Finally, to rule out the possibility that firms incorporated in states that adopt CS laws (treatment group) are substantially different from firms located in states which are not adopting CS laws (control group), we use propensity score matching to build a sample of firms from the control group that matches the treatment group based on Total Q, total cash flow, size, ROA, leverage, and fiscal year. More specifically, we use the nearest neighbour matching procedure with replacement and take the closest 1, 2, 3 and 4 neighbours based on propensity scores for each treated firm in the prior year relative to the adoption of CS laws. In Figure A1 in the appendix, we report the distribution of the variables used for matching firms after matching to the closest one neighbour.[8] The difference between matched firms is trivial, and therefore any

[8] Similar distributions are obtained for the closest 2, 3 and 4 neighbours. These are available from the authors upon request.

differences between the treatment and matched control groups are then assumed to be a result of the enactment of CS laws. The results, reported in Panel F of Table 8, still hold across the models, providing further empirical support to our main results.

We conduct an additional robustness test related to our second argument, suggesting that firms with high levels of intangibles have financial structures that exhibit high levels of cash and low levels of leverage. In particular, we construct two subsamples based on the level of a firm's tangibles and intangibles. Sub-sample 1 includes all firms with Physical Investment rates above the sample median, while Sub-sample 2 includes all firms with Intangible Investment rates above the sample median. Table A3 show that all three measures of a firm's cash holdings are significantly higher for firms with high levels of intangibles. The latter also exhibit significantly low debt ratios and financial constraints (KZ and WW indexes). Table A3 also suggests that both subsamples have almost the same growth opportunities (Total Q) and cash flow volatility. We then propose to run two regressions using equation 1 for each subsample to further test our second argument. The results presented in Table 9 show that the negative effect of stakeholder orientation on firm investment efficiency is present only for Sub-sample 2, where firms have higher cash reserves and low debt capacity, as suggested by our second argument.

6 CONCLUSION

This paper examines the relationship between firm stakeholder orientation, as measured by the enactment of state-level constituency statutes in the US, and investment efficiency for a large sample of non-financial US companies between 1975 and 2019. More specifically, we test the moderating effect of stakeholder orientation on the investment-Q relationship. The paper makes three contributions to the literature. Firstly, it adds new empirical evidence to the literature on the impact of Corporate Social Responsibility (CSR) on firm policies by

examining the impact of stakeholder orientation on investment efficiency. Previous studies have found positive associations between CSR and various firm policies, including innovation, reduced cost of debt, decreased risk-taking, increased shareholder value, and accounting conservatism. We contribute to this literature by examining the causal effect of stakeholder orientation on investment efficiency by exploiting a quasi-natural experiment provided by the enactment of CSR laws. Secondly, the study considers the potential impact of stakeholder orientation on investment efficiency in the context of intangible investments, which has been largely overlooked in previous research. Thirdly, the study uses Peters and Taylor's (2017) Total Q proxy for Tobin's Q to account for tangible and intangible investments, which is expected to be more aligned with the true Q and less affected by measurement error than standard Q measures.

Our findings indicate that stakeholder orientation can have a distortionary effect on intangible investment efficiency, particularly intangible knowledge investments compared to organizational intangible investments. The enactment of constituency statutes leads to a significant decrease in intangible investment efficiency and distorts the firm-level capital allocation efficiency of intangible investments. This highlights the importance of considering the type of investment when evaluating the impact of stakeholder orientation on investment efficiency. The findings have important implications for corporate managers, investors, and policymakers. Board of directors and investors should carefully consider how stakeholder orientation could affect investment efficiency, particularly with intangible assets, which have specific features that distinguish them from tangible assets. Our paper suggests that stakeholder orientation combined with an inefficient choice of a firm’s financial structure could lead to managerial opportunism. Therefore, protecting non-financial stakeholders without choosing an "optimal" financial structure could lead to inefficient investments. Policymakers must also assess the potential trade-offs between protecting non-financial stakeholders and promoting

firms' investments in intangible assets that can drive long-term success. Our paper suggests that protecting non-financial stakeholders without establishing clear property rights, protecting ownership of intangibles, and protecting firms from imitation risk could also lead to inefficiencies in a firm's investment.

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Figure 1. Intangible Intensity (K^{int}/K^{tot})

This figure presents the median values of intangible intensity over the sample period.

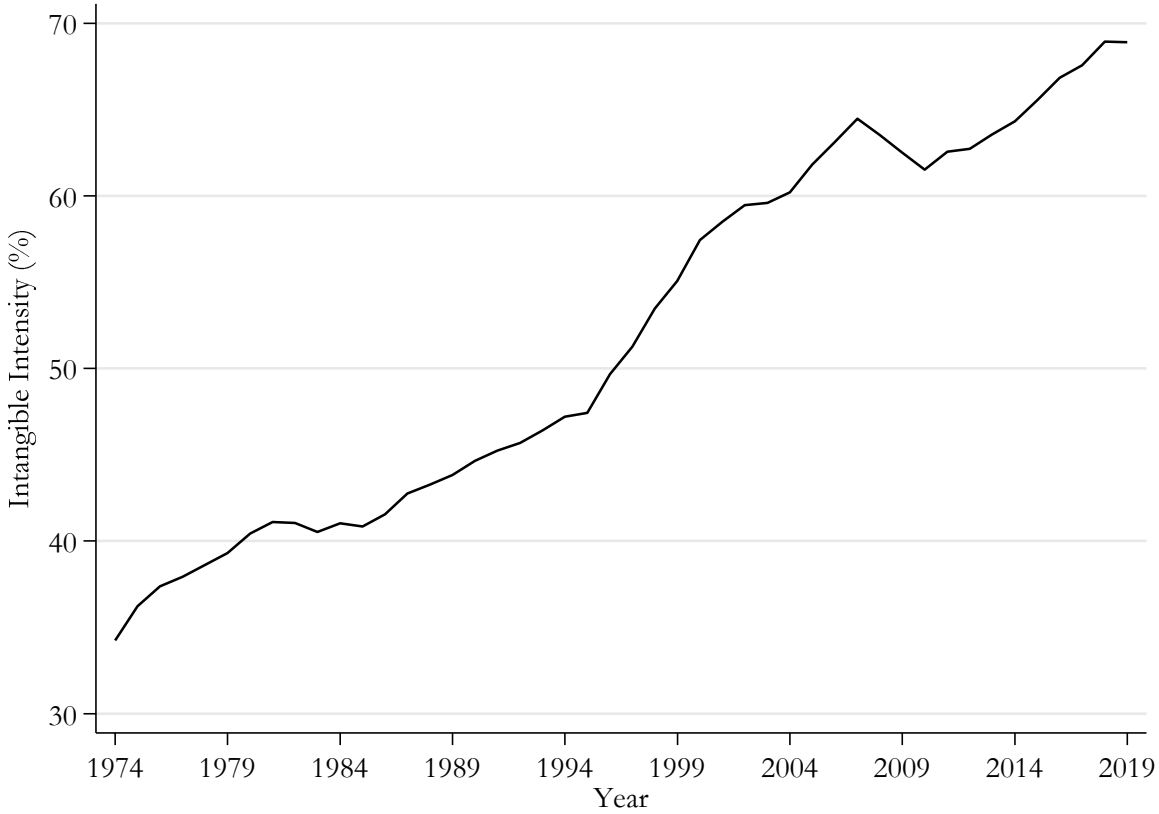


Figure 2. Investment Rates

This figure presents median values for the Physical Investment rate (i^{phy}), Intangible Investment rate (i^{int}) over the sample period.

