

Predictable Corruption and Firm Investment: Evidence from a Natural Experiment and Survey of Cambodian Entrepreneurs*

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ABSTRACT

This paper utilizes a unique dataset of 500 firms in ten Cambodian provinces and a natural experiment to test a long-held convention in political economy that the predictability of a corruption is at least as important for firm investment decisions as the amount of bribes a firm must pay, provided the bribes are not prohibitively expensive. Our results suggest that this hypothesis is correct. Firms exposed to a shock to their bribe schedules by a change in governor invest significantly less in subsequent periods, as they wait for new information about their new chief executive. Furthermore, the amount of corruption (both measured by survey data and proxied by the number of commercial sex workers) is significantly lower in provinces with new governors. Our findings are robust to a battery of firm-level controls and province-level investment climate measures.

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A long-held convention in the literature on corruption has been that corruption, if not prohibitively high and predictable, can be treated as nothing more than a tax in formal models (Kreps 1997). The logic of this convention is that when a bribe schedule is well-known and available, firms will simply build informal charges into their business plans, just as they would with any other additional cost. As a result, a predictable but highly corrupt environment offers a suitable, second-best alternative to the lack of corruption for encouraging firm investment (Wei 1997, Campos *et al.* 1999).

The convention underpins a great deal of recent work on the proper structuring of institutions for economic growth. Shleifer and Vishny (1993) argue that because corruption involves secrecy, it is always more distortionary than taxation. However, they also show that some types of regimes create less distortion than others. A strong state with a centralized bureaucracy, leads to a joint-monopoly over the bribe schedule. Monopolistic bureaucracies will price bribes to maximize returns across different markets (i.e., licenses and health permits). By contrast, in regimes with more decentralized administrative systems, different bureaucrats control particular nodes in the regulatory regime. Each individual bureaucrat tries to maximize his own income from the bribe, without regard to the bribes of other agencies or the economy of the country as a whole. Shleifer and Vishny conclude that monopolistic bureaucrats therefore set bribe schedules at a higher-level of the bureaucracy and reduce uncertainty for firms. As a result, they encourage more investment and economic growth than a large number of bureaucrats operating independently. Kaufmann (1996) confirms these findings, by showing decreasing returns (in investment) from increased regulatory checks on private firms. Olken and Barron (2007) find further empirical evidence of the importance of the market structure for bribes in their study of truckers in Indonesia.

The Shleifer and Vishny model has been used to explain the remarkable investment growth which took place in highly corrupt regimes, such as South Korea in the post-war period (Kang 2002, Chang 2003) and Indonesia during the Suharto years (MacIntyre 2001). MacIntyre, in particular, examines a number of incidents, where Suharto clamped down on corruption — not in order to eliminate it, but rather to ensure he controlled the activities. He argues that this provided a greater degree of predictability for investors. While investors might have to pay substantial bribes, they were assured that their investments would be protected from unpredictable and uncoordinated corruption. More recently, the predictability brought by tight-knit social relations has been used to explain the high growth but high corruption characterized by business in China (Li and Wu 2007).

While the intuitive logic of the predictable corruption argument is appealing and the careful case studies illustrative, the empirical work testing the theory has been less than satisfactory. The careful research designs used to identify the causes and consequences of corruption (Treisman 2000, 2007, Fisman 2001, Golden and Picci 2005, Di Tella and Schargrodsky 2003, Olken 2007, Fisman and Miguel 2006, Johnston 2006) have not been applied to the measurement of predictability. A thorough test of the predictability logic is essential, as it is already being used to justify regulatory interventions such as one-stop business licensing in developing countries (see for example Ogus (2004) and World Bank (2008)).

At present, two major tests of the predictability hypotheses exist in the literature. Wei (1997) used cross-national survey data to demonstrate that arbitrariness in corruption leads to substantially less foreign investment. Arbitrariness is operationalized as the variance on the answer to a question about propensity of firms to pay bribes. This is a clever solution, but one highly prone to measurement error. Variance in responses to corruption on surveys is likely to be driven by a number of other cross-national factors other than the arbitrariness of officials. While Wei recognizes the possibility of measurement error, he assumes that it manifests itself in the stochastic portion of his model and consequently biases his causal variable toward zero. There are reasons to suspect, however, that the variation is actually in the systematic portion of the model and therefore much more damaging for identifying the effect of uncertainty. For instance, differences in average firm size, sector, and state ownership are likely to impact both variability in corruption responses and individual firm investment.¹ Less variance in corruption may simply be an artifact of less variance in firm size.

Second, the measure of corruption itself is prone to differential item functioning or lack of a unique anchor across countries (King *et al.* 2003, Treisman 2007); meaning respondents in different countries perceive of corruption differently and do not have the same scale in mind when they answer the survey questions.² Anchoring problems are likely to bias not only estimates of mean corruption, but also the variance, especially if cultural or political factors deter respondents from choosing extreme value in some countries.

The second approach to measuring predictability of corruption has been to ask firms directly in the same surveys of corruption. Specifically, the World Bank's Investment Climate Assessment Surveys (Iarossi 2006),³ ask a series of questions, probing different mentions of predictability, specifically: (1) advanced knowledge of the payment amount; (2) whether the agreed upon service is delivered; and (3) whether one bribe yields additional requests from other officials. Campos *et al.* (1999) find evidence in cross-sectional regressions that predictability leads to higher investment as percentage of GDP, when controlling for levels of corruption. This technique, however, does not resolve the anchoring dilemma faced by Wei (1997); instead, it simply introduces new sets of questions prone to anchoring bias. Moreover, because the predictability questions follow corruption amount questions directly in the survey ordering, there is a reason to suspect that answers to predictability may be framed by the corruption question (Zaller 1992, Gaines *et al.* 2007). That is, respondents may believe that the predictability questions are further elaborations of the extent of corruption and therefore the respondents who have experienced high corruption, may be led to respond that it is highly predictable. If this is the case, one would expect predictability to be positively correlated with the

¹ Another minor issue is that Wei (1997) draws his data from the Global Competitiveness Survey of the World Economic Forum, which has radically different sample sizes among the 58 countries surveyed in 1996.

² Wei uses this question "Rate the level of corruption according to the extent of irregular, additional payments connected with imports and export permits, business licenses, exchange controls, tax assessments, police protection or loan applications."

³ Survey is available at <http://iresearch.worldbank.org/InvestmentClimate/>.

amount of corruption. Indeed, Lambsdorff (2002) finds this exact relationship, but he attributes a causal relationship to the empirical finding, arguing that highly predictable environments encourage corruption because investors are confident that their bribery yields the expected service delivery. Lambsdorff's cross-sectional design, however, makes it difficult to confirm the longitudinal changes he hypothesizes.

In sum, the theoretical logic of predictable corruption is enticing, but the empirical analysis confirming it has been unsatisfactory. To test the theory, we need a more rigorous approach. First, a subnational within country design is required to address the cross-country anchoring problems encountered in survey research (Di Tella and Schargrodsky 2003, Olken 2004, Golden and Pici 2005). Second, the logic of the argument implies individual investor behavior, but most work has used country aggregates as the unit of analysis. Using individual investors as the unit of analysis offers a fairer test of the theory's micro-logic, while allowing firm-level controls (such as size, age, sector, and formality) to account for the fact that different investors experience corruption in different ways. Third, an exogenous shock is needed to either levels of corruption or predictability, so we can separate their effects on investment. While the first two requirements can be handled relatively painlessly, the third is more difficult. Randomized experiments to alter levels of predictability or corruption in various provinces would be highly unethical. Fortunately, Cambodia offers a useful natural experiment for isolating the impact of corruption and predictability.

Cambodia is one of the poorest countries in the world. Although the country experienced high GDP growth over the past decade, its per capita GDP in 2005 (in constant 2000 US dollar) was relatively low at \$404. Socio-economic variables demonstrate that most Cambodians have not shared in the rapid growth. The most recent data on life expectancy at birth is only 57 years and infant mortality rate remains as high as 68 deaths per 1,000 live births (World Bank, 2007). The underdevelopment of Cambodia largely results from its twenty-year civil war that began in the 1970s, including a three-year period under the rule of the notorious Khmer Rouge regime. The United Nations sponsored a general election for Cambodia in 1993, which largely restored the stability of the economy although internal tensions between political factions remained.

Since 2003, Cambodia has been in the midst of a natural experiment that is of direct relevance to the predictability hypotheses. Hun Sen, the current Prime Minister, has replaced twenty-nine provincial governors in eighteen of Cambodia's twenty-four provinces. The replacements have had striking implications for firm behavior, as Cambodia is among the most corrupt economies in the world (151/163 in the *Transparency International* (2007) scores) and patronage is extraordinarily important for bureaucratic promotions (McCargo 2005, Hach 2006). Cambodian governors are appointed by the Prime Minister after each five-year election cycle. After the 2003 power-sharing arrangement, these governorships and deputy governorships were allocated with the joint agreement of both major parties (Funcinpec and Prime Minister Hun Sen's Cambodian People's Party (CPP)). Constitutionally, governors are appointed to five-year renewable terms (Chapter XI), but in practice they serve at Prime Minister Hun Sen's discretion.⁴

⁴ See also: Royal Decree No. NS/RKT/0704/124 (July 15, 2004), on the Appointment of the Royal Government of the Kingdom of Cambodia.

Recent experience indicates that it takes little administrative effort to remove a sitting governor, beyond an announcement from the Prime Minister's office.

Studies have documented that Cambodian governors purchase their positions, almost as an investment, and maintain their positions by passing a portion of the revenue upward to central benefactors (US-AID 2004, McCargo 2005). The system encourages corrupt behavior down the entire bureaucratic chain, as governors put pressure on lower-level officials in the province to amortize their investments and keep them in power (US-AID 2004). Consequently, the replacements of provincial governors have had important implications for firm behavior. Firms are forced to develop specialized skills in dealing with a specific provincial bureaucracy; they learn who to bribe and how much to pay in order to obtain operating licenses, land titles, and other business certificates, which all require a governor's signature along with a stamp from the relevant line ministry.⁵ As long as the governor is in power, the system is highly predictable. An exogenous replacement of the governor alters this carefully orchestrated mechanism, forcing firms to learn an entirely new bribe schedule. Despite changes in leadership, there is little difference in provincial government institutions (both across provinces and over time). We exploit this natural experiment to see whether the simple replacement of leadership alters firm investment behavior.

The paper is divided into five sections. In Section 1, we discuss the impact of governor replacement on firm investment behavior. Section 2 tests our model empirically, using a retrospective panel dataset of 500 firms in ten Cambodia provinces between 2004 and 2006. Section 3 describes the Cambodian sub-national, institutional environment, paying careful attention to the possible endogeneity of the replacement of governors in recent years. In Section 4, we statistically analyze the determinants of the length of governor tenure and the number of new governors in each province. Finally in Section 5, we ensure that changes in provincial governors affects firms' investments through increasing uncertainty in corruption and not because of other sources of unpredictability in the general business environment caused by changing the executive. We conclude by using our empirical results to flesh out the micro-logic of early work on the corruption-predictability nexus.

PREDICTABILITY OF CORRUPTION AND FIRM INVESTMENT

We follow Wei's (1997) model of corruption with uncertainty where a risk-averse entrepreneur has a static mean-variance preference and chooses how much to invest in order to maximize her utility. The model predicts that the entrepreneur invests less when the mean corruption is high and when there is more uncertainty about corruption.

