



Property rights institutions, foreign investment, and the valuation of multinational firms[☆]

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ABSTRACT

We study the effect of property rights institutions in host countries, the institutions protecting investors from expropriation by host country agents, on the geographic structure and valuation of US multinational corporations (MNCs). We provide firm-level evidence that better property rights attract investment from MNCs. We disentangle the effects of the Stulz (2005) “twin agency problems” in the context of foreign direct investment and show that our results are not driven by legal institutions protecting investors from expropriation by corporate insiders. Further, we show that changes in the quality of property rights in locations where MNCs operate have material impact on MNCs’ valuations.

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1. Introduction

In an influential paper, [Stulz \(2005\)](#) highlights two distinct, but closely related, forms of expropriation risk faced by investors. All investors risk expropriation by the state, and outside investors additionally risk expropriation

by corporate insiders. [Stulz \(2005\)](#) refers to the agency problem of corporate insiders and the agency problem of the state as “twin agency problems” and shows that these two agency problems interact with each other to shape corporate ownership and to limit the benefits of financial globalization. In related research, [Acemoglu and Johnson \(2005\)](#) distinguish the rules and regulations that protect private citizens against the power of the state (“property rights institutions”) from those that govern contracting between ordinary citizens (“contracting institutions”)—for example, between a creditor and a debtor, minority shareholders and corporate insiders, or a supplier and its customers.

A lot of the work in the law and finance literature following the two seminal papers of [La Porta et al. \(1997\)](#) and [La Porta et al. \(1998\)](#) has focused on the agency problem of corporate insiders, showing that legal protection of outside

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investors has substantial effects on firm value (La Porta et al., 2002; Durnev and Kim, 2005), the value of cash holdings (Pinkowitz, Stulz and Williamson, 2006), and resource allocations (McLean, Zhang and Zhao, 2012). Studies have also found that firms in countries with weak investor protection can “bond” themselves to good governance by cross-listing on foreign exchanges of countries with strong investor rights, which, on average, increases their valuations (Reese and Weisbach, 2002; Doidge, Karolyi and Stulz, 2004).

Much less attention has been paid to the business and corporate implications of the agency problem of the government and other country agents. This is surprising, given that Johnson, McMillan and Woodruff (2002) and Acemoglu and Johnson (2005) provide evidence of the importance of property rights institutions, as opposed to contracting institutions, for financial development and economic growth. The authors argue that mechanisms, such as contract design and cross-listings, can partially alleviate the problems originating from weak contracting institutions, while it is hard to mitigate the risk of state expropriation. Specifically, the deadweight costs of weak shareholder protection can be reduced or eliminated by designing contracts that deter corporate insiders from expropriating minority shareholders or by bonding to countries with strong governance. On the other hand, it could be difficult to escape the deadweight costs related to expropriation by host country agents, since the real operations and cash flows are located locally. However, given that the two agency problems are deeply intertwined and both critically depend on the strength of a country's legal system, it is challenging for cross-country studies to empirically distinguish the effects of the two types of institutions (Johnson, McMillan and Woodruff, 2002; Levine, 2005).

In this paper, we exploit a setting where the institutions regulating the agency problems of corporate insiders can be held constant and explore the effect of country property rights institutions on firm geographic structure and valuation. In particular, we study how US multinational corporations' subsidiary location decisions and valuations are related to host country property rights protection. US MNCs are regulated by the US legal system and thus have the same level of legal protection of investors. Alternatively stated, the legal protection of investors in host countries is not a concern for minority shareholders and creditors of US multinational companies, even if those companies obtain part of their external financing through their foreign affiliates.¹ On the other hand, the institutions limiting co-

ercion and expropriation at the foreign country level are highly relevant because foreign agents could take actions that undermine the investments of MNCs.

One way to think of our approach to disentangle the effects of the twin agency problems in the context of foreign direct investment is to consider MNCs as an extreme case of bonding themselves to good governance (Reese and Weisbach, 2002; Doidge, Karolyi and Stulz, 2004). In our setting, the bonding is 100% effective, whereas the effectiveness of the bonding mechanism employed by foreign companies listing in the US has been questioned (Siegel, 2005). By fixing the legal protection of investors at a high level, we are able to provide relatively clean firm-level evidence on the importance of property rights protection that has been shown to be vital for a country's economic growth, investment, and financial development (Johnson, McMillan and Woodruff, 2002; Acemoglu and Johnson, 2005).