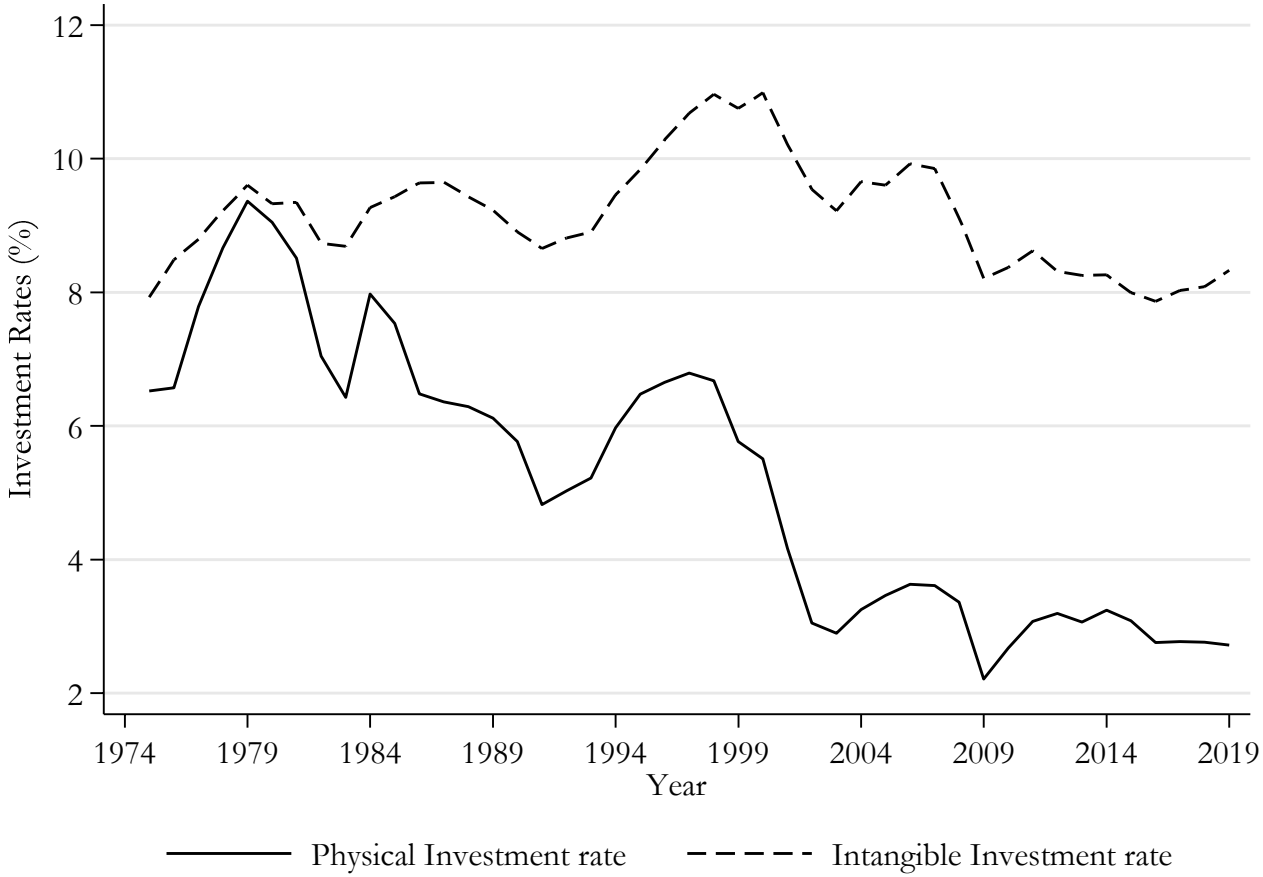


Figure 3. Tobin's q

This figure presents median values for the standard Tobin's Q and Total Q (q^{tot}) over the sample period.

