The Impact of Governance and Transparency on Firm Investment in Vietnam

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Abstract
A large literature asserts a causal relationship between the quality of economic governance and economic performance. However, attempts to establish such a link at an aggregate level have met with considerable methodological criticism. This paper seeks to overcome this limitation. We match a panel of Vietnamese enterprises from 2006-2010 with a unique panel dataset measuring sub-national economic governance to estimate a relationship between local governance and private investment. We do not find a significant relationship between investment and most traditional forms of governance. However, there is one important exception - transparency, especially the public posting of planning documents, is strongly associated with higher investment, across a range of different specifications. Our results have significant implications for policy, given the prevailing theory that changes in the quality of local economic governance will spur improved economic performance.

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1. Introduction

The last two decades have witnessed a rapid expansion of the literature on the relationship between institutions, governance and economic performance. Starting with the seminal work of North (1981, 1989, 1990) there has been an appreciation of the importance of institutions - particularly those associated with the enforcement of contracts and the protection of property rights (Acemoglu and Johnson 2005) - in creating the incentives that give rise generate investment and ultimately lead to economic growth (see Helpman (2008) for several studies).

Empirical work on the relationship, however, has struggled to overcome issues of causal identification and measurement. Growth and the institutions of good governance are inextricably linked. While investors are certainly attracted to high quality institutions, they also may play an important role in transmitting governance reform ideas and improving leadership capacity. Growth itself may even be a pre-requisite for developing and maintaining good institutions (Barro 1999, Przeworski 2000, Hansen 2013). Kaufmann and Kraay (2002) reinforce the idea that the relationship between governance and growth may be bi-directional. They find a strong positive causal relationship running from better governance to higher per capita incomes, but also a weak and sometimes negative relationship running from per capita income to governance.

In addition, error in the measurement of governance has also been shown to be associated with levels of economic development, leading to fears that the analysis of relationships between institutions and outcomes is systematically biased (Kurtz and Shrank 2007, Treisman 2007). For example, Glaeser et al. (2004) argue that some measures of institutions currently in use reflect outcomes (such as respect for property rights) rather than structural institutional determinants. They find little relationship between measures of these deeper structural determinants and economic performance, but a potentially strong role for initial human capital. According to them, the available evidence supports the idea that good policies give rise to growth which then results in institutional improvements.[1]

Other scholars have attempted to clarify the relationship between governance and economic performance by looking at specific institutions such as property rights (North 1981, North and Weingast 1989, Acemoglu and Johnson 2005), contract enforcement institutions (Greif 1993, Laeven and Woodruff 2007), and regulatory institutions (Djankov et al. 2002). Nevertheless, many remain frustrated by the limited progress made thus far in unpacking broad definitions to identify which institutions really matter to business (Ghemawat 2007). At the national level, where most of the statistical work has been done, aggregate measures have been developed for property rights (Polity IV),[2] governance (the World Bank),[3] corruption (Transparency International),[4] regulatory institutions (Doing Business),[5] and contracting institutions (International Country Risk

[1] Moreover, there is dispute over which factors are most important in shaping institutions. Sokoloff and Engerman (2000) suggest that it is initial endowments, rather than the effect of disease patterns on colonial settlement, that determined the nature of the institutions constructed in different countries. They show how extractive institutions controlled by elites could perpetuate inequality which in turn slows economic performance and reinforces the institutional status quo (a theme expounded in detail by Acemoglu and Robinson (2012)).

[2] http://www.systemicpeace.org/polity/polity4.htm

[3] http://info.worldbank.org/governance/wgi/index.asp

[4] http://www.transparency.org/cpi2012/in_detail

[5] http://www.doingbusiness.org/

Guide).[6] These indicators, purporting to capture widely different dimensions of governance, are highly correlated (Haggard and Tiede 2011), creating difficulties in identifying which institutions are actually responsible for growth, and raising worries that all are caused by a common underlying historical impetus (Hansen 2013, Hollenbach et al. 2013).

In the hopes of resolving these issues, a more recent group of scholars has begun to look at variation in governance across sub-national units within countries. Because their data are higher quality and their measurement more exacting, these scholars have been better able to test the micro-logics that inform the theories linking governance and growth. Moreover, subnational designs, such as the ones studied above, have been better able to take advantage of historical natural experiments, local shocks, and even randomized experiments, to tease out the causal tests that have dogged previous work (Galiani and Schargrodsky 2010, Field 2007, Banerjee and Iyer 2005, Dell 2010, Bruhn & Gallego 2012, Gennaioli et al. 2013, Michalopoulos & Papaioannou 2013, Earle and Gehlbach 2010). Our paper attempts to follow in this vein.

Sub-national studies have the advantage that the overarching political and legal framework and, to some extent, aspects of culture and language are more similar within the boundaries of a single country than they are across all countries in the world (although some countries have enormous diversities of ethnicity, culture and language within their borders). Sub-national analysis of this kind is becoming increasingly relevant for policy as many countries move towards greater political, fiscal and administrative decentralization. Indeed, central governments and donor agencies often have an explicit objective of improving governance at the sub-national level on the assumption that this will improve local economic growth.

To study the effect of local governance on investment in Vietnam, we exploit the Vietnamese General Statistical Office's (GSO's) Annual Enterprise Census from 2000-2010 which provides a rich set of firm-level data including information about (domestic and foreign) investment over the period. Our dependent variable is firm-level investment for a variety of reasons. Firm-level investment can be more accurately measured than economic growth, because the data is collected at the firm rather than aggregated from production and customs figures. This removes both noise in the measurement, but also systematic biases caused by provincial officials over-estimating growth for political purposes (Wallace 2011).[7] In addition, investment has been shown to be a key driver of growth in developing countries (Barro 1991), generating employment (Barro and Lee 1993), productivity spillovers, and the linking of technology change with productive use in the economy (Grossman and Helpman 1994).

This is combined with data from the Vietnam Provincial Competitiveness Index (PCI) which measures several dimensions of provincial governance from 2005-2010 (Malesky 2009). Three features of the PCI make it ideal for our empirical analysis. First, the PCI is directly concerned with local economic governance. The index is based upon an annual survey of around 10,000 private enterprises, which is combined with hard data drawn from provincial statistical agencies. The instrument has a number of modules which survey firms' perceptions and experiences with local economic governance. Because of

[6] http://www.prsgroup.com/icrg.aspx

[7] Indeed, the sum of provincial GDPs in Vietnam is roughly 30% higher than national estimates. Figure based on author's calculation drawn from data supplied by the General Statistical Office and available in the annual PCI dataset (www.pcivietnam.org).

that specialized focus, the PCI allows for fine-grained differentiation of the characteristics of governance that is not possible in other measures (especially the national aggregates discussed above). Second, the PCI has tremendous spatial variation to exploit, as it is specifically designed to compare governance across Vietnam's 63 provinces over time. Stratified sampling is used to ensure that provincial samples precisely mirror provincial populations in firm age, industry, and legal form. Third, the PCI allows for longitudinal analysis. The PCI is unique among subnational indices, because it is performed annually in every province in the country, allowing researchers to measure changes in local governance over time, in order to see how they affect investment decisions. This places the focus on institutional change instead of single-shot measures which accidentally capture long-term historical processes (Malesky and Merchant-Vega 2009).

Our fine-grained data allows us to highlight a particular form of governance that has been under-represented in the empirical literature – transparency, defined as the full flow of information within a polity (Hollyer et al. 2011). Transparency has enormous benefits in its ability to reduce the risk and uncertainty for investors (Drabek and Payne 2002, Gelos and Wei 2005), allowing them to engage in long term planning, predict legal and macroeconomic changes that may affect their business, and reduce adjustment costs (Broz, 2002; Stasavage, 2003) and the need for self-insurance (Aizenmen and Marion 1993; Feng 2003).

As Hollyer et al. 2011 point out, however, transparency has been enormously difficult to measure and distinguish from other governance institutions and state capacity. Therefore, a relatively clean measure of transparency represents an important contribution to the political economy literature.

Anticipating our findings, we find that transparency proves the most robust governance determinant of investment in Vietnam, outperforming more widely studied measures, such as property rights, contracting institutions, regulatory costs, and corruption. We find that a one standard deviation in the ten-point transparency index is associated with a 10% increase in firm investment. This effect is most pronounced for foreign firms and small, private operations. Large domestic firms already enjoy a unique information advantage and do not benefit from additional increases in transparency. Digging deeper, the single most influential aspect of transparency is simply making provincial planning documents available to a wider swathe of investments.

Our paper proceeds as follows. We begin with a brief discussion of the existing work on governance and investment growth in Vietnam. Next, we discuss the construction of our dataset. The following section elaborates our basic model and provides initial results. We then disaggregate our analysis by sub-sample (foreign versus domestic; large versus small) and specific indicators of transparency. The final section concludes.

2. Governance and Economic Performance in Vietnamese Provinces

Vietnam makes a particularly appropriate case for studying the impact of governance on investment. In 1986, at its 6th Party Congress, the country initiated the *Doi Moi* (Renovation) economic reforms, which eliminated the role of central planning in the economy and opened the country's borders to international capital and trade flows (Fforde and De Vylder, 1996; Riedel and Turley, 1999). Since that time, the country has

achieved an average annual growth rate of 7.3 percent, ranking it among the very fastest growing countries in the world over the period.

Importantly for our design, investment growth varies substantially across the country's 63 provinces. Via a series of laws in the early 1990s, most business-government interactions were decentralized to the provincial level, including business registration, environmental and safety inspections, labor oversight, local government procurement, and land allocation. In practice, provincial departments of line ministries are "dual subordinate," meaning they report both to the provincial executive (the People's Committee Chairman, or PCOM Chairman), as well as the relevant national line ministry. In practice, however, appointments of department directors and budget allocations are set by the PCOM, closely aligning department interests with those of the province. As a result, many studies have documented that the provincial government, more than the central government, is the relevant level of government when analyzing the institutional climate facing firms (Meyer and Nguyen, 2005; Nguyen et al, 2004;Malesky, 2008).