We follow Acemoglu and Johnson (2005) and define property rights institutions as “the rules and regulations protecting citizens against the power of the government and elites”. Our main measures of property rights are three World Governance Indicators (WGI) developed by Kaufman, Kraay and Mastruzzi (2009) and published by the World Bank. These indexes capture the following governance dimensions: rule of law, control of corruption, and voice and accountability. To control for and capture the agency problem of corporate insiders in host countries directly, we also adopt two widely used measures of investor protection: the anti-self-dealing index and anti-director rights index from Djankov et al. (2008). The correlation between these two investor protection indexes and our property rights proxies is around 0.2 on average, suggesting substantial disparity between the severity of the two agency problems in countries.

We have two main sets of findings. First, using data over the period 1996–2012 from regulatory disclosures enforced by the US Securities and Exchange Commission (SEC) about the locations in which firms operate significant subsidiaries (provided in Exhibit 21 of US firms' 10-K reports), we find that firms are more likely to have material operations in countries with strong property rights institutions. After controlling for conventional country-level factors that have been previously found to affect MNCs' location decisions, we find that a one standard deviation increase in our property rights measure corresponds to a 1.8 percentage point increase in the probability of a firm having a subsidiary in a given country. Such an increase is economically significant, given that the unconditional probability of a multinational firm having a subsidiary in a foreign country is 11.3 percentage points in our data set. Investor protection by contracting institutions, on the other hand, shows a somewhat mixed and unrobust effect on the probability of MNC presence.

Second, we investigate potential MNC valuation effects of property rights in subsidiary host countries.

¹ To the extent that MNCs' subsidiaries need to raise external capital in host countries and that investor protection affects financial market development in those host countries, weak investor protection could constrain the ability of MNCs to raise financing and to invest. However, such an effect is indirect in the sense that even though the costs of external financing could be high when investor protection is weak, weak investor protection does not increase the direct expropriation risk by MNC insiders. In addition, multinationals circumvent financial constraints by employing internal capital markets (Desai, Foley and Hines, 2004), which could mitigate the adverse effects of weak host country investor protection. Another indirect effect of investor protection on MNCs is through competition. If poor investor protection gives MNCs an advantage in external financing

over local competitors, MNCs may even benefit from poor host country investor protection (Bilir, Chor and Manova, 2014).

Specifically, we show that the deterioration of property rights in locations where US MNCs operate is associated with decreases in the values of MNCs. Further, we also examine how MNC values change around expropriation events in host countries. To the extent that such events are not fully anticipated by investors and increase investor perception of future expropriation risk, tests exploiting plausible information shocks around expropriation events should strengthen identification and add credibility to our main set of results. We find that the value of companies with subsidiaries in countries experiencing foreign direct investment (FDI) expropriations decreases by about 3.2% in the year following the occurrence of an expropriation act, with this effect being stronger for firms in expropriated industries (but not directly expropriated themselves). We also show spillover effects, whereby expropriation acts, which occur in neighboring countries, decrease the value of firms operating in the industry that is expropriated.

Our paper contributes to three strands of literature. First, our paper contributes to the large literature of law and finance. Different from [La Porta et al. \(2002\)](#) and [Durnev and Kim \(2005\)](#), who show that legal protection of outside investors in a country has value implications for domestic firms, we show that changes in the property rights protection in host countries has significant value implications for multinational companies. We provide a useful testing ground that allows us to disentangle the effects of the twin agency problems as it applies to cross-border investment and enables us to test the effect of property rights institutions relatively cleanly. Second, our study contributes to the international trade literature that examines the effects of host country legal institutions on multinational companies' activities and foreign direct investment. With a few exceptions, the vast majority of studies that fall into this category use country-level data (e.g., [Wei, 2000](#); [Busse and Hefeker, 2007](#)). In contrast, we provide firm-level evidence on the effects of host country institutions on US MNCs' locational choices. Our novel data and empirical setting allow us to differentiate between the roles of property rights and contracting institutions for FDI. This is also important from a policy perspective, since policies designed to enhance the legal protection of investors, bolster foreign direct investment, and foster financial market development through the improvement of contracting institutions could be ineffective if investors remain concerned about expropriation by local country agents.² Third, our paper also adds to the debate of whether multinational activities create value ([Denis, Denis and Yost, 2002](#); [Creal, Robinson, Rogers and Zechman, 2014](#)). Although we do not answer this question directly, our findings highlight host countries' property rights institutions as an important

