

DOES FOREIGN INVESTMENT CARRY BAGGAGE FROM HOME?

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ABSTRACT

A large literature on international investment demonstrates that weak institutions in host countries reduce both the amount that firms are willing to invest and the amount that firms are willing to pay for investments. In these studies, the role of institutions in the *home* country has been largely neglected. The recent growth of MNEs from emerging-market countries, however, has generated interest in viewing institutions in a broader perspective. We reconsider the mainstream perspective in the literature, and propose a heterodox paradigm, which suggests the importance of the home-country in cross-border investment. Using data on firms' reserve transactions in the global petroleum industry, we test whether foreign investment carries home-country institutions with it. We find supporting evidence for the theory: weak (strong) institutions in the home country reduce (increase) the amount that firms from that country are willing to pay for a petroleum reserve. Our results are robust to a battery of tests controlling for tax effects, firms' capital constraints, foreign aid, and inter-state relations.

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INTRODUCTION

Institutional considerations are central to firms' foreign investment strategies. A large research literature demonstrates that weak institutions and political risk in host countries affect foreign investment, diminishing both capital inflows (Kobrin, 1979; Alfaro, et. al., 2008) and the value of financial (Block and Vaaler, 2004) and direct investment (Phillips-Patrick, 1989; Click and Weiner, 2010).

Strategy research on institutions and political risk developed in the context of multinational enterprises (MNEs) from rich countries' entry into countries with underdeveloped legal and political systems.¹ Not surprisingly, these studies neglected the role of the *home* country, as home institutional environments in developed countries were similar enough that researchers paid little attention to them.

Recently, the emergence and rapid growth of MNEs from emerging-markets (EMNEs) has generated two strands of research on FDI and home-country institutions. The first focuses on EMNE's *non-market capabilities*, which highlight EMNEs' domestic experience navigating politically hazardous, institutionally weak environment as their core competences. The second, which we term *refuge-seeking capital*, takes the objective of investing abroad as escape from the unfavorable domestic environment.

Although the views of firm motivations differ, both strands, which we term the *new mainstream paradigm*, link EMNE's weak home environment to incentives for outward FDI.

¹ Vernon's (1970) obsolescing-bargain conjecture concerns MNEs and host governments in developing countries. Kobrin's (1979) classic political-risk survey discusses the relationship between foreign direct investment (FDI) and political instability, taking the perspective of managers from developed countries. Institutions were later incorporated into standard frameworks for understanding foreign direct investment (FDI), e.g., Dunning's "eclectic paradigm," as a subset of MNEs' ownership advantages (Dunning and Lundan, 2008: 131-137); stronger institutions at home aided MNEs in their expansion abroad.

The paradigm implicitly views FDI as *detached* from the hazards the MNE faces back home -- rather than view home-country governance as detachable. We ask whether weak institutions can truly be left behind when the MNEs depart home and venture abroad.

How can the very same institutions that were formerly viewed as hampering foreign investment now be viewed as facilitating it? This paper provides a new perspective on the role in outward foreign investment decisions of national economic governance – “the structure and functioning of the legal and social institutions that support economic activity and economic transactions by protecting property rights, enforcing contracts, and taking collective action to provide physical and organizational infrastructure” (Dixit 2009: 5).

We hypothesize that weak institutions at home travel abroad with MNEs, and act as a source of disadvantage. We call this home-country-specific disadvantage *baggage from home*, and term our paradigm *heterodox* as opposed to the new mainstream paradigm in FDI. Our heterodox paradigm views MNEs as potentially hampered by rather than aided by weak home-country institutions, as in the new mainstream paradigm.

This paper develops the heterodox paradigm, and tests it against the new mainstream paradigm using data on asset values. Financial models suggest that a country’s institutions contribute to its systematic risk, and thus should affect asset values, through channels such as macroeconomic volatility and corruption (Acemoglu, et. al., 2003; Bartram, et. al., 2011; Julio and Yook, forthcoming). Financial effects of governance have been investigated by numerous authors in host countries, e.g., Bailey and Chung (1995) and Desai, et. al. (2008), but have not been examined in MNEs’ home countries, despite the well-known importance of investor protection in cross-country comparisons of domestic institutions (e.g., La Porta, et. al., 2008, and the authors’ earlier contributions cited therein).

Assessment of home-country effects of institutions on firms' investment strategies faces measurement obstacles unlike those encountered in host-country studies. At one extreme, portfolio assets traded in centralized markets (e.g., stocks and bonds) are homogenous, displaying a single market value at any time, and differences in valuation among investors based in different countries are not directly observable. At the other extreme, heterogeneous real assets (e.g., companies) are sufficiently complex that, in the case of acquisition, for example, comparing target prices by firms from different countries becomes problematic. As discussed below, we avoid this obstacle because the real assets we examine are heterogeneous enough to observe differences among acquirers, yet homogeneous enough to take advantage of natural valuation benchmarks.

This paper provides a new perspective on the role in outward foreign investment decisions of national economic governance – “the structure and functioning of the legal and social institutions that support economic activity and economic transactions by protecting property rights, enforcing contracts, and taking collective action to provide physical and organizational infrastructure” (Dixit 2009: 5). Our study contributes to the literature on EMNEs' outward FDI discussed above, as well as the literature that examines broader home-country effects on international investment (e.g., Bris and Cabolis, 2008; Chari, et. al., 2010; Chen, 2011; Di Giovanni, 2005). We show that foreign asset valuation depends critically on whether cross-border investment carries baggage from home. The new mainstream approach suggests that home baggage is left behind – when outward investment is designed either to leverage experience with or escape weak institutions at home, investors may be willing to pay more for foreign assets in stronger countries. Our heterodox approach is based on the opposite hypothesis. If outward investment cannot detach itself from domestic institutions, and hence carries home

baggage, investors will pay *less* for foreign assets in strong countries.

Using data from transactions on petroleum reserves, we test the effect on cross-border asset valuation of major institutional and political risk characteristics. Our main results demonstrate that – in addition to a discount in the host country – weak home-country institutions indeed reduce the amount that firms from that country are willing to pay for a petroleum reserve. This finding is inconsistent with the predictions of the mainstream approach, and supports the heterodox paradigm.

The remainder of the paper is organized as follows. The next section discusses theory and hypotheses. This is followed by our empirical context. Data and results are discussed in the following sections. The penultimate section provides a series of robustness checks, and the last section summarizes the findings and concludes.

THEORY: (WHY) DO HOME-COUNTRY INSTITUTIONS MATTER?

Mainstream Paradigm

Two distinct theories in the literature address the influence of home country institutions on firms' FDI decisions. The first, which we term *non-market capabilities*, is based on the idea of core competences developed from familiarity with managing in institutionally-weak environments at home. The first research article in this stream surveyed MNEs operating in Thailand, finding (regarding those based in least developed countries): “From their experience operating in their home country, they not only had a clearer picture ... of the risk in the business environment of LDCs, but they knew how to reduce this risk...” (Lecraw, 1977: 447).

Recent papers extend and test the non-market-capabilities view. Cuervo-Cazurra (2006) finds that MNEs from relatively-clean countries are deterred more by host-country corruption

than are MNEs from less-clean countries, which likely benefit from experience dealing with corrupt officials at home. Del Sol and Kogan (2007) focus on performance of Latin-American-based foreign subsidiaries of Chilean MNEs, hypothesizing that their experience managing institutional change accompanying economic liberalization at home explains their success abroad. Cuervo-Cazurra and Genc (2008) develop and test the hypothesis that EMNEs have an advantage over other MNEs in host countries with weak institutions. Perkins (2008) finds that similarity of home-country institutions helps explain survival of MNE subsidiaries in the Brazilian telecom industry. Cuervo-Cazurra (2011) provides a brief survey of this literature.

