Resource Curse: A Corporate Transparency Channel

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Expropriation Risk and Firm Growth: A Corporate Transparency Channel*

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Abstract

We propose a new channel through which expropriation risk reduces capital allocation efficiency and decreases firm growth. We build an agency model of corporate disclosure when companies face risks of expropriation. The model predicts that in countries with insecure property rights, corporations mitigate the risk of expropriation by reducing transparency. We test this channel by employing a difference-in-difference approach. Using a panel of over 16,000 firms from 84 countries, we find that transparency of companies prone to expropriation is lower in countries with insecure property rights. The reduced transparency has an adverse effect on the efficiency of capital allocation and corporate growth.

JEL classification: G15, G18, G38, K42, O43
Keywords: expropriation risk, transparency, investment efficiency, growth

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Introduction

> *In those unfortunate countries, indeed, where men are continually afraid of the violence of their superiors, they frequently bury and conceal a great part of their [capital] stock.*
>
> *Adam Smith (1776).*
> *An Inquiry into the Nature and Causes of the Wealth of Nations.*

Why are some nations rich and others poor? Why have some poor countries managed to catch up with rich countries within one generation's lifetime, and others have lagged behind even further? Since Adam Smith, economists have emphasized the importance of institutions. However, only in recent years economists have begun to measure specific institutions and tried to identify the institutions that are most critical for economic growth. For example, Acemoglu and Johnson (2005) distinguish between property rights and contract enforcement and show that the protection of property rights is by far more important for growth. However, it is hard to identify the causal effect of property rights on growth. While the richer countries tend to have stronger property rights, the direction of causality is not clear, and the cross-country regressions cannot resolve the obvious methodological problems.[1]

In this paper, we study the effect of property rights on growth at the microeconomic level, rather than at the country level. We suggest a channel through which property rights influence the behavior of individual firms: we show that poor protection of property rights can result in lower corporate transparency which, in turn, reduces the efficiency of capital allocation and growth of firms. In order to address the endogeneity issues caused by omitted variables and reverse causality, we apply the difference-in-difference approach. In particular, we study the behavior of firms in industries that are easier to expropriate in countries where expropriation is more likely.

We argue that in countries with weak property rights, governments are more inclined to expropriate rents from certain industries, e.g., natural resource industries or industries with a low share of skilled labor. This makes the firms operating in these sectors especially vulnerable to expropriation and provides them with incentives to withhold and manipulate information about their performance. The resulting lower transparency leads to worse capital allocation and slower economic growth.

[1] There is a notable exception of Acemoglu et al. (2001) who instrument institutions by the European settler mortality and show that institutions have an impact on the long-run economic performance.

We propose a theory based on the idea that corporate profits in expropriation-sensitive industries represent rents that are relatively easy for governments to capture. The theory also takes into account the agency conflict between managers and minority shareholders. Firms in expropriation-sensitive industries face a trade-off. On one hand, in order to attract external capital, they need to be transparent. On the other hand, higher transparency involves greater risks of expropriation by the government.[2] As argued by Watts and Zimmerman (1986) and Stulz (2005), more transparent corporate profits can attract various forms of government expropriation, such as the solicitation of bribes, overregulation, confiscatory taxation, and the outright seizure of firm assets. Transparency would therefore be lower in industries that are more vulnerable to expropriation, particularly in countries that have poor protection of property rights.

In order to test this prediction, we depart from the analysis of country-level data and use microeconomic data, a panel of over 16,000 firms from 84 countries. We apply the approach introduced by Rajan and Zingales (1998) who studied the effect of financial dependence on growth.[3] We test whether the firms that are more vulnerable to government expropriation have lower transparency levels in countries with higher risks of expropriation. Since we include firm and year fixed effects in all our regressions, we essentially focus on a within-country variation in opacity induced by government rent seeking (firm fixed effects naturally absorb country fixed effects and industry fixed effects). This difference-in-difference approach mitigates the bias induced by omitted variables and model misspecification. Moreover, this method makes it easier to differentiate the proposed transparency channel from other explanations for why expropriation risk affects firm transparency.

In order to conduct this test, we need proxies for vulnerability to expropriation. We use three different measures. First, based on substantial anecdotal and statistical evidence, we claim that firms in natural resource sectors, such as the oil sector, are at a greater risk of expropriation than other companies, especially when the oil prices are high. We also extend this logic one step further and construct a continuous (rather than binary) measure of oil dependence. We assume that firms whose profits are correlated with oil prices are also more

[2] Hereinafter, we consider expropriation by a predatory government. However, our predictions do not change if expropriation is conducted by competitors or other private entities.

[3] Rajan and Zingales (1998) ranked industries by the degree of financial dependence (using data from the U.S., arguably the most developed financial market) and then studied the growth of industries in different countries depending on countries' financial development and industries' financial dependence.

prone to expropriation. We calculate the oil dependence for U.S. firms and then use the derived data on the oil dependence in the regressions for the firms outside the U.S.[4] We also repeat the analysis using sensitivities to other commodity prices. The second measure of the sensitivity to expropriation is the intensity of human capital. We argue that governments are less likely to expropriate from industries that employ more high-skilled workers (whose human capital is inalienable). We use U.S. industry data to measure the proportion of college-educated workers and then transplant the measure to other countries (excluding the U.S. from further tests). The third measure is based on the actual number of expropriation instances observed in each industry (we exclude the expropriated firms from the regressions). We use these measures separately and as a unified index constructed using the Principal Component Analysis.

Fearing expropriation by the government, firms can use different strategies to manipulate the reported income. For example, Hall and Stammerjohan (1997) document that, in the U.S., oil producers underreport profitability by using negative accruals and write down the values of aging or unwanted oil fields to decrease litigation risks. As the first measure of income transparency, we use the amount of negative accruals. We also construct other measures of opacity. The measures are based on accounting and financial data; thus they do not reflect the exact mechanisms employed by managers, but rather they can be viewed as aggregate opacity induced by withholding and the manipulation of information. The second measure, accounting opacity, is based on the absolute value of discretionary accruals. It reflects the quality of reported earnings in firms' financial statements since managers often manage reported earnings to hide or obscure information (Shivakumar (2000) and Chaney et al. (2010)). Alternatively, the managers can manipulate the precision of information through stock market trading (Aggarwal and Wu (2006)). For example, managers can depress stock prices of a profitable company by placing a large sell order of the company's stock. To reflect these strategies, we consider insider opacity as the third measure. It is based on a dynamic relationship between stock returns and the trading volume in the stock market, and it can be viewed as the degree of informational asymmetry associated with a company. Furthermore, managers can obfuscate a company's true prospects by passing false

[4] Excluding U.S. firms precludes scenarios in which industries in other countries endogenously adjust their business structure as a response to expropriation risks.

information to investors and market professionals making stock prices less informative. The last measure, informational opacity, tracks the aggregate amount of firm-specific information contained in stock prices. It is proxied by the degree of asynchronicity of the stock price with the stock market index.

Our main empirical finding is that more expropriation-susceptible industries (firms whose profits are highly correlated with oil prices and firms in industries that employ fewer skilled workers) are less transparent in countries with greater risks of government expropriation. Using the sample of oil companies, we illustrate this difference-in-difference method in Figure 1.

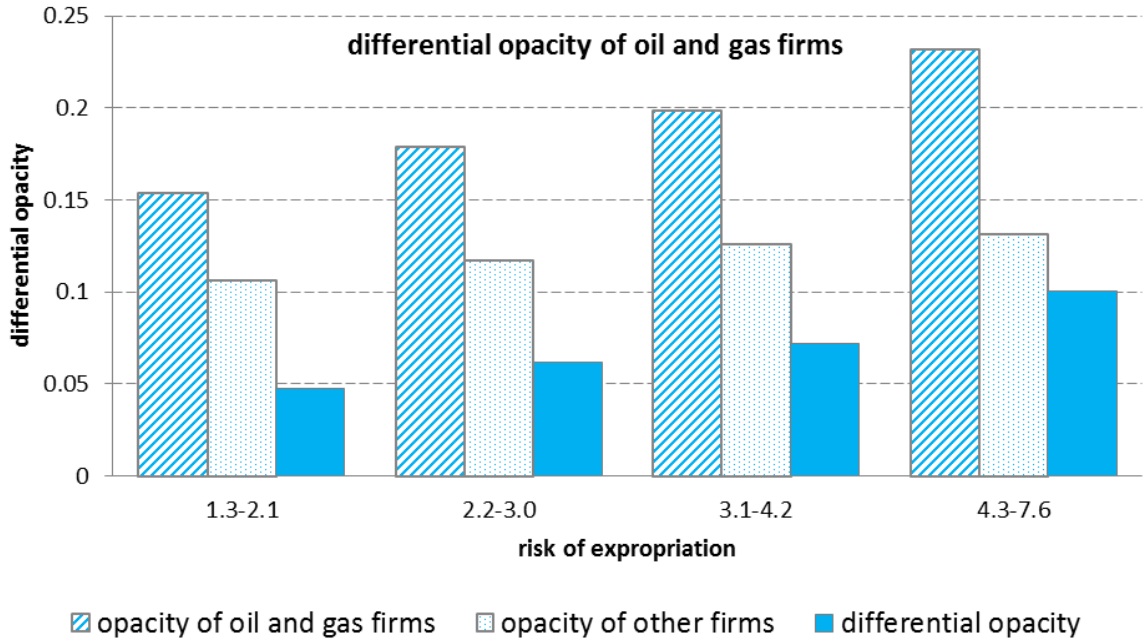

Figure 1. Differential opacity of oil and gas extraction firms relative to other firms plotted against country risk of expropriation. This graph plots accounting opacity of oil and gas companies (SIC = 13), accounting opacity of non-oil and gas companies, and differential accounting opacity. Differential opacity is the difference between median opacity (across firms and years from 1995 through 2007) of oil and gas firms and the median aggregate opacity of all other firms. Accounting opacity is defined as the absolute value of discretionary accruals. Countries are divided in five groups: (i) risk of expropriation is from 1.3 through 2.1, (ii) risk of expropriation is from 2.2 through 3.0, (iii) risk of expropriation is from 3.1 through 4.2, (iv) risk of expropriation is from 4.3 through 7.6. As the risk of expropriation increases, the difference in opacity between the two groups of firms becomes larger. The correlation coefficient between differential opacity and expropriation risk is 0.59 with *p-value* = 0.00.

There is a clear association between government risk of expropriation and corporate transparency. In Figure 1, we plot country-level opacity (based on the absolute value of discretionary accruals) of oil and gas firms versus country risk of expropriation index (the risk of expropriation is defined later). The differential opacity is calculated as country median

opacity of firms that belong to the oil and gas industry minus country median opacity of all other firms. In most countries (68% of the sample), firms subject to greater risks of expropriation are more opaque relative to all other firms (differential opacity is positive). More interestingly, differential opacity is generally larger in countries with a greater risk of expropriation. The correlation coefficient between the two variables is 0.59 with *p-value* 0.00.

Using the triple-difference approach, we also document that the adverse effects of expropriation on transparency of oil companies are larger during periods of high oil prices, the periods when governments can capture larger rents. This triple-difference result is summarized in Figure 2, which depicts how the difference in opacity between oil firms and other firms (differential opacity) in high-expropriation risk countries evolves as oil prices fluctuate.

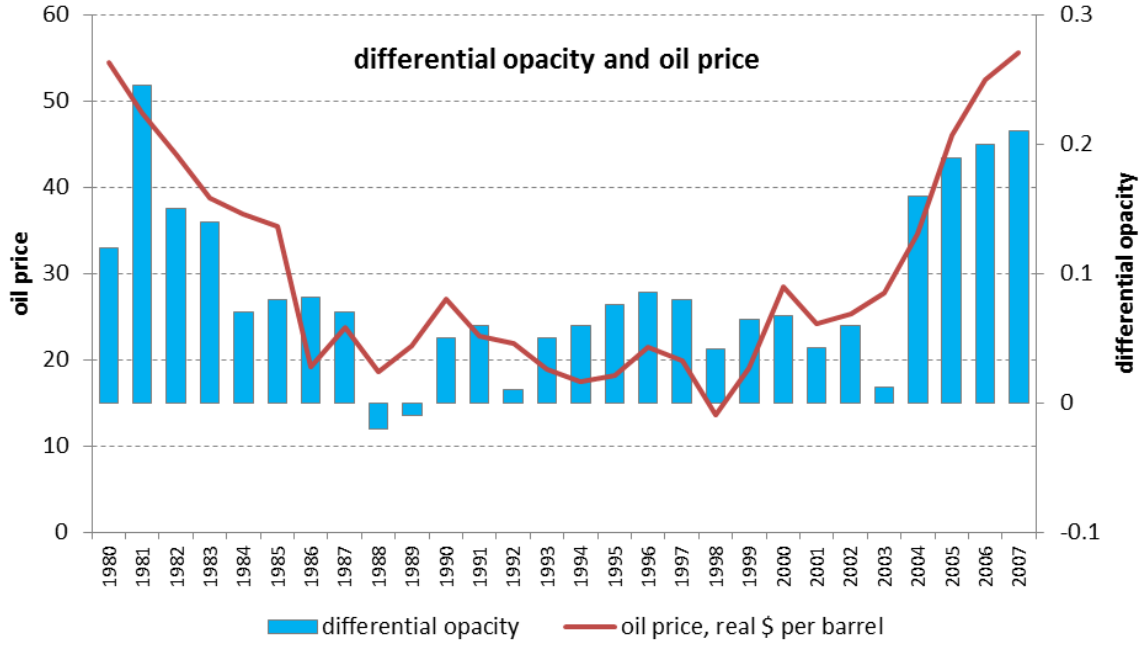

Figure 2. Illustration of the triple-difference approach: differential opacity and oil prices. This graph plots differential accounting opacity of oil and gas companies and oil prices. Differential opacity is the difference between median opacity (across all firms and years from 1980 through 2007) of oil and gas firms and the median aggregate opacity of all other firms. Opacity is the absolute value of discretionary accruals. Oil prices are from the BP statistics, and they are expressed in 2000 dollars per barrel. As oil price increases, the differential opacity becomes larger. The correlation coefficient between differential opacity and oil price is 0.62 with *p-value* = 0.00. The graph utilizes a longer time period (1980-2007) than the time period used in the empirical analysis (1995-2007).

It is evident that differential opacity becomes larger during the periods of high oil prices. For example, when oil prices were low in 1988 (oil price = 19 dollars per barrel), oil

companies were more transparent than other companies. In contrast, oil companies became much more opaque (relative to other firms) in 2007 when oil prices reached record-high levels of 55 dollars per barrel. The correlation coefficient between differential opacity and oil price is rather large, 0.62, with *p-value* of 0.00. Our results do not pertain to oil and gas companies only. We obtain similar results for other natural resource sectors, such as metals.