⁵ See, for instance: Law on Commercial Enterprises and Registration (June 19, 2005); Sub-decree No. 146 ANKr.BK (December 27, 2005) on Economic Land Concession; Sub-Decree No. 111 ANKr.BK (September 27, 2005, on the Implementation of the Law on the Amendment to the Law on Investment of the Kingdom of Cambodia. All are available at: <http://www.cambodiacommerciallaws.com/sub/laws/laws.html>.

As discussed earlier, in the case of Cambodia the predictability of corruption is associated with the tenure of the provincial governor. In this paper, we focus on two political variables that reflect this predictability: (1) whether there was a change in the provincial governor, and (2) the length of the tenure of provincial governors. When there is no change in governor or when the change in governor is infrequent, it is more likely that the bribed services will be delivered. Also, longer tenure implies more common knowledge about the amount of bribes and the norms of corruption conducted in the province. This reduces the information costs and uncertainty. That is, we assume that, all else equal the uncertainty in the provinces without the change in governor is less than the uncertainty in the provinces where the governors were changed. Similarly, we assume that the longer the tenure of the provincial governor, the lower the uncertainty. Since firm investment is negatively associated with uncertainty, investment in the provinces without changes in governors is expected to be higher than investment in the provinces experiencing governor changes. Similarly, investment of firms in the provinces with longer-serving governors is expected to be higher than investment in the provinces with governors of shorter tenure.

To make these formal predictions more tangible, consider firm investment in Battambang and Banteay Meanchey. These two provinces are located in Northwest Cambodia, sandwiched between Thailand and the Angkor Wat temple complex. In 2005, the provinces had very similar structural conditions in terms of GDP per capita (\$277 and \$207), distance from the capital city Phnom Penh (291 kilometers and 351 kilometers), percentage of population in urban area (17.65 and 17.11), foreign tourists (26,000 and 27,000), teachers per 10,000 citizens (3.8 and 3.0), literacy (63.8% and 65%), and road quality (85% and 76% gravel). In 2005, comparable firms in the two provinces (service sector enterprises in operation for over two years) also had almost equal investment rates. Firms in Banteay Meanchey expanded their investment by 15.3%, as opposed to 11.3% in Battambang. At the beginning of 2006, however, Banteay Meanchey received a new governor (On Sum), the second replacement since 2003. Battambang, by contrast, maintained the same governor (Prach Chan) it had since the 2003 elections. The effect on investment among comparable firms in these two very similar provinces was dramatic. Investment growth was up in both areas, commensurate with the trend of general economic growth in Cambodia. But whereas mean investment in Banteay Meanchey grew by 36%; growth in Battambang boomed to 80%. Multiple regression analysis, as we demonstrate below, is necessary to test the relationship. Nevertheless, the fact that the only significant difference in these two provinces between 2005 and 2006 was the change in governor is helpful for illustrating our core hypothesis.

PANEL ANALYSIS OF THE IMPACT OF CHANGING GOVERNORS ON FIRM INVESTMENT

To test the predictions discussed in the previous section, we use retrospective panel data on firm investment behavior between the years 2004 and 2006. All data are obtained from the 2006 Provincial Business Environment Scorecard (PBES) survey, a jointly

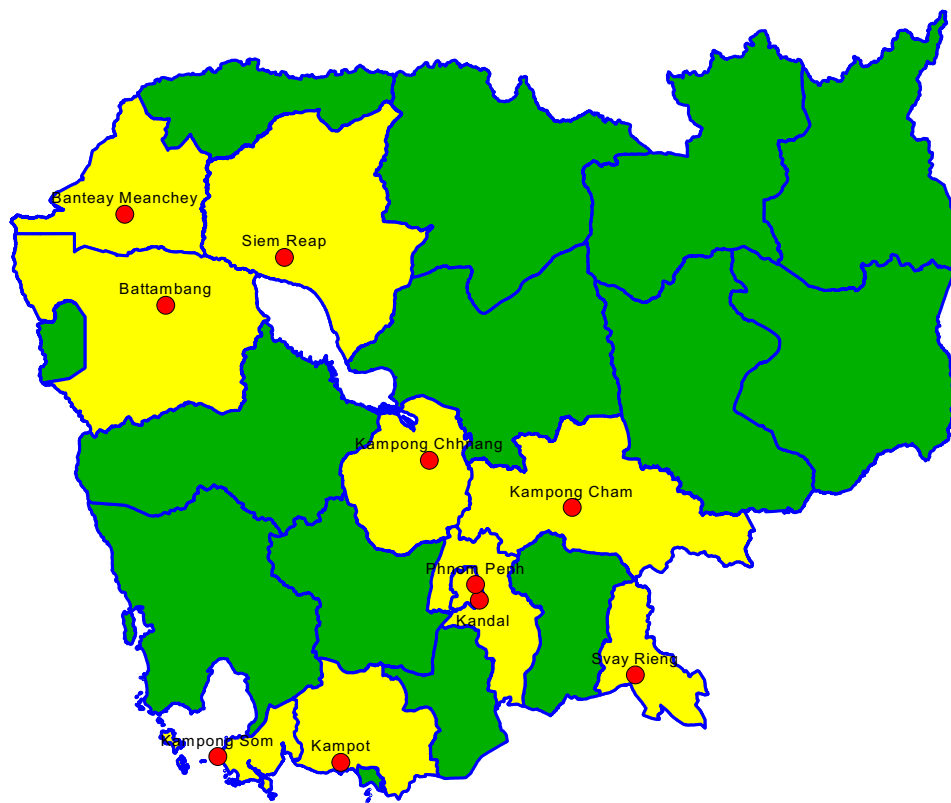


Figure 1. Coverage of provincial business environment scorecard (PBES) in Cambodia.

funded donor exercise to rank the business environments of the ten most economically important Cambodian provinces. These ten provinces (shown in Figure 1) account for 75% of Cambodian GDP and 64% of the population.⁶ From that survey, we created a retrospective panel based on firm recollections of investment in previous years. In development economics, this is relatively common approach, due to the expense and rarity of large-scale firm surveys in many countries.

Although there is always the possibility of some measurement error, the survey is the most comprehensive and rigorous firm-level survey to date in Cambodia. Firms were sampled only after the project performed a census of all business establishments in the capital city and three largest population centers in each province. The census recorded over 41,775 business establishments of various degrees of formality. From this

⁶ The survey was sponsored by the International Finance Corporation (IFC) and The Asia Foundation. More information on the PBES survey can be obtained at: [http://www.ifc.org/ifcext/home.nsf/AttachmentsByTitle/PBES_Report_Eng/\\$FILE/PBES_Report_Eng.pdf](http://www.ifc.org/ifcext/home.nsf/AttachmentsByTitle/PBES_Report_Eng/$FILE/PBES_Report_Eng.pdf).

population, a stratified sampling was conducted based on the size and sectoral distribution of each province.⁷ Five hundred firms were randomly selected for face-to-face interviews. The minimum provincial sample size was 40 firms with slight adjustments made for provinces with larger firm populations. In Phnom Penh (the capital of Cambodia, with over 70% of the population of firms), 90 firms were sampled. The overall response rate to both screening calls and interview contacts was 45%. Non-respondents included firms that were not available, refused to participate, or canceled after arranging an appointment.⁸ A battery of tests reveal that differential response rates across provinces did not have a significant impact on firm responses.

The PBES dataset provides a range of useful variables including information on firm assets, investment, costs, and employment, as well as more subjective information regarding firm perceptions of the business environment. Data on firm performance is derived from Question A9 of the PBES survey. As Cambodian firms are generally quite small and not very sophisticated, trained interviews followed pre-arranged guidelines for guiding firms through the completion of the following worksheet:

QA9: Please provide the following information on your establishment's production, sales, and expenses (in US\$).

	1st year of operation		2004		2005		2006	
Total value of land used for business								
Total value of building which has been purchased for use in business (not including house)								
Total value of machinery, equipment, and vehicles which have been purchased for use in the business								
Total purchases of raw material and intermediate goods (whether used in production or not), including finished goods for resale								
Total cost of labor, including wages, salaries, and bonuses								
Total revenue from sale of goods or services								

Most important for our analysis is the measure of a firms' asset growth or *investment rate* (our dependent variable) that was constructed from annual investment in new assets

⁷ Firms with no employees besides the owner and firms in ethically dubious industries (massage, nightclubs) were eliminated from the sampling.

⁸ While this figure is relatively low for face-to-face interviews by international standards, it is respectable within the Cambodian context for three reasons. First, this was the first time that a survey of such a sensitive nature had been performed in many parts of the country. Second, firms were not accustomed to such an endeavor and may not have had faith in the confidentiality of their responses. Finally, the small scale of most operations meant that if an owner was not available when interviewers were in his/her province, there was little chance that anyone else at the firm would have been able to answer knowledgeably. Whenever it was impossible to interview a firm they had originally selected, the interviewers chose a new firm off a replacement list whose members had also been randomly selected.

during 2004–2006. Asset data were calculated from firms' self-recorded land, building, and machinery/equipment data. Next, investment rates were calculated from the percentage changes in these fixed assets (taking into account depreciation). Because 2004 is the start year, we are left with two years of investment growth (2005 and 2006). The mean annual firm asset growth is about 32% with a standard deviation of 81%. These numbers appear quite large, because of the small size of most firms in 2004. The median initial assets for a firm in 2004 were \$37,647.

The PBES dataset also provides a range of firm-level control variables, which we exploit in the analysis. These variables include the age of the firms, to account for the fact that older firms may have had their major growth spurts prior to our analysis. A variable capturing whether the firm is involved in the service or commercial/retail sector is used, as they have been cited as high growth areas in previous research (World Bank 2004). Besides the booming textile industry, which is dominated by large foreign firms, Cambodia has yet to develop a very large tradable or manufacturing sector (World Bank 2004). We use a four-point measure of the strength of a firm's property rights based on its land title. Land title ranges from a score of 1, indicating that a firm has no formal rights to its land or is renting, to 4, identifying firms that have a "solid title" issued by the Provincial Land Authority after 2001. The solid title is considered to be the most secure form of property rights in the country (ADB 2003). Between the two extremes are the score of 2 for uncertified land exchange receipts and the score of 3 for pre-2000 land titles that are less secure than the newer versions. Firms with secure titles are more likely to invest in their property (De Soto 2000). Panel data for land title questions were reconstructed from firm answers to the years that they received those documents and then projected forward. That is, if a firm received a solid title in 2005, it was coded as having land titles in both 2005 and 2006. Finally, we control the number of electricity disruptions faced by firms in the past year. Electricity is very expensive and highly unstable in Cambodia. A number of commentators have labeled frequent outages as a major barrier to firm performance and expansion (World Bank 2004, Dapice 2005).

The key causal variables are the change and the tenure of the provincial governors, as explained previously. These variables pick up firm estimations of retrospective predictability — whether the bribe schedule in year t is similar to the bribe schedule a firm faced in the previous year ($t - 1$).

H1: Firms in provinces with a change in governors invest less than those where governors have not changed in the last year.