channel through which international exposure could impact firm value.³

The remainder of the paper is organized as follows. [Section 2](#) lays out the hypotheses for our empirical analysis. [Section 3](#) describes our sample and variables and presents summary statistics. [Section 4](#) presents the empirical results on FDI location selection and MNC valuation. Finally, [Section 5](#) concludes.

2. Hypothesis development

Firms engaged in foreign direct investment face many risks, including the risk of expropriation by host country agents. The term expropriation covers a wide range of activities that foreign governments and other country agents can take to directly or indirectly influence MNCs' returns on investment, including outright confiscation of assets, expropriation through tax or regulatory changes, limitations on repatriations of profits, and so on (e.g., [Desai, Foley and Hines, 2008](#); [Stulz, 2005](#)). In host countries with strong property rights, investments are less likely to be expropriated by the host country agents. Such expropriations reduce the cash flows received by shareholders, therefore lowering the unconditional expected returns of investing in countries with weak property rights, as modeled in [Stulz \(2005\)](#).⁴ Consequently, everything else equal, firms will only invest in weaker property rights countries if they expect sufficiently high returns in states of the world when they are not expropriated.⁵

In addition, expropriations could influence an FDI project's discount rate through the increased volatility of foreign investment cash flows. For example, in weak property rights countries, returns could be very low if investments are expropriated and vice versa, resulting in greater volatility of returns. However, country-specific risk might not be particularly relevant for MNCs with globally diversified shareholder bases, in which case, the discount rate should only reflect international, systematic risks. Thus, what should matter for a foreign investment project's discount rate is the correlation of the project's return with the return of the US or world portfolios. In this regard, there are two countervailing forces. On the one hand, investments in countries with weak property rights could decrease systematic risk due to the lower correlation between the economic cycles of low-property rights host countries and the rest of the world ([Kose, Otrok and Whiteman, 2003](#); [Koren and Tenreyro, 2007](#)). On the other

² Related to this point, [Kelley and Woidtke \(2006\)](#) examine the effect of investor protection on investment by US multinationals and find that countries with weak investor protection attract more MNC activities. They do not examine the effects of property rights protection. Moreover, their study uses cross-sectional data at the industry level, whereas we analyze foreign investments of a large panel of US MNCs. Lastly, [Kelley and Woidtke \(2006\)](#) do not analyze the valuation of MNCs as we do in this paper.

³ In addition to expropriation risk, which is the focus of this paper, host country governance could also affect firm value through MNCs' financing decisions (e.g., [Desai, Foley and Hines, 2008](#); [Lee, Lin and Naranjo, 2017](#)).

⁴ For example, several US MNCs such as PepsiCo, Ford Motor Company, and Proctor & Gamble have written off millions of dollars from their investments in Venezuela since 2013 as a result of the government's orchestration of massive currency devaluations. See Wall Street Journal: "PepsiCo Latest Company to Write-Off Venezuela" (E. Chasan, Oct 6, 2015).

⁵ Expropriation risk can be also insured. However, while it is possible to purchase insurance, it is seldom the case that an investment can be fully insured against all contingencies. Further, even when expropriation risk is fully insured, then a company should conduct its net present value (NPV) analysis by simply computing expected cash flows from FDI as if there is no expropriation risk and then subtracting the insurance premium it must pay each year from the cash flows of the project.

hand, if expropriations tend to increase during global economic downturns, as was the case with the Asian financial crisis (Johnson et al., 2000; Lemmon and Lins, 2003), investment returns in high expropriation risk countries could be highly correlated with world economic cycles. These two effects offset each other resulting in a potentially small net effect of property rights on systematic risk. Consistent with this view, Bekaert et al. (2016) provide evidence suggesting that political risk in the context of FDI is mainly a diversifiable risk for global investors, and that it should therefore have a negligible effect on the discount rate.