Can our results be driven by managerial diversion rather than by the risk of expropriation by the government? For example, firms in expropriation-prone industries located in countries with a high expropriation risk can also have worse governance. Moreover, in such countries, firm insiders may bribe state officials to facilitate diversion. If investors are poorly protected, top management can collude with politicians and divert company resources at the expense of minority investors. This type of diversion is usually accompanied by opacity. We show that our results are driven by the described agency problems. First, our regressions include firm fixed effects that control for unobserved firm characteristics. Second, we use time-series data on firm ownership and explicitly control for the ownership wedge – the difference between control rights and cash flow rights of the largest shareholder. Extant literature points out that greater separation of ownership and control makes large shareholders more entrenched and increases their incentives to divert firm resources. Third, we control for the need for external financing which is shown to mitigate the agency conflict. Fourth, we condition our test on government ownership. We assume that a government has weaker incentives to expropriate firm profits if the government holds a large stake in the firm.

We turn our attention from the causes of lower transparency to its implications for capital market efficiency and growth. There is growing empirical evidence that more developed and more information-rich financial markets are a necessary condition for efficient capital allocation (Wurgler (2000), Kumar and Langberg (2009), Claessens et al. (2010)). As a measure of capital allocation efficiency, we use the elasticity of firm investment with respect to value. Consistent with our arguments, capital allocation is indeed less efficient in expropriation-sensitive industries located in countries with more predatory governments. We also show that firms in such industries grow slower. In the empirical tests, we differentiate between growth reduction resulting from greater opacity (triggered by state predatory policies) and growth reduction caused by direct effects of expropriation. It turns out that the drop in firm growth caused by opacity is comparable to the drop resulting from expropriation risk directly. Specifically, a two-standard deviations increase in the risk of expropriation (the

increase in the risk equivalent to the move from Norway to Venezuela) reduces firm growth by about 3.1% directly and by a comparable amount of 2.3% resulting from increased opacity.

To sum up, our contribution to the literature on the effect of property rights of growth (discussed in Section V) is as follows. First, as we use a panel of over 16,000 firms from 84 countries for the period of 1995-2007, we are able to employ difference-in-difference approach, taking advantage of the risk of expropriation between countries, and of the variation of vulnerability to expropriation across industries (and in some specifications, across time). Second, we focus on a specific channel of the effect of expropriation risk on growth: we show that expropriation risk reduces corporate transparency, which in turn has an adverse effect on the efficiency of capital allocation and on the growth of firms. Our findings are also relevant to the debate about the "resource curse", the fact that resource abundance negatively affects economic growth in standard growth regressions. Unlike the existing literature, which is mostly based on cross-country comparisons, we use a panel of firms spanning many years. We examine the effect of government expropriation on corporate transparency, capital allocation, and growth in resource industries at the microeconomic level controlling for agency problem, firm, and time-specific effects.

The paper proceeds as follows. Section I presents an agency model of disclosure with the threat of government's expropriation and derives empirical predictions. In Section II, we describe empirical methodology, the data, and the variables. Our results are presented in Section III. In Section IV, we present alternative interpretations of our findings and provide robustness checks. In Section V, we discuss the related literature. Section VI concludes.

I. A Model of Disclosure with Government Expropriation

To provide the basic intuition for our arguments, we present a model of disclosure under a threat of government expropriation. We consider an asymmetric information game between a firm, outside shareholders, and a government with endogenous corporate disclosure, diversion of funds by insiders (managers or controlling shareholders), and government expropriation. We show that in equilibrium, the less productive firms choose to hide their earnings, while the more productive firms disclose them. We study the comparative statics with regard to exogenous changes in property right protection. We show that the equilibrium

levels of corporate opacity and managerial diversion are higher when property rights are weak. We also discuss alternative explanations for the results.

A. The Setting

We consider a model of corporate disclosure along the lines of Verrecchia (2001) and add elements of expropriation by the government and diversion of funds by insiders (managers or controlling shareholders) as in Stulz (2005). We assume that there is a continuum of firms, outside investors, and a government. Each firm has a project that generates earnings π. The earnings π are distributed on $[\underline{\pi}, \overline{\pi}]$ with a cumulative distribution function $F(\pi)$ and a probability density function $f(\pi) = F'(\pi)$. In what follows, we assume that the distribution is sufficiently close to the uniform distribution, in particular that $y - (1/F(y))\int_{\underline{\pi}}^{y} \pi f(\pi) d\pi$ increases in y.[5]

Each firm needs to raise K dollars to finance a project (K is exogenous). In order to do this, the firm sells γ shares to the outside investors. As the stock price is endogenous, so is γ. Firms act in the interest of the original shareholders (whom we call the firm's "insiders" or just the "firm"); they receive $(1 - \gamma)$ percent of the profit.

Each firm may disclose its earnings at a fixed cost C. This cost covers the resources spent to verify the earnings to the outsiders, for example, the cost of hiring auditors. Investors are perfectly competitive, their time preference is normalized to 1, and they price firms' shares based on all relevant information. We denote the investors' beliefs about the earnings as Π. If the earnings are disclosed, the investors know for sure that the earnings are $\Pi = \pi$. If the earnings are not disclosed, the investors base their decisions on the equilibrium beliefs about which firms disclose and which do not. In this case, we denote the earnings of an average non-disclosing firm as $\Pi = \hat{\pi}$. For example, if investors know that all firms with $\pi > \pi^*$ disclose and others hide, the average firm that does not disclose should have earnings equal to

[5] This condition is tantamount to assuming that the average earnings, given they are below some value y, $1/(F(y))\int_{\underline{\pi}}^{y} \pi f(\pi) d\pi$, increase slower, than y itself. Technically, this assumption is satisfied whenever the distribution is sufficiently close to the uniform distribution, and the density function does not have spikes.

$$\hat{\pi} = E\left(\pi \mid \pi < \pi^*\right) = \frac{\int_{\underline{\pi}}^{\pi^*} \pi f(\pi) d\pi}{\int_{\underline{\pi}}^{\pi^*} f(\pi) d\pi} \quad . \tag{1}$$

The firm's insiders choose a share s of profits to divert. Following Stulz (2005), we assume that the cost of diversion is $bs^2\pi/2$, where b is a proxy for protection of external investors from stealing by insiders. The parameter b can be both firm- and country-specific; larger values of b can represent better country-level investor protection and firm-level internal governance mechanisms.[6]

In addition to the diversion by insiders, there is also expropriation by the government. The government obtains the same information as external investors. Government can expropriate a share x of the post-diversion profits $(1- s)\Pi$ at a cost $x^2(1- s)/(2P)$, where P is the proxy for the degree of predation for a given industry in a country, and s is the share of the earnings diverted by the insiders. The index P is high in industries and countries in which it is easier to expropriate firms' profits. This is an exogenous variable related to the "technology of predation" (including the political and bureaucratic costs of expropriation); it is independent of the firm's own strategy and/or performance. For example, in high-technology industries based on (inalienable) human capital, expropriation is costly (P is low); in natural resource industries, rents are easier to capture (P is high). Similarly, in countries and industries where property rights are better protected, predation is lower (P is low).[7]

The government's ex ante payoff is

$$\int_{\underline{\pi}}^{\bar{\pi}} \left[x(\Pi(\pi))(1 - s(\Pi(\pi)))\Pi(\pi) - x^2(\Pi(\pi))(1 - s(\Pi(\pi)))/2P\right] f(\pi) d\pi \, . \tag{2}$$

In (2), $\Pi(\pi)$ is the expected value of the firm's value: if the earnings are disclosed then $\Pi(\pi) = \pi$; if the earnings are not disclosed then $\Pi(\pi) = \hat{\pi}$; $x(\Pi)$ is the level of expropriation for a

[6] The results of our model do not change if we model country legal environment and the quality of firm governance separately.

[7] The functional form for the cost of expropriation is similar to the one in Stulz (2005) with an important difference. While Stulz assumes for simplicity that the cost of government expropriation is $x^2(1 - s)\Pi/(2P)$, i.e., it is proportional to the firm's profits, we assume that the government can allocate its expropriation efforts across firms and can therefore focus on expropriating the firms that are more profitable than others. This is the major asymmetry between the diversion by insiders (who can only steal from their own firms) and the government (that can choose which firms to expropriate). We therefore follow Stulz's cost function for diversion by insiders but change the government's cost function.

given level of expected earnings Π. In equilibrium, the government will set a higher $x(\Pi)$ for more profitable firms.[8]

We assume that P is sufficiently low so that the level of expropriation x is always between 0 and 1. We also assume that the technical costs of disclosure are sufficiently low. It allows us to focus on the most interesting equilibrium, where some firms disclose in equilibrium and others do not.

B. Timing and Payoffs

The timing is as follows. In period 0, firms learn their profits π and choose whether to disclose. In period 1, investors observe the disclosed profits and buy the issued equity. In period 2, the insiders choose the extent of diversion s. Then the government observes the disclosed profits and chooses the level of expropriation x. In period 3, firms pay out dividends and get liquidated. We solve for the subgame perfect equilibrium (given the assumptions above, there is a unique equilibrium).

The government's objective function can be decomposed into payoffs received from individual firms. For a given firm, the government maximizes

$$U^G = x(1-s)\Pi - x^2(1-s)/(2P) \quad ,$$

where Π is either the true earnings $\Pi = \pi$, if the earnings are disclosed, or $\Pi = \hat{\pi}$ if the earnings are not disclosed.

The investors are perfectly competitive. Their participation constraint is therefore binding,

$$\gamma (1-x) (1-s) \Pi = K \ .$$

Given the decisions by investors and by the government, the firm's insiders choose s to maximize

$$U^F = -bs^2 \pi / 2 + s\pi + (1-\gamma) (1-x) (1-s) \pi \ .$$

[8] We do not differentiate between expropriation and taxation. Therefore, our model shares similar features with tax sheltering and diversion models of Desai and Dharmapala (2006) and Desai et al. (2007) that examine how firm governance interacts with taxes. In the empirical analysis, however, we explicitly control for measures of corporate tax rate and the assessment of the fairness of the tax system.

C. Diversion and Expropriation in Equilibrium

We solve for the equilibrium given the disclosure decision using backward induction. We first obtain the level of expropriation by the government *x,* then profit diversion *s,* and then pricing of the shares by the investors.

The objective function for the government implies that the government chooses $x = P\Pi$. Given the expected earnings Π, the equilibrium level of expropriation x and diversion by insiders s, the investors value the firm at $(1 - x)(1 - s)\Pi$. Therefore, in order to raise K dollars, the investors require the following per cent of the firm's shares:

$$\gamma = \frac{K}{(1-x)(1-s)\Pi} \quad .$$

Let us now solve for the optimal level of diversion. The first order condition implies

$$s = (\gamma\,(1-x) + x) / b \; .$$

As in Stulz (2005), the level of diversion is higher whenever (i) the level of investor protection is lower (b is high) (ii) government expropriates a larger fraction of cash flows (x is high), and (iii) the insider ownership is lower (γ is high). The two equations above imply the quadratic equation for the equilibrium level of diversion by insiders s,

$$bs = \frac{K/\Pi}{1-s} + x \quad . \tag{3}$$

This quadratic equation has two roots; it is easy to check that only the lower one corresponds to the Nash equilibrium:

$$s = 1 - \frac{b - x + \sqrt{(b-x)^2 - 4bK/\Pi}}{2b} \quad .$$

Let us now rewrite the firm's insider payoff as

$$U^F = \pi u(\Pi, x) \;\; ,$$

where

$$u(\Pi, x) = 1 + \frac{b(1-s)^2}{2} - \frac{b}{2} = 1 - \frac{b}{2} + \frac{(b-x)^2 + (b-x)\sqrt{(b-x)^2 - \frac{4bK}{\Pi}} - \frac{2bK}{\Pi}}{4b}$$

and $x = P\Pi$.

The equation above implies that the payoff to insiders u and the level of profit diversion in equilibrium s are negatively correlated (u increases in $1 - s$). This result directly follows from the fact that investors are perfectly competitive and receive zero rent. Therefore, the

insiders eventually bear the costs of their own inability to commit to not stealing from the shareholders. Their incentives to steal from the shareholders in turn depend on the expropriation by the government. If the insiders expect predation P to be high, they are interested in higher diversion from the shareholders. The following lemma describes the properties of the equilibrium.

Lemma 1. *Given the disclosure decision and the respective earnings expectations Π by investors and government, the equilibrium has the following comparative statics:*

- *higher predation P results in higher profit diversion s and lower payoff to the firm's insider* U^F.
- *the sensitivity of the insider's payoff to predation P decreases with the earnings expectations* Π: $\frac{\partial^2}{\partial \Pi \partial P} U^F(\Pi, P\Pi) < 0$.

D. Equilibrium Level of Disclosure and Comparative Statics

Let us now describe the firms' disclosure decisions. We consider the equilibrium where there exists such $\pi^* \in [\underline{\pi}, \overline{\pi}]$ that all firms with $\pi > \pi^*$ disclose and others hide. As we show later, under certain technical assumptions this equilibrium exists and there are no other equilibria. For the firms that disclose, the government and the investors know the true earnings $\Pi = \pi$. For the firms that hide, the government and the investors expect $\Pi = \hat{\pi}(\pi^*)$, where $\hat{\pi}(\pi^*)$ is defined in (1).

The firms that disclose receive the payoff $-C + \pi u(\pi, P\pi)$. The firms that do not disclose receive $\pi u(\hat{\pi}(\pi^*), P\hat{\pi}(\pi^*))$. To understand the disclosure decision, let us introduce the "return to disclosure" function,

$$\Delta(\pi, P) \equiv \pi u(\pi, P\pi) - \pi u(\hat{\pi}(\pi), P\hat{\pi}(\pi)) \quad .$$

The equilibrium level of earnings π^* at which firms are indifferent between disclosing and hiding solves the following equation:

$$\Delta(\pi^*, P) = C \quad . \tag{4}$$

Our main result is described in the following Proposition.

Proposition 1. *Assume that the distribution of returns π is such that (i) $\pi - \hat{\pi}(\pi)$ is an increasing function of π; (ii) the level of predation is sufficiently low so that for all $\pi \in [\underline{\pi}, \overline{\pi}]$,*

$P < \min\left\{\frac{b}{2}, \frac{b-2\sqrt{bK/\pi}}{\pi}\right\}$; *(iii)* $\Delta(\underline{\pi},P) < C$ and $\Delta(\overline{\pi},P) > C$. *In this case, there exists a unique equilibrium with the following properties. There is such* $\pi^* \in [\underline{\pi}, \overline{\pi}]$ *that* π^* *solves equation (4), all firms with* $\pi > \pi^*$ *disclose and all firms with* $\pi \leq \pi^*$ *hide. The equilibrium has the following comparative statics: the level of opacity* $F(\pi^*)$ *increases in predation P and cost of disclosure C, and decreases in external financing needs K. Profit diversion by insiders s is higher in firms that hide. An increase in predation P results in an increase in diversion by insiders.*

The proof directly follows from equation (4) and its properties described in Lemma 1. Under the assumptions of Proposition 1, the returns to disclosure $\Delta(\pi,P)$ increase in earnings π and decrease in predation P (as illustrated using the model simulation in Figure 3). As the returns to disclosure increase in π, the firms with high earnings disclose in equilibrium and the firms with lower earnings hide. As the returns to disclosure decrease in *P,* the higher the predation *P,* the greater the cutoff level of earnings π^*, hence fewer firms disclose.