Due to the 2000 Enterprise Law, which shifted business entry from a certification system to a registration system with fewer licenses and procedures, Vietnam has seen an explosion of entry of domestic, private firms into the economy (Malesky and Taussig 2009). This process was again strengthened with the revised Enterprise Law in 2005, which put private domestic firms and foreign invested enterprises (FIEs) under the same regulatory regime.[8] As a result of the changes, the number of enterprises increased rapidly over this period from 42,123 in 2000, to over 250,000 in the later years, reflecting the strong growth in private sector activity over the decade (GSO 2011). While many of these businesses are concentrated around the major cities (Ho Chi Minh City in the south and Hanoi in the north), there has been substantial investment throughout the country, including very rural provinces. Using PCI data, Tran et al. (2009) demonstrate that even after controlling for distance from markets and initial infrastructure that there is a strong correlation between the size of the domestic, private sector in each province and the quality of local economic governance. Further, Malesky and Taussig (2009) find that business formalization, the movement from businesses out of the household sector into registered businesses after the Enterprise Law, is correlated with governance measured by the PCI. Although the annual PCI report usually demonstrates a correlation between the PCI and GDP per capita (see Malesky 2009), as yet, there has not been any work studying expansion of existing enterprises or the capital value of the investment increase. This is important because, while growing in number, private companies have remained small in size. In 2010, the median private firm in the GSO Census had eight employees and $167,000 in capital. Only 547 throughout the country had greater than 1,000 employees.

By contrast, there is a sizable literature on the determinants of foreign direct investment (FDI) in Vietnam which typically points to traditional location advantages, including factor endowments, market attraction, labor costs and physical infrastructure as key to attracting FDI (Pham Huong Mai 2002, Nguyen Thi Phuong Hoa 2002, Meyer and Nguyen 2005, Mirza and Giroud 2004, Nguyen Phi Lan 2006, Nguyen Ngoc Anh and Nguyen Thang 2007). Le (2007) provides a comprehensive analysis of the sub-national determinants of FDI in Vietnam and finds that agglomeration economies play a key role in attracting investors. This literature does not unequivocally point to the quality of local economic governance as a determinant of FDI, although some authors show that there is

[8] State Owned Enterprises (SOEs) still operate according to a separate Law on State Owned Enterprises.

a positive correlation between local economic governance and FDI (Malesky 2007, Dang 2013), and Huynh (2010) argues that the quality of local business services played a key role in attracting FDI. However, Vo Hung Dung (2011) point out that productivity, income and investment did not increase in line with improvements in the business environment in the Mekong delta, and Nguyen and Nguyen (2007) find no relationship between the quality of local economic governance and FDI.

While students of the Vietnamese economy have made important contributions, the literature has three limitations that we seek to address in this article: 1) Conflation of the needs of foreign and domestic, private investors; 2) Inability to distinguish the specific governance channel that is doing the work; 3) Lack of attention to reverse causality between investment and governance. We examine these in turn.

First, the existing work on private and foreign investment in Vietnam has done little to recognize that foreign and private investors may respond differently to changes in institutions (Hymer 1976). The "liability of foreignness" discussion in the business literature, for instance, emphasizes how foreign companies are at a disadvantage in some markets, because they lack the dense network of contacts and information utilized by private market actors (Zaheer 1995; Zaheer and Mosakowski 1997; Zaheer 2002; Miller and Eden 2006). Consequently, economic governance institutions may be more important for them than they are for domestic actors. Our firm-level data allows us to differentiate the effect of governance on foreign and domestic actors.

Second, previous work has not attempted a fine grain differentiation of which features of economic governance actually play a role in firm decision making. Scholars have shown that aggregate institutions matter (Tran et al., 2009, Dang 2010), but have had little success disaggregating the broad measure of governance. This is a source of frustration to provincial officials, who want to understand exactly what they need to do to improve economic growth in their provinces.

Our fine-grained data allows us to drill deep into the data. In addition to studying the classic measures of property rights, contracting institutions, regulatory costs, and corruption, we also study a critical measure that has received less intention in Vietnam or comparative studies – transparency (Florini 1999, Kaufman and Belver 2005, Hollyer et al. 2011).

Cross-national empirical work has shown that transparency has important direct and indirect effects on investors' decisions to expand their operations (Drabek and Payne 2002, Gelos and Wei 2005). While legally, information on land and provincial planning may be available to all, accessing that information can often be problematic. In the Vietnamese context, this can have a detrimental effect on the growth of the private sector, because firms are not positioned to take advantage of provincial initiatives. This information access includes the availability of new laws, implementing documents or provincial decisions. When changes in the legal regime are not readily accessible, a firm may operate successfully for several years, only to find itself on the wrong side of the law, simply out of ignorance. In most cases, such ignorance will cost the firm little, but there is always the potential for an unscrupulous official to exploit asymmetric information about the legal code to his/her advantage. Conversely, a firm may be eligible for savings, investment opportunities or tax refunds, but never takes advantage of these because it is unaware of these benefits.

Lack of transparency can also affect investment through its impact on predictability, or the notion that provincial laws and regulations are implemented in a manner which would allow firms to forecast, and build new developments into their business plans (Hollyer et al. 2011). With transparency, firms can understand the decisions that are made and how they will be implemented, so that they have a better chance at predicting the direction and risk of long-term strategies and increase their ability to make informed investment decisions (Gelos and Wei 2005).

Transparency can also affect investment indirectly through its impact on the equitable use of provincial resources. Indeed, a lack of transparency can lead to severe inefficiencies in such resources – inefficiencies that represent more than a simple transfer of resources from one party to another. Take, for instance, the issue of provincial planning. The impact of infrastructure and land conversion plans is limited if the details are available to only a select few insiders. One of the reasons this impact may be limited is because of the limited transparency of the real estate market. Only a few knowledgeable insiders know the location of future infrastructure projects and industrial zones. These insiders can then profit by buying up the land ahead of time. Other investors in real estate must make large conjectures based on small bits of information.

Third, a growing literature in Vietnamese political economy suggests that that causality may also run in the opposite direction i.e. that investment and growth may influence local economic governance (Jandl 2013, Bai et al. 2013). These findings suggest that economic growth provides the resources for and generates popular demand for better quality institutions. In Vietnam, Malesky (2004) describes the channels of FDI influence on governance in 10 provinces and Malesky (2008) shows empirically how FDI has empowered sub-national leaders to push forward reform.

In the cross-national literature, considerable ingenuity has been expended to attempt to show a causal link running from institutions to economic performance (most famously, Acemoglu et al (2001). Recent papers by Malesky and Taussig (2009) and Dang (2013) exploit variation in the damage caused by Vietnam's war to isolate the effect of governance on investment attraction.

Nevertheless, this deep, historical work is of limited utility to current leaders or business managers. Showing that an exogenous shock fifty years ago continues to affect governance and thereby prosperity today is not helpful in explaining how provincial leaders can improve the livelihoods of their citizens in the short term or what factors business leaders should prioritize in making investments.

In the pages that follow, we propose a research design that attempts to address the above weaknesses in the existing work. Our dependent variable is firm-level investment, limiting the dangers of reverse causality, as it is unlikely that any individual firm's behavior could affect changes in provincial governance. Panel data allows us to hold constant variation in the histories and cultures of provinces, as well as important differences in firm size, expertise, and sector. Sub-sample analysis allows us to pull apart the influence of governance for foreign and domestic firms. And finally, precisely measured governance variables permit us to isolate the specific policy innovations that drive investment behavior.

3. Data

Our source of firm data is the Vietnam Enterprise Census. This is an annual census of all firms with more than ten employees with an additional random sample of smaller firms. The data includes a wide range of information on firm characteristics including: sector, employees, assets, legal type, performance, source of capital, and investment. We have data from 2000 to 2010. Unfortunately, matching firms across years for the early years is extremely difficult. However, from 2006, a standardized firm identifier was used allowing us to construct an (unbalanced) panel of firms from 2006-2010.[9]

We drop all State Owned Enterprises (SOEs) and equitized (privatized) businesses that were once state-owned but which are now are in private hands despite some ongoing state ownership. These firms have a very different relationship with government that is beyond the scope of our analysis.

The final panel dataset contains 349,214 observations, including 337,327 domestic, private observations and 11,887 observations of foreign investment enterprises (FIEs), which are analyzed together and separately. Fifteen percent of the firms are measured for all five years, but others are measured less frequently either because of firm entry and exit during the time period under investigation, or because they fell below the General Statistical Office's (GSO's) threshold of ten employees for inclusion in the census in a particular year and therefore were only subject to random selection, leading to gaps in the data (see GSO 2011).

Table 1 shows the characteristics of the firms in the Enterprise Census broken down by year and firm size. As in many developing countries, the distribution of firms in Vietnam is strongly biased towards the bottom end, with a very large number of firms with a handful of employees and low revenues, assets, profits and levels of investment; conversely, there are a relatively small number of firms with substantial assets and investments.

<Table 1 about Here>

Two interesting features arise from Table 1. First, we can see the rapid growth in the number of firms since 2005, with an 80% increase over four years (from 114,151 in 2006 to 206,030 in 2010) and particularly rapid growth of small firms (84%, from 69,000 to 127,000). Secondly, Table 1 shows the impact of the 2008 macroeconomic crisis in Vietnam and the global financial crisis at the end of that year with median revenues falling markedly between 2008 and 2009. Median revenue declined for all firms, from about 9 billion VND in 2008 to 7.3 billion VND the subsequent year. Small firms were more acutely affected by the crisis with annual sales typically declining by 29% from 3.2 billion VND in 2008 to 2.3 billion VND in 2009. Medium and large firms, by contrast, only saw a reduction of around 12.5% in their median sales revenue over the same period, suggesting they were in a better position to adjust to the shocks.