Taken together, low-property rights protection reduces the expected cash flows from investments in a country while having an unclear and potentially small effect on the discount rate. As property rights deteriorate and the probability or severity of expropriation increases, fewer firms find sufficiently profitable investment opportunities that offset “bad states” of the world when firms face expropriation, decreasing the probability of MNC investment in countries with weak property rights. Therefore, we hypothesize

Hypothesis 1. US MNCs invest less in countries with weaker property rights.

Our discussion of FDI and the quality of property rights is also relevant for the relation between MNC value and host country property rights. If managers maximize firm value by investing in the highest NPV projects, then cross-sectionally, the property rights of locations where firms operate should not be correlated with firm values in an obvious way. In other words, choosing the highest NPV value project ensures value maximization for investors, regardless of whether such project entails FDI in a country with weak or strong property rights.

Therefore, to investigate the relevance of property rights for MNC valuation, we focus on how changes in the quality of property rights at locations where MNCs operate affect the companies' values. *Ceteris paribus*, an increase in expropriation risk at locations where firms operate reduces expected cash flows to shareholders while having an ambiguous effect on the discount rate. Thus, a deterioration in property rights or an increase in expropriation risk in a given country would hurt the value of MNCs with subsidiaries in that country. Our second hypothesis is stated accordingly:

Hypothesis 2. As property rights in a host country deteriorate, the values of US MNCs with operations in that country decrease.

We next briefly discuss the issue of investor protection from corporate insiders. In contrast to property rights protection, as argued in the Introduction, investor protection from expropriation by insiders in host countries is not expected to have a first order effect on US MNCs because they are regulated by the US legal system and thus have the same level of legal protection of investors. However, the literature has identified two potential indirect channels through which host country investor protection could affect MNCs. The first is the financing channel, whereby

host country investor protection fosters financial market development and improves MNCs' access to local external financing. The second is that improvement in financial markets due to better investor protection may increase entry by domestic firms and reduce MNCs' affiliate revenues (Bilir, Chor and Manova, 2014). The net effect is ambiguous and will depend on the relative importance of these two channels. Therefore, we hypothesize

Hypothesis 3. Host country investor protection from expropriation by corporate insiders has an ambiguous and potentially minimal effect on the FDI of multinational companies.

3. Data, variable definitions, and descriptive statistics

3.1. Sample construction

We use textual analysis of firms' financial statements to build a data set on the international structure of a large cross-section of US MNCs. We start with all firms in the Compustat database during the period 1996–2012.⁶ We require nonmissing Central Index Key (CIK) identifiers so that we can link firms to data from the Securities and Exchange Commission website.⁷ We next match Compustat firm-years to annual frequency data gathered from Exhibit 21 in firms' 10-Ks.

SEC Rule S-K, Item 601(b)(21) requires Exhibit 21 to accompany firms' annual 10-K filings. Specifically, companies are required to report the name and country of incorporation or organization for all of their significant subsidiaries. Under Rule 1–02(w) of Regulation S-X, a subsidiary is considered significant if it accounts for more than 10% of the parent company's investment, assets, or income. Pursuant to Item 601, “the names of particular subsidiaries may be omitted if the unnamed subsidiaries, considered in the aggregate as a single subsidiary, would not constitute a significant subsidiary.” In other words, the omitted subsidiaries combined cannot exceed 10% of the parent company's investment, assets, or income, and, as a result, subsidiaries are often reported in Exhibit 21 even when they are not considered significant individually. Therefore, although the exhibit does not contain financial information related to size, scope, or type of foreign operations, it provides an accurate and comprehensive coverage of a US MNC's presence in foreign countries. Fig. 1 presents an illustrative example of Exhibit 21. It is reported by Lindsay Corporation, a company in our sample, for fiscal year 2012.