The role of assumptions of Proposition 1 is as follows. Assumption (iii) makes sure that in equilibrium some firms disclose and others hide. If the cost of disclosure *C* were higher than $\Delta(\overline{\pi},P)$, then all firms would hide; if *C* were below $\Delta(\underline{\pi},P)$ then all firms would disclose. Assumption (ii) guarantees that every firm can sell equity (i.e., equation (3) has a solution) and that the effect of predation is not too strong so that returns to disclosure increase in π. If (ii) did not hold, then returns for disclosure would be higher for firms with lower earnings. We would then have to allow for the possibility that companies hide part of earnings. The model would become more involved but the equilibrium would still be characterized by the monotonicity of disclosure with regard to true earnings. Assumption (i) is a technical assumption that ensures that the returns to disclosure are monotonic for all $\pi \in [\underline{\pi}, \overline{\pi}]$.

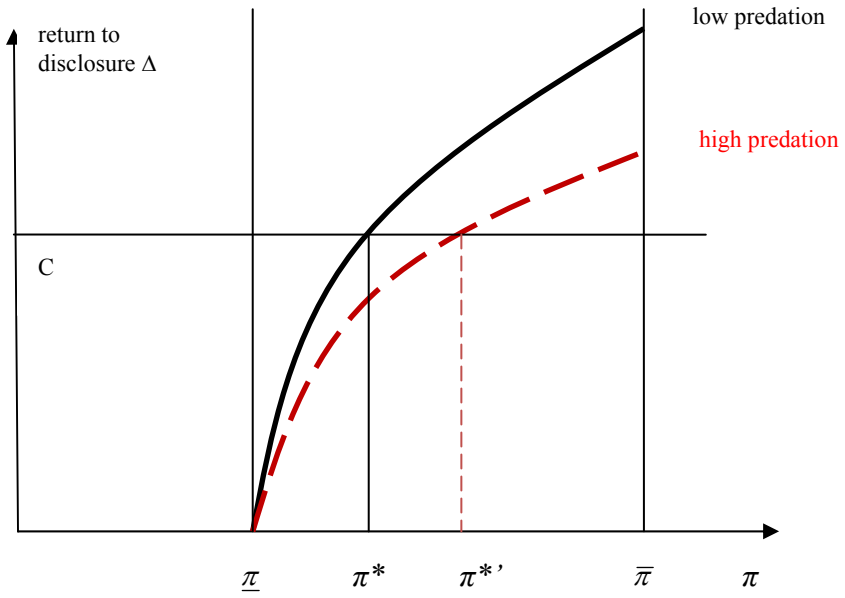

Figure 3. Graphical representation of equation (4). This graph plots returns to disclosure $\Delta(\pi,P)$, defined as the difference in firms' payoffs with and without disclosure, as a function of firms' earnings for π for parameter values b = 10, K = 0.5, C = 0.1, π uniformly distributed on [1,2], and two levels of predation: low P = 0.025 and high P = 0.05. When the risk of expropriation by the government is low (P = 0.025), firms with earnings from $\underline{\pi}$ to $\pi^* = 1.54$ hide and firms with earnings above π^* disclose their earnings. When the risk of expropriation increases to P = 0.05, the level of opacity increases: now only firms with earnings $\pi > \pi^{*\prime}=1.64$ disclose while firms with earnings from $\underline{\pi}$ to $\pi^{*\prime}$ hide.

To sum up, our model implies that controlling for the need for external financing (K) and the level of protection of outside investors (b), higher predation results in lower transparency and higher diversion of profit by insiders. The latter, in turn, implies destruction of value because diversion is socially wasteful (the cost of $bs^2\pi/2$ is a deadweight loss).

Moreover, lower transparency also implies lower efficiency of the capital market. Since all of the non-disclosing firms (with earnings $\pi < \pi^*$) are pooled together, their valuation ($\hat{\pi}$) does not depend in their true earnings. The stock market, in this case, is less efficient because some positive-NPV projects for these firms are not financed.

II. Data, Empirical Methodology, and Variables

A. Data

Our sample comes from the OSIRIS Industrial and OSIRIS Ownership databases.[9] To be present in the sample, a company is required to have time-series accounting and ownership variables. After data cleaning, the unbalanced sample consists of 16,240 firms (79,817 firm-years) from 84 countries spanning the time period from 1995 through 2007.[10] For some countries (Saudi Arabia, Jordan, and Oman), we collected firm data by hand using information from local stock exchanges.

B. Empirical Specifications

B.1. Opacity regressions. To test our hypotheses, we apply the difference-in-difference methodology similar to that in Rajan and Zingales (1998). We use a panel of firm-country-year data to estimate regressions of firm opacity (*Y*) run on the double interaction term of industry sensitivity to expropriation (*EXPR_SENS*) with country risk of expropriation (*EXPR_RISK*), and control variables (*CONTROLS*),

$$Y_{i,t}^{c} = \alpha_i + \eta_t + \beta_1 EXPR\_SENS_{j,t} \times EXPR\_RISK_{t}^{c} + \gamma\ CONTROLS_{i,t}^{c} + \varepsilon_{i,t}^{c}. \qquad (5)$$

Hereinafter, *i* indexes firms, *j* industries, *c* countries, and *t* years. All regressions include firm fixed effects (α_j) and year fixed effects (η_t) to account for time-invariant unobserved characteristics and global macroeconomic shocks, respectively. By including the fixed effects we can also identify a proposed channel of the effect of expropriation risk on opacity and growth. If firms in expropriation-prone industries are more opaque (compared to other companies in the same country) in high-expropriation risk countries, β_1 in (5) is expected to be positive. With regard to the expropriation risk of natural resource industries, by including the fixed effects we can also differentiate the transparency channel of the resource curse from other, more conventional, channels (e.g., stronger real exchange, as in Krugman (1987))

[9] The OSIRIS database is maintained by the Bureau van Dijk Electronic Publishing. It provides a better coverage of listed companies (in terms of the number of companies, countries, and information on companies' ownership structure) than Worldscope – a commonly used source of firm data in international finance research. The original sources of ownership data include Fitch, Moody's, Reuters, Thompson Financial, and World Vest Base.

[10] The requirement on the ownership variable (used to construct the ownership wedge) reduces our sample size from 26,014 firms (112,952 firm-years) to 16,240 firms (79,817firm-years). We confirm that none of our results are affected if the analysis is performed on the large sample without controlling for the ownership wedge.

documented in the literature. As suggested by Petersen (2009), we cluster standard errors by firms to account for error correlation through time. The standard errors are also robust to heteroskedasticity.

The *CONTROLS*, which we will define below include variables that proxy for the parameters of the model *K* (external financing needs) and *b* (firm and country governance). We also control for multiple firm characteristics and other determinants of firm-level corporate governance identified in the existing literature, as well as the level variables *EXPR_SENS* and *EXPR_RISK*.

For the oil industry specifically, we test whether the adverse effects of expropriation risk are higher when economic rents are larger, that is, during the periods of high oil prices. For this, we include the triple interaction term of the oil firm dummy (*OIL_FIRM*) with country risk of expropriation and log of real oil prices (*OIL_PRICE*),

$$Y_{i,t}^{c} = \alpha_i + \eta_t + \lambda_1 OIL\_FIRM_{i,t} \times EXPR\_RISK_t^{c} \times OIL\_PRICE_t + \gamma\, CONTROLS_{i,t}^{c} + \varepsilon_{i,t}^{c} \quad . \tag{6}$$

With this triple-difference method, we make predictions about within-country differences in industry opacity levels and how this difference changes with oil prices. The control variables in (6) include all appropriate double interaction terms and variables expressed in levels.

B.2. Implications of opacity: capital allocation and growth regressions. There are two channels through which expropriation risk may undermine the efficiency capital allocation and reduce growth of companies. First, expropriation risk is likely to reduce firm transparency, which would adversely affect investment efficiency and growth. Second, expropriation may affect the corporate growth directly, for example, when governments seize firms' assets.

To distinguish between the two effects of expropriation risk, we construct a measure of transparency reduction due to expropriation (or other country characteristics), *opacity gap*. For every year and company, opacity gap is calculated as the difference between opacity of a sample firm and opacity of a matched (by industry affiliation, size, and growth opportunities) U.S. firm. A non-U.S. company that is more opaque than a similar U.S. company would have larger values of opacity gap.

We then include the opacity gap variable in the following regression (which we also run only for the non-U.S. companies and industries),

$$CAPITAL\_ALLOCATION_j^c \text{ or } GROWTH_{i,t}^c = \alpha_i + \delta_c + \eta_t + \eta_j + \varphi_1 OPAC\_GAP_{i,t}^c + \lambda_1 EXPR\_SENS_{j,t} \times EXPR\_RISK_t^c + \gamma\, CONTROLS_{i,t}^c + \varepsilon_{i,t}^c \quad . \tag{7}$$

In (7), the coefficient on the opacity gap (ϕ_1) measures the effect of reduced transparency on capital allocation and growth. The coefficient on the interaction term (λ_1), on the other hand, measures the direct effects of expropriation. Since the time-invariant *CAPITAL_ALLOCATION* variable is constructed at the industry level, the above regression is estimated with industry and country fixed effects for the capital efficiency analysis. For the firm growth regressions, (7) is estimated with firm and year fixed effect.

C. Measures of Sensitivity to Expropriation

We use three measures of the risk of expropriation, which are constructed at the two-digit SIC industry level.

C.1 Oil dependence and the periods of high oil prices. To construct the first proxy for firm sensitivity to expropriation, we identify companies that belong to an industry with a primary two-digit SIC code equal to 13. This industry includes companies primarily engaged in producing crude petroleum and natural gas, and extracting oil from oil sands and oil shale. In our sample, we identify 808 oil and gas firms.

There is ample anecdotal evidence that natural-resource companies are frequent targets of government interference. The quintessential example is the story of expropriation of Yukos, once Russia's largest and most transparent oil company. Goriaev and Sonin (2006) document that investors perceived the attacks on Yukos as a strong signal that the state would expropriate other private companies as well. They show that the reaction to the Yukos affair was more negative for the stocks of more transparent companies than for those of less transparent ones. The Yukos affair was certainly not an isolated case and its relevance goes well beyond Russia. By studying 98 oil nationalizations that have occurred in 1960-2006 around the world, Guriev et al. (2011) show that oil companies are more likely to be expropriated by governments in countries with imperfect institutions; the risk of nationalization is especially large when oil prices are high (even controlling for country fixed

effects). Similar logic drove the famous expropriations of oil companies outside the 1960-2006 period, e.g. Expropiación Petrolera in Mexico in 1935.

A clear disadvantage of the above measure is that it is binary and identifies only companies in the oil and gas industry. To build a continuous measure, we calculate the risk of expropriation based on industry profits dependence on oil prices.[11] Our underlying premise is that the risk of government expropriation is higher for industries whose profits are driven more by luck (high prices of oil) rather than managerial skill or effort.[12]

To build a proxy for the *industry oil dependence* we use the coefficient β^{SIC2} at the natural logarithm of oil price in a regression of industry inflation-adjusted valuation on time trend and log of real oil price,

$$Q_t^{SIC2} = \alpha^{SIC2} + t^{SIC2} + \beta^{SIC2} \ln\left(P_t^{oil}\right) + \mu_t^{SIC2} \ , \qquad (8)$$

where Q is the median firm valuation (inflation-adjusted) in an industry, α a constant, t time trend, P^{oil} inflation-adjusted price of oil, and μ the error term. Regression (8) is estimated for every two-digit SIC industry using a sample of U.S. publicly listed firms from COMPUSTAT tapes from 1950 through 2007.[13] We rely on U.S. firms rather than local firms to mitigate the impact of country characteristics on the profitability of local industries. For example, if we estimated the regression (8) using valuation data from local markets, the estimated coefficients would not represent true oil dependence because firms might misrepresent corporate profits in fear of expropriation.

According to Table A in the Appendix, the majority of industries (28 out of 49) show negative oil price sensitivities. As expected, industries whose major output is natural resources exhibit large and positive sensitivities (especially Petroleum Refining, Oil and Gas Extraction, and Metal Mining industries). On the other hand, industries that use oil as a major production input, for example, Transportation by Air, have negative sensitivities.

[11] As discussed later in the draft, our results remain robust if we use prices of other commodities instead of oil price.

[12] Bertrand and Mullainathan (2001) use a similar argument to differentiate between managerial luck and skill in a study of CEOs compensation.

[13] The firm valuation is defined as the sum of firm market value and total assets minus firm book value of equity over firm total assets Oil prices (in U.S. dollars) are obtained from the International Finance Statistics (IFS) available through the International Monetary Fund. We inflation-adjust oil prices by dividing the series by the U.S. Purchasing Price Index from the IFS. An augmented Dickey-Fuller test rejects the hypothesis of a unit root in firm valuation and log of oil price series.

C.2 Human capital intensity. The second measure is based on the intensity of human capital. One can argue that industries that rely on skilled labor for the production processes face lower risks of expropriation because human capital is alienable; and it is hard to replace skilled workers to keep the company profitable. Consistent with this conjecture, Opp (2010) formally shows that high-technology industries are less likely to experience government expropriation.

The *human capital* measure is constructed using the algorithm outlines in Wang (2010). Specifically, we rely on the U.S. Current Population Survey.[14] We classify workers as college educated if they have at least sixteen years of education. For every two-digit SIC industry i and year t, we define human capital as the share of workers with a college education,

$$human\ capital_{i,t} = \frac{\sum_{n \in i} w_{n,t} college_{n,t}}{\sum_{n \in i} w_{n,t}},$$

where w is the survey weight and *college* is the dummy variable for worker n if the worker completes a college degree. We then average the above measure for years from 1995 through 2007.[15] As Table A in the Appendix indicates, Educational Services, Investment Offices, and Brokers industries employ more skilled workers, while Construction, Tobacco, and Forestry industries employ less.

C.3 Industry expropriation instances. Finally, following Guriev et al. (2011) we collect data on the actual number of expropriations. To construct the measure of expropriation instances, we search news articles using Lexis-Nexis for the period from 1990 through 2006. The keywords we use are: "nationalization", "expropriation", "forced sale", and "forced ownership transfer." The largest number of expropriation has been observed in the oil and gas extraction industry. We observe that more oil-dependent industries or industries that rely

[14] The Current Population Survey is a monthly survey of about 50,000 households conducted by the U.S. Bureau of the Census for the Bureau of Labor Statistics. It is considered to be the primary source of information on the labor force characteristics of the U.S. population. Estimates obtained from the CPS include employment, unemployment, earnings, hours of work, and other indicators. They are available by a variety of demographic characteristics including age, sex, race, marital status, and educational attainment. They are also available by occupation, industry, and class of worker.

[15] Survey weights are equal to the probability of being sampled. Sample weights are needed to derive population estimates from the survey sample to obtain unbiased estimates for the U.S. civilian non-institutionalized population.

less on skilled labor are less likely to be expropriated. Our regressions exclude the firms for which the expropriation risk has materialized. The pairwise correlations are 0.450 between oil dependence and expropriations (*p-val* = 0.00); and –0.290 between human capital and expropriation instances (*p-val* = 0.04).