In order to test this hypothesis, we run the following panel regressions.

$$\begin{aligned} Investment_Rate_{i,t} = & \beta_0 + \beta_1 Dummy(Governor\ Change)_{I,t} + \beta_2 D_CPP_{I,t} \\ & + \beta_3 D_CPP_{I,t-1} + AX_{i,t} + BY_i + \Gamma Z_I + \delta P_{i,t} + \varepsilon_{i,t}, \end{aligned}$$

where $Investment_Rate_{i,t}$ is the percentage of total asset growth of firm i in province I during year t . Since a change in governor does not necessarily mean a change in a political party, we add a dummy variable D_CPP_t to capture whether the governor is from CPP, the dominant political party led by Prime Minister Hun Sen. Having a member of the

CPP as a governor may lead firms to believe the business environment will be more propitious in the future.

To address possible omitted variable bias, we use a number of controls: $X_{i,t}$ is a vector of firm-year controls, such as the natural log of a firm's initial total assets and firm's age.⁹ Y_i is a vector of time-invariant, firm-level controls such as electricity disruptions, percentage of service and commerce revenues, and strength of land title. In the full specification, we run sector fixed effects to control for unobserved heterogeneity caused by product type. Z_I is a vector time-invariant, provincial-level controls including road coverage, which measures the percentage of total kilometers of road in each province that are covered by asphalt, partial asphalt, or gravel (JICA 2006); GDP per capita, to gauge whether provincial wealth drives investment patterns; and literacy rate, as a proxy for the quality of human capital. Data for these controls are only available for single years and not for the entire period when the studies were implemented.¹⁰

Finally, $P_{I,t}$ captures performance in the provincial economy over time. There is a possibility that poor economic performance generally might lead firms to reduce their individual investments and also motivate the Prime Minister to fire the governor responsible. Without a measure of performance, the coefficient on governor would appear to be more strongly negative than it would in a perfectly specified model. To address this potential omitted variable bias, we would ideally like to have a measure of GDP growth, but provincial-level measures of GDP are not calculated on an annual basis. Also problematic are indicators of human welfare, such as number of vehicles or telephones, as they are measures of fixed assets that are plausibly endogenous to our measure of investment rates. To proxy annual changes in economic performance, we take advantage of two features of the Cambodian economy. First, according to the 2004 inter-census population survey, fertility rates are a relatively constant (0.5% annual change) among provinces but annual population growth varies tremendously (ranging from below 1% in Svay Rieng to almost 4% in Phnom Penh and Sihanoukville). The variation in population growth is almost entirely accounted for by internal migration, as citizens of poorer areas tend to move to more prosperous places in search of jobs in the growing garment and service sectors. Thus, population growth offers a suitable proxy for general economic performance. Along these same lines, we also measure the annual change in foreign tourists, as between 2003 and 2006 this was one of the primary drivers in the Cambodian economy and highly regionally concentrated. Siem Reap, home of the Angkor Wat temple complex (of Tomb Raider fame), and Phnom Penh, the capital city, have absorbed the vast majority of this lucrative market. Combined tourism and population growth give us a fairly robust measure of general performance in the Cambodian economy. Summary statistics of these variables are shown in Table 1.

⁹ For firms established before 2003, we use a linear projection to interpolate their initial assets in 2003, so that all firms are assessed from the same theoretical starting point of 2003.

¹⁰ While there are myriad other provincial control variables that could be used such as secondary school graduates or telecommunications, there are too few degrees of freedom at the provincial level to add these. Our models display the most important variables in Cambodian context, though a number of sensitivity tests were run to ensure that our results were robust to different provincial variables.

Table 1. Descriptive statistics and data sources

Variable	Description	N	Mean	SE	Max.	Med.	Min.	Source
<i>Panel A: Panel Analysis of Firm Investment Rate (Unit of analysis is firm-year during 2005–2006)</i>								
Investment rate	Growth in firm's total assets (%)	868	32.36	80.79	1198.40	14.47	–70.99	PBES
Dummy for change in governor	1 if change in governor during the year, 0 otherwise	868	0.31	0.46	1	0	0	Who's Who?
Tenure	Number of months current governor has been in office	868	25.08	14.84	48	22	9	Who's Who?
CPP dummy	1 if the governor at year end is from Cambodian people's party	868	0.74	0.44	1	1	0	Who's Who?
Initial total assets (<i>Natural Log</i>)	Firm assets in 2003 or at establishment after 2003	868	10.61	1.02	7.26	10.62	13.71	PBES
Firm age	Years since establishment	868	8.17	7.06	73	6	1	PBES
Electricity disruption	Number of electricity outages faced by firm in the past year	868	49.03	39.43	162.93	35.93	5.36	PBES
% of service & commerce revenue	Share of firm's revenue from service and/or commerce-related business (%)	868	86.99	32.66	100	100	0	PBES
Strength of land title	Scale from 4 (full registration certificate) to 1 (no documentation)	868	2.27	1.30	4	2	1	PBES
Population growth	Annual change in provincial population (%)	868	2.25	0.78	3.48	2.37	1.07	Who's Who?
Growth in foreign tourists	Annual change in number of foreign tourists (%)	868	89.63	171.31	670.75	29.85	–32.68	MOT

(Continued)

Table 1. (Continued)

Variable	Description	N	Mean	SE	Max.	Med.	Min.	Source
Literacy	Percentage of population literate	868	66.44	19.34	88.8	62	21	PBES
GDP per capita	Gross provincial product per capita	868	497.02	388.10	1269.21	305.22	207.42	EIC
Road coverage	Total kilometers of road covered by asphalt or laterite (%)	868	0.35	0.21	0.69	0.29	0.13	JICA
<i>Panel B: Cross-Sectional Analysis of Governor Tenure Length (Unit of analysis is province)</i>								
Average tenure of provincial Governor	Average tenure in months of governors in each province during 1998–2003	20	30.25	8.73	42	25.46	18.68	Who's Who?
Length of tenure of most recent governor	Number of months current governor has been in office	20	27.35	15.82	48	22	9	Who's Who?
Total number of Governors	Number of governors during the years 1998–2003	20	2.21	0.83	1	2	4	Who's Who?
Commercial sex workers per 1000	Estimated total number of commercial sex workers per 1000 citizens	20	1.69	3.44	15.32	0.52	0.13	Steinfatt
CPP Seat in 1998 (%)	Parliamentary seats occupied by the Cambodian People's Party in 1998 (%)	19	3.21	1.81	7	3	1	Carr
Change in CPP Seat, 1998–2003 (%)	Change in the number of parliamentary seats occupied by CPP in 2003 (%)	19	16.23	30.23	100	0	–25	Carr

(Continued)

Table 1. (Continued)

Variable	Description	N	Mean	SE	Max.	Med.	Min.	Source
Poverty	Scale ranging from 1 (less severe poverty) to 5 (more severe poverty)	20	0.06	0.09	0.42	0.03	0.01	EIC
GDP	Gross provincial product in 2003	20	239.4	318.5	1493	157	10.21	EIC
Average annual change in population (1998–2003)	Average annual change in population between 1998 and 2003	20	2.52	1.28	5.44	2.5	0.65	NIS
Pailin dummy	1 if province is Krong Pailin province	20	0.04	0.20	1.00	0.00	0.00	

Panel C: Cross-Sectional Analysis of Business Environment Predictability (Unit of analysis is individual firm in 2006)

Predictability of bribes	Derived from the question “Do you agree with this statement: Firms in my line of business, usually know in advance how much this ‘additional payment’ is, (0 No, 1 Yes)?”	475	0.29	0.46	1	0	0	PBES
Predictability of service delivery	Derived from the question “If a firm pays the required ‘additional payment’ how often is the service also delivered as the firm expected? (1 Never to 5 Always)”	475	2.36	1.32	5	2	1	PBES

(Continued)

Table 1. (Continued)

Variable	Description	N	Mean	SE	Max.	Med.	Min.	Source
Predictability of regulatory policy	Derived from the question “How informed are you about rules, laws, and regulations which materially affect your business (1 Not Informed to 5 Fully Informed)?”	475	1.61	0.94	5	1	1	PBES
Property right stability	Formed from two questions: For firms that own their land, “Please evaluate the risk that your land will be expropriated by the provincial or national government for other purposes (1 Very Low to 5 Very High)” For firms that rent their land, “Please evaluate the risk of changes in rent conditions that materially affect your business (1 Very Low to 5 Very High)”	475	3.66	1.39	5	4	1	PBES
Electricity stability	Calculated from zero minus the natural logarithm of the number of electricity	475	-2.72	1.56	0	-2.40	-6.58	PBES

Source: International Finance Corporation (2006); Who’s Who in Cambodia (2002–2002); Japanese International Cooperation Agency (JICA) (2006); Economic Institute of Cambodia (2003–2006); National Institute of Statistics (NIS) (2008); Carr (2007); Steinfatt *et al.* (2002).

The regression results are reported in Table 2. All regressions are estimated with robust standard errors, clustered at the provincial level. In Models 1 to 6, we use a dummy for changes in governor as a key causal variable. They show that the change in provincial governor is negatively associated with firms' investment rates in the fully specified model in Model 3. Firms in provinces with new governors, invest about 16 percentage points per year less than their counterparts with longer-serving executives. This result supports *H1* and is robust to adding firm-level, provincial-level, and performance control variables to the regression.

Moving on to the controls: Larger and older firms have slower growth. As expected, having a CPP governor increases investment by 12 percentage points a year, as entrepreneurs believe they face less risk under the ruling government. Literacy is significant, but in the wrong direction. This is not entirely surprising, as most investment is in unskilled garment and tourist sectors. Economic performance, measured by growth in foreign tourists is significant and substantively important. A percentage point increase in visitors yields a 0.03 percentage point increase in domestic investment. Notably, adding the performance variables increases the substantive effect of governor change marginally, rather than weakening the correlation as we conjectured above. We run sensitivity checks by excluding firms in Siem Reap (the home of Angkor Wat; Model 4) and Phnom Penh (Model 5) from our sample.¹¹ In Model 6, we use sector fixed effects instead of using the percentage of firm's revenue from commerce and service. The overall conclusion does not change. In fact, the substantive effect is actually stronger after each of these robustness tests. As an alternative test, we use the average tenure of provincial governors as the key causal variable instead of the dummy variable for the change in governor. The results are shown in Models 7 to 12. The overall conclusions are similar to those above. Each year of governor tenure adds about an additional 0.8 percentage points to the investment rate, all else equal.¹²

A further concern one may have is that changes in governors are possibly endogenous. Governor changes might be more likely to occur in corrupt provinces. As a result, our analysis would not achieve the separation in the predictability and the level of corruption necessitated by the model. We turn to this issue in the next section.

¹¹ A part of this robustness test, one province at a time was dropped from the analysis systematically in order to ensure that results were not driven by outliers. Not a single exclusion significantly altered the results on governor change. We present the results of only the two most influential cases.

¹² In another robustness test, we divided firms by investment size (above or below the median size) and by age (older or younger than five years). We find that larger and younger firms have significantly lower investment rates after governor change. Old and small firms also have negative investment rate coefficients, but these are not significantly different from 0. These results make sense; large firms are more visible and easier to harass. In an unpredictable environment, they would certainly be the first to rein-in expansion and avoid drawing attention. Young firms would also slow down, because they are less attuned to the Cambodian policy environment and less established. These robustness tests are provided in the on-line appendix accompanying this paper.