We use a text search algorithm to scan Exhibit 21 tables and identify all distinct foreign countries in which firms report material operations, while also recording the number of times a country's name is encountered in an individual Exhibit 21 table.⁸ Once we build our subsidiary

⁶ The year 1996 is the first year when most firms begin to have electronic 10-K filings, which we process to construct our data. Hence, our sample starts in 1996.

⁷ The company filings search engine of the SEC can be found at: <http://www.sec.gov/edgar/searchedgar/companysearch.html>.

⁸ While the text search program does not perfectly identify all foreign countries with material operations, it does enable us to study a much larger sample than would be possible if the data were read and coded by

Subsidiaries of Lindsay Corporation

	<u>Ownership Percentage</u>
Lindsay Manufacturing, LLC – Nebraska	100%
Lindsay Structures, LLC – Nebraska	100%
Digitec, Inc. – Nebraska	100%
Lindsay Sales Holding Company, LLC – Nebraska	100%
Lindsay Sales & Service, LLC – Nebraska	100%
Irrigation Specialists, Inc. – Delaware	100%
Lindsay International Sales & Service, LLC – Nebraska	100%
Barrier Systems Sales & Service, LLC – Nebraska	100%
Watertronics, LLC – Wisconsin	100%
Lindsay Real Estate Holdings, LLC – Delaware	100%
IRZ Consulting, LLC – Oregon	100%
Lindsay Transportation, Inc. – Nebraska	100%
Barrier Systems, Inc. – California	100%
Safe Technologies, Inc. – California	100%
Barrier Systems, LLC – Delaware	100%
Lindsay International Holdings, BV – Netherlands	100%
Lindsay International, BV – Netherlands	100%
Lindsay Europe SAS – France	100%
Lindsay Manufacturing Africa (PTY) Ltd. – South Africa	100%
Lindsay America do Sul Ltda. – Brazil	100%
Snoline S.p.A. – Italy	100%
Lindsay (Tianjin) Industry Co., Ltd.—China	100%
Lindsay International (ANZ) Pty Ltd.—Australia	100%
Lindsay International Sales Corporation – Delaware (Inactive)	100%

Fig. 1. Exhibit 21 example.

This figure shows a copy of Exhibit 21 reported by Lindsay Corporation in fiscal year 2012. The exhibit can be accessed at <https://www.sec.gov/Archives/edgar/data/836157/000119312512437101/d429917dex21.htm>.

location data set, we obtain additional data from several sources, including data on country property rights institutions (World Bank's Worldwide Governance Indicator

hand. Several other studies have used similar Exhibit 21 data (e.g., [Dyreg and Lindsey, 2009](#); [Dyreg, Lindsey and Thornock, 2013](#); [Black, Dikolli and Dyreg, 2014](#)), lending legitimacy to our approach of identifying the locations of MNCs' material foreign operations. We take a step further to cross-validate our data with other databases as well. Using Compustat Segments data, we find firms that have operations in more countries are larger in terms of sales and assets and have more foreign and less geographically concentrated sales. Using data on international mergers and acquisitions by US companies from SDC Platinum, we find that firms that have acquired companies in a given country in the past are more likely to report presence in that country on their Exhibit 21. Similarly, firms that acquire companies in a given country during a given year are more likely to increase the number of mentions of that country on their Exhibit 21. Such results make intuitive sense and are reassuring about the validity of our data.

Series), colonial links and shared languages ([Mayer and Zignago, 2011](#)), legal origins ([La Porta et al., 1997](#)), minority investor protection indices ([Djankov et al., 2008](#)), economic development indicators (World Bank Development Indicators), bilateral trade (International Monetary Fund (IMF) Direction of Trade Statistics), stock price data (Center for Research in Security Prices), and financial statement data (Compustat). The intersection of these databases yields our main sample that consists of 326,371 firm-year-subsubsidiary country observations (6869 unique US MNCs with operations in 68 unique countries) during the period 1996–2012.⁹ Importantly, these pertain only to instances

⁹ The availability of investor protection data, which we discuss in [Section 3.4](#), reduces country representation in our sample (the number of countries decreases from 138 to 68). The 68 countries that remain in our sample, however, capture the majority (94%) of firm-year-subsubsidiary country observations that indicate MNC presence.

that indicate presence of MNCs in a given country during a given year. Since some of our empirical tests model firms' choices of foreign operation locations (i.e., whether firms choose to operate in a given country or not), we also include firm-year-subsiary country observations for the countries in which firms have no subsidiaries during a given year. Doing so increases our sample to 2,882,744 observations.