C.4 Unified Expropriation Index. We aggregate the three expropriation sensitivity measures into a single index using the Principal Component Analysis. We call this index the unified expropriation index.[16] The first principal component captures 71% of the corresponding cross-sectional variance of the four variables. Moreover, only the first eigenvalue is significantly larger than one; thus one factor is sufficient to capture much of the common variation among the variables. The loadings for the unified index (based on the Principal Component Analysis) are: 0.60 for oil dependence, –0.46 for human capital intensity, and 0.66 for expropriation instances. The three industries with the highest unified risk of expropriation are Oil and Gas Extraction, Pipelines, and Tobacco industries. On the other hand, Educational Services, Brokers, and Insurance Agencies are the three industries with the lowest expropriation risk.

D. Measures of Firm Opacity, Capital Allocation Efficiency, and Growth

D.1 Income reducing strategies. One of the common strategies to reduce reported income is using negative discretionary accruals. Hall and Stammerjohan (1997) indicate that petroleum companies used negative accruals to reduce earnings out of fear of government litigation. We measure discretionary accruals using the methodology in Chaney et al. (2010) augmented by the Kothari's (2005) account for firm performance. Controlling for firm performance is shown to reduce the effect of the mechanical relation between a current period's discretionary accruals estimates and performance. Using the Kothari's method we can either match firms by country affiliation, industry group, and return on assets (ROA) or include past ROA directly in the discretionary accruals regression. We choose the latter approach (to

[16] The Principal Component Analysis is a statistical method to reduce multidimensional data sets to lower dimensions. This method can be viewed as an orthogonal linear transformation that alters the data to a new coordinate system such that the greatest variance by any projection of the data comes to lie on the first coordinate (called the first principal component), the second greatest variance on the second coordinate, and so on. See Stevens (1986) for details.

control for past ROA) because there are many countries in our sample with few companies, making the matching difficult.[17]

We estimate discretionary current accruals for every firm *i* and year *t* by pooling firms according to their two-digit SIC affiliation and running the following cross-sectional regression,

$$\frac{CA^c_{i,t}}{A^c_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A^c_{i,t-1}} + \alpha_2 \frac{S^c_{i,t} - S^c_{i,t-1}}{A^c_{i,t-1}} + \alpha_3 ROA^c_{i,t-1} + \alpha_4 \frac{PPE^c_{i,t-1}}{A^c_{i,t-1}} + \beta_1 GGDP^c_{t-1} + \beta_2 INFL^c_{t-1} + \varepsilon^c_{i,t} \quad .$$

The current accruals (*CA*) is net income before extraordinary items plus depreciation and amortization, minus operating cash flow, *S* net sales, *A* total assets, *PPE* property, plant, and equipment, and *ROA* return on assets. The above regression also controls for country-specific business cycles by including growth in real GDP (*GGDP*) and inflation (*INFL*). Using assets as the deflator is intended to mitigate heteroskedasticity in residuals. The above regression includes a constant term because it provides an additional control for heteroskedasticity not alleviated by assets as the deflator. *PPE* variable is intended to capture variation in depreciation expense. Then we use the estimated parameters of the above regression to calculate expected current accruals,

$$\begin{aligned} \frac{ECA^c_{i,t}}{A^j_{i,t-1}} &= \hat{\alpha}_0 + \hat{\alpha}_1 \frac{1}{A^c_{i,t-1}} + \hat{\alpha}_2 \left(\frac{S^c_{i,t} - S^c_{i,t-1}}{A^c_{i,t-1}} - \frac{AR^c_{i,t} - AR^c_{i,t-1}}{A^c_{i,t-1}} \right) + \\ &+ \hat{\alpha}_3 ROA^c_{i,t-1} + \hat{\alpha}_4 \frac{PPE^c_{i,t-1}}{A^c_{i,t-1}} + \hat{\beta}_1 GGDP^c_{t-1} + \hat{\beta}_2 INFL^c_{t-1} \quad . \end{aligned}$$

Here, *AR* is accounts receivables. By including this variable we assume that sales are not managed in the estimation period, but that the entire change in accounts receivable in the event year represents earnings management. Then discretionary current accruals for every firm and year is the difference between current accruals and expected current accruals,

$$DCA^c_{i,t} = \frac{CA^c_{i,t}}{A^j_{i,t-1}} - \frac{ECA^c_{i,t}}{A^j_{i,t-1}} \quad .$$

We multiply the DCA variable by -1 so that larger numbers correspond to more income reduction. We call this variable *income reducing discretionary accruals.*

[17] Even though we lose 10% of the sample, our results do not change if we control for performance by matching.

D2. Opacity index. In addition to the income reducing measure, we construct the *aggregate opacity* index. The index consists of three components. The first one, *accounting opacity*, measures reported earnings quality. The second component, *insider opacity*, reflects information asymmetry about firm value. The third measure, *informational opacity*, reflects the amount of firm-specific information incorporated into stock prices. These variables are calculated for every firm and year in the sample.

Accounting opacity is based on the quality of earnings reported in firms' financial statements. Managers often use earnings management to obscure information about a company's operating performance (see, e.g., Leuz et al. (2003)). To construct the accounting opacity, we take the absolute value of discretionary accruals defined above. Unlike the measure of negative accruals, this variable also accounts for cases in which a company uses positive accruals to boost reported earnings.

We construct the second component of opacity, insider opacity, to capture the aggregate level of information asymmetry about a company. We use a measure developed by Llorente et al. (2002), which is based on stock return autocorrelation conditional on trading volume. The authors argue that during periods of intense trading volume, hedging trades generate negatively autocorrelated returns, and private information trades generate positively autocorrelated returns. The greater the information asymmetry between the two groups of traders, the more likely it is that returns are positively autocorrelated (conditional on trading volume). Their model suggests the following relation between returns and trading volume:

$$E[r_{i,t+1} \mid r_{i,t}, V_{i,t}] = C_1 r_{i,t} + C_2 r_{i,t} V_{i,t} \quad ,$$

where E is the expectation operator, $r_{i,t}$ is the return for company i in period t, and $V_{i,t}$ is trading volume. They argue that C_2 is larger when information asymmetry about a company is higher.

We define *insider opacity* as coefficient C_2 in the time-series regression,

$$r_{i,w+1} = A_i + C_{i,1} r_{i,w} + C_{i,2} r_{i,w} V_{i,w} + \varepsilon_{i,w} \quad ,$$

run for every firm i during year t using weekly (w) returns and volume data. Data for firm returns and trading volume are from Datastream. In the above regression, A is the intercept,

C_1 and C_2 are the regression coefficients, and ε is the error term. Larger values for the insider opacity variable (C_2) correspond to greater information asymmetry.[18]

As a final component of opacity, we use a measure of information-based trading measured by the degree of stock prices asynchronicity developed in Morck et al. (2000). Intuitively, if a firm's stock return is highly correlated with the market factor then the stock return is less likely to contain firm-specific information. On the other hand, if the stock return moves asynchronously with the market return, it is indicative of more firm-specific information impounded into stock prices.

We calculate stock returns asynchronicity by decomposing the variation in local individual stock returns into two components: the unexplained (residual) sum of squares and explained (by local market index and U.S. index) sum of squares. To perform the decomposition we first run the following regression for every firm and year:

$$r_{i,w} = \alpha_i + \beta_{1,i} r_{m,w} + \beta_{2,i} r_{m,w}^{US} + \varepsilon_{i,w},$$

where $r_{i,w}$ is firm *i*'s weekly return, $r_{m,w}$ the value-weighted local market return, and $r_{m,w}^{US}$ the value-weighted market return in the U.S. All returns are expressed in U.S. dollars. We define informational opacity for every firm and year as the logarithmic transformation of one minus the coefficient of determination of the above regression, $\ln\left(R_{i,t}^{2;} / (1 - R_{i,t}^{2;})\right)$. High values of informational opacity mean that individual stock returns move more synchronously with local and U.S. market indexes which reflects less informative (in terms of firm-specific information) stock prices.

The above methodologies result in three indexes of opacity. To isolate the common component of the cross-section of each index, we use the Principal Component Analysis. Every loading of the principal component enters with the positive sign reflecting the fact that the three measures are positively correlated. The loadings are 0.68 for accounting opacity, 0.35 for informational opacity, and 0.64 for insider opacity.

[18] There is ample empirical evidence that coefficient C_2 is related to other measures of information asymmetry. Specifically, Llorente et al. verify that C_2 is positive (negative) for companies that are more (less) likely to suffer from information asymmetry; that is, firms with high (low) bid-ask spread, small (large) size, and/or with fewer (more) analysts following. In a supportive study, Grishchenko et al. (2003) show that C_2 is, on average, larger for firms that are located in countries where information asymmetry problems are more severe, such as countries with poor disclosure requirements or countries that have weak corporate governance. This variable is also used by Fernandes and Ferreira (2008) for international firms to measure the amount of private information trading caused by information asymmetry between traders. In a recent paper, Gagnon et al. (2009) confirm that C_2 is smaller for firms in countries with more transparent stock markets.

Our methodology assumes that the states cannot decipher firms' true performance from publicly available accounting numbers. While it is plausible that governments can expose a part of firms' profits, it is unlikely they can do it perfectly. Even if they can, an equilibrium response for firms would be to always reveal performance truthfully (see Watts and Zimmerman (1986) for a more detailed discussion). On the other hand, while the governments know that some sectors are more profitable than others, they are likely to be selective in their decisions which companies to predate on as it can be prohibitively costly to seize specific sectors of the economy.

D3. Capital allocation and growth. Following Wurgler (2000), capital allocation efficiency is defined as the country-specific, two-digit SIC industry-specific elasticity (Ω_j^c) of investment (measured by capital expenditures, *I*) with respect to firm value (*Q*), for which we estimate a panel regression (with firm and year fixed effects)

$$\ln\left(\frac{I_{i,t}^j}{I_{i,t-1}^j}\right) = \text{firm effects} + \text{year effects} + \Omega_j^c \ln\left(\frac{Q_{i,t}^j}{Q_{i,t-1}^j}\right) + \varphi_{i,t}^j \qquad (9)$$

for every industry *j* and country *c* using all firm annual data from 1980 through 2007.[19] Holding everything else constant, larger values of Ω_j^c mean better investment efficiency because efficient capital allocation prescribes an increase in investment in growing industries and a decrease in investment in declining industries.[20] Firm growth (*GROWTH*) is measured as the annual growth in real sales. Capital allocation is an industry-specific measure (available for 818 industry-country observations), while growth is a firm-specific one.

E. Country Risk of Expropriation

A country-specific assessment of *expropriation risk* is obtained from the International Country Risk Guide (ICRG). The variable, ICRG Investment Profile, is the assessment of risk of investment due to contract viability/expropriation and profits repatriation. We use this index because it is available for every country in the sample for a long period of time. The index ranges from 0 (high expropriation risk) to 12 (low expropriation risk). We subtract the

[19] Our results are robust if we use sales instead of firm value in (9). One can argue that using sales is preferable because firm value is measured with error for more opaque companies.

[20] The elasticity coefficient in (9) can be biased because of omitted variables. For example, investments in resources-extraction industries are responsive to the value of investment options. To account for this, we repeat regression (9) with an additional variable - oil price volatility. Our results do not change.

index values from 12 so that larger numbers correspond to larger risk of expropriation. We take quarterly averages from 1995 through 2007 to derive annual series. In the robustness section, we discuss alternative definitions of expropriation risk.

F. Control Variables

F.1 Controls for firm agency problems. Ownership data helps us address an alternative explanation of our main results. One can claim that lower transparency is not driven by the risk of expropriation by the government but rather by the insiders who use opacity to divert profits from the outside investors. This may happen in countries where the states do not provide adequate protection of outside investors and in firms that practice poor corporate governance. To control for this type of agency problems, we include firm ownership wedge (difference between control rights and ownership rights of the ultimate shareholders). Firms with the higher wedge are more likely to divert profits from outside shareholders and have lower transparency.

Ownership data come from the OSIRIS Ownership database. It contains detailed information about shareholder identity and their percentage of ownership. The ownership encompasses direct and indirect ownership links, as well an identity of an ultimate owner. It enables us to calculate the firm *ownership wedge*, the difference between control rights and cash flow rights of the ultimate shareholder. According to Faccio and Lang (2002), La Porta et al. (2002), and Paligorova and Xu (2010), this variable may be used as a proxy for the degree of agency costs in a firm. Control rights can exceed cash flow rights because of pyramidal structure, cross-holdings, and dual-class shares. For example, if the controlling shareholder owns ten percent of company A's outstanding shares, which in turn owns 30 percent of firm B's shares, then she is considered to control ten percent of firm B, the weakest link in the chain of control rights. However, the cash flow rights of firm B owned by the controlling shareholder is only three percent (10%×30%).

To calculate the wedge, we first identify an ultimate owner defined as a shareholder owning more than 20% direct or indirect voting rights. We then trace indirect links down the pyramid (a firm belongs to a pyramid if it is controlled by an ultimate owner and owns one more companies). Thirty percent of the sample firms in OSIRIS can be classified as pyramids at the 20% level with 29% of firms having an ultimate owner. Ownership wedge variable is

available for 16,240 sample firm (79,817 firm-years) for years from 1995 through 2007. To condition some of our test on government ownership, we identify firms with state as an ultimate owner. In our sample, 1,815 firms (8,893 firm-years) have state ownership. For firms with non-zero state ownership, the average ownership stake is 38%.

As the second measure of agency problems, we consider the *external financing need*. External financing need is defined as in Rajan and Zingales (1998) as the industry median value (over 1995-2007) of capital expenditures minus cash flows from operations divided by capital expenditures for U.S. companies. Companies in greater need for external financing are expected to have fewer agency problems.

F.2 Other control variables. In addition to firm and year fixed effects, we use multiple additional controls. Specifically, we include for GDP per capita and rule of law in the country because they can have direct impacts on firm opacity.[21] We also control for interactions of industry expropriation sensitivity with GDP per capita and the rule of law to reduce the possibility that we simply capture the effect of weak legal regime and not weak property rights. We also control for the level of financial development (the sum of stock market capitalization and private credit relative to GDP) because firms have lower incentives to misreport accounting numbers in more financially developed countries.

To differentiate between the risk of expropriation and taxes, we control the level of effective corporate taxes (taken from Djankov et al. (2010)). Moreover, we include the assessment of the fairness of the tax system, *tax burden*, from the Economist Intelligence Unit. It is measured whether how corporate taxation impedes the development of private businesses.

At the firm level, we include characteristics that were shown to affect incentives to disclose information (Doidge et al. (2003)). They include: growth opportunities (lagged percentage change in sales) and firm size (logarithm of total assets). We also control for cross-listing by adding the *cross-listing dummy*, which is equal to one if a firm's shares are listed on a U. S. exchange, and zero otherwise.[22] Finally, in some specifications, we control for volatility of fundamentals, calculated using a rolling-window method with five years of

[21] The rule of law variable is a quantitative assessment of the strength of a country's tradition of law and order, and it is taken from the ICRG.
[22] Privately placed ADRs through Rule 144a and over-the-counter stocks are excluded.

sales data, because Hribar and Nichols (2007) document an omitted variables bias when an unsigned version of accruals is used.[23]

In the growth regressions (7), we use the following additional control variables: interaction of intangible assets intensity with country expropriation risk index (Claessens and Laeven (2003) show that in countries with more secure property rights, intangibles-intensive industries grow faster), and interaction of industry need for external financing with country financial development (according to Rajan and Zingales (1998), firms in greater need for financing grow faster in better financially developed markets).