Table 2. (Continued)

Dependent Variable: Total Investment Rate (%) Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	All Firms	All Firms	All Firms	No Angkor	No Phnom Penh	All Firms	All Provinces	All Provinces	All Provinces	No Angkor	No Phnom Penh	All Firms
Annual growth in foreign tourists (%)			0.031 (0.012)	0.028 (0.013)	0.022 (0.019)	0.031 (0.012)		0.034 (0.015)	0.037 (0.016)	0.036 (0.021)	0.017 (0.013)	0.036 (0.016)
Annual growth in population (%)			5.92 (6.03)	2.269 (3.15)	13.6 (6.82)	5.79 (5.97)			8.23 (7.59)	4.64 (3.23)	16.6 (9.81)	8.17 (7.67)
Sector fixed effects	No	No	No	No	No	Yes	No	No	No	No	No	Yes
Constant	199.1 (51.4)	220.1 (46.6)	225.9 (44.4)	224.5 (59.8)	221.5 (47.0)	232.2 (43.8)	199.4 (53.1)	220.1 (51.7)	213.8 (49.6)	207.5 (62.0)	199.9 (48.6)	220 (48.9)
Number of observations	868	868	868	754	718	868	868	868	868	754	718	868
Number of firms	474	474	474	414	389	474	474	474	474	414	389	474
Pseudo R-squared	0.041	0.046	0.05	0.05	0.055	0.053	0.039	0.048	0.049	0.059	0.056	0.052
Root mean squared error	72.9	73	72.1	73	66.2	72.2	71.9	71.9	71.1	71.5	65.5	71.1

The unit of analysis is firm-years (2005 to 2006). All models are OLS panel estimates implemented using *STATA's xtreg*. Robust standard errors (clustered at the province level) are in parentheses. Because 2004 is the base year, we can only calculate investment rates for 2005 and 2006. For firms established before 2003, we use a linear projection to interpolate their initial assets in 2003, so that all firms are assessed from the same theoretical starting point. Models 1–6 use a dichotomous measure of change in governor as the key causal variable. Models 7–12 substitute the dichotomous measure for a continuous measure of tenure of the most recent governor.

POLITICS BEHIND THE REPLACEMENT OF PROVINCIAL GOVERNORS

Between 2003 and 2006, twenty-nine Cambodian Governors were replaced by Prime Minister Hun Sen.¹³ Unfortunately, from a methodological standpoint, the firings do not appear to be random. Explanations abound for the frequency of the changes, so it is important to reverse-engineer the dismissal process to understand its implications for our analysis of firm behavior.

Hun Sen has claimed that the purges, which also included fourteen deputy governors, were necessary to trim down bloated provincial bureaucracies and reduce corruption, arguing that many local officials purchased their positions with bribes and were not skilled administrators (Samean 2006). Indeed, a number of governors like Puth Chandarith of Kampot province had corruption charges filed against them prior to the dismissal (Naren 2006). We must take Hun Sen's claims very seriously, as it could be potentially damaging for our analysis. If it is true that only corrupt governors were targeted, then we must conclude that provinces, which retained governors, are less corrupt as well as more predictable environments — both leading to higher investment of firms. Under these circumstances, we cannot separate corruption and predictability analytically.

H2: More corrupt governors are more likely to be dismissed from office.

Most Cambodian analysts, however, claim that corruption is a red herring to disguise the fact that the purges are in fact politically motivated, dating back to a coalition government formed by Funcinpec, the royalist party, and CPP at the close of elections 2003. The rapid rise of the Sam Rainsy Party (SRP) in urban centers led to a dilemma where the CPP held only 60% of seats in the National Assembly, a clear majority but shy of the two-thirds majority required by the 1993 Constitution for a range of “significant events” (Heder 2005, McCargo 2005). These events include extension of parliament, removal of parliamentary immunity, election of the parliamentary president and vice-presidents, approval of the government, and dismissal of a member (Downie 2000). In short, without the two-thirds majority, Hun Sen could not actually form a government. If the SRP and Funcinpec could hold together in a loose coalition called the Alliance for Democrats (AD), they believed they could stall the formation of government and extract significant demands out of Hun Sen, such as an independent electoral commission and the abolition of key patronage strongholds (Heder 2005). Through a variety of inducements (particularly to Funcinpec leader Prince Ranariddh) and threats, Hun Sen was able to break-up the AD and lure Funcinpec into a coalition government. Hun Sen retained

¹³ Hun Sen became Prime Minister during the Vietnamese occupation of Cambodia in 1985. He later solidified his position through a clever use of patronage when Vietnam withdrew its troops from Cambodia in 1991 (Osborne 2004). Though Hun Sen's Cambodian People's Party (CPP) lost the first free and fair elections sponsored by the United Nations Transitional Authority in Cambodia (UNTAC) in 1993, he was permitted to stay in office as second Prime Minister, while CPP remained in control of the government apparatus. In 1997, Hun Sen organized a coup against the 1st Prime Minister Prince Ranariddh of the Funcinpec Party and assumed the role of sole Prime Minister. He retained that position in the 1998 election and has remained in office thereafter. As a result, Hun Sen has been the most powerful leader in Cambodia for over 23 years (Kingsbury 2001).

control of the Prime Minister's Office, Ranariddh became president of the National Assembly, and all discussion of political reform was dropped from the agenda (Heder 2005). As part of the deal, CPP and Funcinpec officials divided up a range of key government positions including ministries and governorships (Cambodia Daily 2004a, 2004b). Most of the new Funcinpec governors were brought in to replace Funcinpec governors from the previous government, so the deal making only yielded two new governorships for Funcinpec in total. Nevertheless, at the end of 2004, Funcinpec possessed nine of the twenty-four top provincial leadership spots.

The bargain forged by Funcinpec, however, came at a cost. One senior Funcinpec official remarked that the party had made a strategic decision that its relationship would forever be "subordinate, subservient, and lucrative" (Heder 2005). The decision divided the party and placed Funcinpec members who accepted political positions in a very weak bargaining position vis-à-vis the CPP. As veteran Funcinpec members who resisted the coalition were ousted, all of the new leadership owed their lucrative new positions to Hun Sen. According to analysts, it did not take long for Hun Sen to capitalize on this weakness by playing Funcinpec officials off against one another and using the divisions to begin rescinding the appointments immediately (Igawa 2006, Samean 2006). As they see it, trumped up charges of corruption and competence have been merely a means for purging Funcinpec officials and replacing them with CPP loyalists. Higher-level Funcinpec officials have been powerless to combat the purges, because they too owe their government positions to Hun Sen. According to Koul Panha of the Cambodian Committee for Free and Fair Elections, even Ranariddh and Secretary-General of the Funcinpec Party, Nhieuk Bun Chey, were hand-cuffed to resist the assault, leading to a fiery party meeting at Funcinpec headquarters in the Summer of 2006. Panha specifically singled-out Chey, claiming that he did not resist purges of Funcinpec members for fear of losing his own job (Samean 2006).

Analysts claim the impotence of Funcinpec gave CPP license to remove governors on the specious grounds of corruption (Igawa 2006); pointing out that all of the accused governors were members of Funcinpec. In fact, the CPP governor of Ratanakiri province, Kham Khoen, actually continued to sit in office for a year after he had been charged with taking bribes and destroying the government (Naren 2006). As a result, by the end of 2006, only three of the twenty-four governor positions were held by members of the Funcinpec party. This political game leads to the next hypothesis.

H3: CPP governors were less likely to be replaced than their Funcinpec peers.

Despite the net loss of seats in the parliament to Funcinpec, it is important to note that CPP governors have also been targeted for replacement and transfers to new provinces. Eleven of the twenty-nine replacements were CPP members, all of which were replaced by new CPP governors. Of these, six were immediately transferred to new provinces, two waited for six months to a year before receiving a new government appointment, and three were permanently removed. The motivations behind the shake-up of CPP officials are not clear, though there has been some speculation that it is designed to bolster CPP support. The party actually only received 47.4% of the popular vote in 2003, despite receiving 60% of the seats in the National Assembly due to Cambodia's unusual

“highest-average” system of proportional representation, which is biased toward large parties (Gallup 2005, McCargo 2006). Conventional wisdom is that Hun Sen has sought to replace leaders in provinces where the CPP lost votes and seats in between the 1998 and 2003 elections.

H4: Governors in provinces where the CPP lost parliamentary seats are more likely to be replaced than provinces where the CPP remains popular.

EMPIRICAL ANALYSIS OF CHANGES IN PROVINCIAL GOVERNOR

We test hypotheses H2–H4 in a cross-sectional analysis at the provincial level for twenty provinces.¹⁴ We use the tenure of provincial governors between 2003 and 2006 as our dependent variable. The key independent variables include a proxy for corruption, a dummy for whether the governor was a member of CPP in 2003 and CPP Seat Change, capturing the percentage of seats lost or gained by CPP in a particular province between 1998 and 2003.

The data on provincial governors and their affiliated parties are derived from the *Who’s Who in Cambodia?* (2003–2002), and *Council of Ministers* documents (2003–2006). The information lists the names, the date of appointment and the affiliated party of each provincial governor. As shown in Table 3, twelve out of twenty-four provincial governors in 2003 are from CPP but the number increases to twenty-one in 2006.¹⁵ Five provinces did not have any governor change during 2003–2006, while the governor had been replaced three times in Takeo province. Note that none of the replacements was a Funcinpec member entering in place of CPP. With this information, we compute the length of the tenure of each governor (in months). Our key dependent variable is the tenure of the most recent governor, as this allows us to compare all provinces directly, because all are similarly right-censored. If the most recent governor has a short tenure, it means that the province recently experienced a replacement. The longer the tenure implies the more stability in the policy environment. As robustness tests, we also use the average tenure of all governors and the total number of governors in a province as dependent variables. Table 3 shows the percentage change in CPP proportion of National Assembly seats during 1998–2003 (Carr 2007). Across twenty-four provinces, CPP experienced net gains in the seats in eight provinces and net losses in two provinces.

With no standardized measure of corruption available across all provinces, we exploit a tragic feature of the Cambodian economy as a proxy — the number of commercial sex workers (CSW) per 1,000 citizens in each province. The sex industry presents a particularly easy and attractive target for bribe extraction by local officials. First, both prostitution and human trafficking are illegal in Cambodia. Commercial sex does take place, but it generally occurs in massage parlors, dance halls, hotels, and karaoke bars, where entrepreneurs have been licensed for a separate business activity (Kristof 2004,

¹⁴ Four provinces were dropped from the analysis due to data unavailability of one or more variables.

¹⁵ The year 2007 is beyond the scope of this study, but one more Funcinpec Governor was replaced by a CPP member in Kampong Speu province.