Our work is most closely related to Holburn and Zelner (2010), who focus on a specific but critical non-market institution – the government, demonstrating that host-country political risk is less detrimental to MNEs from home countries where governments face fewer constraints on decision-making. They hypothesize that MNEs from politically-hazardous (in the sense that governments can easily change policy) countries are able to transfer home-country political capabilities abroad.

The second strand of literature is based on a predatory model of the state (sometimes called the “grabbing hand,” Shleifer and Vishny, 1998), wherein institutions are utilized to extract rent and transfer it to the powerful. We term *refuge-seeking* the objective of investing abroad to escape political hazards and predatory institutions at home, and propose adding this objective to the widely-used taxonomy (set out in Dunning and Lundan, 2008: 67-74) of resource-seeking, market-seeking, efficiency-seeking, and asset/capability-seeking FDI.² In these instances, when the home government’s grabbing hand threatens domestic investment, capital is shifted abroad, as FDI is assumed detachable, beyond the reach of extractive

² Refuge-seeking FDI is conceptually distinct, but related to capital flight, which typically refers to portfolio investment (e.g., offshore bank accounts).

institutions back home.

The seminal paper in this strand is Tallman (1988), who found that FDI into the USA is dependent on home country political conditions, specifically: “domestic conflict, which appears to produce a poor business climate with higher risks and encourages overseas direct investment in the relatively stable United States (p. 227).” Witt and Lewin (2007) review the small literature on what they term “escape response FDI,” noting (pp. 579-580) “that rigorous conceptual and empirical treatment of OFDI [outward FDI] as an escape response from the home country has been relatively sparse in the IB literature....” With one exception, the few articles cited in their Table 1 are either purely conceptual, based on anecdotal evidence, or about portfolio flows, rather than FDI.

Additional articles examining refuge-seeking FDI include Grosse and Trevino (1996), Thomas and Grosse (2001), and Bulatov (1998), who surveyed Russian managers, finding obstacles to domestic investment, in the form of high taxes and domestic political and legal instability, as primary motivations for outward FDI among industrial companies.

These two approaches differ in their assumed motivation for EMNE’s internationalization, as well as their emphasis – the refuge-seeking model focuses narrowly on the government, while the non-market capabilities theory is more broadly about home-country institutions. The non-market capabilities theory views EMNE institutional capabilities as having developed in the past, whereas the refuge-seeking / grabbing-hand theory views FDI as escaping the predatory home-government in the present. In summary, the new mainstream paradigm suggests a home-country effect, but that institutional weakness does not affect firms’ future profitability (and hence asset

value), because investment detaches itself from the home country when it goes abroad.³

Heterodox Paradigm

In contrast to the new mainstream paradigm, our proposed heterodox paradigm entertains the notion that foreign investment carries its home-country institutions and political risk with it. In its simplest form, the paradigm suggests that the grabbing hand back home can reach foreign investments from that country, e.g., through tax changes, regulations on repatriation of profits and capital, or by meddling in the multinational firm's affairs and assets at home. Foreign investment thus effectively cannot escape home-country governance.

Relative to purely domestic investments in the host country, foreign investments thus have higher risks due to the weak institutions back home. As a consequence, there is much less incentive for firms to undertake foreign investment. Note, however, that the grabbing hand back home may instead be a "helping hand" in the case of firms from strong countries. When these firms go abroad, they may be able to use their home-country advantages to strengthen their positions in weak countries. These advantages may include home-government diplomatic or military support to protect investments from its country. For example, the US and UK governments intervened when the government of Iran nationalized British petroleum investments in the 1950s.⁴ More recent, less dramatic examples include the Gore-Chernomyrdin commission, through which the US government advocated for petroleum FDI in Russia in the 1990s, capital

³ The notion that foreign investment detaches itself from the home country is in fact broader. Coffee (1999) and Stulz (1999) suggest that firms from weak institutional environments can list their stock in countries with strong institutions and 'bond' themselves to stronger institutions. This is less about escaping the grabbing hand and more about regulatory arbitrage.

⁴ Newcombe and Paradell (2009: 9) note that Britain intervened in Latin America with force or threats of force to enforce claims against its citizens and protect property at least 40 times in the century before World War I.

subsidies by the Chinese government to its MNEs in acquiring petroleum reserves abroad, and recent informal pressure on the Israeli government (see Levinson and Chasen, 2010). Taken together, these stories suggest that foreign investment carries baggage (bad or good) from home.

Implications for Asset Values

The two paradigms regarding the role of home-country political risk and institutions provide competing implications for foreign investments. The mainstream paradigm suggests that foreign investors will be willing to pay more for assets in strong countries. This premium is the price paid to escape. Symmetrically, investments will be undertaken only if foreign investors pay less for assets in weak countries.

The heterodox paradigm, in which foreign investment carries baggage from home, implies opposite valuation effects. It recognizes disincentives for outward investment from weak countries. In turn, these disincentives suggest that investments will be undertaken only if foreign investors pay less for assets in strong countries than domestic investors in the host country. This discount is the cost of weak institutions back home. Symmetrically, firms from strong countries will be willing to pay more for foreign assets.

Consider a simple equation in which the price of an asset depends on host and home country institutions:

$$P = \mu + \beta_{HOST} I_{HOST} + \beta_{HOME} I_{HOME} + \gamma X \quad (1)$$

where P is the asset price, μ is a constant, I_{HOST} and I_{HOME} are the institutional indexes (in which a higher value indicates stronger institutions) for the host country and the home country, respectively, and X is a dummy variable for cross-border investments. There may also be a vector of control variables to capture asset heterogeneity, not shown in equation (1). There is

general agreement that assets in weak countries are priced at a discount relative to assets in strong countries (see, for example, Click and Weiner, 2010); $\beta_{HOST} > 0$. A novel part of this paper is thus the investigation of possible effects from home-country institutions.

In domestic transactions, the host- and home-country institutions are identical by definition: $I_{HOST} = I_{HOME}$. This identity would also hold for cross-border investment into a country with the same institutional rating as the home country, which is why we allow for a cross-border dummy to capture any difference between domestic and cross-border investments in this situation.

From the perspective of the literature at large, the null hypothesis is that home-country characteristics do not matter:

$$H1_0 : \beta_{HOME} = 0.$$

In this instance, we would have β_{HOST} capture the full effects of institutions – for both domestic and cross-border transactions – and γ capture a proportionate differential for the cross-border transactions (which could be either positive or negative).

The new mainstream paradigm suggests that the relevant alternative hypothesis is:

$$H1_{A,MAINSTREAM} : \beta_{HOME} < 0$$

indicating that as the index of institutional quality for a home country improves, the amount paid for a foreign asset decreases.

The heterodox paradigm suggests that the relevant alternative is the opposite of the mainstream hypothesis:

$$H1_{A,HETERODOX} : \beta_{HOME} > 0$$

indicating that as the home country index of institutional quality improves, the amount paid for a foreign asset increases.

The two paradigms are largely silent on the relative magnitudes of β_{HOST} and β_{HOME} , but if institutions are less important in the home country than in the host country for asset valuation, then we would expect $\beta_{HOST} > \beta_{HOME}$. Since it has not been tested, we point out that the heterodox paradigm may indeed suggest that home-country institutions are more important than host country institutions if the effects of the grabbing hand back home are bigger than the grabbing hand in the host country: $\beta_{HOST} < \beta_{HOME}$.