To reduce the impact of outliers, we winsorize every firm and industry-level variable at the 1% and 99% levels. We note that our results do not change if winsorization is not performed.

G. Summary Statistics

Panel B in the Appendix provides the summary statistics of the main variables by country: oil reserves, number of firms, number of firm-years, number of companies in oil and gas extraction industry, risk of expropriation, income decreasing accruals, accounting opacity, insider opacity, informational opacity, and aggregate opacity.

Firms in the U.K., Spain, and Singapore face the lowest risk of expropriation, while in Venezuela, Nigeria, and Pakistan the risks are the highest. According to the aggregate opacity index, the most transparent companies are in Denmark, U.K., and Canada, while the most opaque ones are in Russia, Vietnam, and Serbia. Canada has the largest number of oil companies in our sample – 131.

The unreported correlation coefficients between the main variables indicate that, across the sample countries, risk of expropriation is positively and significantly correlated with aggregate opacity and its components (accounting opacity, insider opacity, and informational opacity). Some of the aggregate opacity components are weakly correlated (e.g., informational opacity is not correlated with insider opacity or accounting opacity), indicating that the components measure different aspects of opacity.

[23] Our result also survive a long list of additional control parameters suggested by Francis et al. (2004). They include: leverage, market-to-book, log of market capitalization, and operating cycle (the log of the sum of days in receivable and days in inventory). We do not include them in the main tables to save space.

III. Empirical Results

To test our predictions, we first run regressions as in (5) using the difference-in-difference approach and test whether expropriation-prone companies are more opaque in countries with greater expropriation risk. Then, using the sample of oil companies, we test if the above effect is stronger during the periods of high oil prices by using the triple-difference method as in (6). The reported *p-values* are calculated using robust standard errors that are clustered by firm and adjusted for heteroskedasticity.

A. Impact of Expropriation Risk on Expropriation-sensitive Companies

Table I presents regressions using the difference-in-difference method with the aggregate opacity as the dependent variable and double interactions of expropriation sensitivities (oil dependence, human capital, expropriation instances, and unified expropriation sensitivity) with country expropriation risk. Every specification controls for the level variables (expropriation sensitivity and risk of expropriation) and multiple industry and firm variables described in the data section, including the variables for the agency problem (ownership gap and the need for external financing). The results indicate that firms whose profits are correlated with the price of oil, as well as firms that rely less on human capital, are more opaque if they are located in countries with a high risk of expropriation (the interaction terms of industry oil dependence and human capital with country risk of expropriation are highly significant). A similar relation is observed if industry sensitivity to expropriation is measured by the observed number of expropriations or when we combine the three expropriation sensitivities into a unified index.

We note that the above relations are not driven by agency problems as we control for ownership wedge. While firms with a larger ownership wedge are significantly more opaque, expropriation risk is a first-order effect for company opacity. Moreover, as we have argued, the observed opacity is expected to be lower for industries that require more external financing for their growth because a greater need for external financing requires managers to practice better governance. Consistent with our prediction, industries in greater need for external financing are less opaque and the adverse effect of expropriation risk on opacity is lessened for such industries; this is evident from the negative and marginally significant (at the 10% level) coefficient on the need for external financing and interaction of external financing need with expropriation risk.

We also note that, while the effective corporate tax rate has no effect on opacity, the assessment of the fairness of tax system works similarly to the risk of expropriation. In every specification, the burden of taxation variable is positive and significant.

To evaluate the economic significance of the above results, we compare the aggregate opacity of companies that belong to a high-expropriation risk industry (petroleum refining, aggregate expropriation index = 0.614) to the opacity of companies that belong to a low-expropriation risk industry (electronic equipment, aggregate opacity index = 0.142) in two countries, Venezuela (high risk of expropriation = 7.580) and Norway (low risk of expropriation = 2.285). Based on the regression coefficient of 0.00784 (from Table I), the petroleum refining industry in Norway is more opaque than the electronics industry, and the difference is equal to $0.00784 \times (0.614 - 0.142) \times 2.285 = 0.00846$. In Venezuela, however, the difference is larger, and it equals $0.00784 \times (0.614 - 0.142) \times 7.580 = 0.02805$, which is 6% larger relative to the sample average of opacity of 0.350.[24]

In Table II, we examine the individual components of the opacity index and use the unified expropriation index interacted with country expropriation risk as the main independent variable. First, we use the unsigned version of discretionary accruals as a measure of income-decreasing discretionary accruals. The positive and significant coefficient on the interaction term of the unified expropriation sensitivity with country risk of expropriation indicates that companies are more likely to under-report income using negative accruals if the risk of expropriation is high. Next, we use the accounting opacity (the absolute value of discretionary accruals) as a measure of earning quality. It turns out that the main variable of interest, the double interaction term, has the largest impact on accounting opacity (in terms of coefficient magnitude and its significance level) compared to the remaining two opacity measures, insider opacity and informational opacity. When the second opacity component is used, the informational opacity, the coefficient on the interaction of expropriation sensitivity with country expropriation risk is significant as well. However, it becomes less significant for the third opacity component, insider opacity; the coefficient on the double interaction term is significant at the 10% level.

Table III presents the estimates of regression (6) (the triple-difference approach) with the oil industry indicator variable as a measure of expropriation sensitivity conditional on country risk of exportations. The dependent variables are: income decreasing accruals,

[24] The reported regression coefficients are multiplied by 100.

aggregate opacity index, and its components (accounting opacity, and insider opacity, and informational opacity). The variable of interest is the triple interaction term of oil and gas industry with country risk of expropriation and oil price. Since the inference based on a triple interaction can only be made when all appropriate interaction terms are in the regression, we also control for appropriate double interactions (oil industry with country risk of expropriation, oil price with country risk of expropriation, and oil industry with oil price) and variables expressed levels. According to Table III, firms in the oil industry in countries with greater expropriation risks use more income reducing negative accruals, especially during periods of high oil prices. This is evident from the positive and significant coefficient on the triple interaction term. A similar relation is observed when individual components of the opacity index are used or when we use the aggregate opacity index. Some of the double interaction effects are significant as well. Specifically, oil industries are less transparent in high-expropriation risk countries, independent of oil price; the coefficient on the interaction of oil industry with risk of expropriation is positive and significant. From this table we conclude that oil companies obfuscate their financial and accounting information in fear of state expropriation, and their incentives to hide information is greater when economic rents are higher, that is, during the period of high oil prices.

With regard to high oil prices, one can argue that higher rents decrease the need for external financing and reduce incentives to disclose information. Since we explicitly control for the need for external financing, our difference-in-difference approach mitigates the direct effect of the higher oil price on the cash flows of oil firms, which results in lower transparency. Our approach captures the differential effect of oil price in countries with high and low expropriation risk given the need for external finance.

The results in Tables I -III are consistent with the predictions of our stylized theoretical model. As the risk of expropriation increases, industries which are more susceptible to expropriation under-report their income by using negative accruals, and become more opaque. For the oil companies, this effect is especially strong during periods of high oil prices. The observed results are not driven by agency considerations. The results are robust to multiple definitions of opacity (information opacity, accounting opacity and the aggregate index, which captures the common component of the three individual constituents).

B. Other Commodities

Our results in Table I are not specific to industry oil dependence. In this section, we report the estimates from re-running our regressions for other commodities. Specifically, we construct the measures of industry profits sensitivity to other commodity prices.

The commodities price data come from the Bureau of Commodity Research (BCR). The BCR tracks the prices of 22 commodities, which are grouped into 7 indexes: metals, raw industrial materials, textiles, foods, fats, livestock, and a composite commodities index. The prices used in the index are obtained from trade publications and government agencies. Although the sub-indexes are highly correlated among each other, the sensitivities of industrial profitability to particular commodity indexes are not. For example, oil dependence is positively and significantly correlated with sensitivities constructed using metals, raw industrial materials, and the composite commodity index. It is uncorrelated with textiles, foods, fats, and livestock commodity indexes.

Table IV summarizes main regression results with the seven sensitivities described above. We only report the coefficients on the interaction terms of commodity price sensitivities with country risk of expropriation. For comparison, the first row of Table IV contains the coefficient on the double interaction term for oil dependence with country expropriation risk reported in the first column of Tables I. It is apparent that the result holds for the composite commodity index (we exclude oil from the index). Out of the seven indexes, the coefficients are significant for metals and raw industrial materials. Interestingly, textiles, foods, fats, and livestock do not affect opacity in any consistent way. These results are broadly consistent with Boschini et al. (2006) who show that the resource curse is mostly driven by mineral resources (especially by oil, diamonds and precious metals) rather than by agricultural resources.[25]

C. Expropriation Risk, Capital Allocation, and Growth

In this section, we show that expropriation-sensitive industries exhibit worse investment efficiency and grow more slowly when property rights are weak. By including the opacity gap variable (difference between a firm's observed opacity and opacity of a similar firm in

[25] Boschini et al. (2006) show that the negative effect of resource abundance on growth depends on the extent of the resources' "appropriability." As rents from mining oil, diamonds, and precious metals are easier to capture than the rents in agricultural production, the countries richer in the former resources are more vulnerable to the resource curse.

the U.S.) along with the interactions (expropriation sensitivity with risk of expropriation) we differentiate between efficiency and growth reduction caused by opacity and direct risks of expropriation. If capital efficiency and firm growth deteriorate because of lower transparency, we expect the coefficient on the opacity gap variable to be significant. On the other hand, the interaction term should matter if investment efficiency and growth are directly affected by expropriation.[26]

In Panel A of Table V, we report the results of the regression when the dependent variable is firm sales growth. The main variables of interest are the opacity gap and the double interaction term of industry unified expropriation sensitivity with country risk of expropriation. The coefficient on opacity gap is positive and highly significant indicating that more opaque companies (relative to similar U.S. firms) grow slower. The coefficient on the double interaction is also negative but less significant (*p-value* = 3%) indicating that both effects take place: firms grow slower because they are more opaque and also because their cash flows are at risk due to expropriation. The interaction effects of external financing with financial development is positive and significant (financially dependent firms grow faster in more financially developed countries), while those of intangibles intensity with expropriation risk turn out insignificant.

Based on regression coefficients in the first specification of Table V, we calculate the drop in firm growth resulting from deterioration in transparency and compare it to the reduction in growth resulting from expropriation risk. As in the previous examples, consider two countries, Norway (average opacity gap = 0.466) and Venezuela (average opacity gap = 1.300). The coefficient on the opacity gap variable is equal to – 0.028. Therefore, holding everything else constant, the reduction in firm growth due to increased opacity in Venezuela is $-0.028 \times (1.300 - 0.466) = -2.34\%$ which is a significant reduction relative to the sample average firm growth rate of 6%. The reduction in firm growth due to direct risks of expropriation, however, is of similar magnitude and equal to –3.13%.[27] Evidently, firm growth suffers because of both opacity caused by state predation and direct risks of expropriation.

[26] The proposed approach does not take out the effect of a weaker legal environment. The results do not change if the effect of the legal environment is removed by the regressing firm opacity on firm, industry, and country variables, including rule of law, and using the residuals as a proxy for the opacity gap.

[27] It is calculated as $-0.019 \times (0.521 - 0.210) \times (7.580 - 2.285) = -3.13\%$, where –0.019 is the coefficient on the triple interaction term, 0.521 and 0.210 are the average values of the unified expropriation sensitivity in Venezuela and Norway, and 7.580 and 2.285 are expropriation risks for Venezuela and Norway, respectively.

With regard to capital allocation (Panel B of Table V), the results are also consistent with the predictions.[28] The coefficient on opacity gap is negative and significant indicating that more opaque companies are less likely to increase (decrease) investment when its value grows (shrinks). The coefficient on the triple interaction variable, however, is negative but much less significant. This shows that capital allocation efficiency is lower mostly due to increased opacity triggered by the risks of expropriation and not directly by expropriation.

Taken together, the results indicate that expropriation sensitive industries grow slower and invest less efficiently in countries with weak property rights. A part of the reduction in growth and investment efficiency results from lower transparency triggered by the risk of expropriation.

IV. Robustness

Our results are robust to alternative interpretations, endogeneity, and different definitions of main variables.[29]

A. Alternative Explanations

Using the data on government ownership, we perform further tests to distinguish between state expropriation and state collusion hypotheses. Expropriation is less likely to be directed towards state-owned firms. At the same time, if managers of state-owned companies collude with government officials to divert from minority shareholders, they are more likely to increase opacity. Therefore, we predict that if the expropriation effect dominates the agency costs effect, the risk of expropriation by the government is expected to have little impact on the opacity of state-owned firms. This is confirmed in Table VI, in which we condition our tests on state ownership. Specifically, by using the double interaction term of the unified expropriation sensitivity with country risk of expropriation, we run separate regressions on the sample of firms without government ownership (Panel A) and with government ownership (Panel B). It is apparent that the risk of expropriation (interacted with expropriation sensitivity) matters only for firms with no state ownership. The Wald-test of

[28] The capital allocation measure is country- and industry-specific, and it does not vary through time. Since our regression includes industry and country fixed effects, we cannot include certain time-invariant double interactions, or any of the country and firm control variables.

[29] We do not tabulate some of the robustness results. They are available from the authors upon request.

the regression coefficients equivalence (between different sets of data) indicates that the coefficients between the two sets of data are statistically different. We therefore conclude that firms are opaque because of the risk of expropriation and not because managers divert from minority shareholders.

Furthermore, although industry fixed effects and firm variables are included to control for unobserved characteristics, we can never be sure that our results are not driven by missing factors. Companies can reduce the risk of government expropriation by becoming more indispensable to the state. This can be achieved, for instance, by seeking greater internationalization, securing higher levels of short-term debt, and/or hiring more employees. To check the robustness of our results, we explicitly control for the aforementioned factors and confirm that our results are robust to the inclusion of these variables.[30]

For the tests in Table III, as oil price is the same for all countries and industries in a given year, it may capture the effect of the time dummies. We therefore replace oil price with country oil reserves. Unlike oil price, oil reserves are country- and year-specific. As oil reserves are measured as economically relevant proven reserves, this variable is a good proxy for the expected Net Present Value of future rents given the prevailing technology and oil price. Therefore, oil reserves also capture corporate rents in the oil industry and oil-dependent industries; our model implies that oil-dependent industries should be less transparent in countries with predatory governments and greater oil reserves, and this is what we confirm empirically. Furthermore, many companies are diversified across geographical regions. This can potentially bias our results because, for example, a U.K. company operating in Nigeria is subject to greater political risk than a company with operations only in the U.K. However, in our sample, there are more oil companies from stronger institutional environments operating in countries with weaker institutional environments than vice versa. Therefore, if a bias were to exist, we would be less likely to observe our results if geographical diversification were present. Nevertheless, we have obtained detailed

[30] Companies with greater international exposure may be more immune to government expropriation. When shareholder rights are violated, investors can file claims in international rather than local courts. To control for internalization we include the value of exports relative to sales. Companies can also alter their capital structure to elude government capture. It is established that debt rather than equity, and in particular short-term debt, is a main source of financing in developing countries (see, e.g., Harvey et al. (2004)). Short-term debt can serve not only as a monitoring device but also as an instrument to make state capture costlier (Stulz (2005)). Consequently, we control for the level of short-term debt (past ratio of short-term debt to sales). Finally, firms that employ more workers would presumably suffer less from government interference because unemployment-conscious governments are less likely to bring a firm to bankruptcy. We control for employment by the ratio of the number of employees to sales.

information on geographical segments and repeated our tests based on the sample of single-segment companies. Although we lose 40% of the sample, the results remain qualitatively unchanged.