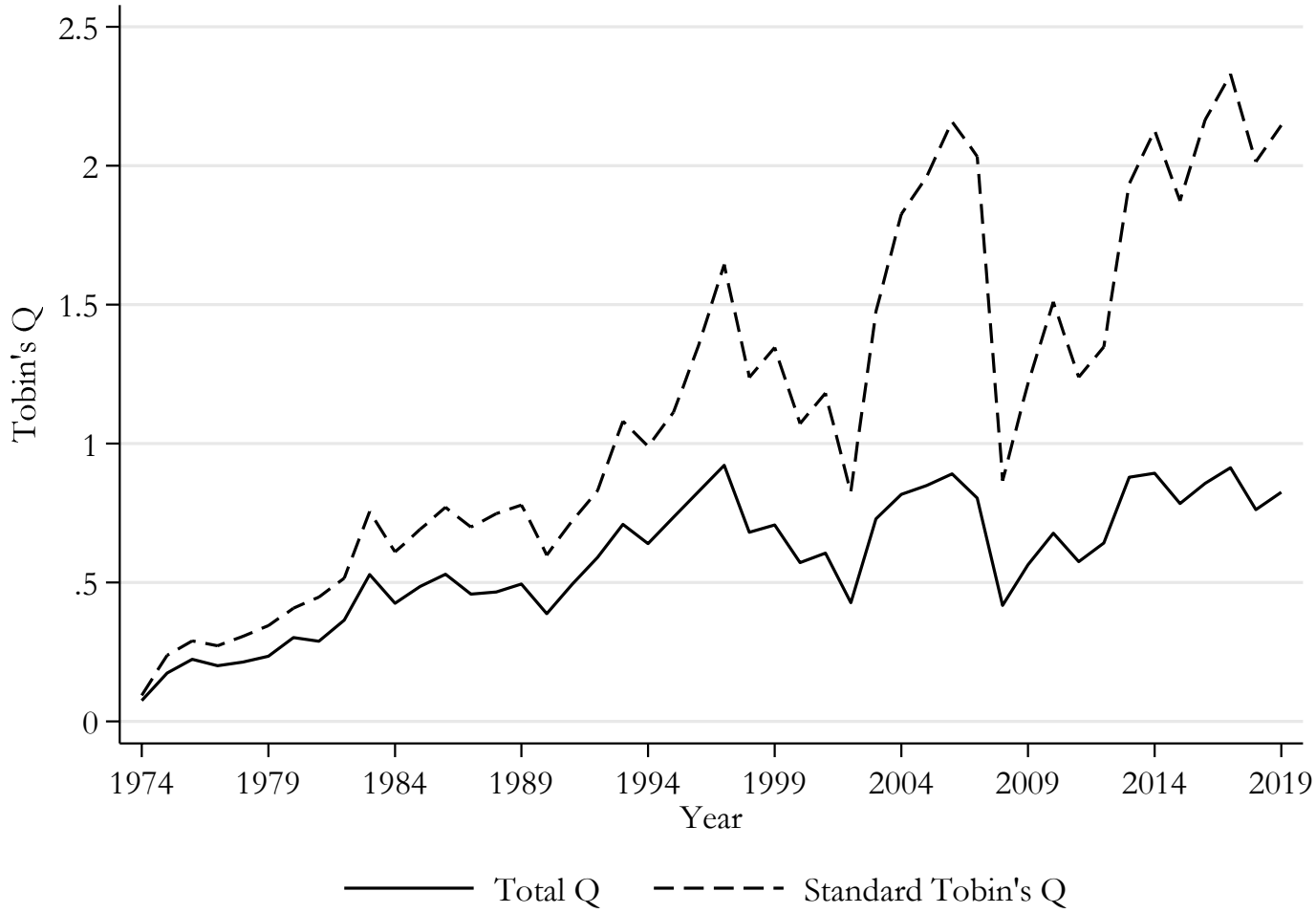


Table 1. Descriptive statistics

This table presents the descriptive statistics for all variables included in the study. All continuous variables are winsorised at the top and bottom 1% of their distributions by year. We follow the advice of Peters and Taylor (2017) about their measures of intangible capital and exclude observations: (1) before 1975, (2) for firms with missing or non-positive book value of assets or sales, or (3) for firms with less than $5 million in physical capital (Compustat variable ppegt) measured in 1990 dollars. We also exclude the following industries, as it is the standard practice in the finance literature: regulated utilities (SIC codes 4900-4999), financial firms (6000-6999), and firms categorised as public service, international affairs, or non-operating establishments (9000+). Detailed variable definitions are provided in Table A2 in the appendix.

Variable	N	Mean	SD	P25	Median	P75
Physical Investment rate (i^{phy})	132,057	8.47	11.95	2.33	4.79	9.59
Intangible Investment rate (i^{int})	133,355	11.85	11.67	3.92	9.23	15.68
Total Investment rate (i^{tot})	132,057	20.53	18.25	10.01	15.73	24.4
Intangible Knowledge Investment rate (i^{int_know})	133,355	3.7	7.81	0	0	3.71
Intangible Organizational Investment rate (i^{int_org})	133,355	8.05	7.51	2.73	6.23	11.17
Total Q (q^{tot})	134,187	1.14	2.33	0.22	0.61	1.26
Total cash flow (c^{tot})	133,355	0.15	0.2	0.08	0.14	0.22
Cash Flow volatility	122,309	0.09	0.13	0.02	0.05	0.1
Size	146,772	5.44	1.93	3.98	5.24	6.74
ROA	146,749	0.04	0.19	0.01	0.07	0.13
Book leverage Ratio	146,117	0.12	0.36	-0.09	0.15	0.34
Z-score	129,682	4.01	6.03	1.84	3.2	5.05
Turnover	134,591	13.48	1.2	12.72	13.56	14.35
Sales growth	133,449	0.1	0.3	-0.02	0.08	0.2
Dividend cut	132,803	0.1	0.3	0	0	0

Table 2. Pairwise correlations

This table reports the correlations between the variables used in this study. The correlation coefficients with a * are significant at the 1% level. Table A2 in the Appendix provides the variable definitions.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
i^{phy}	1.000														
i^{int}	0.099*	1.000													
i^{tot}	0.750*	0.717*	1.000												
i^{int_know}	0.018*	0.742*	0.501*	1.000											
i^{int_org}	0.120*	0.728*	0.547*	0.102*	1.000										
Total Q (q^{tot})	0.211*	0.331*	0.360*	0.309*	0.184*	1.000									
Total CF (c^{tot})	0.170*	0.266*	0.287*	0.098*	0.305*	0.324*	1.000								
Cash Flow volatility	0.091*	0.244*	0.234*	0.192*	0.148*	0.149*	-0.019*	1.000							
Size	-0.033*	-0.156*	-0.123*	-0.081*	-0.154*	0.038*	0.067*	-0.078*	1.000						
ROA	0.080*	-0.156*	-0.050*	-0.291*	0.071*	0.049*	0.556*	-0.223*	0.260*	1.000					
Book leverage Ratio	0.036*	-0.401*	-0.235*	-0.452*	-0.146*	-0.232*	-0.218*	-0.098*	0.118*	0.092*	1.000				
Z-score	0.113*	0.293*	0.266*	0.231*	0.208*	0.636*	0.430*	-0.046*	0.027*	0.349*	-0.428*	1.000			
Turnover	0.041*	0.215*	0.167*	0.266*	0.053*	0.189*	0.090*	0.153*	0.379*	-0.051*	-0.206*	0.119*	1.000		
Sales growth	0.342*	0.274*	0.417*	0.173*	0.230*	0.258*	0.229*	0.018*	0.020*	0.135*	-0.051*	0.179*	0.089*	1.000	
Dividend cut	-0.039*	-0.093*	-0.086*	-0.100*	-0.039*	-0.054*	-0.027*	-0.043*	0.074*	0.047*	0.061*	-0.005	-0.050*	-0.092*	1.000

Table 3. The impact of Constituency Statutes laws (CS) on Physical (tangible) Investment rate-Q relationship

This table estimates the effects of stakeholder orientation on corporate investment efficiency. The main variables are defined in Table A2 in the Appendix. The sample period covers 1975 to 2019. Regressions in all columns control for firm, year, and state-of-headquarter-year-fixed effects. Robust z-statistics clustered at the state of incorporation are reported in parentheses. The coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: i^{phy}			
	Model 1	**Model 2**	**Model 3**	**Model 4**
CS	0.177	0.146	0.0628	0.0816
	(0.446)	(0.417)	(0.201)	(0.312)
Total Q_{t-1}	1.145***	1.006***	1.066***	0.984***
	(42.021)	(29.636)	(27.818)	(26.901)
CS * Total Q_{t-1}	0.0131	0.0542	0.0833	0.0846
	(0.063)	(0.275)	(0.445)	(0.486)
Total cash flow $_{t-1}$	9.684***	7.360***	6.058***	5.516***
	(8.405)	(8.323)	(7.903)	(8.745)
CS* Total cash flow $_{t-1}$	0.502	-0.149	-0.145	-0.374
	(0.332)	(-0.109)	(-0.111)	(-0.322)
Cash Flow volatility$_{t-1}$		0.792***	0.663***	0.728***
		(2.968)	(3.625)	(3.969)
Size$_{t-1}$		-0.893***	-1.096***	-0.930***
		(-7.636)	(-7.429)	(-7.992)
ROA$_{t-1}$		4.398***	4.017***	3.456***
		(16.337)	(13.821)	(14.699)
Book leverage Ratio $_{t-1}$		-3.988***	-4.730***	-4.358***
		(-20.917)	(-25.925)	(-26.488)
Z-score $_{t-1}$			-0.0909***	-0.0830***
			(-8.304)	(-7.623)
Turnover $_{t-1}$			0.524***	0.455***
			(13.688)	(12.769)
Sales growth $_{t-1}$			2.674***	2.481***
			(17.161)	(18.988)
Dividend cut $_{t-1}$			-0.249**	-0.210*
			(-2.212)	(-1.896)
$i_{-1,s}^{phy}$				-6.025***
				(-9.776)
Constant	4.813***	10.26***	4.579***	54.25***
	(24.842)	(18.598)	(5.368)	(9.751)
Observations	112958	104512	99972	99972
Adjusted R-squared	0.491	0.505	0.512	0.563