Predictions for the effects of national borders differ sharply between theories. The heterodox paradigm views asset values as reflecting home and host-country governance, but the border itself as irrelevant; domestic investment and FDI in a country with similar-quality governance will be equally valued. Hence,

$$H2_{0,HETERODOX}: \gamma = 0.$$

In contrast, the new mainstream paradigm's non-market-capabilities stream [views the MNE as adept domestically, and facing liability of foreignness](#) abroad despite the advantage of weak institutions back home – MNEs “may not know the precise customs and may not be insiders to the relationships in the other country, but they are better aware of the need to learn the customs and build the relationships. ...their specific asset is the entrepreneurial and managerial skill in navigating economic systems with poor governance” (Dixit, 2009: 20). Controlling for host- and home-country governance, foreign assets are worth less than domestic assets:

$$H2_{A, NON-MARKET CAPABILITIES}: \gamma < 0.$$

The refuge-seeking-capital stream yields the opposite prediction – the border serves to protect investment from predatory institutions back home, so that the same asset in a country

with similar governance to the MNE's home-country will be worth more:

$$H2_{A,REFUGEE-SEEKING}: \gamma > 0.$$

EMPIRICAL CONTEXT: PETROLEUM RESERVE TRANSACTIONS

“Operations in the oil business ... are 90 percent political and 10 percent oil” (Wilkins, 1974).

As suggested by the quote above (describing the 1930s), the international petroleum industry is fertile ground for studying institutions and political risk, given its history of host-country expropriation of assets (Fanning, 1947; Vernon, 1970; Kobrin, 1984, 1985) and resource nationalism (Click and Weiner, 2010; Jensen and Johnston, 2011). We extend such analysis to consider the effects of home-country political risk, and weak institutions in general, on outward FDI.

Difficulty in valuing real assets hinders research on impacts of institutions. In this paper, we use the global petroleum industry as a laboratory, allowing us to overcome the usual limitations. Unlike manufacturing, where value cannot easily be compared across plants, petroleum assets produce similar products everywhere. Such asset heterogeneity as exists can be largely controlled for through the use of proxies for production costs. Moreover, a liquid market for trade in assets and data on such trades allows researchers to observe values directly, rather than impute them.

The petroleum assets we examine are reserves, that is, oil and gas in the ground. Reserves are the capital base of the firm, and serve as collateral for loans (Muñoz, 2009). As a result, considerable care is taken in estimating their size, typically by independent consulting firms specializing in reserve audits, which are based on engineering, petroleum geology, and experience. The auditing process provides a measure of integrity, and gives us confidence in the

use of data for research.

The industry employs probabilistic estimates because reserves themselves are not directly observable. Reserves are typically classified as proved (1P), proved + probable (2P), or proved + probable + possible (3P), depending on the probability that the quantity recoverable economically at current prices and costs will equal or exceed the estimate provided. *Proved (1P) reserves* refers to the estimate for which this probability is 90%. *Proved + probable reserves (2P)* and *proved + probable + possible (3P) reserves* are similarly defined, but with 50% probability and 10% probability, respectively.⁵ The classification system is illustrated in Figure 1. Typically only one estimate and classification is reported for each reserve; we control for classification using dummy variables at both firm and country levels.

Our model is designed to be as simple as possible. The value of a petroleum reserve is given by:

$$V = R(P^E - C^E) \quad (2)$$

where V refers to reserve value, R is the (probabilistic) size of the reserve, P^E and C^E are respectively expected petroleum prices and costs over the life of the reserve. In practice, costs are often taken as proportional to prices, both because the main component of costs is output taxes, and because production costs tend to rise with prices:⁶

$$C^E = \phi P^E. \quad (3)$$

In addition, we adjust for costs of non-conventional reserves using simple dummy variables.

Substituting equation (3) into (2) and dividing by R , we obtain a specification for reserve

⁵ If F_i is the cumulative probability distribution of economically-recoverable petroleum in reserve i , then estimates are as follows: $F_i(1P) = 0.1$, $F_i(2P) = 0.5$, $F_i(3P) = 0.9$.

⁶ For example, Adelman and Watkins (2005) note that cost data are generally unavailable, and assume that cost is 35% of price.

value per unit:

$$V / R = P^E (1 - \phi). \quad (4)$$

Expressing the dependent variable on a per-barrel basis is standard in the literature (e.g., Ghicas and Pastena, 1989) using accounting data to value petroleum reserves, and helps reduce heteroscedasticity problems associated with orders-of-magnitude variation in reserve sizes.

We incorporate host- and home-country institutional quality from equation (1) into equation (4). Rewriting equation (4) in logarithmic form, and introducing institutional variables, control variables, and additional cost proxies, the equation we estimate is thus:

$$\ln(V / R) = \mu + \alpha \ln P^E + \beta_{HOST} I_{HOST} + \beta_{HOME} I_{HOME} + \gamma X + \sum_i \delta_i Z_i + \varepsilon \quad (5)$$

where V / R is the value of a barrel in the ground (the ratio of the reserve value to size), P^E is the expected price of petroleum in the market over the life of the reserve, I_{HOST} and I_{HOME} are the institutional indexes for the host country and the home country, respectively, X is a dummy variable for cross-border investments, and Z_i is a vector of i control variables, including a set of reserve type dummies to adjust for differences in the cost of extraction, percentage of gas in the reserve, and dummies for buyer-reported reserve, and reserve uncertainty (1P as a baseline, 2P, 3P).

DATA

We use transactions in the reserves market to measure value. Like other real assets with active secondary markets (land, buildings, companies, airplanes, etc.), trading in reserves is

private and decentralized, rather than conducted through centralized auctions.⁷ Reserve deals are typically announced by transactors and reported in the trade and business press. Transaction data are then compiled by consulting firms, investment banks, and the trade press. We use transaction data collected and maintained by the U.S. firm John S. Herold (JSH).⁸

Our sample of deals covers the period January 2000 through December 2009. We exclude transactions: (1) of unknown value; (2) of less than \$10 million; (3) that failed to close; (4) without an estimate of reserve size; and (5) that involve reserves in multiple host countries.⁹ This yields a sample of 2,017 transactions of which 1,516 are domestic and 501 are cross-border, defined as the asset location in a country different from that of the purchaser. Table 1 lists the 59 host countries and the 51 home countries in the database, and the number of transactions in each. Although the database is dominated by transactions in the U.S., the breadth of countries involved is substantial.

INSERT TABLE 1 ABOUT HERE

For each deal, we use the announcement date, reserve price (V), reserve size (R), oil vs. gas composition of the reserve (GASPERCENT), type of reserve (conventional, deepwater, etc.), asset location, name of the acquiring firm, whether the deal was reported by the buyer or the seller (BUYERREPORT), and reserve classification (1P, 2P or 3P).

We match JSH transactions with: (1) information on the host country and the home

⁷ A limited, centralized market in the USA (Oil & Gas Clearinghouse, www.ogclearinghouse.com) auctions small-scale petroleum assets. These transactions are too small for our analysis.

⁸ We are grateful to JSH (a subsidiary of NYSE-listed IHS Inc.) for data access.

⁹ Many transactions do not report deal value. Although \$10 million is an arbitrary threshold, it is commonly used in the scholarly M&A literature. Moreover, JSH reporting of smaller deals is likely to be less accurate; JSH's aggregate statistics are based on the \$10 million threshold. Occasionally deals are added, updated, reclassified, or removed from the JSH database. The data used here are from the database accessed at the end of 2009.

country of the acquirer, including institutional quality and measures of political risk; and (2) macro-level data on the futures prices for oil and gas traded on the New York Mercantile Exchange (NYMEX) from Bloomberg.

We employ two widely-used measures of institutional quality. The first is a composite of five variables representing the quality of national governance from the World Bank's *Worldwide Governance Indicators* (WGI).¹⁰ We use an unweighted average of political stability, government effectiveness, regulatory quality, rule of law, and control of corruption, and use data from the previous year to reflect prevailing knowledge of institutional quality at the time of the transaction.¹¹

Our second institutional measure is a political-constraints index, designed to capture checks on the ability of a government to change policy. POLCON3 and POLCON5 (Henisz, 2000, 2002) focus on the number and independence of political institutions in a country, as well as the extent to which these institutions are aligned politically.¹² They are transparent and objective, based on publicly available information on institutional differences among nations, and reflect a structural model of political decision-making (Henisz, 2000, 2002). Researchers have used the indexes to proxy for policy stability (Vaaler and Schrage, 2009) and commitment to investor protection (Andonova and Diaz-Serrano, 2009). They are constructed without reference to the petroleum sector, thereby ensuring exogeneity. However, because they are not released on a regular schedule, it is difficult to know what information is available to managers

¹⁰ We do not include the voice and accountability measure as it is designed to capture the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. For methodology and analytical issues related to these measures, see Kaufmann, et. al. (2010).