It is possible that some of our results are driven by changes in firms' fundamentals in response to economic shocks. For example, high oil prices may stabilize firms' fundamentals. More stable fundamentals, in turn, affect the measure of informational opacity, since firms with more stable earnings are also likely to have similar returns. This reasoning, however, would affect only one opacity measure, namely the informational opacity. There is no reason to expect that the other measures of opacity (income-reducing accruals, insider opacity and accounting opacity) are affected by changes in firm fundamentals. We further check the robustness of the results by directly controlling for firms' fundamentals stability. We measure it as the coefficient of determination (R^2) of the following time-series regression,

$$ROA_{i,t} = \alpha_i + \beta_{1,i} ROA_{m,t} + \beta_{2,i} ROA^{US}_{m,t} + \varepsilon_{i,t}$$

where ROA_i is the return on assets for company i, ROA_m is the value-weighted average of ROA across all firms in a country, and $ROA^{US}_{m,t}$ is the value-weighted average of ROA across U.S. firms. The main results reported above remain unchanged with this additional control.

B. Endogeneity

We claim that companies strategically withhold information in response to the risk of expropriation. However, one could argue that causality runs in the opposite direction. Specifically, more opaque companies, especially government monopolies, may try to secure natural resources rents by lobbying for the type of government that would set up inefficient institutions. This view, nonetheless, would be inconsistent with the findings by Guriev at al. (2011), who show that oil companies are under a greater risk of nationalization by governments in countries with imperfect institutions. Moreover, our results indicate that the effect of predation on opacity is actually larger when oil prices are high.

To address endogeneity of country expropriation risk, we repeat every regression instrumenting expropriation risk with a set of exogenous variables: proportion of Catholics, ethnolinguistic fractionalization, and settlers' mortality rate. These instruments were shown to be related to the level of institutional development, while they are not likely to directly

affect individual firms' reporting choices and growth.[31] We also run a series of tests to show that these instruments are relevant and indeed exogenous. We then re-run our main regressions with the instrumental variables. The results are very similar (in terms of coefficients magnitude and their levels of significance) to those reported.

Another source of endogeneity can arise from the measurement error of expropriation sensitivity, which is used as an independent variable. As suggested by Newey (1983), the measurement bias in multivariate linear models can be attenuated in the General Method of Moments estimation. Moreover, the dependent variables (transparency and growth in our case) can be serially correlated. We address the issues of the error-in-variables and serial correlation by re-estimating every regression by the Arellano and Bond (1991) dynamic panel-data General Method of Moments. This method is designed for panel data sets with autocorrelated dependent variables and unobserved fixed characteristics. All of the results survive.

C. Other Robustness Checks

As an alternative measure of property rights protection, we consider the degree of political autocracy. Djankov et al. (2002) argue that members of autocratic governments are less constrained than the democratic ones, and thus they are more likely to pursue rent-seeking. The results do not change if we use this variable. All of the results are also robust if we construct a unified risk of expropriation index (using the Principal Component Analysis) that consists of multiple attributes: corruption in government, the risk of government expropriation, the lack of property rights protection, government stance towards business, freedom to compete, and the quality of bureaucracy The data are the *Economist Intelligence Unit*. Moreover, to ascertain that the results are not driven by a specific country, we repeat all of the regression by dropping one country at a time from the sample. We find similar patterns in the magnitudes and significance levels of the coefficients reported in Tables I-VI. Finally,

[31] La Porta et al. (1999) argue that governments usually intervene more in countries with greater ethnolinguistic fractionalization or a larger proportion of Catholics or Muslims. According to Acemoglu and Johnson (2005), in countries with greater mortality rates due to tropical diseases, the settlers were more likely to set up weak property rights in order to extract rents from the native population. We verify the relevance by regressing the predation index on the instruments. The F-test of joint significance is equal to 9.14 indicating the relevance of the instruments. The instruments also pass the exogeneity J-test of over-identifying restrictions.

the results are robust if include industry-year fixed effects to control for changes in industry regulation.

V. Related Literature

Our paper is related to three streams of literature. First, there are studies that examine the implications of firm corporate governance and disclosure for efficiency and growth. Second, there is literature on the political economy of corporate governance that shows that imperfect political institutions may result in inefficient disclosure and suboptimal corporate governance. Third, there is the resource curse literature, which focuses on the interaction of resource abundance and institutions and their effects on economic growth. Our paper connects all of the three streams of literature as we build a consistent microeconomic argument linking poor property rights protection, incentives to withhold information, and slower growth. We identify a specific channel of corporate transparency through which expropriation risk affects corporate growth. Finally, we directly test the importance of this channel using a large panel of firm-level data.

The first stream of literature investigates the relationship between investor protection, firm governance, disclosure, and economic growth. It is shown that better legal protection for investors is associated with higher valuation of the stock market (La Porta et al. (2002)). Recent firm-level studies also show that good corporate governance structures implemented by individual firms yield higher returns for shareholders (see, e.g., Doidge et al. (2003)). Qi et al. (2010) document that property rights protection and political stability reduce the spread of corporate bonds. Related to our result that expropriation risk reduces investment efficiency, Claessens et al (2010) show that better institutional environment results in better capital allocation through lowering firm financial transaction costs and reducing the required rate of return. With regard to accounting reporting choices, our paper is related to literature that examines the effects of government intervention on the quality of information. Watts and Zimmerman (1978) develop a positive accounting theory which studies how firms make accounting choices under risk of government intervention. This positive accounting theory has been empirically confirmed by Hall and Stammerjohan (1997) who show that in the U.S., oil producers underreport profitability to decrease tax liability.

The literature on the effects of political institutions on corporate governance is related to the classical political theories described in North (1990) and Olson (1993). These theories contend that individuals and governments who hold authority shape policies to increase their chances to stay in power and accumulate wealth. According to Rajan and Zingales (2003), centralized and closed governments can achieve these goals by constraining financial development. Politicians can also suppress competition to maintain their economic advantage. For example, states might control information (especially firm-specific information) to hide expropriation by politicians (Bushman et al. (2004)). Moreover, the deals between some firms and governments require opaqueness. Chaney et al. (2010) find that the quality of earnings reported by politically-connected firms is significantly poorer than that of similar non-connected companies. Another effect of political economy on corporate governance is described by Pagano and Volpin (2005). They provide a model in which left governments implement laws that protect labor and right governments are more likely to favor governance and investor protection. Our theoretical model incorporates the double-agency problem introduced by Stulz (2005) and Desai et al. (2007). Stulz (2005) models the complementary relation between managerial diversion and state expropriation and discusses how state quality affects investment strategies and corporate ownership. Desai et al. (2007) show that stricter tax enforcement improves firm governance. Desai and Dharmapala (2006, 2009) investigate how firm governance interacts with firm incentives to use tax shelters and the impact of tax sheltering on firm valuation. In their models, sheltering raises shareholder wealth for firms with strong governance. Durnev et al. (2009) report that firms practice worse governance in countries with higher expropriation risk.

Our paper also contributes to the literature on the resource curse. Sachs and Warner (1997) were first to show that the share of primary resources in exports negatively affects economic growth in standard growth regressions. Early studies have attributed this phenomenon to the macroeconomic "Dutch disease": Krugman (1987) considers a model with dynamic economies of scale where the negative effect of resource abundance on the competitiveness of manufacturing sector may have long-term implications. However, more recent literature (Boschini et al. (2006), Caselli (2006), Hodler (2006), Mehlum et al. (2006), Robinson et al. (2006)) shows that the negative effect of resource abundance on growth is related to the deterioration of economic and political institutions. In particular, Mehlum et al. (2006) find that the average effect of natural resource abundance on growth is not robust. In

countries with mature institutions, natural resources have no significant impact on economic growth; if anything, the effect is positive. However, if institutions are underdeveloped, resource abundance negatively and significantly affects growth. Resource rents create incentives for the political elite to engage in rent-seeking rather than productive activities, and suppress the development of property rights, and of governmental checks and balances. This effect was documented in a seminal paper by Ross (2001), who showed that oil-rich countries tend to be less democratic. Tsui (2005) followed up on Ross' cross-sectional results with a more sophisticated test. He instrumented oil abundance with unexpected discovery of oil and showed that oil abundance does reduce the level of democracy in a country in the subsequent 30 years. Using a panel of countries Egorov et al. (2009) show that controlling for country fixed effects, oil richness implies lower media freedom. Guriev et al. (2011) finds that nationalization of private oil companies is more likely in countries with imperfect political institutions, and when oil prices are high. Using the case of Russian oil export, Berkowitz and Semikolenova (2006) argue that an increase in tax revenue due to high oil prices enables governments to delay institutional reforms. The literature also identifies the human capital channel of the resource curse. Gylfason (2001) argues that natural resource abundance reduces incentives for accumulating human capital thus suppressing long-term growth rates. Suslova and Volchkova (2007) use the Rajan and Zingales (1998) methodology (similar to the methodology used in this paper) to provide microeconomic evidence supporting this conjecture. Most of the empirical resource curse literature faces serious methodological problems (Treisman (2010)). As institutions change very slowly, the empirical analysis is generally conducted using cross-country Ordinary Least Squares regressions that are vulnerable to multiple biases. The few exceptions using the panel data and Instrumental Variables estimation include the abovementioned Tsui (2005), Egorov et al. (2009), and Suslova and Volchkova (2007). We contribute to this research stream using the Rajan-Zingales (1998) difference-in-difference methodology controlling for industry and country specifics; we also enhance the methodology by taking advantage of the time variation in the expropriation risk.

VI. Concluding Remarks

We propose and examine a new channel through which expropriation risk can reduce economic growth through the deterioration of corporate transparency. We develop a model of

disclosure that incorporates the agency conflict between managers and shareholders, and the risk of expropriation by a government. The model predicts that firms subject to greater risks of expropriation can reduce this by becoming opaque and hiding profits. Lower corporate transparency, in turn, leads to inefficient capital allocation and hampers economic growth.

For the empirical tests, we construct several proxies for opacity, income reducing strategies, earnings management, and information asymmetry. In order to test whether risk of expropriation results in lower transparency at the firm level, we use the difference-in-difference approach. We identify industries that are more prone to expropriation and show that these industries are relatively less transparent in countries with higher risk of expropriation. We use three different measures of sensitivity to expropriation: oil dependence, human capital intensity, and the realized incidences of expropriation.

Our results show that controlling for firm agency problems, as well as firm and year fixed effects, firms in oil-dependent industries or industries that rely less on skilled labor are less transparent. We also investigate the real impact of corporate opacity of expropriation-prone industries and find that the sensitivity of investment with respect to value as well as the rate of growth in sales are significantly lower in industries prone to expropriation in countries with weaker property rights. We document that the deterioration in efficiency of capital markets and firm growth results from both reduced transparency and the direct risks of expropriation.

The results on expropriation risk of the oil industry also shed additional light on the consensus that slower growth in resource-rich economies may be explained by the negative impact of resource endowments on the development of economic and political institutions, which in turn suppresses economic growth. Our main contribution is empirical. Unlike the existing literature, which is mostly based on cross-country comparisons, we use a panel of firms spanning many years. We examine the effect of government predation on corporate transparency, capital allocation, and growth in resource industries at the microeconomic level controlling for agency problem, firm and time-specific effects.

Our results show that the returns to transparency are reduced for industries with high expropriation risk operating in weak institutional environments. The policymakers should bear in mind that in such industries stricter disclosure laws only work in the presence of strong property rights, so the focus should be on reducing the risk of the expropriation which will in turn bring higher transparency, efficient capital allocation, and growth.

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Table I
Risk of expropriation and opacity of expropriation-sensitive companies: The difference-in-differences approach.

This table reports the results of OLS regressions with aggregate opacity as the dependent variable. Aggregate opacity index is calculated using the Principal Component Analysis with the following weights: 0.677 for accounting opacity, 0.362 for informational opacity, and 0.641 for insider opacity. The independent variables are: interaction term of industry expropriation sensitivity (oil dependence, human capital, expropriation instances, and unified expropriation sensitivity) with country risk of expropriation (double interaction), country risk of expropriation, industry unified expropriation sensitivity, firm ownership wedge (difference between control rights and cash flow rights of the ultimate shareholder), industry external financing need, interaction of industry external financing need with country risk of expropriation, interaction of industry unified expropriation risk with country GDP per capita, interaction of unified expropriation risk with country rule of law, country effective corporate tax rate, country burden of taxation, firm cross-listing dummy variable, country financial development, country GDP per capita, country rule of law, firm growth opportunities, firm size, and volatility of fundamentals. The unified expropriation sensitivity is calculated using the Principal Component Analysis with the following weights: 0.571 for oil dependence, -0.470 for human capital, and 0.672 for expropriation instances. All of the coefficients are multiplied by 100. Regressions include firm and year fixed effects. Numbers in parentheses are probability levels at which the hypothesis of zero correlation can be rejected. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in bold face. Firms from the U.S. and firms that experienced expropriation are dropped from the sample. Standard errors are robust to heteroskedasticity, and they are clustered by firm.

dependent variable	**aggregate opacity**			
expropriation sensitivity	**oil dependence**	**human capital**	**expropriation instances**	**unified expropriation sensitivity**
expropriation sensitivity × risk of expropriation	**0.716**	**-1.043**	**0.257**	**0.784**
	(0.00)	(0.00)	(0.05)	(0.00)
risk of expropriation	**0.034**	**0.042**	0.027	**0.051**
	(0.10)	(0.05)	(0.12)	(0.10)
expropriation sensitivity	**0.013**	**-0.021**	0.019	**0.069**
	(0.04)	(0.00)	(0.15)	(0.00)
ownership wedge	**0.057**	**0.063**	**0.083**	**0.098**
	(0.03)	(0.01)	(0.06)	(0.04)
industry external financing need	**-0.396**	-0.108	**-0.218**	**-0.032**
	(0.08)	(0.15)	(0.10)	(0.10)
external financing need × risk of expropriation	**-0.458**	**-0.357**	**-0.391**	**-0.487**
	(0.00)	(0.00)	(0.00)	(0.00)
expropriation sens. × GDP per capita	-0.005	0.004	0.005	0.031
	(0.24)	(0.18)	(0.53)	(0.20)
expropriation sens. × rule of law	-0.068	-0.028	-0.017	-0.007
	(0.21)	(0.20)	(0.14)	(0.18)
effective corporate tax	0.124	0.121	0.188	0.170
	(0.12)	(0.14)	(0.13)	(0.12)
tax burden	**0.161**	**0.222**	**0.180**	**0.140**
	(0.00)	(0.00)	(0.00)	(0.00)
cross-listing dummy	**-0.055**	**-0.097**	-0.067	**-0.038**
	(0.10)	(0.03)	(0.11)	(0.10)
financial development	-0.015	-0.032	-0.015	0.007
	(0.22)	(0.18)	(0.18)	(0.22)
GDP per capita	-0.004	-0.012	-0.020	0.005
	(0.39)	(0.21)	(0.36)	(0.30)
rule of law	-0.052	-0.073	-0.056	-0.053
	(0.30)	(0.14)	(0.67)	(0.33)
firm growth opportunities	**1.167**	**1.318**	**1.379**	**1.508**
	(0.00)	(0.00)	(0.00)	(0.00)
firm size	**0.027**	**0.018**	**0.025**	**0.032**
	(0.05)	(0.00)	(0.09)	(0.05)
volatility of fundamentals	**0.278**	**0.256**	**0.241**	**0.211**
	(0.00)	(0.00)	(0.00)	(0.00)
firm fixed effects	included	included	included	Included
year fixed effects	included	included	included	Included
R^2	0.352	0.314	0.339	0.380
number of observations	78,835	78,835	78,835	78,835
number of countries	65	65	65	65

Table II
Risk of expropriation and opacity attributes of expropriation-sensitive companies: The difference-in-difference approach.