Table 4. The impact of Constituency Statutes laws (CS) on Intangible Investment rate-Q relationship

This table estimates the effects of stakeholder orientation on corporate investment efficiency. The main variables are defined in Table A2 in the Appendix. The sample period covers 1975 to 2019. Regressions in all columns control for firm, year, and state-of-headquarter-year-fixed effects. Robust z-statistics clustered at the state of incorporation are reported in parentheses. The coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: i^{int}			
	Model 1	**Model 2**	**Model 3**	**Model 4**
CS	0.214	0.188	0.260	0.349
	(0.825)	(0.655)	(0.938)	(1.372)
Total Q_{t-1}	1.334***	1.199***	0.998***	0.955***
	(88.996)	(76.555)	(33.149)	(30.664)
CS * Total Q_{t-1}	-0.633***	-0.684***	-0.693***	-0.670***
	(-6.301)	(-7.700)	(-7.238)	(-7.521)
Total cash flow $_{t-1}$	8.138***	8.228***	7.614***	6.897***
	(16.152)	(14.188)	(13.406)	(14.357)
CS * Total cash flow $_{t-1}$	2.038	2.032	1.642	1.695
	(1.413)	(1.470)	(1.118)	(1.218)
Cash Flow volatility$_{t-1}$		2.683***	2.413***	2.299***
		(12.616)	(10.483)	(10.329)
$Size_{t-1}$		-0.782***	-0.975***	-0.884***
		(-19.372)	(-17.775)	(-16.083)
ROA_{t-1}		-0.562**	-2.156***	-2.163***
		(-2.072)	(-9.539)	(-9.600)
Book leverage Ratio $_{t-1}$		-2.740***	-2.237***	-2.037***
		(-5.834)	(-6.658)	(-6.920)
Z-score $_{t-1}$			0.112***	0.107***
			(6.066)	(6.000)
Turnover $_{t-1}$			0.371***	0.332***
			(11.269)	(10.057)
Sales growth $_{t-1}$			1.804***	1.631***
			(26.358)	(23.735)
Dividend cut $_{t-1}$			0.0862**	0.0817**
			(2.326)	(2.375)
$i_{-1,s}^{int}$				-7.590***
				(-13.988)
Constant	8.201***	12.52***	8.537***	98.37***
	(105.322)	(41.821)	(28.368)	(15.375)
Observations	114050	105464	100782	100782
Adjusted R-squared	0.775	0.785	0.793	0.810

Table 5. The impact of Constituency Statutes laws (CS) on Total Investment rate-Q relationship

This table estimates the effects of stakeholder orientation on corporate investment efficiency. The main variables are defined in Table A2 in the Appendix. The sample period covers 1975 to 2019. Regressions in all columns control for firm, year, and state-of-headquarter-year-fixed effects. Robust z-statistics clustered at the state of incorporation are reported in parentheses. The coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: i^{tot}			
	Model 1	**Model 2**	**Model 3**	**Model 4**
CS	0.396	0.350	0.351	0.441
	(0.970)	(0.862)	(0.917)	(1.303)
Total Q_{t-1}	2.567***	2.294***	2.128***	1.999***
	(84.310)	(48.581)	(33.894)	(33.164)
CS * Total Q_{t-1}	-0.657**	-0.677**	-0.643**	-0.623**
	(-2.324)	(-2.591)	(-2.475)	(-2.582)
Total cash flow $_{t-1}$	18.15***	15.80***	14.00***	12.73***
	(10.687)	(10.474)	(10.491)	(11.781)
CS * Total cash flow $_{t-1}$	2.570	1.844	1.350	1.186
	(1.053)	(0.756)	(0.591)	(0.571)
Cash Flow volatility$_{t-1}$		3.665***	3.251***	3.215***
		(8.236)	(8.522)	(8.397)
Size$_{t-1}$		-1.795***	-2.184***	-1.908***
		(-15.188)	(-17.080)	(-20.302)
ROA$_{t-1}$		4.016***	1.883***	1.253***
		(13.224)	(5.899)	(3.953)
Book leverage Ratio $_{t-1}$		-6.945***	-7.180***	-6.550***
		(-12.794)	(-22.723)	(-21.951)
Z-score $_{t-1}$			0.0272	0.0308
			(1.048)	(1.134)
Turnover $_{t-1}$			0.871***	0.761***
			(15.286)	(14.517)
Sales growth $_{t-1}$			4.593***	4.223***
			(25.633)	(29.986)
Dividend cut $_{t-1}$			-0.118	-0.0896
			(-1.086)	(-0.808)
$i_{-1,s}^{tot}$				-6.642***
				(-12.959)
Constant	13.00***	23.46***	14.02***	148.6***
	(47.168)	(52.640)	(14.621)	(13.753)
Observations	112958	104512	99972	99972
Adjusted R-squared	0.582	0.593	0.608	0.647

Table 6. The impact of Constituency Statutes laws (CS) on Knowledge intangible Investment rate-Q relationship