¹¹ We cannot use the variables separately due to high correlations among them (median = 0.95; minimum = 0.70; maximum = 0.97).

¹² POLCON3 excludes the judiciary, and POLCON5 includes the judiciary.

at the time they negotiate deal terms. It is thus easier to interpret cross-country than time-series variation in the index; we use average scores for each country for the period covered by our data for which the index is available, 2000-2007.

Our measures of political risk are from ICRG and *Institutional Investor*. ICRG distributes (through the PRS Group) a rating of country risk and three sub-ratings – for political, financial, and economic risk. We focus on the political risk rating as the subject of interest.¹³ The *Institutional Investor* rating is based on surveys regarding country creditworthiness.

We use the most recent political-risk ratings available on the transaction date.¹⁴ The rating is the one “in effect” on the date of the announcement, and so is released by ICRG or *Institutional Investor* prior to release of information about the transaction. This timing reduces potential endogeneity; transactors know political risk scores before the transaction is announced, but the political risk ratings are produced without knowledge of the transaction.

Variable descriptions and characteristics are presented in Table 2.

INSERT TABLE 2 ABOUT HERE

One feature of our specification in equation (5) is that host country and home-country ratings enter separately. For domestic transactions, host and home ratings by definition will be identical, raising the possibility that multicollinearity will prevent us from estimating β_{HOST} and β_{HOME} separately. Correlation coefficients are shown in Table 3; for all five indexes, the correlation between host and home-country ratings is moderately high, but not so high as to

¹³ This rating is composed of 12 weighted variables covering both political and social attributes, including government stability, socio-economic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability, and bureaucracy quality.

¹⁴ The *Institutional Investor* rating is updated each March and September; for consistency we use these months for ICRG as well.

prevent simultaneous estimation of β_{HOST} and β_{HOME} .¹⁵

INSERT TABLE 3 ABOUT HERE

The characteristics of the cross-border transactions, which provide the variation of host and home ratings required to estimate our model, are presented in Table 4. In general, two-thirds of the cross-border transactions are ones in which the host country is rated worse than the home, and one-third are ones in which the host country is rated better than the home.

INSERT TABLE 4 ABOUT HERE

RESULTS

Estimates of equation (5) are presented in Table 5 using two different robust estimators. The first set of columns presents regressions with standard errors clustered by home country; the second set of columns presents median regressions with heteroscedasticity-consistent standard errors. Since the dataset has 2,068 transactions but only 50 home countries, clustered standard errors should remove intragroup correlations. There is some non-normality in the data¹⁶; median regressions (which minimize the sum of the absolute errors from the conditional mean) are robust to such a problem (Cameron and Trivedi, 2005; Koenker and Bassett, 1978; Hao and Naiman, 2007). All of the coefficients on the host country variables are positive and statistically significant at the 99% level; reserves located in countries with stronger institutions are worth more. The same is true of home countries, although the evidence is slightly less strong; all

¹⁵ For WGI, the correlation is 0.68. For POLCON3 and POLCON5 the correlation coefficients are 0.63 and 0.77, respectively. For ICRG, the correlation coefficient is 0.65, and for *Institutional Investor* the correlation coefficient is 0.63. Our examination of inflation factors (<10) and condition numbers (<100, Cameron and Trivedi, 2005: 350) indicates no serious concern for multicollinearity.

¹⁶ The Shapiro-Wilk W test on the dependent variable is 0.943 and is significant at the 1% level. Table 5 indicates that residuals of OLS regressions have similar test statistics and significance.

coefficients are statistically significant at the 99% level in the median regressions, while p-values vary in the regressions using clustered standard errors.

INSERT TABLE 5 ABOUT HERE

Note that the two regression techniques produce very similar coefficient estimates, indicating the robustness of the finding that the value of a petroleum reserve is positively related to ratings of institutional strength and political risk *in both host and home countries*. The value of a petroleum reserve increases as the host country institutional or political risk rating rises, a result consistent with the literature. Also, the null hypothesis that $\beta_{HOME} = 0$ is rejected in favor of the alternative hypothesis $\beta_{HOME} > 0$ in 9 of 10 regressions at conventional levels. This finding indicates that reserves purchased by firms from stronger home countries are also worth more. In terms of the discussion above, this is support for the heterodox paradigm rather than the new mainstream paradigm.

The coefficients on the cross-border dummy variable in Table 5 are largely insignificant, suggesting that cross-border transactions do not have additional discounts or premiums once accounting for host and home-country institutions. We interpret that cross-border transactions are likely priced just by considering the host and home countries involved; in other words, *the border itself does not matter*.

Variables capturing home country institutional strength and political risk are important in the pricing of petroleum reserves. The regression fit is modestly higher in comparison to regressions without the home country variables (not shown). In addition, the coefficient on the host country variable is notably lower when the home country variable is included. In other words, when the home country variable is not included, the effects of the home country are loaded onto the host country variable. As seen in Table 3, home- and host-country indicators are

correlated at roughly 63-77 percent, depending on which measure is used; companies from better home countries tend to invest in better host countries, implying that omitting home-country quality (as in the literature) is likely to bias host-country effects upward.

Since our host and home variables are on identical scales, comparisons of coefficients are possible. For the Worldwide Governance Indicators and *Institutional Investor* data, host country and home-country institutional quality and political risk are (perhaps surprisingly) equally important in pricing petroleum reserve transactions. However, for the POLCON data host country institutional quality is (approximately three times) more important than home-country institutional quality. The ICRG data suggest that home country political risk is (1½ to 2 times) more important than host-country political risk.

The coefficients on other variables are consistent with *a priori* expectations and previous research (Click and Weiner, 2010). The coefficient on the log of the strip price (LSTRIP) is about unity, suggesting that a 1% increase in the market price of petroleum increases the value of a petroleum reserve 1%. A reserve that consists of more gas than oil (PERCENT GAS) is marginally more valuable than otherwise.¹⁷ Transactions reported by buyers (BUYERREPORT) are systematically underpriced by approximately 10% compared to transactions reported by sellers, which we conjecture is because buyers who get a “good deal” will report it to the press while buyers who do not get a good deal will let the seller report. Finally, reserves that are 2P and 3P are much less valuable than reserves that are 1P. Thirteen variables on the type of reserve (bituminous, coalbed, etc.) allow for differences in the cost of extraction affecting the value of the reserve, but coefficients are not reported in the table to conserve space.

¹⁷ Reserves include both crude oil and natural gas, which are often found together. The energy in 1 barrel of oil and 6000 cubic feet of gas are equal on average, so we follow the literature in aggregating oil and gas on a thermal-equivalent basis: $R = R_{OIL} + R_{GAS} / 6$.

Table 6 presents regression results for the purely domestic transactions. Once again, the coefficients on the country variables are positive and statistically significant at the 99% level. In fact, the coefficients are always higher than the sum of the coefficients on host and home variables in Table 5. Considering that these are only domestic transactions, the implication is that home country institutions and political risk might be more important than institutions and political risk abroad.