To measure the quality of local economic governance we draw on the Provincial Competitiveness Index (PCI). The PCI is a composite index of provincial economic

[9] In a few cases, we discovered duplicate (or triplicate or more) observations with the same firm id. In these cases we had no way of determining which of the firms was the true match across years, so we deleted all firms with duplicate identifiers from the dataset. The characteristics of the firms deleted were statistically indistinguishable from those that were retained, so there does not appear to have been any systematic reason for the duplications that occurred.

governance which has been calculated each year since 2006 by the Vietnam Chamber of Commerce and Industry (VCCI).[10] It is based upon a mail-out survey to a random sample of firms in each province.[11] The survey asks a range of questions about firms' perceptions of local economic governance, as well as concrete measures of their experience of local governance. A particular strength of the PCI is that it focuses on aspects of local governance which are under the control of the provincial administration. It therefore excludes factors such as the quality or availability of national roads, airports and ports which would bias the index in favor of larger cities or provinces.

The final outcome is a composite index ranking Vietnam's 63 provinces according to the following 10 dimensions of governance:

1. *Entry Costs:* A measure of the time it takes a firm to register, the time to receive all the necessary licenses needed to start a business, the number of licenses required to operate a business, and the perceived degree of difficulty to obtain all licenses/permits.
2. *Land Access and Security of Tenure:* A measure combining two dimensions of the land problems confronting entrepreneurs: how easy it is to access land and the security of tenure once land is acquired.
3. *Transparency and Access to Information:* A measure of whether firms have access to the proper planning and legal documents necessary to run their businesses, whether those documents are equitably available, whether new policies and laws are communicated to firms and predictably implemented, and the business utility of the provincial web page.
4. *Time Costs of Regulatory Compliance:* A measure of how much time firms spend on bureaucratic compliance after registration, as well as how often and for how long firms must shut their operations down for inspections by local regulatory agencies.
5. *Informal Charges*: A measure of how much firms pay in informal charges, how much of an obstacle those extra fees pose for their business operations, whether payment of those extra fees results in expected results or "services," and whether provincial officials use compliance with local regulations to extract rents.
6. *Competition Environment and SOE Bias:* A measure focusing on the perceived bias of provincial governments toward state-owned enterprises, equitized firms, and other provincial champions in terms of incentives, policy, and access to capital.
7. *Proactivity of Provincial Leadership:* A measure of the creativity and cleverness of provinces in implementing central policy, designing their own initiatives for private sector development, and working within sometimes unclear national regulatory frameworks to assist and interpret in favor of local private firms.
8. *Business Development Services (BDS):* A measure of provincial services for private sector trade promotion, provision of regulatory information to firms, business partner matchmaking, provision of industrial zones or industrial clusters, and technological services for firms.[12]

[10] A pilot PCI was conducted in 2005 but this did not cover all provinces in the country.
[11] The sampling frame for the survey is the list of firms provided by the provincial tax authority. For example, in 2007, 6,700 firms were chosen randomly from the list of 177,815 firms provided by the tax office. To ensure representativeness, the sample is stratified by legal type of enterprises, sector of business and age of firm.
[12] This index is dropped from sub-sample analysis, because it heavily favors more populous regions.

9. *Labor and Training:* A measure of the efforts by provincial authorities to promote vocational training and human capital development for local industries and to assist in the placement of local labor with provincial businesses.
10. *Confidence in Legal Institutions:* A measure of the private sector's confidence in provincial legal institutions; whether firms regard provincial legal institutions as an effective vehicle for dispute resolution, or as an avenue for lodging appeals against corrupt official behavior.

Provincial scores on each sub-index represent the province's performance on that topic relative to the performance of other provinces in Vietnam. The overall PCI index is a combination of the sub-indices, yielding an overall score for the quality of economic governance in each province.[13]

One limitation of the annually announced PCI is that each year, minor changes are made in the methodology in order to keep up with current policy debates and accommodate the needs of stakeholders. Individual survey questions have been dropped, new questions added, and indicators re-coded over time. All of these re-calibrations have introduced additional error into the measurement of governance and limit the ability to compare scores in the survey over time. To address this problem, we created a consistent PCI, which re-constructs the entire index using only a consistent set of indicators and equal weights across time.[14]

Figure 1 plots changes in our index using consistent PCI indicators over time (2006 to 2012). The chart plots changes in the median province along with scores by the maximum and minimum performers. Unfortunately, our firm-level panel data only extends to 2010, so later years of PCI could not be utilized in our analysis

<Figure 1 about here>

In addition to the Enterprise Census and PCI data, we also draw on a range of provincial statistics from the GSO Statistical Yearbook.

4. **Model Specification**

Our empirical specification, which is simple and intentionally conservative, is displayed in equation (1) below. We employ an ordinary least squares (OLS) design.

$$1.Y_{ijt} = \beta_0 + \beta_1 * PCI_{jt-1} + \beta_2 * Tel_{jt-1} + \beta_3 * Pop_{jt-1} + \beta_1 * Road_{jt-1} + \eta_i + \phi_t + \varepsilon_{ijt}$$

The dependent variable (Y) is the natural log of investment in a given year (in constant VND), indexed by the firm id (i), province (j) and year (t).

[13] Each of the sub-indices is scaled from 1-10, so the final unweighted index score can be calculated by simply summing up the components. A weighted PCI is available, but it is not useful for this empirical analysis, because individual weights are based on a sub-index's contribution to private sector growth and performance - see VCCI (2008).

[14] Specifically, the consistent PCI reconstructs the PCI using only questions that are the same across years. In addition, the published PCI creates a score based on the minimum and maximum performance in that year; however, this makes the score for a province in any year depend on the performance of the best and worst provinces in that year, which changes over time. In the consistent PCI, we use the best and worst performance over the entire period of the panel, to ensure that inter-year variations for a province reflect changes against a single scale for the entire period.

The key causal variable is PCI, the PCI score for the province-year in which the firm was situated. Our core specification uses the unweighted PCI score that we reconstructed using the consistent set of variables reported in the PCI Annual reports (Malesky 2009). Subsequent specifications replace the unweighted PCI with the individual sub-indices in order to isolate which governance factor might actually be driving investment decisions.

Our data is characterized by three features that have generated a great deal of debate about proper specification in the econometric literature. First, our key independent variable of interest and our dependent variable are at different units of analysis. Firms are nested within provinces, meaning that individual firms within provincial borders cannot be treated as independent draws from the underlying population, as their errors may be correlated. To address this problem, we cluster robust standard errors at the provincial level in all models.

Secondly, we are working with a panel of firms in a highly dynamic environment where macroeconomic forces, policies, and other characteristics of the business environment are changing over the same period. Time (φ_t) captures shocks in the data that occur in particular years of the survey (e.g. entry into the WTO in 2007 or the global financial crisis in 2008) which may lead to correlation in the errors of respondents in those years. Using time fixed effects is a highly conservative approach that is less prone to spurious correlation caused by nonstationarity or serial correlation.

Third, unobserved heterogeneity is a serious threat. Underlying and difficult to measure historical or socio-cultural features of a province may be associated with both good governance and increased entrepreneurial behavior. If this is the case, we may confuse their potential correlation with both governance and investment, with a causal relationship between governance and investment. To mitigate, this problem, firm (η_i) fixed effects are employed, so that the analysis can isolate the empirical effect of annual changes in governance on individual firm's investment decisions. This modeling decision essentially ensures that we are only looking at the impact of governance within individual firms.

Firm fixed effects address time invariant confounders, however, they do not entirely remove the potential for omitted variable bias. Unobserved time varying factors at the provincial level could lead to bias if they are correlated with both governance and investment decisions. In particular, the quality of infrastructure and size of the provincial market both change over time in ways that could be correlated with both governance and investment. To address this possibility, we include them as control variables. To capture, traditional infrastructure, we use the share of provincial *roads* that are covered with asphalt. Telecommunication infrastructure is measured by the total number of land lines per capita (*Tel/Cap*). Market size is captured simply by the population (*Pop*) within the province.

Time variant measures, such as a province's GDP per capita, level of state transfers, share of State Owned Enterprises, and state investment were not included as control variables because of concerns about endogeneity. Provincial GDP, of course, is mechanically correlated with firm investment, because GDP includes investment in its construction. Transfers, on the other hand, are negatively correlated, as the central budget is used to transfer resources to poorer provinces. Introducing such variables

would bias all variables in the model, including the endogenous covariates. To avoid these problems, we felt the safest strategy was simply not to include them in the model.[15]

In some models, we also control for firm-level characteristics, including: 1) the gender of the entrepreneur (female=1) to address sexism in governance implementation; 2) the education level of the owner (college=1; advanced degree=2) to capture entrepreneurial sophistication; 3) and age of the business owner. Once again, endogenous covariates were left out of our models to avoid bias. Including time-variant measures of employment and revenue is highly problematic because they may result from investment decisions in prior years, leading to reverse causality. As an alternative, we run split sample analyses by firm size at the time of establishment and firm type. By using size at establishment, we avoid the danger that correlations with size are resulting from subsequent investment behavior. Of course, size at establishment is time invariant and therefore cannot be included in models with year fixed effects. Table 2 provides summary statistics for each of the variables used in the main analyses.[16]

[Table 2 about Here]

Analysis Plan

We recognize that reasonable minds disagree in their approaches to panel data and that our preferred choice is extremely conservative in that it looks only changes in individual firms' investment choices over time. It is possible that our approach "ties our hands behind our backs" by reducing the statistical power necessary to observe correlations that might appear in less rigorous settings. Thus, we might overlook important relationships that are tentative but deserve further exploration. Consequently, we build up to our preferred model through a series of regression specifications, beginning with the most naïve analysis, and then slowly adding rigor. This approach allows us to see if and when observed correlations disappear.

Table 3 displays our empirical strategy. In Model 1, we display only the bivariate correlation between the consistent PCI (lagged one year to mitigate reverse causality) and firm investment. Models 2, 3, and 4 add province, year, and sector fixed effects respectively. Model 5 introduces province specific time trends by multiplying province dummies by a variable measuring time since 2006. Finally, Model 6 introduces firm-level and time variant provincial levels controls. In Model 7, we test to see whether results survive the introduction of firm-level fixed effects, essentially measuring whether changes in governance observed within a firm's home province affects its individual decisions, holding the features of the operation (size, sector, owner sophistication) constant. Model 8 adds year fixed effects. Model 9 tries a firm-specific time trend. Finally, we reach Model 10, the most rigorous specification with firm and year fixed effects,[17] combined with a set of time variant controls at the provincial level.[18] Our main

[15] As a robustness test, we did include them in some specifications. Their inclusion has virtually no effect on our main conclusions. These additional tests will be made available to readers along with our replication and data files on the Dataverse website (http://thedata.org/).