This table estimates the effects of stakeholder orientation on corporate investment efficiency. The main variables are defined in Table A2 in the Appendix. The sample period covers 1975 to 2019. Regressions in all columns control for firm, year, and state-of-headquarter-year-fixed effects. Robust z-statistics clustered at the state of incorporation are reported in parentheses. The coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: i^{int_know}			
	Model 1	**Model 2**	**Model 3**	**Model 4**
CS	0.403***	0.400***	0.406***	0.391***
	(2.962)	(3.093)	(2.892)	(3.165)
Total Q_{t-1}	0.739***	0.680***	0.465***	0.435***
	(74.958)	(38.980)	(10.479)	(11.298)
CS * Total Q_{t-1}	-0.428***	-0.466***	-0.473***	-0.444***
	(-6.913)	(-10.873)	(-12.133)	(-11.781)
Total cash flow $_{t-1}$	2.202***	2.379***	2.641***	2.276***
	(17.778)	(26.041)	(31.571)	(31.692)
CS * Total cash flow $_{t-1}$	-0.205	-0.237	-0.295	-0.257
	(-0.259)	(-0.373)	(-0.433)	(-0.402)
Cash Flow volatility$_{t-1}$		0.754***	0.817***	0.784***
		(5.144)	(5.102)	(6.231)
Size$_{t-1}$		-0.0428*	-0.137***	-0.136***
		(-1.998)	(-3.241)	(-3.146)
ROA$_{t-1}$		-0.717***	-2.135***	-1.944***
		(-5.430)	(-9.827)	(-9.672)
Book leverage Ratio $_{t-1}$		-1.817***	-1.094***	-0.982***
		(-5.834)	(-5.706)	(-5.980)
Z-score $_{t-1}$			0.134***	0.122***
			(6.654)	(6.736)
Turnover $_{t-1}$			0.113***	0.0981***
			(5.758)	(4.678)
Sales growth $_{t-1}$			0.585***	0.496***
			(8.788)	(7.775)
Dividend cut $_{t-1}$			0.137***	0.115***
			(7.954)	(8.127)
$i_{-1,s}^{int\_know}$				-13.09***
				(-15.404)
Constant	2.210***	2.519***	1.207***	50.10***
	(90.061)	(16.620)	(7.239)	(15.820)
Observations	114050	105464	100782	100782
Adjusted R-squared	0.805	0.814	0.817	0.838

Table 7. The impact of Constituency Statutes laws (CS) on Organisational intangible Investment rate-Q relationship

This table estimates the effects of stakeholder orientation on corporate investment efficiency. The main variables are defined in Table A2 in the Appendix. The sample period covers 1975 to 2019. Regressions in all columns control for firm, year, and state-of-headquarter-year-fixed effects. Robust z-statistics clustered at the state of incorporation are reported in parentheses. The coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: i^{int_org}			
	Model 1	**Model 2**	**Model 3**	**Model 4**
CS	-0.219	-0.226	-0.171	-0.0802
	(-1.022)	(-0.942)	(-0.797)	(-0.398)
Total Q_{t-1}	0.543***	0.477***	0.487***	0.467***
	(22.363)	(18.974)	(14.189)	(14.989)
CS * Total Q_{t-1}	-0.182***	-0.200***	-0.203***	-0.198***
	(-3.142)	(-2.975)	(-2.849)	(-3.042)
Total cash flow $_{t-1}$	5.776***	5.669***	4.863***	4.423***
	(11.932)	(11.331)	(9.569)	(10.064)
CS * Total cash flow $_{t-1}$	2.283**	2.253**	1.979*	1.992*
	(2.379)	(2.066)	(1.730)	(1.843)
Cash Flow volatility$_{t-1}$		1.868***	1.667***	1.569***
		(6.072)	(4.992)	(5.020)
Size$_{t-1}$		-0.725***	-0.826***	-0.747***
		(-24.680)	(-30.185)	(-25.916)
ROA$_{t-1}$		0.227	0.0373	-0.0696
		(1.148)	(0.143)	(-0.274)
Book leverage Ratio $_{t-1}$		-0.885***	-1.080***	-0.963***
		(-5.636)	(-7.407)	(-7.463)
Z-score $_{t-1}$			-0.0195***	-0.0181***
			(-3.524)	(-3.650)
Turnover $_{t-1}$			0.260***	0.234***
			(15.381)	(13.962)
Sales growth $_{t-1}$			1.183***	1.080***
			(15.741)	(17.814)
Dividend cut $_{t-1}$			-0.0445	-0.0372
			(-1.592)	(-1.455)
$i_{-1,s}^{int\_org}$				-6.793***
				(-15.260)
Constant	6.028***	9.960***	7.250***	61.57***
	(93.442)	(49.692)	(31.228)	(17.471)
Observations	114050	105464	100782	100782
Adjusted R-squared	0.769	0.783	0.793	0.810

Table 8. Robustness tests

The tables below present estimated coefficients for the interaction term between CS and total Q, using the full Model 4 reported in tables 3-7. The variables are defined in Table A2 in the Appendix. The sample period covers 1975 to 2019. All regressions control for firm, year, and state-of-headquarter-year-fixed effects. Robust z-statistics clustered at the state of incorporation are reported in parentheses. The coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

Panel A: Excluding Delaware Firms

	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	0.236	-0.602***	-0.533	-0.444***	-0.00744
	(0.830)	(-3.032)	(-1.034)	(-3.622)	(-0.095)
Observations	37961	38379	37961	38379	38379
Adjusted R-squared	0.625	0.825	0.678	0.856	0.828

Panel B: Controlling for the financial crisis 2008-2007

	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	0.0846	-0.670***	-0.623**	-0.444***	-0.198***
	(0.486)	(-7.521)	(-2.582)	(-11.781)	(-3.042)
Observations	99972	100782	99972	100782	100782
Adjusted R-squared	0.563	0.810	0.647	0.838	0.810

Panel C: Restricting the sample to 1976 -2000 (Pre - Sarbanes-Oxley Act)

	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	0.202	-0.251***	-0.0792	-0.257***	0.0337
	(0.942)	(-3.032)	(-0.303)	(-5.529)	(0.633)
Observations	52339	53043	52339	53043	53043
Adjusted R-squared	0.575	0.845	0.661	0.865	0.851

Panel D: Excluding firms incorporated in Arizona (AZ), Indiana (IN), Massachusetts (MA), Minnesota (MN), and Pennsylvania (PA)

	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	0.249	-0.637***	-0.412	-0.430***	-0.192**
	(1.024)	(-5.354)	(-1.276)	(-8.223)	(-2.239)
Observations	91951	92633	91951	92633	92633
Adjusted R-squared	0.562	0.809	0.644	0.837	0.809

Panel E: Excluding firms incorporated in California (AZ), and Washington (WA)

	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	0.0503	-0.656***	-0.624**	-0.427***	-0.213***
	(0.296)	(-7.199)	(-2.622)	(-10.792)	(-3.440)

Observations	97255	98034	97255	98034	98034
Adjusted R-squared	0.564	0.809	0.645	0.837	0.810

Panel F: Estimation based on propensity-score-matched samples

One match per observation	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	-0.302	-0.185	-0.479	-0.182**	-0.00479
	(-1.197)	(-1.267)	(-1.406)	(-2.591)	(-0.051)
Observations	33076	33404	33076	33404	33404
Adjusted R-squared	0.595	0.822	0.651	0.844	0.829

Two matches per observation	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	-0.156	-0.238*	-0.374	-0.170**	-0.0478
	(-0.576)	(-1.985)	(-1.416)	(-2.114)	(-0.529)
Observations	42039	42434	42039	42434	42434
Adjusted R-squared	0.589	0.817	0.649	0.833	0.827

Three matches per observation	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	-0.164	-0.228*	-0.369	-0.145**	-0.0695
	(-0.647)	(-1.932)	(-1.371)	(-2.367)	(-0.734)
Observations	47109	47539	47109	47539	47539
Adjusted R-squared	0.596	0.816	0.652	0.832	0.826