Table 3. Changes in provincial Governors and parliamentary seats

Province	Name of Governor in 2006	Party in 2003	Party in 2006	Number of Governor replacements since 2003	Change in Seats 1998–2003 (%)
Banteay Meanchey*	On Sum	FUN	CPP	2	33
Kandal*	Khim Bo	FUN	CPP	2	25
Krong Kep	Has Sareth	FUN	CPP	2	0
Mondolkiri	Lay Sokha	FUN	CPP	2	0
Oudor Mean Chey	Pech Sokhen	FUN	CPP	2	—
Prey Veng	Ung Samy	FUN	CPP	2	–14
Siem Reap*	Sou Phirin	FUN	CPP	2	33
Stung Treng	Loy Sophat	FUN	CPP	2	0
Kampong Cham*	Hun Neng	CPP	CPP	1	14
Kampong Chhnang*	Touch Marim	CPP	CPP	1	0
Kampong Speu	Chap Nhalivuth	FUN	FUN	1	–50
Kampong Thom	Nam Turn	FUN	CPP	1	0
Kampot*	Thach Khorn	FUN	FUN	1	0
Kratie	Kham Phoeun	CPP	CPP	1	100
Krong Pailin	Y Chhian	CPP	CPP	1	—
Phnom Penh*	Kep Chutema	CPP	CPP	1	0
Pursat	Chhay Sareth	CPP	CPP	1	50
Svay Rieng*	Cheang Orm	CPP	CPP	1	0
Battambang*	Prach Chan	CPP	CPP	0	67
Koh Kong	Yuth Phouthang	CPP	CPP	0	0
Preah Vihear	Preap Tann	CPP	CPP	0	0
Ratanakiri	Kham Koeun	CPP	CPP	0	0
Sihanoukville*	Say Hak	FUN	FUN	0	0

Note: Name of Governor in 2006 is the name of governor at the time of the survey in 2006. Party in 2003 is the name of the affiliated party of the 2003 provincial governor. Party in 2006 is the name of the affiliated party of the 2006 provincial governor. Number of Governor Replacements since 2003 is the number of times that provincial governors were replaced in each province since 2003. Change in Seats 1998–2003 is the percentage change during 1998–2003 of the parliamentary seats occupied by CPP. *Indicates the ten provinces in the sample of this paper.

2007). Second, while no official statistics have been compiled, unsubstantiated estimates of the industry's size are massive, with the largest putting revenues from the sale of sex as high as 10% of Cambodia's GDP, which stood at USD 6.6 billion in 2006 (EIU 2006, p. 5). Given this, it is not surprising that nongovernmental organizations (NGOs) working to combat human trafficking frequently report of civil servants — in particular, members of the police force and military — receiving payments from brothel owners in both money and in kind. Frequent bribes to police and local officials are used as protection to ward off a crack down on the illicit secondary activity (Kristof 2006a, Kristof 2006b). In fact, because of the awkward legal arrangement, many of the commercial sex establishments are actually owned by police officers and local officials (Kristof 2007). Several high profile

incidents of traffickers escaping prosecution also suggest that they have patrons at even higher levels of government (Schwarz 2004).

While information is not available on the exact amount of bribes to provincial officials, health researchers have worked very hard to document the number of CSW in the hope of developing targeted sex-education programs to ward off an impending HIV crisis (Sopheab *et al.* 2003). The most thorough analysis was performed by Steinfatt *et al.* (2002) and Steinfatt (2003), who hired cyclo and motorcycle taxi drivers to map out all locations for purchasing commercial sex, followed by a series of extensive interviews at each of the establishments identified. The analysis yielded estimated commercial sex populations for every province in Cambodia. The total number of 22,000 for both direct and indirect workers has been controversial, because it was far lower than the 80,000 announced by a consultative group of NGOs, which has great currency but had no methodological underpinning.

For us, the data is useful because it provides estimates for each province, while other studies only conjecture about Phnom Penh and a few other cities. It is possible that Steinfatt *et al.* (2002) may have underestimated to some degree, but their rigorous methodology is consistent across geographical units, and at the very least should yield systematic under-reporting across all provinces. Overall, the results indicate large concentrations of sex workers in major cities such as Sihanoukville (4.7 CSW per 1,000) and Phnom Penh (3.4 CSW per 1,000). Nevertheless, other provinces also have sizable populations. One notable province is Pailin (15.3 CSW per 1,000), a gem-rich province tucked along the border of Thailand, which due to a series of informal agreements that ended Khmer Rouge, was governed as a relatively autonomous fiefdom for several years (Gottesman 1995). In fact, all of the Khmer Rouge top leaders presently on trial in Phnom Penh made their homes in Pailin.

In using CSW as a proxy for corruption, we do not mean to imply an argument about the direction of the causal relationship between the two variables, only that they are highly correlated. As most analysts of corruption have bemoaned, it is very hard to observe and measure corrupt behavior in practice, as it is multi-faceted and amorphous. Because CSW is illegal and can only thrive when civil servants willfully turn a blind eye to the practice, it provides one observable implication of a culture of corruption among local officials. Our working assumption is that local officials who willfully violate their duties in one arena are more likely to do so in other arenas. An assumption that Fisman and Miguel (2006) have demonstrated holds internationally in the strong correlation between parking tickets received by foreign diplomats in New York City the perception of corruption in their home countries, as measured by international indices. Moreover, there is reason to suspect that the practice of taking bribes is not limited to a particular subset of businesses. If officials in a province are willing to allow proprietors of illegal sex to prosper in exchange for payment, they would certainly be willing to extend this service to other business arenas, such as police officers soliciting protection payments or officials charging a fee for expediting normal business services.

Figure 2 demonstrates this correlation by comparing CSW per 1,000 in each province to data from 2006 Provincial Business Environment Scorecard (PBES) on four activities commonly experienced by firms in Cambodia: (1) the percentage of firms paying bribes

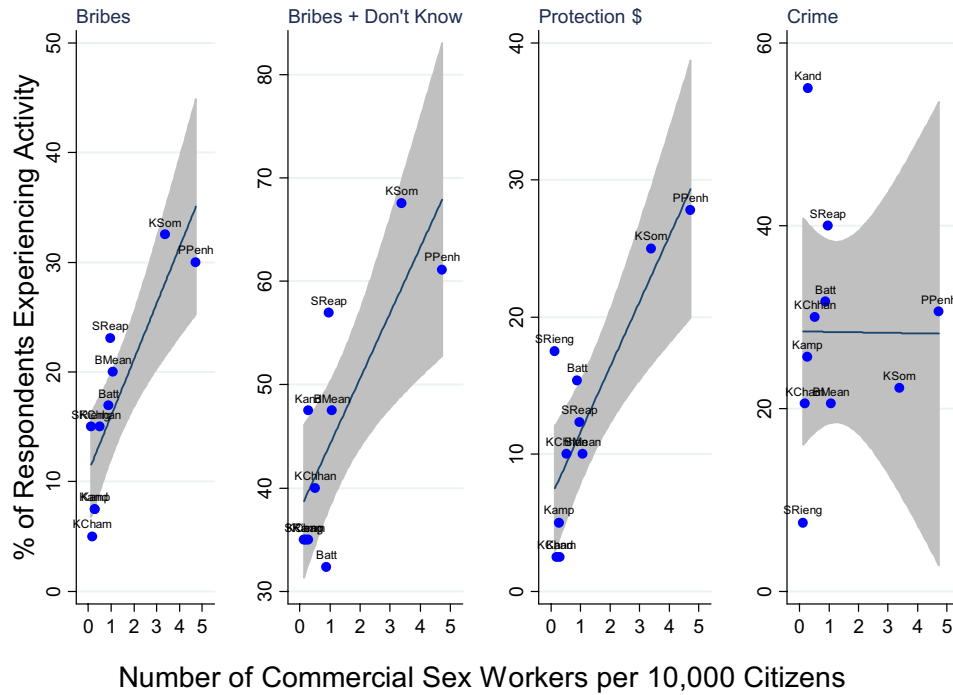


Figure 2. Relationship between commercial sex workers, crime, and corruption.

Source: Lines represent fitted values, markers denote observed values, and shaded areas depict 95% Confidence Intervals. Among the ten provinces, CSW is correlated with bribes at (0.85), bribes or do not know if firm paid a bribe at (0.80), protection payments at (0.84), and crime at (−0.006).

to local officials; (2) those paying bribes or claiming they “did not know” if they paid or not; (3) those paying protection payments to local police officers; and (4) those experience a crime such as robbery, vandalism, or arson. Notice that the first three are all strongly correlated with the scope of corrupt behavior on the part of some local officials.¹⁶ In fact, all of the correlations are above 0.8 and significant at the 0.01 level. The strong correlation between these two independently collected sources of data indicates the utility of sex workers as a proxy for corruption. On the other hand, CSW is not correlated with the percentage of firms experiencing a crime in the past year at all. This is important, as it indicates that CSW is part of general culture of corruption and not associated with high crime environments, which can also reduce investment but through a very different causal pathway.¹⁷

¹⁶ We distinguish scope or the breadth of corruption from the scale or size of the actual bribe payments, which is much harder to measure and generally closely associated with the size of firms.

¹⁷ Because some readers may be suspicious of scatter plots employing only 10 provinces, we also tested CSW per 1,000 citizens in regressions with firm-level data from the 500-firm PBES survey with

Other independent variables include: a dummy if the governor prior to replacement was from the CPP; GDP, as governors of wealthy provinces may be more likely to retain positions; a dummy variable to control for the special status of *Pailin* Province; and *Poverty*, measured by a commonly used 1–5 severity index. *Poverty* is used to account for potential omitted variable bias with commercial sex workers, as commercial sex may seem a more attractive employment option to women in dire straits. According to a 2003 government survey, direct female sex workers have a mean monthly income of \$80, while beer-promoters and karaoke workers make on average \$92 and \$71, respectively (Ministry of Health 2003). In the same year, Cambodian GDP per capita was \$28 per month (EIU 2006), illustrating poignantly the economic incentives of the profession for poor families. Once again, we use the change in population (1998–2003) and the change in foreign tourists (2002–2003) as indicators of economic performance. Note that the data for all of the independent variables are prior to or as of 2003.¹⁸

Table 4 shows the results of our analysis of the changes in provincial governor. In Panel A, we use the tenure of the most recent governor in the province as the dependent variable. All governors in this test were active in 2006, so a shorter tenure reveals a recent change in the administration. As shown in Models 1–5, *CSW per 1,000* is positively associated with provincial governor tenure; leading to a rejection of *H2*. Note that this is the exact opposite of Hun Sen’s claim. It is the least, rather than the most, corrupt governors that are being replaced. Though survey questions about corruption should always be treated with some caution, results are confirmed using the PBES data. 20% of firms in provinces with new governors believe bribes are a regular part of doing business in their province, as opposed to 31% in provinces with old governors — a difference that is significant at the 5% level. This result is consistent with other reports of the importance of patronage involved in the Cambodian polity. More corrupt governors are better able to pass money up to their patrons in Phnom Penh (St. Johns 2005), allowing them to retain the positions longer, build a dense network of clients, and a mass enormous personal wealth. Because of this, the longevity of particular provincial officials has been one of the chief complaints of Sam Rainsey (US-AID 2004).¹⁹ In terms of our analysis of firm–investment behavior, this result implies that governors with longer tenure are likely to be more corrupt and therefore any investment advantage for firms must be attributed to predictability.

appropriate firm and province-level controls (firm size, age, sectors, property rights, provincial GDP, and provincial infrastructure), finding very similar results. Each CSW per 1,000 leads to a 15% marginal probability of a bribe payment and a 12% marginal probability of a protection payment (both are significant at the 0.01 level). Experiencing a crime, however, is not correlated with CSW at all. These results are available in our online appendix.

¹⁸ Alternatively, one may prefer using first differences in control variables rather than levels as the explanatory variables in this regression specification. However, data are available only in cross-sectional form. This problem also makes panel data analysis impossible. Provincial GDP prior to 2001 is also of dubious quality, making it impossible to look at the impact of changes in GDP on governor tenure.

¹⁹ David Koh has documented a similar pattern of local–central relations in Hanoi, Vietnam, regarding the enforcement of restrictions on Karaoke bars (Koh 2001).