[16] A correlation table is available in Online Appendix 1.

[17] Note that because each firm only exists in one province, it is not possible to have both firm and province level fixed effects.

[18] An additional concern is that in many analyses of this type a large portion of the observations record zero investment in a given year, leading to left censoring that can bias OLS regression coefficients and make Tobit regression preferable. In our study, this is less of a concern than appears at first glance. Our measure of investment includes both long-term changes in fixed capital stock, but also short-term changes, such as equipment purchases, upgrading, or maintenance. As a result, only 360 out of 350,000 record zero investment in a given year. Under these

results are drawn from this most rigorous specification, with the others models included as robustness checks.

5. Results

Table 3 reports the results from the application of the above model. The naïve bivariate Model 1 is displayed, followed by models with province fixed effects in the second panel of the table, and models with firm fixed effects effect in panel 3.

<Table 3 about Here>

Overall economic governance is almost never significantly correlated with firm decisions to expand their investment. Of the ten specifications, we only observe results that are significantly different from zero in two models, neither properly accounting for omitted variable bias caused by changes in other time variant factors occurring at the provincial level. Once we introduce firm-level effects, the coefficient on overall governance shrinks even further. Simply put, there is no evidence that changes in overall governance at the provincial level have an influence on firm decisions to expand existing operations. The largest driver of firm expansion appears to be the quality of infrastructure, as proxied by telephone lines per capita. A one standard deviation in telephone coverage is associated with a 12% increase in firm investment.

However, overall governance conflates several institutional mechanisms and policy processes. It is entirely possible that certain locations may excel at one aspect of governance while performing poorly on others. This would limit variation and make it difficult to detect an association with investment. Moreover, if a specific policy process is actually responsible for investment, including it in an additive index may create noise that obscures the identification of a relationship. To guard against this possibility, we replicated all specifications, but this time regressed investment on each individual sub-index of the PCI. To be clear, we simply replaced the one hundred-point full governance PCI in equation one above, with each individual, ten-point sub-index shown in Figure 1.

<Figure 2 about here>

Rather than presenting ten separate tables, we summarize the results of this analysis in the ten panels of Figure 2. In the first panel, we present the coefficient (diamond) and 90% confidence interval (range bars) resulting from the ten specifications regressing investment on the overall PCI score in Table 3. When the diamond is to the right of the zero line, there is a positive relationship between governance and investment. But it is only statistically significant if the range bar is also to the right of zero. As we describe above, this is rarely true with respect to overall governance.

What Figure 2 makes clear is that the zero effect of governance appears to be generally true across almost all the types of governance. Reducing entry costs, improving land use rights, and reducing corruption, appear to occasionally have a positive effect on

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circumstances, OLS appears to the appropriate modeling choice. Nevertheless, to allay concerns about bias, we ran a Tobit analysis with a full set of firm and provincial controls, and province-specific time trends in the data. Results can be seen in Online Appendix 4. Substantively, the results are the same as the OLS models with only Transparency proving statistically significant.

governance, but their effects are not robust. Significance is only observed in half of the entry cost regressions and three of the corruption regressions. Improving the access to land and security of business premises (Panel 3) is more robust, demonstrating significance in seven models, but the model is inefficiently estimated in the most rigorous specification (Model 10). Overall, the results are striking in the rejection of a robust relationship between governance and investment decisions.

However, there is an important exception to this general trend. One aspect of governance is positively correlated with decisions to expand investment – transparency. As Figure 2 shows, the marginal effect of transparency is significant and sizable in every single regression specification. Even the most rigorous assessment, that properly addresses trending over time, finds a positive relationship. This confirms the results of previous PCI reports (Malesky 2009), which have consistently found transparency to be the most influential sub-index in firm decision making. Table 4 records the full set of regression models for the Transparency sub-index.

<Table 4 about Here>

Not only is the transparency score statistically significant, but the effect is quite large. In the fully-specified model, a one-unit change (about one standard deviation) in the ten-point index is associated with a 10% increase in firm investment. A one-unit change is well within the reach of a province's leadership. Over the timeframe covered by the PCI, the average province improved its transparency (2006 to 2010) score by 0.8 points with a standard deviation of three points, implying that some provinces drastically improved their score over time. Taking the extrapolation a bit further, a province moving from the lowest transparency to highest transparency recorded in a given year, would increase its investment by nearly a standard deviation.

Sub-Sample Analysis

Thus far, we have pooled all firms into the same regression models. While we have held constant, time invariant factors at the firm level, the assumption has been that the effect of governance on investment is homogenous across units. There is reason to be suspicious about such bold conclusions. Most obviously, foreign and domestic firms may differ in their preferences for good governance.

As we noted above, the "liability of foreignness" literature has highlighted the fact that foreign firms lack location-specific knowledge and contacts in their competition with domestic actors. In this case, transparent rules and procedures may be particularly important for ensuring that foreigners can compete on equal footing in domestic markets. A good deal of the "equal treatment" provisions in WTO accession and bilateral investment treaties, in fact, focus on opening access to information as part of the agreement.

This was definitely the case in Vietnam. The 2002 Law on the Promulgation of Legal Normative Documents (LNDs)—the Law on Laws—requires publication of all national level legal documents for 15 days in the Official Gazette before coming into legal effect; revisions in 2008 establish a 60-day public comment periods for LNDs. The 2005 Law on Local Laws requires the establishment of Provincial Official Gazettes. These reforms were designed to meet BTA and WTO obligations.

Business size also matters. Large local champions may have privileged access to decision makers not available to their smaller peers. Consequently, general governance may matter much less for their business than their ability to lobby for exceptions to a specific regulation that may be affecting their operations. In regard to the specific question of information, large firms may benefit less from transparency, as they may have proprietary information channels of their own or their size cushions them from information shocks.

To address these concerns, we re-run Model 10, our fully-specified regression specification but disaggregate the analysis by four sub-samples: 1) Domestic Small and Medium Size Enterprises (SMEs);[19] 2) Foreign SMEs; 3) Large domestic operations; 4) Large foreign operations. Large is defined by firms with an employment size above the 75th percentile (13 employees) at the time of establishment. Results are robust to using the 90th percentile (36 employees) and 50th percentile (7 employees). We do not use an interaction term, but merely re-run four regression equations of the form:

$$2.Y_{ijt} = \beta_0 + \beta_1 * Transparency_{jt-1} + \beta_2 * Tel_{jt-1} + \beta_3 * Pop_{jt-1} + \beta_1 * Road_{jt-1} + \eta_i + \phi_t + \varepsilon_{ijt}$$

The dependent variable (Y) is the natural log of investment in a given year (in constant VND), indexed by the firm id (i) province (j) and year (t). Once again, (φ_t) represents year fixed effects to capture shocks in the data that occur in particular years of the survey and (η_i) fixed effects are employed, so that the analysis can isolate the empirical effect of annual changes in governance on individual firm's investment decisions. Transparency is the key independent variable, and telephones per capita, population, and road quality enter as time variant controls.

Table 5 records the sub-sample specifications for the overall PCI score and the transparency sub-index, while Figure 3 records the coefficient and 90% confidence intervals for all sub-indices with different sizes and ownerships. Together, they show overall governance and most other sub-indices are insignificant across all sub-samples.

Transparency, however, demonstrates a fascinating pattern. The first two columns of Figure 3 show that transparency is equally important for the full sample of domestic and foreign firms. However, when we disaggregate again by size we find that the effect of transparency is most pronounced among domestic SMEs and large foreign operations. A one-unit change in transparency is associated with 15.8% increase in investment among domestic SMEs. Similar, a one-unit change in transparency is associated with an 18.1% increase for large, foreign firms. By contrast, the same change is not statistically different from zero among the other two sub-samples. For small, foreign firms the marginal effect is 6% but imprecisely estimated due to the much, smaller sample size. For large, domestic firms, the effect is only 2.6%

<Figure 3 about here>

These results appear to confirm the idea that transparency helps overcome the "liability of foreignness," aiding large firms to overcome their lack of connections and local knowledge in an opaque emerging market. Similarly, it shows how large, private firms

[19] These are all private operations. State Owned Enterprises were dropped.

are particularly advantaged in a non-transparent setting. Leveling the playing field increases optimism among smaller operations who also lack connections and for whom expansion is a greater risk.

Transparency

Given the standout performance of transparency, it is worth exploring this particular sub-index in more detail. As Table 6 shows, the transparency sub-index is a composite index created from six indicators measured over time. It measures whether firms have access to the proper planning and legal documents necessary to run their business, whether those documents are equitably available, whether new policies and laws are communicated to firms and predictably implemented, and the business utility of the provincial web page. In detail:

1) Access to important planning documents, such as the provincial budget, socio-economic plan, infrastructure construction plans, and maps regarding re-zoning land from agricultural to commercial usage. Access to this information provides firms with a strategic advantage and ability to better plan for the future without the risk of major structural changes that may threaten their operations. [20]

2) Access to legal documents entails the ability of firms to access legal, normative documents such as central laws, provincial decisions and circulars, local regulations, and official letters from departments of line ministries at the provincial level.

Since 2006, access to legislation has been better than access to planning documents, due to Vietnam's commitments under WTO accession, which required the publication of local gazettes. After peaking in 2008, however, access to legal documentation in the median province has declined marginally while the gap between the most and least transparent provinces doubled. Similarly, access to planning documents, which is not required by WTO commitments, declined over the period. Access to planning documents is important for leveling the playing field between investors with connections to provincial governments and those without such links. Without transparency of land and infrastructure plans, investors may under-invest out of fear that changes in local plans will negatively affect them.