Four matches per observation	i^{phy}	i^{int}	i^{total}	i^{int_know}	i^{int_org}
CS * Total Q_{t-1}	-0.148	-0.221*	-0.342	-0.151***	-0.0412
	(-0.642)	(-1.783)	(-1.379)	(-2.781)	(-0.448)
Observations	51130	51594	51130	51594	51594
Adjusted R-squared	0.599	0.817	0.656	0.835	0.824

Table 9. The impact of Constituency Statutes laws (CS) on Investment rate-Q relationship using two sub-samples of firms with high physical and intangible investment rates

This table estimates the effects of stakeholder orientation on corporate investment efficiency for two subsamples: (i) Firms that have physical investment rates higher than the median value for each year; and (ii) Firms that have intangible investment rates exceeding the median value for each year. The sample period covers 1975 to 2019. Regressions in all columns control for firm, year, and state-of-headquarter-year-fixed effects. Robust z-statistics clustered at the state of incorporation are reported in parentheses. The coefficients marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	**i**	**ii**
	High i^{phy}	**High** i^{int}
CS	0.0114	0.254
	(0.032)	(0.724)
Total Q_{t-1}	0.868***	0.970***
	(28.990)	(22.255)
CS * Total Q_{t-1}	**0.216**	**-0.564*** **
	(1.276)	**(-6.213)**
Total cash flow $_{t-1}$	4.631***	8.035***
	(7.328)	(23.634)
CS* Total cash flow $_{t-1}$	-1.887	1.356
	(-1.615)	(0.980)
Cash Flow volatility$_{t-1}$	1.087***	2.264***
	(2.758)	(9.769)
Size$_{t-1}$	-1.648***	-1.229***
	(-10.094)	(-31.472)
ROA$_{t-1}$	2.855***	-1.593***
	(7.273)	(-5.977)
Book leverage Ratio $_{t-1}$	-5.563***	-3.512***
	(-19.818)	(-7.594)
Z-score $_{t-1}$	-0.0857***	0.0417**
	(-6.023)	(2.452)
Turnover $_{t-1}$	0.445***	0.344***
	(8.638)	(8.353)
Sales growth $_{t-1}$	3.083***	2.282***
	(17.092)	(25.859)
Dividend cut $_{t-1}$	0.0265	0.188***
	(0.182)	(3.316)
$i_{-1,s}^{phy}$	-12.97***	-13.16***
	(-13.833)	(-10.234)
Constant	124.3***	185.0***
	(14.938)	(10.989)
Observations	46571	48603
Adjusted R-squared	0.597	0.728

Appendix for "Stakeholder Orientation and Investment Efficiency: Disentangling the Effect on Intangible and Tangible Investments"

Table A1: Constituency Statutes (CS)

This Table lists all 35 US states with the enactment date of their CS. The list was adapted from Flammer and Kacperczyk (2016).

State	Year
Arizona	1987
Connecticut	1997
Florida	1989
Georgia	1989
Hawaii	1989
Idaho	1988
Illinois	1985
Indiana	1989
Iowa	1989
Kentucky	1989
Louisiana	1988
Maine	1986
Maryland	1999
Massachusetts	1989
Minnesota	1987
Mississippi	1990
Missouri	1989
Nebraska	2007
Nevada	1991
New Jersey	1989
New Mexico	1987
New York	1987
North Carolina	1993
North Dakota	1993
Ohio	1984
Oregon	1989
Pennsylvania	1990
Rhode Island	1990
South Dakota	1990
Tennessee	1988
Texas	2006
Vermont	1998
Virginia	1988
Wisconsin	1987
Wyoming	1990

Table A2. Definitions of key variables

Variable	Definitions
	Tobin's Q and Cash Flows
Replacement cost of physical capital or physical capital stock (K^{phy})	Book value of property, plant, and equipment (Compustat item *PPEGT*)
Intangible capital	Balance sheet Intangible assets, that measures externally purchased intangible capital. Compustat item *ITAN*
OBS Intangible capital (K^{int_obs})	Off-balance sheet intangibles from Peters and Taylor (2017), that measures internally created intangible assets which is the sum of knowledge capital (K^{int_know}) and organization capital (K^{int_org}).
Knowledge capital/intangible capital (K^{int_know})	Knowledge capital is the replacement cost of the firm's knowledge capital, which is the portion of intangible capital that comes from R&D. This variable corresponds to G (equation 11 in Peters and Taylor (2017))
Organization capital/intangible capital (K^{int_org})	Organization capital is the replacement cost of the firm's organization capital, the portion of intangible capital that comes from SG&A. This variable corresponds to S in Peters and Taylor (2017).
Replacement cost of intangible capital or intangible capital stock (K^{int})	$ITAN + \underbrace{K^{int\_obs}}_{K^{int\_know} + K^{int\_org}}$
Total Capital (K^{tot})	$K^{phy} + K^{int}$
Intangible intensity (K^{int_int})	K^{int} / K^{tot}
Total Q (q^{tot})	$V/(K^{phy} + K^{int}) = V/K^{tot}$; We measure the firm's market value V as the market value of outstanding equity, plus the book value of debt, minus the firm's current assets, which include cash, inventory, and marketable securities (CSHO * PRCC_F + (DLTT + DLC) - ACT).
***Standard* Tobin's Q ($q^{standard}$)**	V/K^{phy}
Total cash flow (c^{tot})	$c^* = (IB + DP + I^{int}(1-k))/K_{t-1}^{tot}$; IB is income before extraordinary items, k is the marginal tax rate and DP is depreciation expense.
	Investment and investment rates
Physical Investment (I^{phy})	Capital expenditures (Compustat item CAPX)
Physical Investment rate (i^{phy})	I^{phy}/K_{t-1}^{tot}
Intangible Investment (I^{int})	$\underbrace{R\&D}_{I^{int\_know}} + \underbrace{(0.3 * SG\&A)}_{I^{int\_org}}$
Intangible Investment rate (i^{int})	$\underbrace{\frac{I^{int\_know}}{K_{t-1}^{tot}}}_{i^{int\_know}} + \underbrace{\frac{I^{int\_org}}{K_{t-1}^{tot}}}_{i^{int\_org}} = \frac{I^{int}}{K_{t-1}^{tot}}$
Total Investment rate (i^{tot})	$i^{phy} + i^{int}$
	Control Variables