INSERT TABLE 6 ABOUT HERE

Does it matter whether the home country is stronger or weaker than the host country? Our results above constrain the responses to be symmetric between investments from weak countries into strong countries and those from strong countries into weak countries. However, we also considered the possibility of asymmetries. We categorized the cross-border transactions into two groups, those for which $I_{HOME} - I_{HOST} > 0$ and those for which $I_{HOME} - I_{HOST} < 0$. We then estimated:

$$\ln(V/R) = \mu + \alpha \ln P^E + \beta I_{HOST} + \rho_{POS} (I_{HOME} - I_{HOST} \mid I_{HOME} - I_{HOST} > 0) + \rho_{NEG} (I_{HOME} - I_{HOST} \mid I_{HOME} - I_{HOST} < 0) + \gamma X + \sum_i \delta_i Z_i + \varepsilon \quad (6)$$

where we expect $\rho_{POS} > 0$ and $\rho_{NEG} > 0$ to conform to the heterodox hypothesis documented above. The results (not reported here) indicate that there is a strong positive pricing effect when the home-country ratings are better than the host, but there is no pricing effect when the host ratings are better than the home. Thus, the helping hand seems to be more compelling than the grabbing hand. Nevertheless, it is clear that the heterodox paradigm is supported over the mainstream paradigm; foreign investment indeed carries baggage (bad and good) from home.

ROBUSTNESS CHECKS

The main results presented thus far suggest that home country institutions and political risk affect the price that a firm from that country will pay for a petroleum reserve. This section investigates some alternative explanations for the finding and controls for additional factors that may influence the results. Four types of alternative drivers of asset valuation are addressed: (1) tax effects; (2) capital constraints; (3) foreign aid; and (4) inter-state relations.

Tax Effects

Our results may be influenced by taxes imposed by the host and home countries. A high tax rate in the host country, for example, may be the reason for a discount on petroleum reserves, rather than institutional weakness and political risk. Similarly, an acquirer from a foreign country may have a residual tax liability to its home government, or possibly even a credit when the home tax rate is low. Our regressions should therefore control for these two effects.

We use two sources of tax rates: Djankov, et. al (2010) and the American Enterprise Institute database (Hassett and Mathur, 2011). We use the host country tax rate and the home country tax rate together in our regressions, and expect the coefficients on both tax rates to be negative. Table 7 reports results of regressions that include host and home country statutory tax rates using clustered standard errors. The home tax rate is always negative and statistically significant at conventional levels: a one point increase in the tax rate decreases the amount paid by about two basis points. The host country tax rate is not very important. Together, the coefficients suggest that the home country tax rate is more important than the host rate. Moreover, the coefficients on the institutional variables are barely affected by the inclusion of the tax variables, so we are left to conclude that the effects of institutions and political risk are not related to tax rates in the host and home countries.

INSERT TABLE 7 ABOUT HERE

Capital Constraints

The petroleum industry is highly capital-intensive, and cash flow has been shown to affect investment (Griffin, 1988, Baltagi and Griffin, 1989, Lamont, 1997), suggesting that lack of access to finance constrains investment. Financing constraints are likely more severe when institutions do not protect capital providers effectively (Carreira and Silva, 2010). Weak rule of law and investor/creditor protection may result in an underdeveloped stock market and limit lending (Di Giovanni, 2005). To consider this possibility, we examine the robustness of our results with controls for capital constraints.

We construct two macroeconomic variables widely used in the literature (e.g., Di Giovanni, 2005; Aghion et. al., 2007) to proxy for financial development: (1) the ratio of domestic credit to the private sector to GDP (CREDIT) and (2) the ratio of stock market capitalization to GDP (STOCKCAP).¹⁸ The literature examines quantities (e.g. of investment); we focus on pricing, and consider whether capital constraints reduce the prices firms pay for petroleum reserves. Correlation coefficients show that our governance and political risk indicators are indeed positively correlated with the two capital constraint variables; e.g., the correlation between the home WGI and the ratio of domestic credit is 0.60 and its correlation with the ratio of stock market capitalization is 0.42. Hence, our main results might capture the effects of capital constraints rather than governance.

Regression results (not presented but available from the authors upon request) reveal that the findings in Table 5 are robust to controls for capital constraints. Consistent with the findings

¹⁸ Variations of these are utilized by inter alia Islam and Mozumdar (2007), Love (2003), and Beck et. al. (2006).

of Di Giovanni (2005) on FDI outward flows, CREDIT is not significant in least-squared regressions; coefficients even have the wrong sign in median regressions. STOCKCAP is consistently positive and significant at conventional levels. The positive sign on stock-market development could indicate that firms in countries where firms can more easily raise equity capital tend to pay more, or could simply reflect stock-market development as an outcome of better institutions. In either case, our main results are unaffected.

Foreign Aid

Asiedu, Jin, and Nandwa (2009) find that political risk has a negative effect on the quantity of FDI and that foreign aid mitigates but cannot eliminate this effect. With mitigation of risks, acquirers may be willing to pay more for assets being acquired. Aid may indicate that the home country is supporting the host country, possibly encouraging investment and inducing investors from the home country to alter the prices offered for assets.

To consider the possible helping-hand effects of aid, we add information regarding the bilateral assistance from the home country to the host country in our main regressions. From the Aid Data Portal (www.aiddata.org), we calculate the number of aid projects undertaken by the home country in the host country for each year in our sample (2000-2009). We match each petroleum transaction to the number of aid projects undertaken in the prior year.¹⁹

Furthermore, we consider the effects for all cross-border transactions as well as a subsample in which the home is rated better than the host country.

The empirical results (not reported) generally suggest that as the number of aid projects

¹⁹ Only 160 transactions are associated with country-pairs with aid projects. In addition, domestic transactions are not associated with aid. The count of aid projects does not involve any weighting of the significance of the projects, and dollar values of aid provided are not complete enough in the database to allow any weighting or a complete shift to dollars spent.

undertaken in the host country increases, the price that acquirers in the home country are willing to pay increases but by a very small amount. Although most coefficients are positive, they are not statistically significant. Hence, both economically and statistically, the impact of aid is minor. Furthermore, the inclusion of the aid variable does not materially alter the coefficients on the other variables. In all, these results suggest that institutions and political risk dominate stories about aid in asset valuation.

Inter-state Relations

Finally, we consider the overall relationship between the home and host country. Is bilateral amicability or hostility priced? Inter-state relations may provide a helping or hurting hand in cross-border transactions. When the home country is friendly to the host country, acquirers from the home country may be willing to pay more for an acquisition in the host country. Conversely, when the home country is belligerent to the host country, acquirers may invest only when they can pay lower prices.

Following the lead of several researchers (e.g., Desbordes and Vicard, 2009), we use the quality of interstate political relations developed by King and Lowe (available from <http://gking.harvard.edu>). Based on news reports, events are coded according to the actor, the target, the type of event, and the date.²⁰ We match each petroleum transaction with the King and Lowe variables from the previous year. The data are available through 2004, so we use 2004

²⁰A scale based on Goldstein (1992) is used to aggregate daily interactions into two annual flows of cooperative and conflictive interstate political relations. We consider both the number of incidents as well as the scale representing cumulative severity. There are four variables: the number of cooperative actions by the home country directed at the host country (GPCASE); the number of conflictive actions by the home country directed at the host country (GNCASE); the cumulative magnitude of cooperative actions by the home country directed at the host country (GPCUM); and the cumulative magnitude of conflictive actions by the home country directed at the host country (GNCUM).

data for all subsequent years but also examine the subset of transactions in 2000-2005. None of these regressions yields statistically significant coefficients on the King and Lowe variables, and the coefficients on the other variables are not altered.

Altogether, the investigation of interstate relations leads to the conclusion that the quality of interstate relations does not affect the pricing of transactions in the petroleum markets. The results suggest that institutions and political risk dominate stories about inter-state relations.

SUMMARY AND CONCLUSION

Using data on reserve transactions in the global petroleum industry, we examined a heterodox view that has not received attention in the literature – whether foreign investment carries its home-country institutions and political risk with it. There are two main conclusions. First, there is conclusive evidence that the home-country institutions and political risk do matter in outward investment decisions. In fact, data from WGI and *Institutional Investor* suggest that home-country risk is just as important as host-country risk. This alone suggests that future work on political risk should not overlook home-country effects. POLCON data suggest that home-country risk is about one-third as important as host country risk, suggesting that future work on political risk would suffer some peril overlooking home-country effects. ICRG data suggest that home country political risk is more important than host risk.