3) The equity and consistency of access to documentation – are relationships or negotiations required to obtain the needed information? One of the reasons why some provinces score poorly on transparency is that personal relationships can be of critical importance for accessing business documentation. Three quarters of investors in the median province believe that having friends or family in government is important for accessing planning and legal documents (up from 52% in 2007). It is unclear why personal connections have grown in importance over time, but their salience likely affects the efficiency of businesses in two ways. First, by favoring those with connections instead of those with the best ideas and talent, local governments negatively influence the

[20] Each year, the PCI asks respondents to rank their access to government documentation necessary for operating a business on a five-point scale, ranging from 1) Impossible to 5) Very Easy. Factor analysis demonstrates that these documents divide neatly into two categories: 1) Legal Normative Documents (e.g. Central Laws, Provincial Implementing Documents, and the Provincial Budget) and 2) Planning Documents (e.g. State Investment Plans, Infrastructure Roll-Out Plans, Land-Use Maps). Remember, this is just one of the indicators used in the transparency sub-index. While the final transparency sub-index is re-scaled to range from 1 to 10, individual indicators have different ranges prior to re-scaling. These two questions range from 1 to 5 before re-scaling, and we enter the non-transformed measure into the regression.

quality of businesses in their province. Second, all investors must invest time and resources into developing connections that might be better spent on their operations. Thus, the greater the importance of connections, the less investment growth we would expect.

4) The transparency of policy processes, measured by whether firms pay taxes through the specified Value Added Tax formula or whether the full tax liability is subject to negotiation with the tax authority. Legally, there is no provision for negotiating taxes, so this measure demonstrates the arbitrariness of legal enforcement and its clear competitive advantage for some operations. More negotiation should be associated with lower firm investment.

5) The predictability of implementation of central laws according to respondents. Here, we are simply interested in whether legal changes catch firms by surprise and thereby affect their assessment of the costs and risk of their strategic plans.

6) The openness of the provincial web-page – a simple count of 15 documents and whether they can be obtained on the province's banner website with five points allotted for usage according web traffic Table 6 provides the specific indicators used to create the overall sub-index in the time-consistent PCI.

<Table 6 about Here>

Figure 4 shows the results of the disaggregated analysis of transparency indicators on the full sample and sub-samples. For this analysis, we perform the same set of regressions in Equation 2 on the four separate sub-samples, but simply replace the full transparency sub-index with each individual indicator from Table 6 in order to observe which measures of transparency are doing the work. Observing the first panel of Figure 4, we find that only one of the indicators is statistically significant by conventional standards – access to planning documents. Not only is better access to planning documents significant, but the substantive effects are astounding. A one standard deviation increase in average access to planning documents in the process is associated with nearly an 8% increase in investment in the average model. Access to legal documents, equity of access, tax negotiations, and web page openness have effects in the predicted direction, but the estimates are inefficient, and thus the 90% confidence intervals include zero. One indicator, the predictability of law, is in the opposite direction of our theoretical predictions.

Turning to the sub-sample analyses, we find results that are very consistent with the general effects of transparency. Increases in the availability of planning documents are most important for SMEs (both domestic and foreign) and large foreign operations. Large, domestic businesses which enjoy a privileged position in the Vietnamese economy receive no benefit from increasing the availability of information that they likely had access to anyway. For large, foreign firms in particular, transparency provides a tremendous confidence boost. A one standard deviation in access to planning documents leads to nearly a 23% increase in investment.

6. Conclusions

This paper set out to try and pin down the causal relationship between governance reform and private investment in Vietnam. As the literature shows, this is not an easy task, since the impact is potentially confounded by endogeneity, halo effects, unobserved heterogeneity and insufficiently precise measures of the relevant variables, particularly when they are measured at an aggregate level. We argued in the introduction that successful identification would require three things: a narrow measure of economic performance at the firm level and over time; a time series of credible measures of local economic governance; and a plausible source of exogenous variation in governance which does not influence firm-level economic performance other than through its effect on governance.

By focusing on firm-level investment data from the Vietnam Enterprise Census we have a precise measure of economic performance. Using the PCI panel, we have a rich and credible set of governance indicators at the local level. Together these allow us to effectively address both individual time-invariant heterogeneity and covariate time-varying shocks. The robustness of our results lead us to believe that we have identified a clear causal impact of transparency on private sector investment (and equally found that many other aspects of local governance have no discernible impact on investment).

We find the substance of our results striking. First, consider what we did *not* find. We find no evidence for a systematic causal relationship between most aspects of local economic governance and private investment. To recap, we discern no impact on investment from: lower entry costs, better access to land, smaller time costs, reduced informal charges, a more pro-active local government, better private sector development programs, greater labour flexibility, and a better legal environment. This is quite remarkable since, as discussed earlier, there is a voluminous literature suggesting that each of these is important for boosting private investment and growth. Indeed many government and donor programs focus on reducing entry costs (consider the huge policy emphasis in recent years on the time and cost to start an enterprise arising, in part, from the World Bank's Doing Business surveys). Similarly, there has been considerable policy effort on reducing corruption and informal charges, promoting flexible labor markets and improving legal certainty. The fact that these aspects of governance do not appear to have a reliable association with private domestic and foreign investment is puzzling.

What are the possible reasons for not observing a robust association between these aspects of governance and private investment? One possibility is that an important effect exists, but that we still haven't found it. There is a huge amount of noise in firm-level data, particularly in investment – it could be that this noise is swamping important effects. Whilst we cannot deny that this is possible, we are not convinced by this argument; we have an extremely large dataset and employ an extremely conservative strategy to account for heterogeneity. Indeed, it is hard to conceive of a better dataset for exploring this question (unless one had the power to impose random governance shocks on sub-national governments).

Another possibility is that the effects exist but are masked by negative reverse causality from economic performance to local economic governance (Kaufmann and Kraay 2002). In general, we find this idea attractive – it is entirely possible that, as countries or regions grow, the quality of their local economic governance deteriorates as actors attempt to capture rents. Moreover, Schmitz et al (2012) find strong qualitative evidence of the role

of the private sector in both driving and blocking economic reform in Vietnam's provinces. However, in our particular context, it seems implausible that individual firm investments (of the very small size that dominate our dataset) are going to have a material impact upon the province's economic governance.

Thus, a little like Sherlock Holmes, we conclude that "When you have eliminated the impossible, whatever remains, however improbable, must be the truth." That is, we suggest that the above aspects of local economic governance, in fact, have a minimal impact upon firm investment. That does not mean that they are not desirable. Indeed, many surveys suggest that these are the sorts of changes that investors want. However, it is possible that these changes are introduced over time as economies and institutions develop, but have no particularly strong causal impact upon performance. As an analogy, improving local economic governance may be a bit like improving the interior design of your house – having nicely painted walls, pleasant pictures and comfortable furniture may make you feel good – but it has no discernible impact on the ability of the house to keep you warm and dry. Similarly, improving local economic governance may make investors lives more comfortable, but they will invest when there are opportunities, and put up with (and lobby to reduce) the discomfort as they go along.

Our second major conclusion appears to contradict our first. We *do* find a strong causal connection between transparency and private investment. Why should we observe an association with transparency, but not with any of the other aspects of governance measured? One possibility is that transparency and access to information are more fundamental requirements than the other aspects measured. If entrepreneurs are not able to access information about opportunities, they are unlikely to invest. Similarly, if they cannot obtain basic legal and regulatory information they will not even consider investing. Thus transparency may have a critical role in reducing the risks associated with investments. Another possibility is that transparency – by reducing the need for personal connections – encourages more widespread investment. Without transparency, only those with personal connections can receive the assurances necessary to invest; with clear rules and processes, even those unconnected to the local elite can consider investment. Returning to our "House" analogy – transparency would appear to be part of the House (along with public infrastructure, the existence of a key opportunity and proximity to markets) rather than part of the interior décor of policy. We are hopeful that future research will be able to pin down the precise pathways through which transparency affects private investment – and ascertain why so many other aspects of local economic governance appear to have so little effect.

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Table 1: Descriptive Statistics on Firms in GSO Enterprise Census

Year	2006	2007	2008	2009	2010
All firms					
No. of firms	114,151	136,691	174,687	219,954	206,030
Employees	33	34	31	28	31
Revenues	5,983	7,676	8,994	7,324	8,318
Assets	4,357	5,674	6,145	6,177	8,520
Investment	836	1,317	1,359	2,489	1,677
Profits	294	377	241	279	98
FDI Share	4.5%	3.6%	3.2%	2.9%	3.0%
Female Manager	25.2%	24.7%	24.3%	24.3%	24.5%
Age	64	64	65	66	66
Manager Education	5	5	5	5	5
Small firms (<10 employees)					
No. of firms	69,322	81,942	103,991	138,580	127,366
Employees	5	5	5	5	5
Revenues	1,747	2,056	3,247	2,294	1,870
Assets	773	1,042	1,209	1,446	2,493
Investment	396	652	771	795	820
Profits	3	7	-30	-11	-222
FDI Share	0.8%	0.7%	0.7%	0.7%	0.7%
Female Manager	30.2%	29.7%	28.9%	29.5%	29.7%
Age	65	65	66	66	66
Manager Education	5	5	5	5	5
Medium firms (10-99 employees)					
No. of firms	42,705	49,637	65,865	74,814	77,562
Employees	26	26	25	25	26
Revenues	5,623	7,717	9,442	8,247	8,594
Assets	3,778	4,877	5,050	5,891	7,779
Investment	825	1,225	1,150	1,597	1,184
Profits	81	159	46	109	-102
FDI Share	4.4%	4.3%	3.7%	3.8%	3.7%
Female Manager	22.4%	22.1%	22.1%	22.0%	22.0%
Age	63	64	64	65	65
Manager Education	5	5	5	5	5
Large firms(100+ employees)					
No. of firms	12,308	14,906	15,961	19,364	13,450
Employees	408	416	415	407	412
Revenues	37,812	44,050	51,109	44,692	86,270
Assets	47,551	60,320	74,790	73,927	90,477
Investment	4,402	6,095	7,149	6,079	17,772
Profits	3,372	3,684	3,311	3,548	5,576
FDI Share	28.2%	18.7%	19.7%	17.5%	26.3%
Female Manager	17.9%	18.1%	17.9%	17.9%	14.7%
Age	62	64	64	66	62
Manager Education	4	4	4	5	4

Note: Figures are means unless stated otherwise. Monetary values are in constant VND Million (Base year=2006).