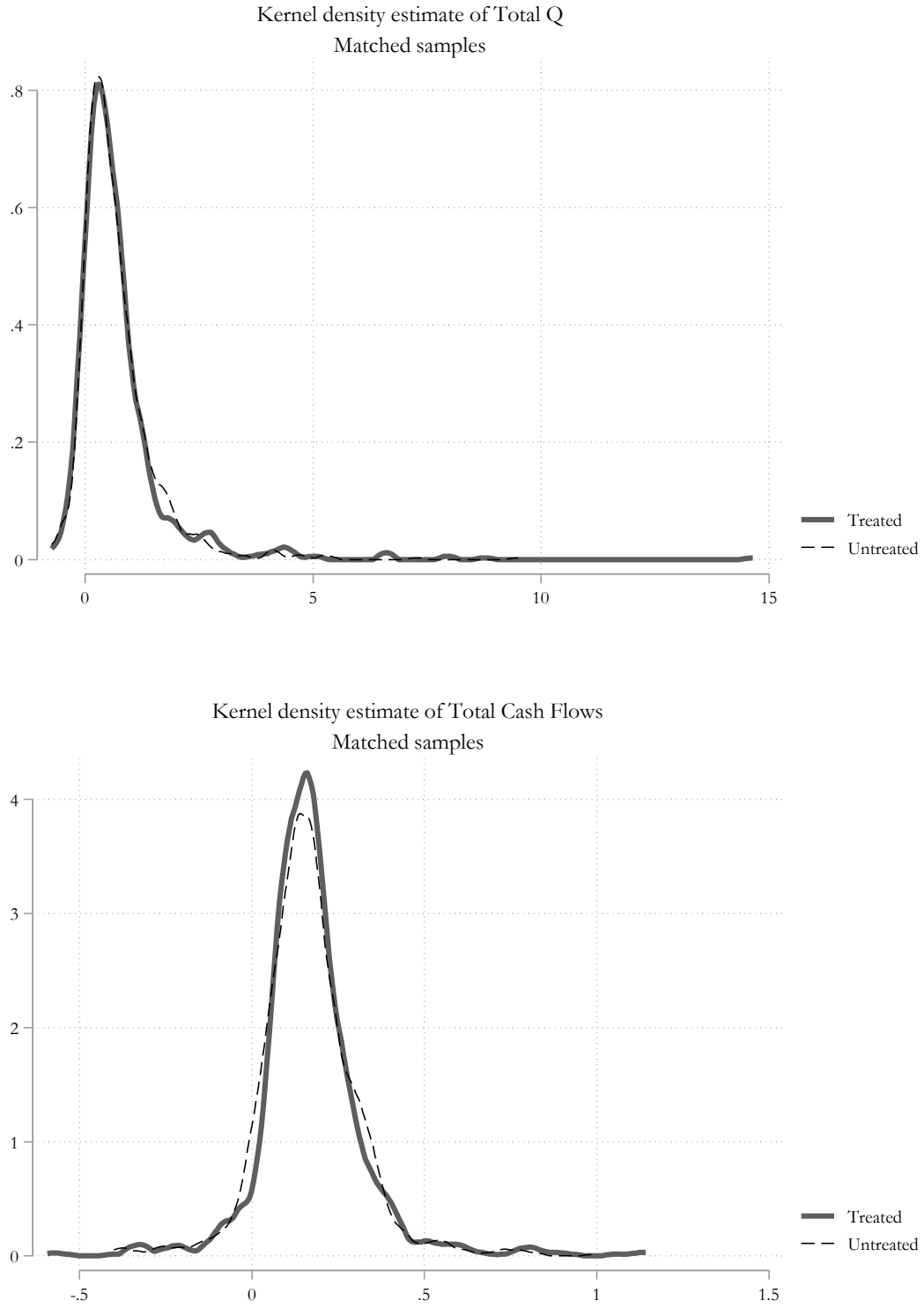
Cash Flow volatility (CF_vol)	The standard deviation of total cash flow (c^{tot}) over the previous 5 years.
Size	The natural log of the firm's assets: $Ln(at)$
Return on Assets (ROA)	It is computed as earnings before interest and tax (EBIT) to total assets. It is computed = $ebit/at$
Book leverage Ratio ($BLEVERAGE$)	Book leverage Ratio of long- and short-term debt to total book assets. It is computed = (Long-Term Debt + Debt in Current Liabilities - cash and marketable securities) /Total Assets = $(dltt + dlc - che)/at$
Altman Z-score ($ZSCORE$)	Probability of bankruptcy: Altman Z-score w/ total assets, computed as follows = $(3.3 * oiadp/at) + 1.2 * (wcap/at) + 1.0 * (sale/at) + 0.6 * ((prcc\_f * csho)/lt) + 1.4 * (re/at)$; where $OIADP$ is operating income after depreciation, AT is total assets, $SALE$ is sales, RE is retained earnings, $WCAP$ is working capital, $PRCC\_F$ is fiscal-year end stock price, $CSHO$ is common shares outstanding, LT is Book Value of Total Liabilities and *RE* is retained earnings.
Turnover	Natural logarithm of Common Shares Traded divided by number of shares outstanding = $ln(cshtr\_f/csho)$
Sales Growth	The growth rate of sales $= ln(sale/l.sale)$
Dividend Cut	Indicator variable that takes the value of one if there is a reduction in annual dividend (Δdvc<0), and zero otherwise.

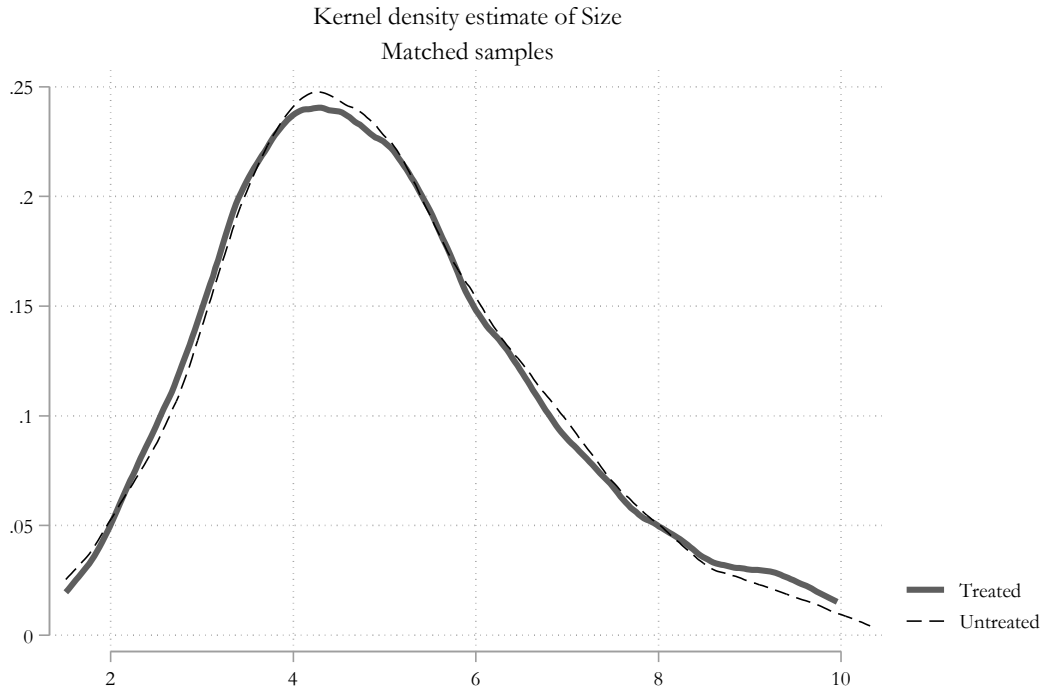
Table A3. Mean difference across selected variables between two sub-samples of firms with high physical and intangible investment rates