The second conclusion is that asset prices are positively related to indexes of home-country institutional quality and political risk. As a result, firms from weak (strong) host countries pay less (more) for petroleum assets around the world. This result is noteworthy because it directly contradicts the new mainstream paradigm of the role of home-country characteristics in outward foreign investment. Instead, it supports the heterodox paradigm

introduced in this paper.

Why aren't acquirers with lower valuations always outbid? We explain this by noting that asset purchases are sizeable enough and infrequent enough that even the largest companies engage in transactions infrequently; prices reflect buyer valuation, notwithstanding that companies from countries with stronger institutions might have offered more for a given asset had they bid.²¹

The main results in Table 5 indicate that investors from weak countries buying assets abroad pay less than domestic investors, and we interpret this as the cost of the grabbing hand from a second bandit back home. Symmetrically, investors from strong countries buying assets abroad pay more than domestic investors, and we interpret this as the premium associated with a helping hand from home.

²¹ The market for companies exhibits a similar phenomenon – acquisition prices vary systematically with buyer characteristics. See Bargeron, et. al. (2008) and Betton, et. al.(2008).

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Table 1: Host and Home Countries

Country	Domestic Transactions	Home in Cross-Border Transactions	Host in Cross-Border Transactions	Country	Domestic Transactions	Home in Cross-Border Transactions	Host in Cross-Border Transactions
Algeria	1		7	Luxembourg		1	
Angola	1		4	Malaysia		8	1
Argentina	6		18	Mauritania			8
Australia	33	31	25	Mongolia			1
Austria		1		Netherlands	1	8	6
Azerbaijan			6	New Zealand	2		4
Bangladesh			3	Nigeria	1		1
Brazil		4	7	Norway	8	13	24
Cameroon			3	Oman			4
Canada	581	104	49	Pakistan			2
Chile		1		Papua New Guinea	2		2
China	9	25	6	Peru			1
Colombia	1		19	Philippines	2		2
Congo	2		8	Poland		3	
Cote d'Ivoire			1	Romania			2
Croatia			2	Russia	87	9	30
Cuba			1	Singapore		4	
Denmark	3	2	4	South Africa		1	
Ecuador			7	Spain		8	
Egypt			13	Sudan			4
Equatorial Guinea	1		2	Sweden		8	
Finland		1		Switzerland		1	
France		20	3	Syria			1
Gabon			4	Thailand	2	3	1
Germany		15	1	Trinidad & Tobago	2		5
Guatemala			1	Tunisia			6
Hong Kong	1	1		Turkey	2		3
Hungary		3		Turkmenistan			1
India	4	5	3	Ukraine			3
Indonesia	11	2	34	United Arab Emirates		11	
Ireland	1	1	3	United Kingdom	37	64	48
Israel		3		United States	721	87	79
Italy	1	12	1	Uzbekistan			2
Japan	1	30		Venezuela	2		3
Kazakhstan	12		16	Vietnam	1		1
Korea		5		Yemen			1
Kuwait		5		TOTALS	1,539	500	500
Libya			3				

Table2: Variable Characteristics

Variable	Brief Description	All					Domestic					Crossborder					
		Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max	N	
lnVR	Reserve value (logged)	2.11	1.04	-3.03	4.81	2,068	2.22	1.00	-3.03	4.81	1,539	1.78	1.08	-1.96	4.32	529	
ICRG	HOST Rating	80.10	9.89	42.50	93.00	2,014	82.31	7.23	45.00	92.00	1,515	73.41	13.30	42.50	93.00	499	
	HOME Rating	82.39	7.20	45.00	94.50	2,044	82.31	7.23	45.00	92.00	1,515	82.64	7.10	54.00	94.50	529	
INSTITUTIONAL	HOST Rating	82.53	20.07	9.70	96.00	2,021	88.08	13.00	13.80	96.00	1,514	65.98	27.13	9.70	95.90	507	
INVESTOR	HOME Rating	87.73	12.46	13.80	96.00	2,043	88.08	13.00	13.80	96.00	1,514	86.73	10.72	40.20	96.00	529	
POLCON3	HOST Rating	0.40	0.08	0.02	0.64	1,914	0.41	0.07	0.07	0.64	1,491	0.38	0.12	0.02	0.64	423	
	HOME Rating	0.41	0.10	0.00	0.64	2,018	0.41	0.07	0.07	0.64	1,491	0.41	0.14	0.00	0.64	527	
POLCON5	HOST Rating	0.77	0.20	0.05	0.87	1,914	0.80	0.17	0.07	0.87	1,491	0.65	0.25	0.05	0.87	423	
	HOME Rating	0.78	0.19	0.00	0.87	2,018	0.80	0.17	0.07	0.87	1,491	0.73	0.24	0.00	0.87	527	
WGIHOME	World Governance Indicator*	1.26	0.63	-1.32	1.97	2,068	1.27	0.64	-1.32	1.91	1,539	1.23	0.60	-0.67	1.97	529	
CREDIT	Financial constraint (macro)	155.37	50.07	2.40	230.31	2,068	160.81	50.29	2.40	230.31	1,539	139.55	45.94	27.47	222.28	529	
STOCKCAP	Financial constraint (macro)	114.31	37.74	0.00	561.43	2,068	116.98	33.82	0.00	561.43	1,539	106.52	46.50	12.01	471.35	529	
LSTRIP	Expected petroleum price (logged)	3.79	0.49	2.69	4.97	2,068	3.78	0.47	2.69	4.97	1,539	3.81	0.53	2.73	4.95	529	
GASPERCENT	Percent gas in reserve	43.43	39.82	0	100	2,068	48.56	38.83	0	100	1,539	28.50	38.92	0	100	529	
Dummy Variables						Sum						Sum					
CROSSBORDER	Cross-border deal	0.26	0.44	0	1	529	-	-	-	-	1,539	-	-	-	-	529	
DIVERSIFIED	Financial constraint (micro)	0.07	0.26	0	1	150	0.05	0.22	0	1	78	0.14	0.34	0	1	72	
FINANCE	Financial constraint (micro)	0.03	0.17	0	1	65	0.03	0.18	0	1	50	0.03	0.17	0	1	15	
LARGE	Financial constraint (micro)	0.41	0.49	0	1	842	0.36	0.48	0	1	555	0.54	0.50	0	1	287	
MEDIUM	Financial constraint (micro)	0.11	0.32	0	1	231	0.14	0.35	0	1	212	0.04	0.19	0	1	19	
STATE	Financial constraint (micro)	0.00	0.06	0	1	7	0.00	0.07	0	1	7	-	-	-	-	-	
SMALL	Financial constraint (micro)	0.37	0.48	0	1	770	0.41	0.49	0	1	634	0.26	0.44	0	1	136	
BUYERREPORT	Buyer reported reserve	0.43	0.50	0	1	895	0.47	0.50	0	1	728	0.32	0.47	0	1	167	
P90	Proved reserves	0.82	0.38	0	1	1,694	0.86	0.34	0	1	1,331	0.69	0.46	0	1	363	
P50	Proved & probable reserves	0.15	0.36	0	1	315	0.11	0.31	0	1	168	0.28	0.45	0	1	147	
P10	Proved & probable & possible reserves	0.03	0.17	0	1	59	0.03	0.16	0	1	40	0.04	0.19	0	1	19	

Note: *Mean values of the five World Bank's World Governance Indicators -- Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption for various years.