Table 2: Summary Statistics of Key Variables Used in Regressions

Variables	Mean	Std. Dev.	Min	Max
Dependent Variable				
Total fixed and variable investment (ln)	6.52	1.67	0.00	18.82
Measures of Governance				
Unweighted PCI	48.27	3.99	36.62	61.56
Transparency Sub-Index	6.29	0.76	2.37	8.40
Other PCI Sub-Indices				
Entry Costs	7.85	0.75	5.05	9.58
Land Access and Security	5.93	1.05	2.89	9.50
Time Costs of Regulatory Compliance	7.12	0.89	2.61	9.69
Informal Charges	5.55	0.76	3.63	9.10
Bias toward SOEs	5.00	0.73	3.11	7.54
Proactivity	4.93	1.44	1.87	9.92
Labor Quality	5.04	1.96	1.00	9.79
Legal Institutions	5.55	0.89	2.30	8.19
Indicators in Transparency Sub-Index				
Transparency of planning documents.	2.58	0.46	2.00	3.97
Transparency of legal decisions and decrees	3.48	0.44	2.79	4.54
Relationship important or very important to get access to provincial documents (% Important or Very Important)	0.57	0.14	0.31	0.96
Negotiations with tax authority are an essential part of doing business (% Agree or Strongly Agree)	0.46	0.11	0.17	0.87
Predictability of implementation of central laws at the provincial level (% Usually or Always)	0.35	0.20	0.06	0.82
Openness of provincial webpage score	16.69	3.65	0.00	20.00
Firm Level Controls				
Female	0.25	0.43	0.00	1.00
Foreign Investment Enterprise=1	0.03	0.18	0.00	1.00
Private Domestic Enterprise=1	0.97	0.18	0.00	1.00
Owner Education	4.85	2.23	1.00	9.00
Owner Birth Year	1943	10	1915	1988
Province Level Variables				
Paved Roads (%)	0.68	0.22	0.02	1.00
Population (ln)	7.92	0.83	5.69	8.88
Telephones/Cap	0.26	0.12	0.01	1.17

All data from PCI (www.pcivietnam.org); ln(natural log)

Table 3: Relationship between Total Governance and Firm-Level Changes in Investment

Dependent Variable: Total fixed and variable investment (time t, ln)	1. Naïve	2. Province Fixed Effects					3. Firm Fixed Effects			
		Only	Year	Year/Sect	Trend	Controls	Only	Year	Trend	Controls
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Unweighted PCI (lag)	-0.032	0.015	0.021**	0.018*	0.042	0.013	0.015	0.009	-0.018	0.008
	(0.021)	(0.024)	(0.010)	(0.009)	(0.027)	(0.017)	(0.032)	(0.015)	(0.012)	(0.014)
Female						-0.093***				
						(0.014)				
Owner Education						-0.071***				
						(0.012)				
Owner Age						0.006***				
						(0.001)				
Foreign Invested Enterprise						0.910***				
						(0.305)				
Paved Roads (%, lag)						0.430				-0.019
						(0.511)				(0.242)
Population (ln, lag)						0.075				0.203
						(0.097)				(0.131)
Telephones/Cap (lag)						2.426***				1.117***
						(0.192)				(0.391)
Constant	8.164***	5.859***	5.821***	6.402***	-372.134***	-757.828***	5.841***	6.371***	7.488***	4.512***
	(1.047)	(1.155)	(0.470)	(0.428)	(6.973)	(45.560)	(1.587)	(0.713)	(0.586)	(1.271)
Province FE	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Year FE	No	No	Yes	Yes	No	No	No	Yes	No	Yes
Sector FE	No	No	No	Yes	No	No	No	No	No	No
Firm FE	No	No	No	No	No	No	Yes	Yes	No	Yes
Province Trend	No	No	No	No	Yes	Yes	Yes	Yes	No	No
Firm Trend	No	No	No	No	No	No	No	No	Yes	No
Observations	349,214	349,214	349,214	342,506	349,214	207,870	349,214	349,214	263,823	347,690
R-squared	0.005	0.081	0.102	0.228	0.106	0.090	0.728	0.739	0.435	0.739
RMSE	1.687	1.621	1.603	1.481	1.600	1.790	1.384	1.357	1.663	1.356
Panels	.	63	63	424	.		207,631	207,631	89,661	206,591
Clusters	64	64	64	64	64	63	64	64	64	63

OLS regression with robust standard errors, clustered at province level, in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 4: Relationship between Transparency Sub-Index and Firm-Level Changes in Investment

Dependent Variable: Total fixed and variable investment (time t, ln)	**1. Naïve**	**2. Province Fixed Effects**					**3. Firms Fixed Effects**			
		Only	**Year**	**Year/Sect**	**Trend**	**Controls**	**Only**	**Year**	**Trend**	**Controls**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Transparency Sub-Index (lag)	0.365***	0.322***	0.125***	0.134***	0.117***	0.040*	0.281***	0.113***	0.130***	0.104**
	(0.062)	(0.034)	(0.028)	(0.028)	(0.030)	(0.022)	(0.059)	(0.041)	(0.043)	(0.041)
Female						-0.093***				
						(0.014)				
Owner Education						-0.072***				
						(0.012)				
Owner Age						0.006***				
						(0.001)				
Foreign Invested Enterprise						0.909***				
						(0.307)				
Paved Roads (%, lag)						0.454				-0.113
						(0.573)				(0.195)
Population (ln, lag)						0.134				0.170
						(0.102)				(0.149)
Telephones/Cap (lag)						2.403***				0.940**
						(0.294)				(0.428)
Constant	4.285***	4.557***	6.008***	6.347***	-310.893***	-702.669***	4.813***	6.085***	5.779***	4.575***
	(0.342)	(0.215)	(0.181)	(0.186)	(18.643)	(60.826)	(0.371)	(0.270)	(0.270)	(1.241)
Province FE	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Year FE	No	No	Yes	Yes	No	No	No	Yes	No	Yes
Sector FE	No	No	No	Yes	No	No	No	No	No	No
Firm FE	No	No	No	No	No	No	Yes	Yes	No	Yes
Province Trend	No	No	No	No	Yes	Yes	Yes	Yes	No	No
Firm Trend	No	No	No	No	No	No	No	No	Yes	No
Observations	349,214	349,214	349,214	342,506	349,214	207,870	349,214	349,214	263,823	347,690
R-squared	0.032	0.093	0.103	0.228	0.106	0.090	0.734	0.740	0.436	0.739
RMSE	1.664	1.611	1.602	1.480	1.600	1.790	1.370	1.356	1.662	1.355
Panels	.	63	63	424	.		207,631	207,631	89,661	206,591
Clusters	64	64	64	64	64	63	64	64	64	63

OLS regression with robust standard errors, clustered at province level, in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 5: Correlates of Firm-Level Changes in Investment (by Firm Size and Ownership)

	Total Governance				Transparency			
Dependent Variable: Total fixed and variable investment (time t, ln)	Small & Medium		Large		Small & Medium		Large	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unweighted PCI (lag)	0.013	0.028	-0.003	0.007				
	(0.018)	(0.042)	(0.013)	(0.035)				
Transparency (Sub 3)					0.158***	0.006	0.026	0.181**
					(0.053)	(0.179)	(0.045)	(0.080)
Paved Roads (%, lag)	0.080	0.404	-0.027	-0.755*	-0.056	0.426	-0.054	-0.980**
	(0.480)	(0.819)	(0.187)	(0.415)	(0.361)	(0.973)	(0.193)	(0.444)
Population (ln, lag)	0.281	0.040	0.239*	-0.522*	0.223	0.100	0.218	-0.520**
	(0.213)	(0.143)	(0.132)	(0.266)	(0.223)	(0.115)	(0.145)	(0.247)
Telephones/Cap (lag)	1.738**	-0.215	0.552	-0.301	1.433**	-0.216	0.497	-0.487
	(0.685)	(0.879)	(0.523)	(0.822)	(0.669)	(0.833)	(0.531)	(0.924)
Constant	3.289*	4.884***	4.970***	12.220***	3.530*	5.702***	4.858***	11.533***
	(1.824)	(1.796)	(1.376)	(2.605)	(1.825)	(1.259)	(1.276)	(2.336)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	229,178	2,453	106,355	9,370	229,178	2,453	106,355	9,370
R-squared	0.753	0.795	0.706	0.762	0.754	0.795	0.706	0.763
RMSE	1.267	1.624	1.465	1.493	1.266	1.624	1.465	1.490
Panels	145,027	1,300	56,117	4,096	145,027	1,300	56,117	4,096
Clusters	63	39	63	60	63	39	63	60

OLS regression with robust standard errors, clustered at province level, in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