This table presents the mean difference across selected variables between two subsamples: (i) Firms that have physical investment rates higher than the median value for each year; and (ii) Firms that have intangible investment rates exceeding the median value for each year. The sample period covers 1975 to 2019. Cash ratio is the ratio of cash and marketable securities to book assets. Cash to net book assets is cash and marketable securities divided by book assets minus cash and marketable securities. Cash to PP&E is cash and marketable securities divided by property, plant, and equipment. KZ index refers to Kaplan and Zingales (1997) index and WW index refers to Withed and Wu (2006) index. The mean differences marked with *, **, and *** are significant at the 10%, 5%, and 1% levels, respectively.

Variable	**mean of sub-sample 1 (high_i_phy)**	**mean of sub-sample 2 (high_i_int)**	**Mean Difference (high_i_phy - high_i_int)**
Cash Ratio	0.137	0.203	-0.066***
Cash to net book assets	0.248	0.47	-0.223***
Cash to PP&E	1.036	2.826	-1.790***
Leverage Ratio	0.128	0.006	0.123***
WW index	-0.216	-0.202	-0.014***
KZ index	0.592	0.29	0.302***
Total Q	1.416	1.317	0.098***
Cash Flow volatility	0.090	0.104	-0.014***

Figure A1. Kernel density of covariates post-matching with one closest neighbour in year *t-1*




Kernel density estimate of Size
Matched samples
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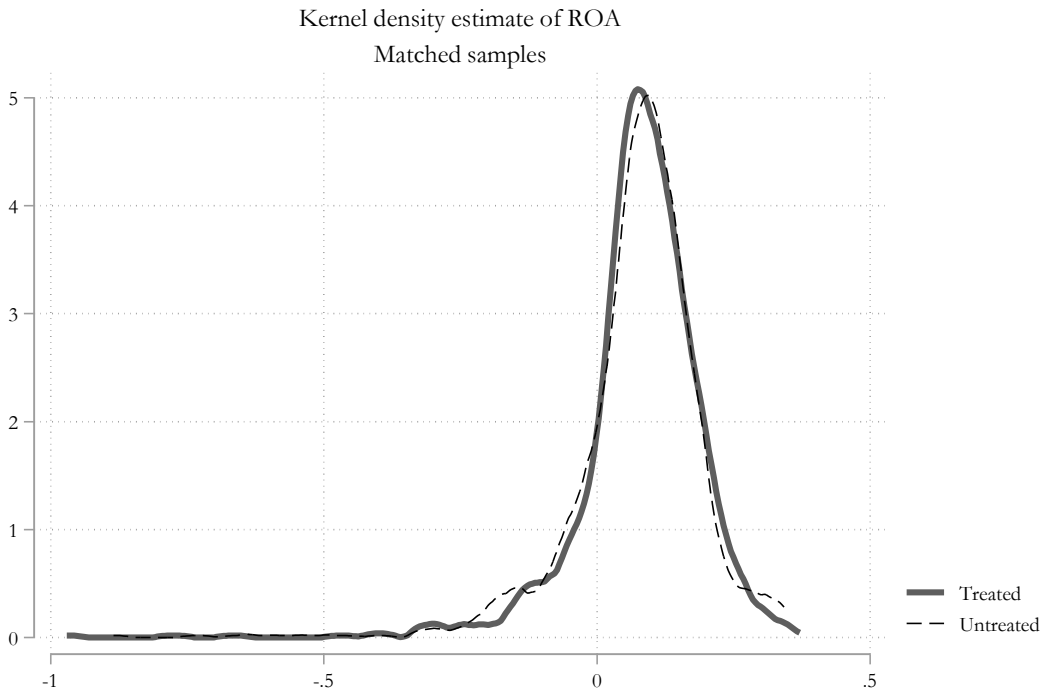
.2
.15
.1
.05
0
2
4
6
8
10
Treated
Untreated


Kernel density estimate of ROA
Matched samples
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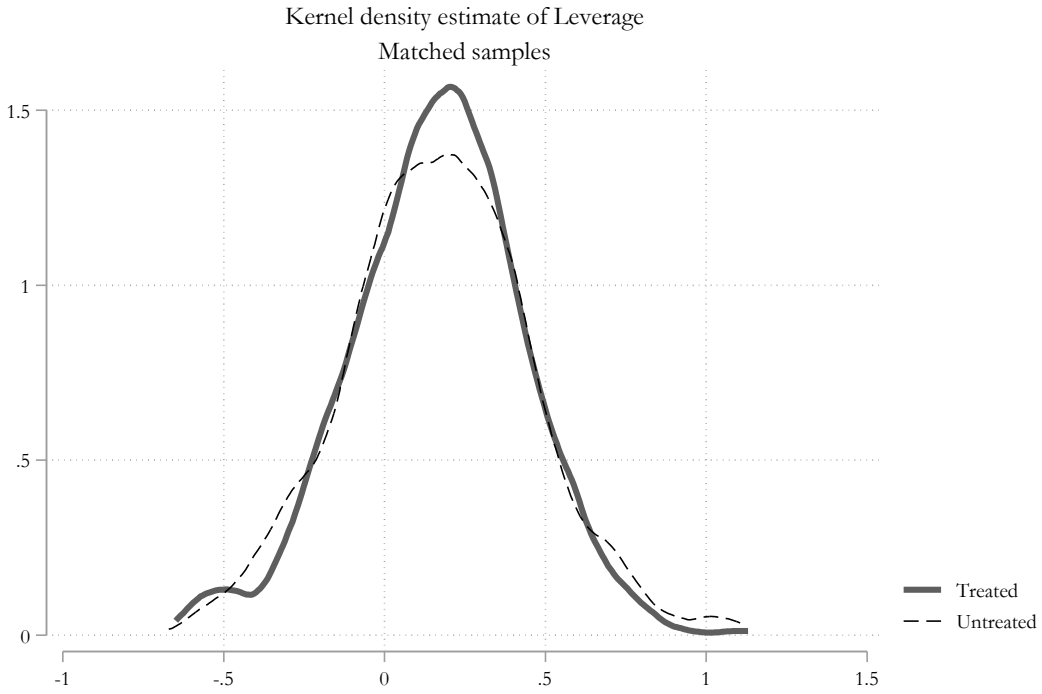
4
3
2
1
0
-1
-.5
0
.5
Treated
Untreated


Kernel density estimate of Leverage
Matched samples
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1
.5
0
-1
-.5
0
.5
1
1.5
Treated
Untreated

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