Table 3: Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
1 lnVR	1.00																									
2 ICRGHOST	0.39	1.00																								
3 ICRGHOME	0.31	0.61	1.00																							
4 INSTINVHOST	0.46	0.86	0.43	1.00																						
5 INSTINVHOME	0.41	0.50	0.76	0.59	1.00																					
6 POLCON3HOST	0.49	0.70	0.53	0.59	0.47	1.00																				
7 POLCON3HOME	0.32	0.38	0.60	0.33	0.54	0.58	1.00																			
8 POLCON5HOST	0.52	0.80	0.55	0.82	0.63	0.82	0.54	1.00																		
9 POLCON5HOME	0.39	0.49	0.71	0.51	0.78	0.60	0.84	0.72	1.00																	
10 WGIHOME	0.40	0.56	0.89	0.51	0.87	0.61	0.71	0.67	0.86	1.00																
11 CROSSBORDER	-0.18	-0.39	0.02	-0.48	-0.05	-0.14	-0.02	-0.32	-0.17	-0.02	1.00															
12 STRIP PRICE (log)	0.31	-0.17	-0.23	0.03	0.05	-0.10	-0.06	-0.11	-0.12	-0.16	0.03	1.00														
13 GASPERCENT	0.22	0.29	0.19	0.33	0.24	0.23	0.14	0.33	0.27	0.24	-0.22	-0.35	1.00													
14 BUYERREPORT	0.05	0.05	0.04	0.14	0.14	0.00	0.06	0.06	0.11	0.07	-0.14	0.18	-0.02	1.00												
15 P90	0.31	0.23	0.15	0.24	0.17	0.23	0.09	0.33	0.24	0.18	-0.20	-0.29	0.51	-0.04	1.00											
16 P50	-0.17	-0.17	-0.08	-0.21	-0.11	-0.14	-0.01	-0.24	-0.16	-0.10	0.20	0.24	-0.46	0.02	-0.90	1.00										
17 P10	-0.34	-0.15	-0.18	-0.10	-0.15	-0.23	-0.17	-0.24	-0.21	-0.20	0.03	0.17	-0.19	0.05	-0.36	-0.07	1.00									
18 DIVERSIFIED	-0.07	-0.04	-0.06	-0.01	-0.06	-0.06	-0.03	-0.10	-0.14	-0.10	0.14	0.05	0.00	-0.10	-0.10	0.08	0.04	1.00								
19 FINANCE	0.00	-0.02	-0.02	0.01	0.03	-0.01	-0.02	0.02	0.01	0.01	-0.01	0.02	0.05	-0.07	0.03	-0.02	-0.01	-0.05	1.00							
20 LARGE	-0.25	-0.17	-0.20	-0.19	-0.18	-0.17	-0.21	-0.17	-0.18	-0.21	0.16	-0.21	-0.01	-0.08	-0.01	-0.01	0.05	-0.23	-0.15	1.00						
21 MEDIUM	0.08	0.09	0.04	0.08	0.02	0.09	0.08	0.11	0.09	0.05	-0.14	-0.03	0.04	0.06	0.04	-0.03	-0.03	-0.10	-0.06	-0.29	1.00					
22 STATE	-0.03	-0.01	-0.03	0.01	0.00	-0.02	-0.02	0.00	-0.01	-0.02	-0.03	-0.02	0.05	-0.02	0.01	0.00	-0.01	-0.02	-0.01	-0.05	-0.02	1.00				
23 SMALL	0.24	0.14	0.22	0.14	0.19	0.14	0.18	0.15	0.19	0.24	-0.14	0.20	-0.04	0.12	0.02	0.00	-0.04	-0.22	-0.14	-0.64	-0.27	-0.05	1.00			
24 CREDIT	0.35	0.40	0.48	0.53	0.75	0.36	0.36	0.60	0.65	0.63	-0.19	-0.02	0.29	0.16	0.28	-0.22	-0.18	-0.10	0.05	-0.09	0.03	0.01	0.11	1.00		
25 STOCKCAP	0.22	0.26	0.37	0.32	0.50	0.18	0.17	0.34	0.44	0.46	-0.12	-0.04	0.14	0.17	0.09	-0.09	-0.02	-0.12	0.08	-0.09	-0.01	0.00	0.13	0.47	1.00	

Note: Pearson product-moment correlation coefficients.

Table 4: Cross-Border Characteristics

Series	Transactions in which the host is rated worse than the home	Transactions in which the host is rated better than the home	Transactions in which the host and home are rated the same	Total
Worldwide Governance Indicators	343	157	0	500
POLCON 3	263	158	2	423
POLCON 5	264	156	3	423
ICRG	341	145	13	499
Institutional Investor	355	145	7	507

Table 5: Effects of Home-Country Institutions on Value of Petroleum Reserves

	Clustered Standard Errors					Median Regressions				
	WGI	POLCON3	POLCON5	ICRG	Institutional Investor	WGI	POLCON3	POLCON5	ICRG	Institutional Investor
Host rating	0.348*** (0.050)	3.674*** (0.592)	1.770*** (0.250)	0.020*** (0.004)	0.012*** (0.001)	<i>0.294***</i> (0.017)	<i>3.990***</i> (0.269)	<i>1.738***</i> (0.115)	<i>0.016***</i> (0.002)	<i>0.011***</i> (0.001)
Home rating	0.313** (0.104)	1.571* (0.707)	0.558 (0.353)	0.031* (0.012)	0.013† (0.007)	<i>0.315***</i> (0.021)	<i>1.415***</i> (0.247)	<i>0.576***</i> (0.117)	<i>0.031***</i> (0.002)	<i>0.011***</i> (0.002)
CROSSBORDER	0.001 (0.123)	-0.144 (0.096)	0.028 (0.130)	-0.093 (0.129)	-0.004 (0.174)	<i>-0.003</i> (0.027)	<i>-0.134**</i> (0.045)	<i>0.052</i> (0.039)	<i>-0.121***</i> (0.037)	<i>-0.005</i> (0.053)
LSTRIP	1.099*** (0.137)	1.005*** (0.151)	1.012*** (0.151)	1.148*** (0.137)	0.925*** (0.118)	<i>1.135***</i> (0.022)	<i>1.050***</i> (0.040)	<i>1.054***</i> (0.033)	<i>1.205***</i> (0.030)	<i>1.001***</i> (0.042)
GASPERCENT	0.003** (0.001)	0.004 (0.000)	0.003*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	<i>0.004***</i> (0.000)	<i>0.005***</i> (0.001)	<i>0.004***</i> (0.000)	<i>0.005***</i> (0.000)	<i>0.004***</i> (0.001)
BUYERREPORT	-0.129*** (0.026)	-0.085** (0.032)	-0.122*** (0.024)	-0.117*** (0.029)	-0.131*** (0.026)	<i>-0.075***</i> (0.019)	<i>-0.057</i> (0.036)	<i>-0.095**</i> (0.030)	<i>-0.073**</i> (0.027)	<i>-0.106**</i> (0.038)
2P	-0.538*** (0.168)	-0.455** (0.134)	-0.370*** (0.146)	-0.532** (0.172)	-0.516** (0.186)	<i>-0.379***</i> (0.031)	<i>-0.268***</i> (0.059)	<i>-0.159**</i> (0.049)	<i>-0.369***</i> (0.043)	<i>-0.331***</i> (0.060)
3P	-1.962*** (0.210)	-1.983*** (0.191)	-1.919*** (0.198)	-2.107*** (0.276)	-2.135*** (0.294)	<i>-2.198***</i> (0.059)	<i>-2.006***</i> (0.113)	<i>-1.850***</i> (0.097)	<i>-2.317***</i> (0.082)	<i>-2.312***</i> (0.115)
Constant	-2.737** (0.506)	-3.749*** (0.754)	-3.452*** (0.671)	-6.311*** (1.447)	-3.425*** (0.712)	<i>-2.838**</i> (0.088)	<i>-4.001***</i> (0.186)	<i>-3.654***</i> (0.150)	<i>-6.270***</i> (0.211)	<i>-3.486***</i> (0.198)
Reserve Types	Included	Included	Included	Included	Included	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>
Adjusted [Pseudo] R ²	0.570	0.566	0.563	0.533	0.511	<i>[0.375]</i>	<i>[0.366]</i>	<i>[0.351]</i>	<i>[0.354]</i>	<i>[0.326]</i>
N	2039	1913	1913	2014	2021	<i>2039</i>	<i>1913</i>	<i>1913</i>	<i>2014</i>	<i>2021</i>

Statistical significance is reported based on two-sided tests: † p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Reserve type dummies include conventional (baseline), bitumen, coalbed, deepwater, enhanced, frontier, heavy oil, LNG, shale, nonconventional, shallow water, tight gas, diversified and royalty.