This table reports the results of OLS regressions with income reducing accruals, accounting opacity, informational opacity, and insider opacity as dependent variables. The independent variables are: interaction term of industry unified expropriation sensitivity with country risk of expropriation (double interaction), country risk of expropriation, industry unified expropriation sensitivity, firm ownership wedge (difference between control rights and cash flow rights of the ultimate shareholder), industry external financing need, interaction of industry external financing need with country risk of expropriation, interaction of industry unified expropriation risk with country GDP per capita, interaction of unified expropriation risk with country rule of law, country effective corporate tax rate, country burden of taxation, firm cross-listing dummy variable, country financial development, country GDP per capita, country rule of law, firm growth opportunities, firm size, and volatility of fundamentals (for specifications with income reducing accruals, accounting opacity and aggregate opacity as dependent variables). The unified expropriation sensitivity is calculated using the Principal Component Analysis with the following weights: 0.571 for oil dependence, -0.470 for human capital, and 0.672 for expropriation instance. All of the coefficients are multiplied by 100. Regressions include firm and year fixed effects. Numbers in parentheses are probability levels at which the hypothesis of zero correlation can be rejected. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in bold face. Firms from the U.S. and firms that experienced expropriations are dropped from the sample. Standard errors are robust to heteroskedasticity, and they are clustered by firm.

dependent variable	**income reducing discretionary accruals**	**accounting opacity**	**informational opacity**	**insider opacity**
unified expropriation sensitivity × risk of expropriation	**0.519**	**0.696**	**0.592**	**0.114**
	(0.00)	(0.00)	(0.00)	(0.10)
risk of expropriation	**0.032**	**0.045**	0.029	**0.031**
	(0.10)	(0.03)	(0.21)	(0.10)
unified expropriation sensitivity	**0.139**	**0.064**	**0.021**	**0.068**
	(0.00)	(0.00)	(0.10)	(0.01)
ownership wedge	**0.051**	**0.020**	**0.044**	**0.212**
	(0.03)	(0.05)	(0.10)	(0.00)
industry external financing need	-0.064	-0.035	0.009	-0.052
	(0.21)	(0.14)	(0.36)	(0.20)
external financing need × risk of expropriation	**-0.255**	**-0.334**	**-0.443**	**-0.186**
	(0.10)	(0.00)	(0.01)	(0.00)
unified expropriation sensitivity × GDP per capita	0.045	0.012	0.056	-0.014
	(0.25)	(0.13)	(0.21)	(0.25)
unified expropriation sensitivity × rule of law	-0.009	-0.017	-0.009	0.025
	(0.14)	(0.51)	(0.44)	(0.31)
effective corporate tax rate	0.154	0.115	0.171	**0.051**
	(0.18)	(0.20)	(0.21)	(0.10)
tax burden	**0.173**	**0.112**	**0.118**	**0.046**
	(0.01)	(0.01)	(0.00)	(0.00)
cross-listing dummy	0.012	**-0.028**	**-0.013**	-0.048
	(0.33)	(0.10)	(0.03)	(0.14)
financial development	-0.006	-0.002	-0.012	0.047
	(0.23)	(0.23)	(0.14)	(0.23)
GDP per capita	-0.006	**0.012**	0.007	-0.020
	(0.14)	(0.08)	(0.41)	(0.62)
rule of law	**-0.252**	-0.063	0.017	-0.078
	(0.10)	(0.12)	(0.43)	(0.50)
firm growth opportunities	**0.708**	**1.625**	**0.670**	**0.657**
	(0.00)	(0.00)	(0.00)	(0.00)
firm size	**-0.050**	**-0.078**	**0.012**	**0.031**
	(0.00)	(0.01)	(0.06)	(0.09)
volatility of fundamentals	**0.164**	**0.184**	-	-
	(0.00)	(0.00)		
firm fixed effects	included	included	included	included
year fixed effects	included	included	included	included
R^2	0.340	0.334	0.381	0.387
number of observations	79,817	79,817	78,835	78,835
number of countries	84	84	65	65

Table III
Risk of expropriation and opacity of oil and gas companies: Triple-difference approach.

This table reports the results of OLS regressions with income reducing accruals, accounting opacity, insider opacity, informational opacity, and aggregate opacity as dependent variables. Aggregate opacity is calculated using the Principal Component Analysis with the following weights: 0.677 for accounting opacity, 0.362 for informational opacity, and 0.641 for insider opacity The independent variables are: interaction term of oil and gas industry dummy variable with country risk of expropriation and the log of real oil price (triple interaction), oil and gas industry dummy variable with country risk of expropriation (double interaction), the log of real oil price with country risk of expropriation (double interaction), oil and gas industry dummy variable with the log of real price (double interactions), country risk of expropriation, firm ownership wedge (difference between control rights and cash flow rights of the ultimate shareholder), industry external financing need, interaction of industry external financing need with country risk of expropriation, interaction of industry unified expropriation sensitivity with country GDP per capita, interaction of unified expropriation sensitivity with country rule of law, country effective corporate tax rate, country burden of taxation, firm cross-listing dummy variable, country financial development, country GDP per capita, country rule of law, firm growth opportunities, firm size, and volatility of fundamentals (for specifications with income reducing accruals, accounting opacity and aggregate opacity as dependent variables). All of the coefficients are multiplied by 100. Regressions include firm and year fixed effects. Numbers in parentheses are probability levels at which the hypothesis of zero correlation can be rejected. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in bold face. Firms from the U.S. and firms that experienced expropriations are dropped from the sample. Standard errors are robust to heteroskedasticity, and they are clustered by firms.

dependent variable	**income reducing discretionary accruals**	**accounting opacity**	**informational opacity**	**insider opacity**	**aggregate opacity**
oil and gas industry × oil price × risk of expropriation	**0.711**	**1.186**	**0.840**	**0.095**	**0.875**
	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)
oil and gas industry × risk of expropriation	**0.037**	**0.081**	-0.014	**0.036**	**0.052**
	(0.00)	(0.10)	(0.16)	(0.00)	(0.10)
oil price × risk of expropriation	-0.280	-0.004	0.186	-0.006	0.089
	(0.54)	(0.24)	(0.20)	(0.36)	(0.22)
oil and gas industry × oil price	-0.002	-0.038	0.007	-0.069	-0.140
	(0.63)	(0.13)	(0.18)	(0.13)	(0.13)
risk of expropriation	0.024	**0.058**	0.039	**0.036**	0.065
	(0.12)	(0.03)	(0.21)	(0.10)	(0.11)
ownership wedge	**0.044**	**0.039**	**0.038**	**0.046**	**0.056**
	(0.03)	(0.05)	(0.10)	(0.00)	(0.02)
industry external financing need	-0.056	-0.367	0.017	0.005	**-0.210**
	(0.21)	(0.13)	(0.39)	(0.21)	(0.10)
external financing need × risk of expropriation	**-0.156**	**-0.331**	**-0.424**	**-0.394**	**-0.529**
	(0.10)	(0.00)	(0.01)	(0.00)	(0.00)
oil and gas industry × GDP per capita	0.029	0.037	0.046	-0.019	0.040
	(0.25)	(0.13)	(0.21)	(0.25)	(0.20)
oil and gas industry × rule of law	-0.008	0.001	-0.015	0.025	0.001
	(0.14)	(0.51)	(0.44)	(0.29)	(018)
effective corporate tax	0.149	0.123	0.176	0.070	0.183
	(0.16)	(0.20)	(0.23)	(0.11)	(0.14)
tax burden	**0.155**	**0.095**	**0.128**	**0.155**	**0.168**
	(0.03)	(0.05)	(0.00)	(0.00)	(0.00)
cross-listing dummy	0.031	**-0.024**	**-0.024**	**-0.030**	**-0.035**
	(0.33)	(0.10)	(0.03)	(0.16)	(0.10)
financial development	-0.005	0.018	0.005	-0.028	0.005
	(0.23)	(0.23)	(0.17)	(0.20)	(0.20)
GDP per capita	-0.011	**-0.002**	0.025	0.004	0.013
	(0.14)	(0.10)	(0.48)	(0.68)	(0.34)
rule of law	**-0.270**	**-0.278**	0.003	0.014	-0.161
	(0.10)	(0.02)	(0.43)	(0.50)	(0.30)
firm growth opportunities	**0.695**	**0.618**	**0.665**	**0.639**	**0.895**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
firm size	**-0.060**	**-0.066**	**0.014**	**0.027**	**-0.025**
	(0.01)	(0.02)	(0.06)	(0.08)	(0.05)
volatility of fundamentals	**0.160**	**0.188**	-	-	**0.222**
	(0.00)	(0.00)			(0.00)
firm fixed effects	included	included	included	included	Included
year fixed effects	included	included	included	included	Included
R^2	0.380	0.334	0.380	0.387	0.340
number of observations	79,817	79,817	78,835	78,835	78,835
number of countries	84	84	65	65	65

Table IV
Sensitivity measures based on various commodities prices.

This table reports the results of regressions in Table I with aggregate opacity as the dependent variable and using various industrial commodity sensitivities measures (metals, raw industrial materials, textiles, foods, fats, livestock, and composite) in place of industry oil dependence. The sensitivity measures are constructed using equation (8) by regressing industry valuation on the logarithm of corresponding commodity price index, industry fixed effects, and year fixed effects. The reported coefficients and *p-values* are for the double interaction term of the sensitivity of industry profits to corresponding commodity index price with country risk of expropriation. All coefficients are multiplied by 100. The first row replicates the results of Table I.

commodity index	**oil**	**0.716**
		(0.00)
	metals	**0.611**
		(0.00)
	raw industrial materials	**0.403**
		(0.00)
	textiles	0.010
		(0.32)
	foods	0.090
		(0.26)
	fats	-0.117
		(0.14)
	livestock	0.111
		(0.20)
	composite (excluding oil)	**0.207**
		(0.05)

Table V
Firm growth and industry capital allocation efficiency of expropriation-sensitive industries conditional on risk of expropriation. Difference-in-difference approach.

This table reports the results of the OLS regressions of firm growth (Panel A) and industry capital allocation efficiency (Panel B) as dependent variables. The independent variables are: firm opacity gap, interaction term of industry unified expropriation sensitivity with country risk of expropriation (double interaction), industry external financing need with country financial development, industry intensity of intangibles with country risk of expropriation, industry oil-price-dependence with country GDP per capita, industry oil-price-dependence with country rule of law, country risk of expropriation, country financial development, country GDP per capita, country rule of law, firm growth opportunities, firm size, industry oil-price-dependence, industry external financing need, and industry intangibles intensity. Opacity gap is defined as the difference between opacity level of a sample firm and a matched firm in the U.S, matched by two-digit industry SIC code, firm size, and firm growth opportunities. Regressions in Panel A include firm and year fixed effects. Regressions in Panel B include industry and country fixed effects. Numbers in parentheses are probability levels at which the hypothesis of zero correlation can be rejected. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in bold face. Firms from the U.S. and firms that experienced expropriations are dropped from the sample. Standard errors are robust to heteroskedasticity, and they are clustered by firms (in Panel A) and industries (in Panel B).

dependent variable	**Panel A : growth in firm sales**	**Panel B: industry capital allocation**
opacity gap	**-0.028**	**-0.060**
	(0.00)	(0.00)
unified expropriation sensitivity × risk of expropriation	**-0.019**	**-0.021**
	(0.03)	(0.08)
risk of expropriation	**-0.136**	-
	(0.00)	
unified expropriation sensitivity	-0.211	-
	(0.16)	
ownership wedge	-0.314	-0.023
	(0.14)	(0.21)
external financing need	**0.027**	-
	(0.10)	
external financing need × risk of expropriation	**0.613**	**0.208**
	(0.00)	(0.00)
intangibles intensity	0.173	-
	(0.29)	
intangibles intensity × risk of expropriation	0.007	**-0.020**
	(0.40)	(0.01)
unified expropriation sensitivity × GDP per capita	0.021	**0.214**
	(0.12)	(0.07)
unified expropriation sensitivity × rule of law	**0.402**	0.120
	(0.00)	(0.20)
effective corporate tax	-0.033	**-0.3231**
	(0.16)	(0.08)
tax burden	**-0.039**	**-0.138**
	(0.05)	(0.03)
external financing need × financial development	**0.606**	**0.129**
	(0.00)	(0.00)
cross-listing dummy	**0.004**	-
	(0.00)	
risk of expropriation	**-0.161**	-
	(0.00)	
financial development	**0.347**	-
	(0.10)	
GDP per capita	**0.001**	-
	(0.01)	
rule of law	**0.028**	-
	(0.00)	
firm growth opportunities	**0.816**	-
	(0.00)	
firm size	**-0.042**	-
	(0.00)	
firm fixed effects	included	not included
industry fixed effects	not included	included
country fixed effects	not included	Included
year fixed effects	included	included
R^2	0.208	0.223
number of observations	79,817	818
number of countries	84	72

Table VI
Expropriation risk vs. government collusion hypotheses: Tests conditional on state ownership.

This table reports regressions conditional on state ownership. The specification used is as in the last column of Table III, run on the subsamples of firms without government ownership (Panel A) and with government ownership (Panel B). There are 1,815 firms (8,893 firm-year observations) with non-zero government ownership. To conduct the Wald-test of coefficient equivalence, we create a dummy variable equal to 1 if a firm has non-zero government ownership, and 0 otherwise. We multiply every independent variable by the corresponding dummy variables and include them in the regressions. The Wald-test of coefficient equivalence (reported at the bottom of the table) is an F-test of joint significance of the interaction terms with the dummy variables. The null hypothesis is that the relation between the dependent variable and independent variables does not change across the two samples.