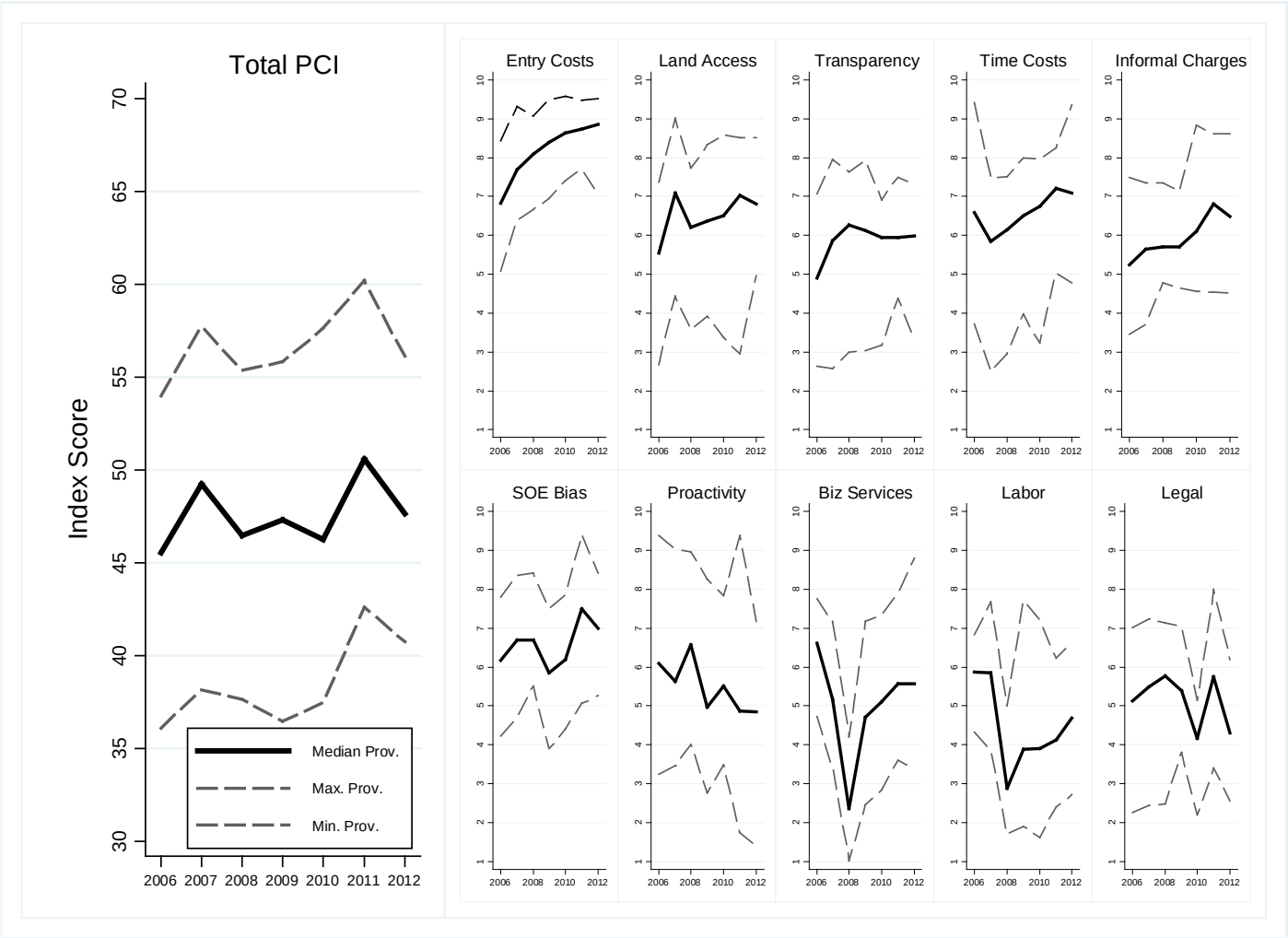
Table 6: Indicators Used in Constant Transparency Index

Indicator	Survey Question	Measure	2006	2007	2008	2009	2010	Coefficient of Variation within Province (2005 to 2010)
Consistent Unweighted PCI	F1.1-F1.13†	Min	43.85	46.94	44.68	41.86	43.26	0.007
		Median	50.63	53.35	52.32	50.70	51.28	0.041
		Max	57.29	61.77	61.07	59.92	63.05	0.074
		Standard Deviation	3.160	3.563	3.451	3.841	4.284	0.016
		Correlation w/Previous Year	NA	0.7651*	0.6861*	0.6527*	0.6686*	
Consistent Transparency Sub-Index	F1.1-F1.13†	Min	3.62	3.69	4.18	4.11	3.52	0.051
		Median	4.85	5.02	5.44	4.99	4.50	0.105
		Standard Error	6.629	6.585	6.341	7.238	5.798	0.165
		Max	0.56	0.52	0.47	0.57	0.46	0.029
		Correlation w/Previous Year	NA	0.5966*	0.6120*	0.4113*	0.3797*	
Transparency of planning documents.	F1.1-F1.13†	Min	2.25	2.20	2.25	2.13	2.00	0.020
		Median	2.63	2.51	2.55	2.44	2.31	0.066
		Max	3.17	2.96	2.79	3.08	2.62	0.102
		Standard Deviation	0.164	0.133	0.118	0.166	0.139	0.017
		Correlation w/Previous Year	NA	0.64*	0.61*	0.49*	0.48*	
Transparency of legal decisions and decrees	F1.1-F1.13†	Min	2.86	2.63	2.80	2.68	2.79	0.013
		Median	3.15	3.05	3.11	3.11	3.05	0.033
		Standard Error	0.154	0.145	0.123	0.167	0.118	0.073
		Max	3.53	3.38	3.36	3.61	3.44	0.014
		Correlation w/Previous Year	NA	0.61*	0.59*	0.38*	0.56*	
Relationship important or very important to get access to provincial documents (% Important or Very Important)	F2	Min	31.48	38.4	33.57	45.57	37.28	0.03
		Median	62.5	56.6	49.82	61.26	78.64	0.19
		Max	77.14	73.4	67.9	78.26	95.71	0.35
		Standard Deviation	0.076	0.074	0.080	0.066	0.097	0.059
		Correlation w/Previous Year	NA	0.38*	0.55*	0.37*	0.30*	
Negotiations with tax authority are an essential part of doing business (% Agree or Strongly Agree)	D14.3	Min	47.17	24.1	17.39	29.69	23.75	0.13
		Median	61.05	44.7	36.71	41.32	40.78	0.35

		Max	86.96	73.2	54,25	62.4	67.04	0.81
		Standard Deviation	0.090	0.097	0.075	0.076	0.085	0.164
		Correlation w/Previous Year	NA	0.52*	0.73*	0.36*	0.27*	
Predictability of implementation of central laws at the provincial level (% Usually or Always)	F8	Min	2.76	1.89	1.03	3.57	2.38	0.08
		Median	9.49	7.96	6.94	8.4	8.97	0.37
		Max	37.88	18.3	15.69	22.22	20.24	0.74
		Standard Deviation	0.053	0.040	0.031	0.040	0.042	0.160
		Correlation w/Previous Year	NA	0.46*	0.3*	0.50*	0.10	
Openness of provincial webpage score	Analysis by VNCI Research Team (For Scorecard See Section)ψ	Min	0	0	0	0	0.00	0.05
		Median	9	13.75	14.25	15	15.00	0.21
		Max	18	20	20	20	19.00	1.84
		Standard Deviation	5.20	4.87	5.19	4.22	3.84	0.29
		Correlation w/Previous Year	NA	0.51*	0.70*	0.74*	0.79*	

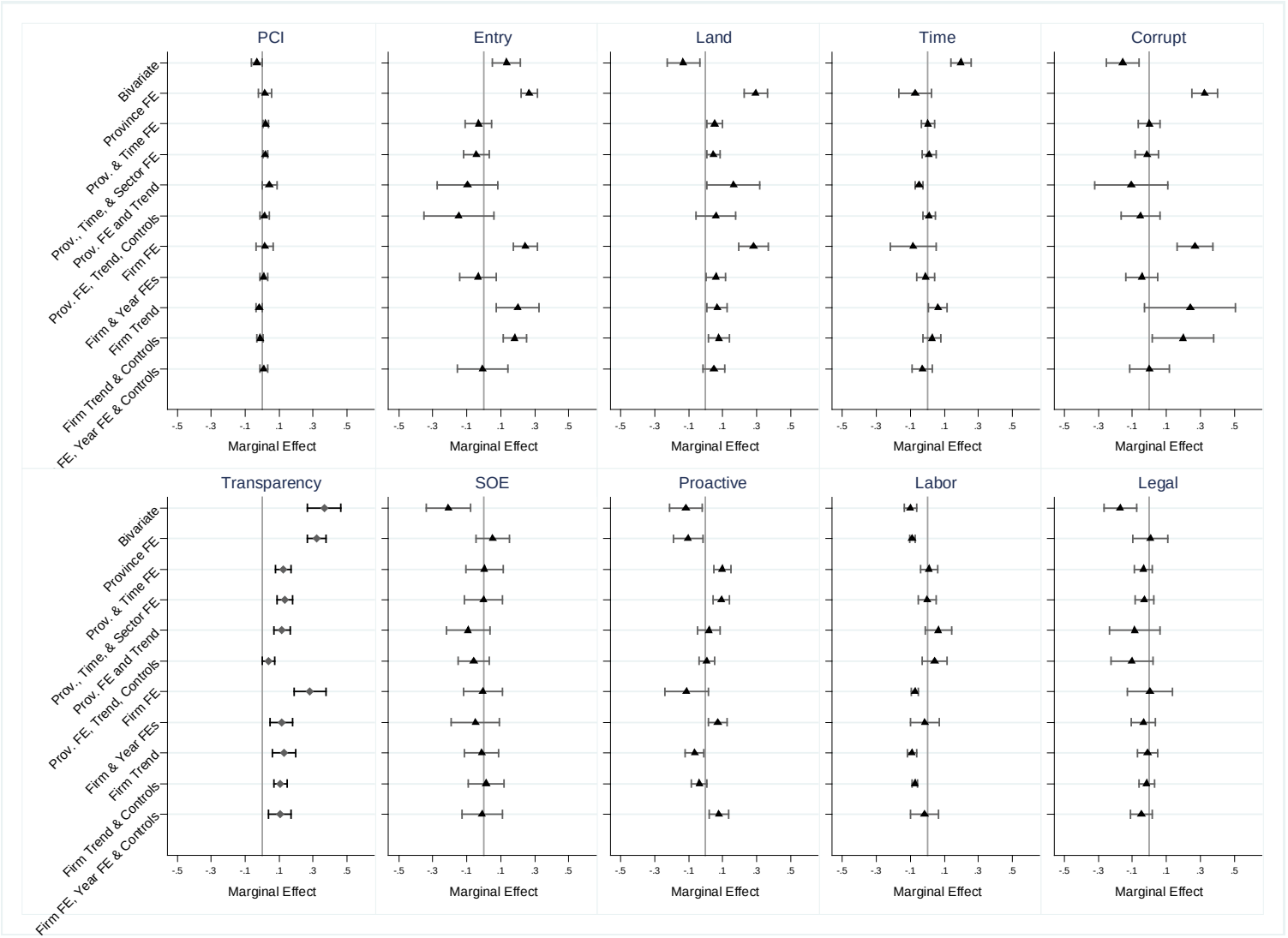
All values are at the provincial level. * Significant at 5% level; NA = not applicable; † Average access to all documents on a 5 pt. scale (1 very difficult to 5 very easy); Coefficient of Variation= Province Standard Deviation/Provincial Mean between 2006 and 2010.