Table 4. Corruption and Governor's Tenure

Dependent Variable	Panel A: Length of Tenure of Most Recent Governor (Months)				Panel B: Average Tenure of Provincial Governors per (Months)				Panel C: Total Number of Governors							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
Commercial sex workers per 1,000	2.23 (0.72)	8.88 (3.39)	8.57 (4.41)	5.64 (2.08)	9.96 (2.13)	1.65 (0.38)	3.96 (1.95)	4.48 (2.62)	3.15 (1.23)	5.94 (1.07)	-0.0212 (0.018)	-0.183 (0.093)	-0.136 (0.096)	-0.215 (0.059)	-0.0723 (0.058)	
Dummy for CPP	16.4 (5.40)	17.1 (5.94)	16.3 (5.83)	16.3 (5.83)	16.5 (5.71)	1.65 (0.38)	5.51 (2.74)	6.15 (2.78)	5.74 (2.77)	4.88 (3.77)		-0.274 (0.13)	-0.273 (0.13)	-0.236 (0.15)	-0.242 (0.12)	
CPP Seat in 1998 (%)	-0.69 (2.30)	-0.69 (2.64)	-0.96 (2.64)	-2.08 (1.71)			-0.837 (1.42)	-0.830 (1.59)	-1.309 (1.02)			0.039 (0.068)	0.054 (0.073)		0.073 (0.049)	
Change in CPP Seat, 1998-2003 (%)	-0.027 (0.11)	-0.027 (0.14)	-0.047 (0.14)	-0.062 (0.12)			-0.096 (0.092)	-0.103 (0.11)	-0.108 (0.092)			0.002 (0.003)	0.002 (0.003)		0.002 (0.003)	
GDP	-0.013 (0.01)	-0.013 (0.02)	-0.013 (0.02)		-0.018 (0.01)		-0.003 (0.006)	-0.006 (0.009)		-0.01 (0.005)		0.0005 (0.0003)	0.0005 (0.0004)	0.0006 (0.0003)		
Average annual change in population (1998-2003)			0.207 (2.8)	1.67 (2.48)	-0.133 (2.3)			-0.696 (1.43)	0.024 (1.02)	-1.22 (1.09)		-0.054 (0.070)	-0.054 (0.070)	-0.037 (0.064)	-0.096 (0.052)	

(Continued)

Table 4. (Continued)

Dependent Variable	Panel A: Length of Tenure of Most Recent Governor (Months)				Panel B: Average Tenure of Provincial Governors per (Months)				Panel C: Total Number of Governors						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Change in foreign tourists (2002–2003)			–0.004 (0.003)	–0.004 (0.003)	–0.0037 (0.002)			–0.004 (0.002)	–0.003 (0.002)	–0.002 (0.002)			0.00002 (0.0001)	–0.00001 (0.0001)	–0.00001 (0.0001)
Poverty				–71.8 (91.8)					–40.9 (41.6)						3.35 (2.17)
Dummy for Palin					–25.7 (59.4)					–9.49 (43.6)				3.501 (1.85)	
Constant	23.6 (3.43)	13.2 (9.36)	14.2 (10.9)	16.9 (11.2)	11.4 (7.53)	27.7 (1.82)	27.2 (6.67)	29.4 (7.86)	30.7 (7.70)	26.7 (4.94)	0.799 (0.091)	0.82 (0.28)	0.898 (0.31)	1.051 (0.20)	0.817 (0.31)
Observations	20	19	19	19	20	20	19	19	19	20	20	19	19	20	19
R-squared/Pseudo	0.24	0.63	0.64	0.64	0.67	0.38	0.55	0.60	0.60	0.56	0.0032	0.04	0.04	0.038	0.045
R-squared error	14.21	11.09	11.81	11.93	10.96	7.49	6.68	6.88	6.89	7.00					
Log likelihood											–28.52	–26.72	–26.66	–27.73	–26.58

Note: Unit of analysis is the province. Regressions in Panels A and B are OLS. Regressions in Panel C are negative binomial regression. Robust standard errors are in parentheses. Palin has an extraordinary number of sex workers, but did not have elections in 1998. Therefore the fifth model of each set tests whether the results are robust to including a Palin Dummy.

Model 2 presents the results when we add a dummy for CPP and a change in CPP seats. The regression coefficient of *CSW per 1,000* remains positive and statistically significant. On average, each one-unit shift in *CSW per 1,000* results in the increase in average governor tenure by three months. *H3*, however, is confirmed. CPP governors are more likely to hold on to their positions than their Funcinpec counterparts, serving 16 months longer on average. But it does not appear that the lost seats during 1998–2003 (*H4*) has any effect on government tenure. These results are robust when we control for other provincial characteristics. Notably, we find that GDP has a negative relationship with tenure, indicating, perhaps, that Hun Sen attempted to secure control of wealthy, high-performing areas. Other control variables are in the predicted direction, but are not statistically significant.

Panels B and C of Table 4 present the results when we use the *average tenure of all governors since 2003* and the *total number of governors since 2003* as dependent variables. The overall conclusions do not change. Holding all other variables constant, each one-unit shift in *CSW per 1,000*, the average tenure of the governors increases by 4.5 months and the total number of governors over the past 10 years declines by about one-fifth. A CPP governor is less likely to be replaced and CPP seat change does not seem to affect the changes in provincial governor.

The fact that corruption and party affiliation are the major predictors of changes in governor affects our analysis in the previous section because it causes endogeneity bias when we test hypothesis *H1*. Since changes in governor are negatively correlated with the degree of corruption, endogeneity should bias our results toward a finding that investment rates in more corrupt provinces (without changes in governor) should be lower than firms in less corrupt provinces (which experienced leadership changes). In other words, this bias should predict a positive relationship between governor changes and investment rates — firms freed of corruption should invest more. However, even with this endogeneity bias, we still find a strong negative relationship between governor changes and firm investment in the previous section.²⁰

Table 4 also provides a clue as to how we can address endogeneity bias in a more sophisticated manner. Among the two most robust indicators of governor tenure is the party affiliation of the governors in 2003, demonstrating empirically that Hun Sen has been systematically unwinding his power-sharing arrangement with the Funcinpec in 2003. Because the two parties were in a power-sharing arrangement and the Cambodian party system is far more patronage-based than programmatic (Heder 2005, McCargo 2005), there is very little reason to suspect that the party of the original governor in 2003 has much impact on firm investment decisions a year or two later. This is confirmed by bivariate correlations. A lagged CPP dummy is significantly correlated with change in

²⁰ An alternative possibility suggested by an anonymous reviewer is that reporting bias may be correlated with unpredictability in the province. Firms with less trust in officials may be more afraid to report their wealth accurately. This is an important possibility but one that is counter-veiled by our findings (discussed below) that: (1) older governors are likely to be more corrupt and (2) that there is no significant difference between transferred governors, of whom firms have some information about, and of others who they do not.

governor (-0.33) and tenure of the most recent governor (-0.47), but its relationship with firm investment is statistically indistinguishable from zero (0.02). We re-run our original estimations of firm investment rates, using a one-year of lag of CPP dummy as our instrument in an IV-2SLS procedure.²¹

These results, which can be seen in Table 5, confirm the utility of the instrument and our original findings. Lagged CPP is a strong determinant of our key causal variables, leading to an estimated 40% in reduction in the probability of governor replacement (Model 1) and 8.6 months longer in the tenure of a sitting governor (Model 3), replicating our results in Table 4. The instrument also strongly passes two tests of under-identification (Anderson Canonical LR Test) and instrument strength (Cragg–Donald F -Statistic). The rule of thumb for the Cragg–Donald F -test is a score of 10, but in both models the F -test is several times that size. Moreover, the second-stage results are in the same direction as the original models and substantively large. The size of the coefficients on governor change and tenure are slightly larger in the IV-2SLS than in the OLS model, but the differences are very small.

In sum, we find that endogeneity is not a threat to our findings from the panel analysis above. In fact, we find that corruption is actually higher among governors with longer tenures. However, corruption in these provinces is also more predictable. Since we find that firms in the provinces with long-tenured governor invest more than firms in provinces with short-tenured governors, the overall findings suggest that predictability of corruption has a stronger effect on firm investment than the level of corruption itself.

DO CHANGES IN GOVERNOR AFFECT INVESTMENT THROUGH CHANNELS OTHER THAN CORRUPTION?

Thus far in this analysis, we have assumed that a change in governor is associated solely with changes in predictability of corruption. While the fact that governor positions are purchased as investments lends credibility to this assumption and Cambodian analysts generally agree, there are reasons to suspect that the assumption may be too cavalier. Changing the executive may affect a number of components of the business environment outside of corrupt activities. Perhaps it is these general changes in the business environment and not the predictability of corruption that drive our results. In this section, we divide this general hypothesis into three specific predictions and test their applicability.

First, one can imagine that changes in governors may result in simple bureaucratic delays, as the new leadership settles into power. Business registration and licensing may slow down for a period as new actors adjust to their roles, slowing their investment growth. Second, leadership changes could alter regulatory policy or infrastructure provision. Instability in these arenas may also impact firm investment behavior. Finally, change in provincial leaders could destroy the soft information about the governors that firms have gained through observation and repeated interaction. Firms' evaluation of

²¹ For simplicity, we treat the first stage in the governor change model as a linear probability model with robust standard errors.

Table 5. Instrumental variable estimation of change in Governor and firm investment

Dependent variable: Total investment rate (%)	IV for dummy for governor change		IV for dummy for tenure change	
	First stage (1)	Second stage (2)	First stage (3)	Second stage (4)
Dummy for Governor change		-27.1 (15.9)		
Tenure of Governors (Months)				1.27 (0.73)
CPP dummy ($t - 1$)	-0.403 (0.056)		8.59 (0.98)	
CPP dummy (t)	0.483 (0.041)	18.86 (9.43)	-1.52 (0.48)	7.7 (5.59)
Initial total assets (<i>Natural Log</i>)	-0.002 (0.012)	-16.3 (4.34)	1.07 (0.31)	-17.58 (4.56)
Firm age	0.0002 (0.002)	-0.981 (0.31)	-0.088 (0.046)	-0.876 (0.29)
Electricity disruption	-0.00005 (0.0006)	0.075 (0.10)	0.084 (0.015)	-0.03 (0.097)
% of Service & commerce revenue	-0.0003 (0.0003)	-0.068 (0.07)	0.013 (0.007)	-0.076 (-0.07)
Strength of land title	-0.007 (0.009)	3.65 (1.61)	-0.083 (0.24)	3.94 (1.68)
Literacy	-0.002 (0.0008)	-0.312 (0.23)	-0.012 (0.02)	-0.25 (0.22)
GDP per capita	-0.0003 (0.00007)	-0.002 (0.012)	0.036 (0.0014)	-0.04 (0.030)
Road coverage	0.014 (0.11)	-11.43 (16.7)	-45.07 (2.25)	45.43 (35.6)
Angkor dummy	0.058 (0.053)	32.3 (9.58)	-13.11 (0.98)	47.38 (15.2)
Annual growth in foreign tourists (%)	0.0003 (0.00007)	0.028 (0.021)	-0.01 (0.001)	0.034 (0.02)
Annual growth in population (%)	-0.057 (0.028)	2.37 (3.58)	-0.2 (0.59)	4.16 (3.76)
Constant	0.595 (0.15)	215 (55)	7.38 (3.72)	189.6 (53.3)
Number of observations	869	868	869	868
Number of firms	474	474	474	474