	Panel A: firms without state ownership	**Panel B: firms with state ownership**
dependent variable	**aggregate opacity**	
unified expropriation sensitivity × risk of expropriation	**0.775**	-0.144
	(0.00)	(0.42)
risk of expropriation	**0.056**	0.073
	(0.10)	(0.11)
unified expropriation sensitivity	**0.072**	**0.099**
	(0.00)	(0.00)
ownership wedge	**0.116**	**0.130**
	(0.02)	(0.00)
industry external financing need	**-0.031**	-0.371
	(0.10)	(0.18)
external financing need × risk of expropriation	**-0.417**	-0.176
	(0.00)	(0.20)
unified expropriation sensitivity × GDP per capita	0.025	-0.030
	(0.20)	(0.12)
unified expropriation sensitivity × rule of law	-0.006	-0.032
	(0.14)	(0.29)
effective corporate tax	0.163	0.090
	(0.12)	(0.16)
tax burden	**0.120**	0.080
	(0.00)	(0.17)
cross-listing dummy	**-0.034**	**-0.098**
	(0.10)	(0.10)
financial development	0.010	-0.004
	(0.22)	(0.28)
GDP per capita	0.007	**-0.597**
	(0.24)	(0.10)
rule of law	**-0.094**	-0.068
	(0.10)	(0.13)
firm growth opportunities	**1.318**	**1.219**
	(0.00)	(0.00)
firm size	**0.030**	**0.018**
	(0.00)	(0.00)
volatility of fundamentals	**0.210**	**0.258**
	(0.00)	(0.00)
firm fixed effects	included	included
year fixed effects	included	included
R^2	0.382	0.414
Wald test of coefficient equivalence (F-test)	**318.660** (0.00)	
number of observations	70,924	8,893

Appendix

Panel A: Expropriation sensitivities by industry.

This table contains summary statistics of expropriation sensitivities: oil dependence, human capital, and the number of observed expropriations. Oil dependence is defined as a coefficient β^j on the natural logarithm of oil price in a regression of industry inflation-adjusted valuation on time trend and log of real oil price, $Q_t^j = \alpha^j + t^j + \beta^j \ln\left(P_t^{oil}\right) + \mu_t^j$, where Q is the median industry valuation (inflation-adjusted using Producer Price Index), α a constant, t time trend, and P^{oil} inflation-adjusted price of oil. Human capital is the proportion of labor with an advanced college degree using data from the 1995-2007 Current Population Survey (Wang (2010)). Observed expropriations is the number of expropriation instances in the sample countries occurred during the period from 1950 through 2007. We use Lexis-Nexis to conduct the search using the following words: "nationalization", "expropriation", "forced sale", and "forced ownership transfer." The unified expropriation sensitivity is calculated using the Principal Component Analysis with the following weights: 0.571 for oil dependence, -0.470 for human capital, and 0.672 for expropriation instance. The index is converted to the 0-to-1 scale. The pairwise correlations are: -0.141 between oil dependence and human capital (*p-val* = 0.33); 0.450 between oil dependence and expropriations (*p-val* = 0.00); and -0.290 between human capital and expropriation instances (*p-val* = 0.04).

SIC	industry	oil dependence	human capital	expropriation instances	unified expr. sensitivity
200	Agriculture	-0.206	0.121	0	0.269
800	Forestry	-0.913	0.089	0	0.117
900	Fishing, hunting, and trapping	0.136	0.097	0	0.369
1000	Metal Mining	0.666	0.108	1	0.599
1200	Coal Mining	0.475	0.105	1	0.554
1300	Oil And Gas Extraction	0.774	0.192	5	1.000
1400	Mining Of Nonmetallic Minerals	0.414	0.120	1	0.529
1500	Building Construction	-0.135	0.075	2	0.532
2000	Food And Kindred Products	0.333	0.229	0	0.329
2100	Tobacco Products	0.401	0.081	2	0.660
2200	Textile Mill Products	0.049	0.121	1	0.439
2300	Apparel And Other Finished Products	-0.207	0.102	0	0.281
2400	Lumber And Wood	0.263	0.178	1	0.454
2600	Paper And Allied Products	0.456	0.089	1	0.560
2700	Printing, Publishing, And Allied Industries	0.355	0.206	0	0.350
2800	Chemicals And Allied Products	-0.151	0.171	0	0.249
2900	Petroleum Refining	0.950	0.190	1	0.614
3000	Rubber And Miscellaneous Plastics Products	-0.188	0.206	0	0.217
3100	Leather And Leather Products	-0.221	0.199	0	0.213
3200	Stone, Clay, Glass, And Concrete	0.333	0.173	1	0.474
3300	Primary Metal Industries	0.109	0.206	1	0.397
3500	Machinery	-0.06	0.189	0	0.259
3600	Electronic Equipment	-0.486	0.208	0	0.142
3700	Transportation Equipment	-0.028	0.186	0	0.269
3800	Measuring Instruments	-0.253	0.201	0	0.204
4000	Railroad Transportation	-0.107	0.147	1	0.383
4200	Motor Freight Transportation	-0.103	0.148	1	0.384
4400	Water Transportation	-0.180	0.140	1	0.370
4500	Transportation By Air	-0.796	0.124	1	0.230
4600	Pipelines, Except Natural Gas	0.410	0.118	2	0.637
4700	Transportation Services	-0.445	0.131	1	0.311
4800	Communications	-0.051	0.187	1	0.371
4900	Electric, Gas, And Sanitary Services	-0.08	0.216	0	0.237
5000	Wholesale Trade-durable Goods	-0.183	0.118	0	0.277
5200	Building Materials, Hardware, Garden Supply	0.359	0.124	1	0.513
5500	Automotive Dealers And Gasoline Stations	0.214	0.132	0	0.365
6000	Depository Institutions	-0.022	0.399	0	0.129
6200	Security And Commodity Brokers	-0.282	0.403	0	0.063
6400	Insurance Agents, Brokers, And Service	-0.173	0.380	0	0.105
6500	Real Estate	-0.032	0.379	0	0.140
6700	Holding And Other Investment Offices	-0.025	0.406	0	0.124
7000	Hotels, Rooming Houses	0.341	0.111	2	0.625
7300	Business Services	-0.172	0.141	0	0.264
7500	Automotive Repair, Services, And Parking	0.273	0.137	0	0.376
8000	Health Services	-0.198	0.305	1	0.256
8100	Legal Services	0.084	0.173	0	0.305
8200	Educational Services	-0.134	0.552	0	0.000
8300	Social Services	0.273	0.201	0	0.333
8700	Engineering And Related Services	-0.148	0.142	0	0.269
average		0.034	0.187	0.612	0.350

Panel B: Descriptive statistics by country, 1995-2007.

This table contains summary statistics of the opacity sample by country (average values across firms and years). The variables are: oil reserves (in billions of barrels), number of firms, number of firm-years, number of oil companies, country risk of expropriation, income reducing accruals, accounting opacity, informational opacity, insider opacity, and aggregate opacity. Oil reserves statistics are from the 2008 BP Statistical Review. U.S. is dropped from the sample. The sample years are 1995-2007. The aggregate opacity index is calculated using the Principal Component Analysis with the following weights: 0.677 for accounting opacity, 0.641 for insider opacity, and 0.362 for informational opacity. The index is converted to the 0-to-1 scale.

country	oil reserves, billions barrels	number of firms	number of firm-years	number of oil firms	risk of expropriation	income decreasing accruals	accounting opacity	informational opacity	insider opacity	aggregate opacity
Algeria	10.154	10	33	4	4.500	0.082	0.308	-	-	-
Argentina	2.39	113	728	12	5.593	-0.039	0.269	-0.457	0.085	0.603
Australia	3.649	452	2,644	94	2.282	-0.063	0.091	-0.158	-0.017	0.297
Austria	-	69	348	4	1.827	0.045	0.372	-1.544	0.015	0.554
Bahrain	-	14	44	4	2.298	0.016	0.218	-	-	-
Bangladesh	-	7	29	-	5.878	0.066	0.187	-1.552	0.006	0.305
Belgium	-	102	379	-	2.010	-0.128	0.064	-1.637	0.027	0.159
Bolivia	-	16	115	6	4.131	0.038	0.167	-	-	-
Brazil	5.942	463	3,140	-	5.212	0.051	0.113	-0.882	0.019	0.290
Bulgaria	-	14	42	-	2.170	0.001	0.121	-0.252	-0.017	0.326
Canada	13.572	1,282	5,934	131	1.917	-0.122	0.028	-1.647	-0.011	0.072
Chile	-	218	1,373	6	2.032	0.055	0.106	-1.633	-0.031	0.153
China	16.061	1,108	6,487	21	4.801	0.121	0.272	-0.663	0.069	0.570
Colombia	1.848	86	259	6	5.058	0.054	0.195	-0.857	-0.010	0.368
Croatia	-	29	37	-	3.372	0.036	0.082	-0.950	0.063	0.289
Cyprus	-	10	65	4	1.769	0.026	0.085	-1.747	0.057	0.207
Czech Rep.	-	65	244	6	2.240	0.047	0.124	-1.803	0.047	0.241
Denmark	0.791	85	365	2	2.269	0.005	0.004	-2.075	-0.009	0.000
Ecuador	2.930	15	20	4	6.538	0.051	0.156	-	-	-
Egypt	3.780	73	139	6	4.394	0.069	0.144	-	-	-
Estonia	-	16	18	-	2.136	0.081	0.116	-	-	-
Finland	-	55	271	2	1.756	0.072	0.058	-0.331	-0.016	0.238
France	-	700	3,550	-	1.821	0.003	0.091	-1.497	0.031	0.212
Germany	-	605	3,186	6	1.901	-0.096	0.073	-1.594	-0.008	0.139
Greece	-	184	999	4	2.410	0.098	0.092	-0.310	-0.007	0.294
Guatemala	-	10	17	2	3.029	0.032	0.106	-	-	-
Honduras	-	10	18	-	4.545	0.126	0.119	-	-	-
Hong Kong	-	140	862	4	2.378	0.088	0.076	-1.536	0.059	0.218
Hungary	-	13	29	2	1.929	0.163	0.130	-1.374	-0.005	0.237
India	4.991	454	799	45	4.708	0.018	0.112	-0.824	0.049	0.326
Indonesia	6.535	71	319	8	5.753	0.116	0.135	-0.828	0.229	0.544
Ireland	-	63	389	11	1.545	0.056	0.132	-1.631	0.125	0.350
Israel	-	111	666	6	3.433	0.082	0.157	-0.894	0.003	0.329
Italy	0.716	219	1,187	8	2.125	0.324	0.143	-1.210	0.107	0.388
Japan	-	1,858	9,990	-	2.756	0.169	0.079	-1.160	0.139	0.344
Jordan	-	80	104	6	2.881	0.093	0.067	-	-	-
Kazakhstan	35.302	12	12	4	3.596	0.068	0.147	-0.781	0.202	0.536
Kenya	-	17	37	3	4.231	0.052	0.162	-	-	-
Korea	-	1,087	7,016	18	3.657	0.084	0.119	-1.283	0.168	0.413
Kuwait	92.704	59	131	8	3.372	0.074	0.079	-0.809	0.243	0.488
Latvia	-	26	49	2	2.096	0.041	0.088	-	-	-
Lithuania	-	35	68	4	2.119	0.026	0.090	-	-	-
Malaysia	4.156	296	1,364	12	3.984	0.102	0.107	-1.059	-0.004	0.241
Mexico	39.723	129	784	2	2.721	0.056	0.182	-0.763	0.246	0.629
Morocco	-	31	76	4	3.660	0.000	0.084	-0.964	-0.025	0.198
Netherlands	-	117	316	6	1.484	-0.031	0.051	-2.104	0.035	0.104
New Zealand	-	57	285	6	1.939	-0.075	0.052	-1.676	0.017	0.129
Nicaragua	-	12	29	2	5.112	0.135	0.129	-	-	-
Nigeria	23.304	21	54	6	6.801	-0.038	0.120	-0.452	0.193	0.524
Norway	8.425	102	329	-	2.285	0.054	0.033	-1.820	0.195	0.276
Oman	4.742	43	105	6	3.019	0.026	0.140	-	-	-
Pakistan	-	82	256	16	6.638	-0.015	0.232	-0.828	0.209	0.648
Panama	-	20	50	4	3.051	0.066	0.182	-0.347	0.147	0.567
Paraguay	-	41	55	4	3.952	0.003	0.112	-	-	-
Peru	0.834	184	431	6	4.022	-0.006	0.177	-0.372	0.072	0.480
Philippines	-	199	893	43	3.535	0.056	0.169	-0.473	-0.015	0.368
Poland	-	77	129	8	1.907	0.071	0.126	-0.726	0.113	0.421
Portugal	-	66	321	3	1.484	-0.100	0.104	-1.877	0.075	0.237
Qatar	10.216	20	47	6	2.782	0.119	0.140	-0.435	0.024	0.375
Romania	1.052	12	29	-	4.010	0.058	0.102	-0.814	0.036	0.301
Russia	70.371	209	426	-	5.128	0.072	0.493	-1.611	0.299	1.000
Saudi Arabia	235.347	70	204	4	3.013	0.174	0.083	-1.106	0.079	0.292
Serbia	-	13	13	-	4.500	0.086	0.319	-1.210	0.159	0.669
Singapore	-	403	2,098	-	1.449	0.059	0.078	-1.610	0.018	0.171
Slovakia	-	10	16	2	2.436	-0.039	0.054	-0.832	0.005	0.204
Slovenia	-	11	22	2	1.583	0.090	0.155	-0.258	-0.019	0.368
South Africa	-	221	1,217	2	2.692	0.072	0.115	-0.427	-0.037	0.280
Spain	-	209	1,176	6	1.404	-0.032	0.060	-2.094	0.037	0.118
Sri Lanka	-	60	377	-	4.356	0.020	0.112	-0.691	-0.013	0.275
Sweden	-	420	2,671	18	2.304	-0.121	0.059	-1.018	0.070	0.260
Switzerland	-	171	493	2	2.734	0.066	0.077	-1.274	0.092	0.281
Syria	2.252	11	25	6	6.176	0.049	0.082	-	-	-
Taiwan	-	428	2,652	10	1.849	0.049	0.063	-1.349	-0.011	0.147
Thailand	0.316	400	2,109	16	4.391	-0.030	0.160	-1.608	0.171	0.437
Tunisia	1.064	34	57	-	3.551	-0.026	0.086	-0.327	0.034	0.327
Turkey	-	132	632	6	4.500	-0.004	0.147	-0.286	-0.002	0.372
Uganda	-	10	21	-	3.782	0.093	0.153	-	-	-

Ukraine	-	13	45	2	5.991	0.075	0.122	-0.781	0.315	0.621
United Arab Emirates	83.803	46	147	6	2.955	0.034	0.198	-1.647	0.008	0.311
United Kingdom	5.015	1,613	7,364	130	1.256	-0.009	0.062	-1.912	-0.071	0.026
Uruguay	-	18	50	-	2.631	-0.003	0.332	-	-	-
Venezuela	61.749	30	92	5	7.580	0.014	0.079	-0.221	0.162	0.462
Vietnam	1.579	130	180	4	4.958	0.053	0.150	-0.763	0.332	0.677
Zambia	-	13	35	-	4.744	0.061	0.349	-	-	-
average	22.215	193	950	12	3.367	0.041	0.135	-1.072	0.070	0.343
total	755.313	16,240	79,817	808						