Figure 1: Changes in Provincial Governance over Time in Vietnam



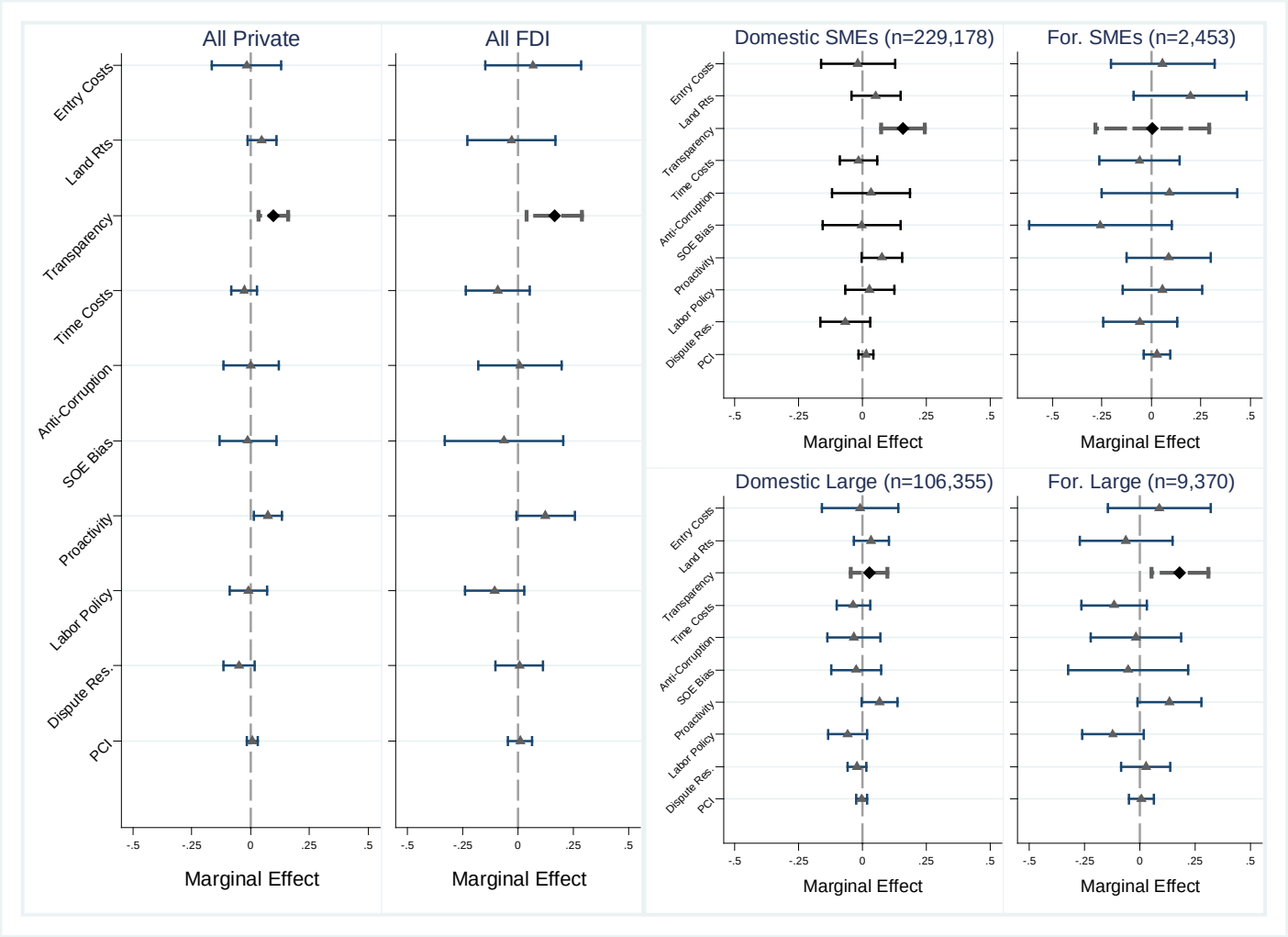
This figure plots changes in our index using consistent PCI indicators over time (2006 to 2012). The chart plots changes in the median province along with scores by the maximum and minimum performers.

Figure 2: Bounds Analysis: Robustness of Multiple Regression Results to Specification Choice



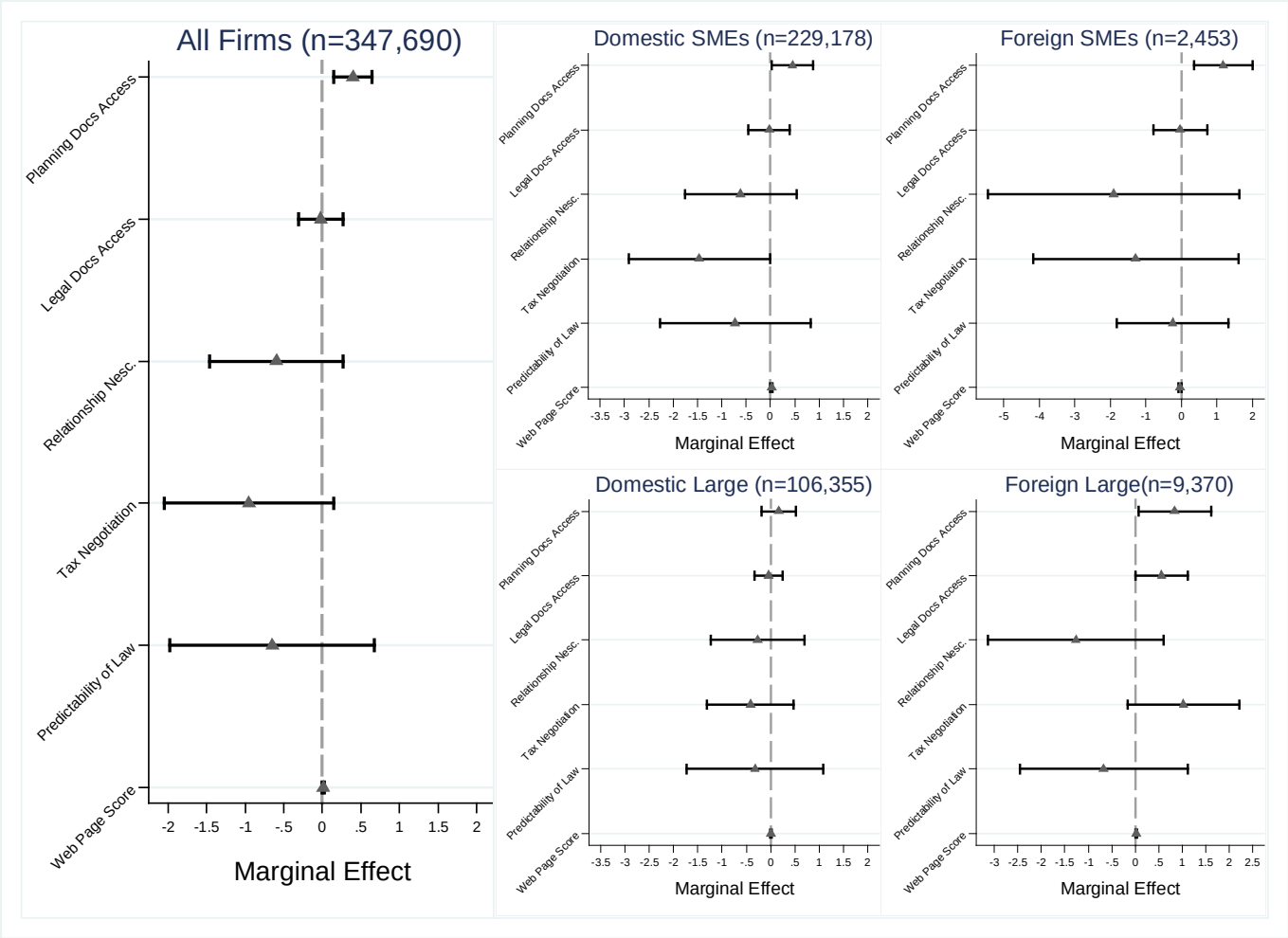
This figure replicates the analysis in Table 3 for the full index and all ten sub-indices of the PCI. We present the coefficient (diamond) and 90% confidence interval (range bars) resulting from the ten specifications for each of the 10 sub-indices. In all cases the core PCI, or its sub-indices are lagged to allow for possible delay in the influence of governance changes on investment. When the diamond is to the right of the zero line, there is a positive relationship between governance and investment. But it is only statistically significant if the range bar is also to the right of zero. Full regression results can be found in Online Appendix 4.

Figure 3: Sub-Sample Analysis of Governance Indicators (By Ownership (FDI v. Domestic) and Size (SMEs vs Large))



This figure builds off the analysis in Figure 2 using the fully specified model (Table 3, Model 10), but dividing the analysis by sub-group. This illustrates the difference between foreign and domestic firms, as well between small and large firms. Large is defined by firms with an employment size above the 75th percentile (13 employees) at the time of establishment. Each row represents the full index and the PCI's 10 sub-indices. In all cases the sub-indices are lagged to allow for possible delay in the influence of governance changes on investment. We present the coefficient (diamond) and 90% confidence interval (range bars) resulting from each model. Full regression results can be found in Online Appendix 5.

Figure 4: Effects of Individual Indicators used in Transparency Sub-Index (by Firm Size and Ownership)



This figure explores the individual indicators of the transparency index by sub-group, illustrating the difference between foreign and domestic firms, as well as between small and large firms.. Each row represents an individual transparency indicator. Once again, the fully-specified model with firm fixed effects, year fixed, and time variant controls is employed. As usual, the indicators are lagged to allow for possible delay in the influence of governance changes on investment. Large is defined by firms with an employment size above the 75th percentile (13 employees) at the time of establishment. Small and Medium Size Enterprises (SMEs) include all other firms. We present the coefficient (diamond) and 90% confidence interval (range bars) resulting from each model. Full regression results can be found in Online Appendix 6.