(Continued)

Table 5. (Continued)

Dependent variable: Total investment rate (%)	IV for dummy for governor change		IV for dummy for tenure change	
	First stage (1)	Second stage (2)	First stage (3)	Second stage (4)
Pseudo <i>R</i> -squared	0.37	0.06	0.71	0.07
Root mean squared error	0.366	78.37	7.99	78.06
Anderson canonical LR statistic		74.81		71.86
Cragg–Donald <i>F</i> statistic		76.87		73.71

Note: Models 1–4 are OLS panel estimates implemented using the *xtivreg2* procedure in STATA. Models 1 and 3 are the first stage estimates and Models 2 and 4 are the second stage results. As Model 1 has a dichotomous dependent variable, it should be interpreted as a linear probability model. Second stage standard errors are corrected using the (Generalized Methods of Moments) GMM moments procedure and White robust option. As a result, coefficient estimates are efficient in the presence of both arbitrary heteroskedasticity and arbitrary autocorrelation. Cragg–Donald *F* Statistic is a test of weak identification. 68.79 and 93.07 are greater than 16.38, the critical value for one endogenous regressor, one instrumental variable, and a 10% maximal size of a 5% Wald Test. Therefore, the null hypothesis that $\beta = 0$ can be rejected and we can be confident that lagged party status is a strong instrument for change in governor and tenure (Stock and Yogo 2004). The Anderson (1984) canonical correlations test is a likelihood-ratio test of whether the equation is identified, i.e., that the excluded instruments are “relevant,” meaning correlated with the endogenous regressors. The null hypothesis is that the equation is under-identified and is rejected by the test.

investment risk often depends on gradual learning about the new regulatory environment in which they are operating. Soft information about a governor would certainly include the extent of corruption in the administration, but also would contain a broader set of information about the attitude and trustworthiness of particular officials. Consequently, decreases in investment could result from the general acquisition of soft information, of which the bribe schedule plays only a small role. We address each of these concerns in turn.

Normal Bureaucratic Delays

Do changes in provincial governor affect firms’ investment through channels other than increasing predictability of corruption, particularly through normal bureaucratic delays as the new administration settles into office? To test this possibility, Table 6 presents data for five bureaucratic procedures necessary for operating a business legally in Cambodia (Chandarrot *et al.* 2006). The data is examined according to whether or not the province received a new governor in 2006 and would therefore be in the midst of a bureaucratic transition at the time of the survey. To be fair, we only use data on firms who applied for the documents after 2005 and therefore were affected directly by the new administration.

We test the effect of change in governor on the following dependent variables derived from the PBES with an array firm and provincial controls used in the core analysis of Table 2: (1) the average number of months that a firm waited from the time it began business registration until it had completed all legal procedures, (2) the percentage of businesses who applied but are still waiting for full documentation, (3) the average number of days that it took a firm to receive a land title after submitting the application, (4) the firm's assessment of the land titling process (1 = very difficult to 5 = very easy), and (5) the total time in days owners or high-level managers spent in dealing with requirements imposed by government regulations (such as taxes, customs, labor regulations, licensing and applications), including both dealing with the government officials and completing forms.

The results in Table 6 show that these bureaucratic factors are not associated with changes in provincial governors. In fact, the only significant differences are waiting periods for licenses and land, which are actually of a lower magnitude in provinces with new governors. In short, we cannot attribute the impact of a new governor to increases in normal bureaucratic delays.

Increasing Unpredictability in Corruption vs. Business Environment Instability

Some readers might suspect the impact of new governors may not show-up in aggregate measures of bureaucratic performance and regulation, but instead manifests itself in general business environment instability, of which corruption is only a small slice. To test this hypothesis it is necessary to separate predictability in the general business environment from the predictability of corruption. The term "business environment" implies three types of instability that are conceptually distinct from corruption: regulatory policy, property rights, and infrastructure provision. We use the PBES survey to operationalize these components. To address the predictability of regulatory policy, we use the question "How informed are you about rules, laws, and regulations which materially affect your business (1 Not Informed to 5 Fully Informed)?" As we do not have the total number of policy changes implemented by provincial governors in the past year, this question offers a suitable proxy. To gauge predictability of property rights, we use a combination of two questions. For firms that own their land, we ask "Please evaluate the risk that your land will be expropriated by the provincial or national government for other purposes (1 Very Low to 5 Very High)." For firms that rent their land, we ask "Please evaluate the risk of changes in rent conditions that materially affect your business (1 Very Low to 5 Very High)."²² Together, the two form a variable we call *property stability*. Finally, to measure predictability of infrastructure provision, we draw on the single most important factor for Cambodian businesses — electricity provision. PBES provides the information on the number of electricity disruptions faced by a firm in the past year. We take the natural logarithm to address outliers and subtract the value from 0, so a positive value denotes higher stability as with the other measures.

²² For example, rent increases, sales to new parties, and new contractual terms which limit business activity, etc.

Table 6. Costs of regulatory compliance by new and old Governor

Dependent variable	Number of days waiting for registration (1)	Still waiting for registration dummy (2)	Number of days waiting for land title (3)	Ease of land titling process (1 = very difficult, ..., 5 = very easy) (4)	Cost of regulatory compliance (5)
Dummy for Governor change in 2006	-18.61 (7.06)	-1.47E-08 (2.60E-08)	-49.99 (12.3)	-0.048 (0.15)	-0.301 (0.19)
CPP dummy (<i>t</i>)	13.22 (5.45)	-0.00871 0.0078	-43.91 (13.6)	-0.044 (0.068)	0.101 (0.070)
CPP dummy (<i>t</i> - 1)	-35.49 (9.00)	-1.33E-07 (2.20E-05)	-34.51 (16.1)	-0.43 (-0.08)	-0.365 (0.13)
Firm age	0.795 (1.01)	-1.78E-09 (2.00E-07)	2.71 (1.34)	0.007 (0.011)	-0.0104 (0.006)
% of service & commerce revenue	0.007 (0.093)	-3.85E-10 (1.02E-09)	0.583 (0.37)	-0.003 (-0.002)	0.0017 (0.0014)
Strength of land title	-0.781 (4.06)	(3.70E-08) (3.80E-08)	12.81 (4.99)	-0.06 (0.049)	0.0274 (0.026)
GDP per capita	-0.011 (0.020)	1.34E-09 (2.51E-09)	-0.018 (0.03)	0.0008 (0.0002)	0.0005 (0.0001)
Annual growth in foreign tourists (%)	4.87 (11.0)	-2.46E-07 4.90E-07	14.52 (14.5)	-0.301 (0.10)	-0.244 (0.13)
Annual growth in population (%)	-0.064 (0.011)	-4.82E-10 (1.18E-09)	-0.015 (0.03)	-0.0002 (0.00024)	-0.0007 (0.00017)
Constant	51.51 (17.2)		19.48 (70.3)	4.55 (0.41)	2.004 (0.42)
Number of observations	54	332	186	185	338
R-Squared	0.23	0.27	0.14	0.09	0.04
Root mean squared error	26.92		97.40	0.890	0.951

Note: Number of days waiting for registration is from PBES QC_5 (How long did you wait from the time you began business registration until you had completed all legal procedures?). Still waiting for registration dummy is from PBES QC_5b (= 1 if still waiting for registration, = 0 otherwise). Number of days waiting for land title is from PBES QD_3_4_14 (From the day you submitted your application, how long did it take to receive your land title?). Ease of land titling process is from PBES Q_3_3_13 (How would you characterize the land titling process? 1: Very Difficult, 2: Difficult, 3: Neither Difficult or Easy, 4: Easy, 5: Very Easy). Cost of regulatory compliance is from PBES QH_1_5 (In 2005, what amount of time did owners or high-level managers spend dealing with requirements imposed by government regulations (e.g. taxes, customs, labor regulations, licensing, and registration) including dealings with officials, completing forms, etc.?).

To assess the predictability of corruption, we use two common questions from the World Bank's investment climate surveys: (1) "Do you agree with this statement: 'Firms in my line of business, usually know in advance how much this 'additional payment' is'?" (0 No, 1 Yes); and (2) "If a firm pays the required 'additional payment' how often is the service also delivered as the firm expected? (1 Never to 5 Always)."

Panel A of Table 7 presents summary statistics for these predictability variables. Because all of these various forms of predictability are highly correlated, we next use factor analysis with *varimax* rotation to derive a set of uncorrelated measures. Panel B depicts the result of this procedure, demonstrating clearly that there are two distant factors, accounting for 48% of the explained variance between the variables. The predictability of corruption questions load strongly on the first component, while the other measures of business environment are correlated with the second.

The clear separation of predictability measures allows us to test their association with changes in governors, knowing they are conceptually distinct and empirically uncorrelated. We perform this analysis in Table 8. The first five columns show the correlations between each of the dependent variables and changes in governor, controlling for the party affiliation of the incumbent and the party affiliation of the governor in 2005. Regulatory stability and property rights stability are analyzed using an ordinal probit (OPROBIT) model, but are robust to OLS specifications as well. In these specifications, changes in governor are not associated with the predictability of regulatory information or property rights.

Table 7. Factor analysis of predictability of corruption and predictability of business environment

	Predictability of bribes	Predictability of service delivery	Predictability of regulatory policy	Property Right stability	Electricity stability
<i>Panel A: Pair-wise correlations</i>					
Predictability of bribes	1				
Predictability of service delivery	0.1855*	1			
Predictability of regulatory policy	0.1444*	0.0638*	1		
Property right stability	-0.0244	-0.0272	-0.0195	1	
Electricity stability	-0.1222*	-0.0684*	-0.0639*	-0.0493*	1
<i>Panel B: Factor analysis</i>					
Predictability of bribes	0.741	-0.153			
Predictability of service delivery	0.656	-0.113			
Predictability of regulatory policy	0.493	0.466			
Property right stability	-0.193	-0.449			
Electricity stability	-0.209	0.794			
Eigen value	1.302	1.086			
Cumulative variance explained	0.261	0.478			

*Significant at the 0.05 level.

Note: Results after Varimax Rotation.