Table 6: Effects of Home-Country Institutions on Value of Petroleum Reserves in Cross-Border Transactions

	Clustered Standard Errors					Median Regressions				
	WGI	POLCON3	POLCON5	ICRG	Institutional Investor	WGI	POLCON3	POLCON5	ICRG	Institutional Investor
Host rating	0.283*** (0.053)	1.590** (0.541)	1.202*** (0.285)	0.015** (0.004)	0.010*** (0.002)	0.270*** (0.039)	1.242*** (0.378)	1.286*** (0.178)	0.014*** (0.003)	0.009*** (0.001)
Home rating	0.072 (0.053)	0.329 (0.370)	-0.045 (0.245)	0.010* (0.005)	-0.001 (0.003)	0.121† (0.064)	0.406 (0.312)	-0.001 (0.197)	0.014* (0.006)	0.004 (0.004)
LSTRIP	0.952*** (0.126)	0.866*** (0.118)	0.866*** (0.118)	0.936*** (0.112)	0.846*** (0.130)	0.986*** (0.084)	0.935*** (0.090)	0.915*** (0.086)	0.993*** (0.086)	0.917*** (0.084)
GASPERCENT	-0.001 (0.002)	0.000 (.001)	-0.001 (0.001)	0.000 (0.002)	-0.001 (0.002)	0.000 (0.001)	0.002 (.001)	-0.000 (0.001)	0.002 (0.001)	0.001 (0.001)
BUYERREPORT	-0.231** (0.064)	-0.184* (0.074)	-0.166* (0.072)	-0.231** (0.068)	-0.203** (0.061)	-0.164* (0.082)	-0.147† (0.086)	-0.162† (0.083)	-0.170*** (0.084)	-0.196*** (0.084)
2P	-0.881*** (0.106)	-0.793*** (0.113)	-0.802*** (0.103)	-0.781*** (0.113)	-0.850*** (0.098)	-0.752*** (0.097)	-0.773*** (0.109)	-0.751*** (0.104)	-0.719*** (0.100)	-0.790*** (0.099)
3P	-1.737*** (0.217)	-1.835*** (0.277)	-1.835*** (0.277)	-1.735*** (0.223)	-1.781*** (0.228)	-1.685*** (0.205)	-1.744*** (0.234)	-1.907*** (0.225)	-1.731*** (0.212)	-1.688*** (0.212)
Constant	-1.709** (0.494)	-1.919*** (0.3537)	-1.899*** (0.386)	-3.430*** (0.543)	-1.688** (0.543)	-1.919*** (0.342)	-2.127*** (0.407)	-2.163*** (0.393)	-3.909*** (0.626)	-2.364*** (0.426)
Reserve Types	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Adjusted R ²	0.464	0.439	0.472	0.404	0.430					
N	500	422	422	499	507	500	422	422	499	507

Statistical significance is reported based on two-sided tests: † p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Reserve type dummies include conventional (baseline), bitumen, coalbed, deepwater, enhanced, frontier, heavy oil, LNG, shale, nonconventional, shallow water, tight gas, diversified and royalty.

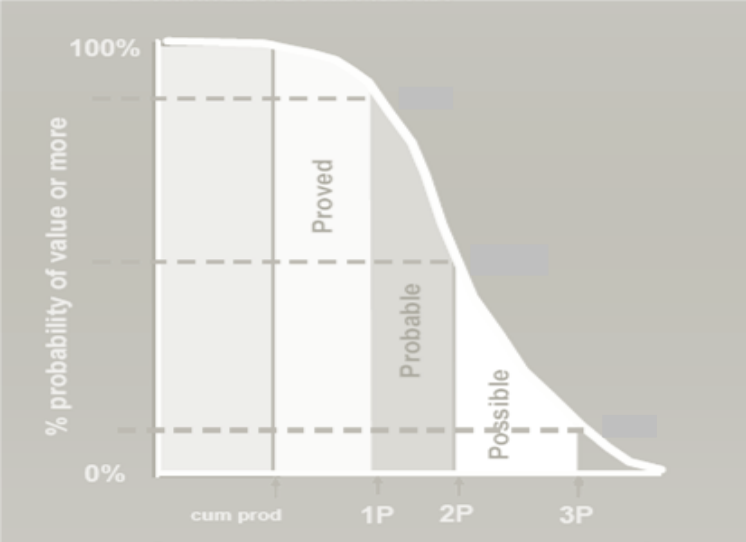
Table 7: Effects of Home-Country Institutions and Financial Constraints on Value of Petroleum Reserves

	Clustered Standard Errors					Median Regressions				
	WGI	POLCON3	POLCON5	ICRG	Institutional Investor	WGI	POLCON3	POLCON5	ICRG	Institutional Investor
Host rating		3.418***	1.780***	0.021***	0.012***					
		(0.453)	(0.211)	(0.004)	(0.002)					
Home rating		1.192	0.482	0.021*	0.008					
		(0.741)	(0.383)	(0.009)	(0.006)					
CROSSBORDER		-0.075	0.071	-0.014	0.075					
		(0.098)	(0.111)	(0.140)	(0.168)					
LSTRIP		0.981***	0.991***	1.088***	0.896***					
		(0.112)	(0.105)	(0.118)	(0.094)					
GASPERCENT		0.004***	0.004***	0.004***	0.003***					
		(0.001)	(0.001)	(0.001)	(0.001)					
BUYERREPORT		-0.150***	-0.150***	-0.162***	-0.171***					
		(0.030)	(0.028)	(0.029)	(0.028)					
2P		-0.424***	-0.384**	-0.500**	-0.508**					
		(0.114)	(0.122)	(0.144)	(0.145)					
3P		-1.920***	-1.935***	-2.067***	-2.123***					
		(0.191)	(0.191)	(0.226)	(0.231)					
LARGE		-0.147	-0.177	-0.152	-0.224+					
		(0.100)	(0.107)	(0.093)	(0.115)					
MEDIUM		0.015	0.003	0.036	0.028					
		(0.053)	(0.053)	(0.064)	(0.061)					
DIVERSIFIED		-0.245	-0.258	-0.277	-0.359					
		(0.157)	(0.159)	(0.188)	(0.222)					
FINANCE		-0.294**	-0.320**	-0.290**	-0.366**					
		(0.108)	(0.112)	(0.106)	(0.119)					
STATE		-0.499	-0.540	-0.542	-0.683					
		(0.359)	(0.359)	(0.453)	(0.458)					
CREDIT		0.001	-0.001	0.001	0.000					
		(0.001)	(0.001)	(0.001)	(0.002)					
STOCKCAP		0.003**	0.002*	0.002*	0.002*					
		(0.001)	(0.001)	(0.001)	(0.001)					
Constant		-3.759***	-3.245***	-5.562***	-3.045***					
		(0.539)	(0.456)	(1.087)	(0.461)					
Reserve Types	Included	Included	Included	Included	Included	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>
Adjusted [Pseudo] R ²		0.582	0.573	0.544	0.527					
N		1910	1910	2011	2018					

Statistical significance is reported based on two-sided tests: † p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Reserve type dummies include conventional (baseline), bitumen, coalbed, deepwater, enhanced, frontier, heavy oil, LNG, shale, nonconventional, shallow water, tight gas, diversified and royalty.

Figure 1: Reserve Classifications



Source: Society of Petroleum Engineers <http://www.spe.org/industry/reserves.php>