Table 8. Changes in Governor, predictability of corruption and predictability of business environment

Dependent variables specification	Predictability of business environment												
	Information on changes in regulation					Predictability of corruption							
	Ordinal probit (1)	Marginal probability of answering informed (4) or fully informed (5)	Property rights stability Ordinal probit (3)	Marginal probability of low risk (4) or very low risk (5)	Electricity stability OLS (2)	Predictability of bribes Probit (4)	Marginal probability if knowledge of bribe schedule Ordinal probit (5)	Certainty of service delivery Ordinal probit (5)	Marginal probability of certain (4) or very certain (5)	Predictability of corruption factor 1 OLS (6)	Predictability of business environment factor 2 OLS (7)	OLS (8)	OLS (9)
Dummy for Governor Change	-0.216 (0.148)	-2.6%	0.367 (0.349)	13.6%	1.21 (0.14)	-0.56 (0.232)	-18.7%	-0.281 (0.143)	-8.4%	-0.605 (0.16)	-0.422 (0.22)	0.382 (0.24)	0.171 (0.29)
CPP Dummy (<i>t</i>)	0.337 (0.240)	3.4%	-0.375 (0.256)	-14.3%	0.501 (0.31)	0.146 (0.285)	4.9%	0.093 (0.100)	2.7%	0.177 (0.17)	0.2 (0.065)	0.437 (0.21)	0.469 (0.11)
CPP Dummy (<i>t</i> - 1)	-0.348 (0.127)	-4.6%	0.317 (0.0837)	11.90%	1.356 (0.51)	-0.533 (0.108)	-18.7%	0.0007 (0.114)	0.00%	-0.517 (0.078)	-0.44 (0.11)	0.403 (0.28)	0.178 (0.18)
Firm Age													
% of Service & commerce revenues													
Strength of land title													
GDP per capita													
Population growth (%) 2005-2006													
Growth in foreign tourists (%) 2005-2006													
Constant													
Cut 1	0.317		-1.068		-4.544 (0.30)	0.425 (0.095)		2.455 (0.11)		0.449 (0.17)	-0.382 (0.27)	-0.795 (0.21)	-0.807* (0.40)
Cut 2	0.86		-0.742					-0.333					
Cut 3	1.506		-0.313					0.108					
Cut 4	2.514		0.382					0.706					
Observations	500		496	496	478	500	500	1.396	475	475	475	475	475
R-squared/Pseudo R-squared	0.007		0.007	0.02	0.07	0.09	0.006	0.006	0.03	0.06	0.04	0.15	0.15
Log likelihood	-524.1		-731.9	1.385	1.503	-299.1	-736.1		0.989	0.977	0.982	0.930	
Root mean squared error													

Note: The unit of analysis is the firm in 2006. Robust standard errors (clustered at the province level) are in parentheses. For ordinal probit and probit models, marginal probabilities are displayed in adjacent columns. Predictability of Corruption and Business Environment in Models 6-9 are derived from the factor analysis in Table 7.

Replacing governors has a positive impact on electricity stability, yielding about 1.2% fewer outages per firm; a substantively large number when one realizes Cambodian firms experienced a median of 10 outages per year and two firms actually suffered over 700. It is not clear why new governors are associated with more stable electrical provision. We expected an insignificant result. One potential hypothesis that deserves further testing is that Hun Sen may put pressure on the state owned electricity companies to ensure smoother transitions of his new CPP appointees — including his brother, Hun Neng, in Kampong Cham province.

Most importantly, new governors are negatively correlated with the predictability of corruption as shown in Models 4 and 5. Firms with new governors are less likely to know the specific amount of bribe they need to pay and more uncertain of whether the service will be delivered after payment. Moving on to the factor analysis in Models 6 to 9, we see that changes in governors are negatively correlated with the predictability of corruption factor, while on the predictability of the general business environment (factor 2), the impact of a new governor is not significantly different from zero. The results are robust to the addition of other firm-level and province-level controls.

In sum, this analysis allows us to feel comfortable that a change in governor is an effective shock to the predictability of corruption in Cambodian provinces. Our results on firm investment in the panel analysis are not inflated by instability in the general business environment. The primary result of changing governors is to upset firm knowledge of and confidence in the provincial bribe schedule. Moreover, the only other measure of predictability that was significant, electricity provision, should actually have yielded more firm investment and counter-veiled the impact on bribe predictability.

Acquisition of Soft Information Unrelated to Corruption

A final hypothesis is that change in provincial leaderships destroys the soft information that the firms have already acquired through observation and interactions with the bureaucracy. Soft information includes amorphous information on attitude and trustworthiness that may not be reflected in the measures of regulatory procedures above. This hypothesis is analogous to the idea that banks use soft information on lenders to ameliorate the asymmetric information risk in lending (Gerschenkron 1962, Stiglitz and Weiss 1981). In the lending literature, loan recipients with longer relationships to banks receive better interest rates and collateral requirements. Similar to banks, firms may withhold investment until they obtain greater soft information on their leadership — both in terms of their corrupt behavior and other noncorruption related factors. It is possible that the decrease in investment that we find in above results from the learning process that is unrelated to corruption, but we attribute the effect solely to the predictability of the bribe schedule. Empirically, these two learning processes are very hard to separate as they generally occur simultaneously.

However, the nature of information related and unrelated to corruption are distinct. Information regarding illegal transactions such as corruption is, by necessity, usually kept private between individual bureaucrats in a governor's administration and a firm,

while other soft information about the attitude and trustworthiness of the governor can be more readily observed and discussed among entrepreneurs.

Fortunately, we have three different types of new governors in our dataset: (1) deputy governors from the same province who were promoted up to the level of governor; (2) transferred governors who served for a time in another province; and (3) governors who are completely unknown to firms in the province, as they were appointed from various central–state agencies. We can distinguish the three types of new governors with the soft information the firms may have about them. Firms will have both information on normal governance and private information on illicit activity about deputy governors. There is a band of uncertainty around their knowledge, but in general we should expect that the environment should be more predictable than with the other two types of new governors and firms should be more willing to expand activities than in the other two locations. If a new governor is transferred from another province, firms will have seen his behavior in office or can discuss it with firms who experienced it directly. Nevertheless, firms were less likely to have any exposure to the private information of the governor’s position on bribes or other forms of corruption, as they would with a promoted deputy governor. If regular soft information is of primary importance in firm’s investment decisions, we should see a larger increase in firm investment in provinces with transferred governors compared with governors that are totally unknown to them. On the other hand, if private information dominates, we should see no differences between transferred and unknown governors, but see a significant difference between the promotion of deputy governors and the other two types of governor change.

We take advantage of the differences between the types of governors in Table 9. By adding dummy variables for whether the governor was promoted from a deputy position or transferred from another province to the analysis in Table 2.²³ Unknown governor is the untested dummy and its results are embedded in the constant. Results should be taken with some caution, because the number of transferred governors (6) and deputy governors (2) are limited, impacting only 210 and 80 firms, respectively. These are sufficient firm-level observations to demonstrate statistically significant results, but could be somewhat fragile as more governors are replaced in the future.

Model 1, where both variables are included, shows that the effect of transferred governors is not significantly different from unknown governors, while the coefficient on deputy governors is positive and significant, as would be predicted by the predictability hypotheses. Though the results are not significant by traditional standards, the coefficient on the tenure specification (Model 2) for deputy governors is also in the predicted direction. The transferred governor dummy remains indistinguishable from unknown governors and even has a slightly negative sign. The results are consistent to the hypothesis that firms wait to acquire private information under transferred governors, but

²³ Two province-level variables (literacy and road coverage) had to be dropped in order to create degrees of freedom at the provincial level for the two new dummies. Robustness tests using alternative specifications with these variables included did not impact the analysis greatly.

Table 9. Governor transfer, deputy governor promotion, and firm investment

Dependent variable: Total investment rate (%)	(1)	(2)
Dummy for Governor change	-19.18 (6.95)	
Tenure of Governors (Months)		0.402 (0.414)
Governor transferred from another Province	8.52 (16.63)	-2.24 (19.18)
Governor promoted from Deputy Governor	18.67 (9.34)	8.51 (11.15)
CPP dummy (<i>t</i>)	3.18 (6.36)	0.341 (8.77)
Initial total assets (<i>Natural Log</i>)	-15.85 (4.458)	-16.25 (4.697)
Firm age	-0.991 (0.186)	-1.012 (0.183)
Electricity disruption	-0.103 (0.098)	-0.115 (0.12)
% of Service & commerce revenue	-0.083 (0.104)	-0.093 (0.105)
Strength of land title	3.01 (2.34)	2.65 (2.18)
Annual growth in foreign tourists (%)	0.016 (0.014)	0.019 (0.016)
Annual growth in population (%)	-2.35 (4.74)	-3.9 (4.98)
Constant	218.8 (51.46)	217.1 (55.44)
Number of observations	868	868
Number of firms	474	474
Pseudo <i>R</i> -squared	0.044	0.041
Root mean squared error	71.45	70.53

Note: The unit of analysis is firm-years (2005 to 2006). All models are OLS panel estimates implemented using *STATA's xtreg*. Robust standard errors (clustered at the province level) are in parentheses.

can be expansionary (within a year) when they have some familiarity with the bribe schedule under deputy governors. Together, these findings suggest that the decrease in investment has less to do with the acquisition of general soft information than it does with the time needed to acquire private, soft information related to the predictability

of the bribe schedule that can only be obtained through direct interactions with bureaucrats.

It is important to note that the implicit assumptions we make in this test are that (1) firms *do* know about the publicly available, corruption-unrelated information of the transferred governors, and (2) firms *do not* know about the private information regarding corruption practice of the transferred governors. Although assumption (2) is likely to hold, assumption (1) may not. Small firms in a poor country may not have adequate information about political activities in other provinces. In this case, we would not be able to separate the effect of the corruption-unrelated to soft information from the corruption-related information. As a result, this test should be seen as weakly supporting our findings when considered along with the other empirical tests.

In sum, this section demonstrates that our assumption regarding governor change having its strongest impact through a shock to the predictability of corruption survives a number of tests. Change in governor does not appear to be associated with general bureaucratic delays, instability in the business environment, or the time needed to obtain soft information about factors other than corruption. In Cambodia, changing a leader is first and foremost about changing the bribe schedule faced by entrepreneurs.

CONCLUSION

Our analysis utilizes a unique dataset and natural experiment to rigorously test a long-held proposition in political economy that the predictability of a corruption is at least as important for firm investment decisions as the amount of bribes a firm must pay, provided the bribes are not prohibitively expensive. We find evidence that this hypothesis is correct. Firms exposed to a shock to their bribe schedules by a change in governor invest significantly less in subsequent periods, as they wait for new information about their chief executive. Moreover, the amount of corruption (both measured by survey data and proxied with the amount of commercial sex workers) is significantly lower in provinces with new governors. Thus, as predicted by the theoretical literature, predictability is critically important in individual firm investment decisions. The finding is robust to a battery of firm-level controls and province-level investment climate measures. Moreover, further testing using a comprehensive survey reveals that changes in governor are most strongly associated with changes in corruption predictability, not other measures of general stability in the business environment. In sum, our analysis offers confirmation of the predictability assumption in theoretical models of corruption.

In policy terms, the frequent changes in governor, while politically efficacious for the top leadership, have had a negative impact on overall economic welfare. In the short term, it may be better for the Cambodian central government to refrain from changing new governors, thereby allowing the investment climate to stabilize and firms to feel more comfortable expanding their operations. In the long-term, Cambodian and other highly centralized developing economies might be well-served to allow the direct election of provincial executives. The appointment system too easily lends itself to wasteful rent-seeking and creates problematic incentives for governors to alter bribe schedules

in order to amortize the investments they laid-out to purchase their positions. Already, Cambodia has experimented a great deal with commune-level decentralization, but provincial-central relations continue to remain highly centralized. The clear losers are entrepreneurs who find themselves unable to engage in any long-term business planning.

On the other hand, there is reason to suspect that our analysis sits in the transitory stage of Hun Sen's construction of a monopolistic corruption environment (Shleifer and Vishny 1993), similar to Suharto's Indonesia (MacIntyre 2001). Shifting governors has led to temporary inefficiencies, but after they hold their positions for a while and firms become accustomed to the bribe schedule, Cambodia will find itself in a new equilibrium of centralized corruption controlled by Hun Sen. Firms will face less corruption and more stability than they did previously, but the environment will be inferior to an investment climate free of corruption.

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