3.2. Characteristics of subsidiary locations

We first investigate the location of firm subsidiaries across different countries. Table 1, Panel A reports the number of firm-year-subsiary country observations by country of location for the top 30 countries by representation. While our subsidiary location data set captures a total of 68 unique countries in which US MNCs do business, a relatively small number of countries account for the majority of MNCs' foreign operations. For example, the top ten countries by representation account for nearly 45% of our subsidiary sample. The constituents of this list are no surprise. These are mostly large economies with strong trade relations with the United States—a likely destination of US MNCs' subsidiaries. The top three countries are Canada, the United Kingdom, and Germany.

Table 1, Panel B reports the number of firm-year-subsiary country observations by year. The number of observations is steadily increasing from 1996 to 2012. Specifically, reported firm-country observations increased from 13,627 in 1996 to 21,485 in 2012. Such evidence is consistent with Denis et al. (2002) and Jang (2018) who show that the scope of international business activities of US corporations has experienced a dramatic increase over the last couple of decades.

Table 2, Panel A reports descriptive statistics for our data set. *Presence*, defined as an indicator variable taking the value of one if a firm reports subsidiaries in a given country during a given year (and zero otherwise) has a mean of 0.11 with a standard deviation of 0.32. Thus, 11% of our sample consists of locations where firms report presence. *NSub*, a proxy for the number of subsidiaries a firm has in a given country, has an unconditional mean of 0.34. This translates into an average of around three subsidiaries per country in a given year based on observations that reflect a firm's presence.

3.3. Property rights institutions

To examine whether property rights institutions have any influence on foreign direct investment by US MNCs, we use the WGI calculated by Kaufman, Kraay and Mastruzzi (2009) and published by the World Bank. Such data, available for 215 countries over the period 1996–2012, comprises several indicators based on hundreds of specific individual variables gauging various aspects of governance. The data are drawn from 35 data sources and are constructed by 33 different organizations worldwide. These data reflect the governance perceptions of the public sector, private sector, and NGO experts, including thousands of citizen and company respondents across the world.

Table 1

Country and year breakdown of MNC international presence.

This table sorts into groups 326,371 firm-year-subsiary country observations of 6869 US MNCs during the period 1996–2012 (each observation corresponds to a country in which an MNC has operations during a given year). In Panel A, the observations are sorted by country (top 30 countries by representation), while in Panel B the events are sorted by year. The table provides the number of observations, the percentage among all observations, and average quality of property rights institutions for each category.

Panel A: Countries			
Country	Freq.	%Sample	Mean PR
Canada	22,131	6.78	2.25
United Kingdom	21,334	6.54	2.03
Germany	15,689	4.81	1.99
France	14,383	4.41	1.51
Netherlands	14,119	4.33	2.35
Mexico	13,429	4.11	-1.2
Australia	12,164	3.73	2.15
Japan	11,190	3.43	1.19
China	10,693	3.28	-2.23
Singapore	10,449	3.20	1.22
Hong Kong SAR, China	10,402	3.19	1
Italy	9960	3.05	0.43
Brazil	9269	2.84	-0.79
Spain	8792	2.69	1.31
Switzerland	7807	2.39	2.36
India	7805	2.39	-0.7
Ireland	7433	2.28	1.85
Belgium	7121	2.18	1.55
Sweden	6460	1.98	2.46
Korea, Rep.	6002	1.84	0.31
Malaysia	5287	1.62	-0.59
Austria	4520	1.38	2.17
Poland	4497	1.38	0.38
Denmark	4478	1.37	2.58
Thailand	4229	1.30	-0.79
New Zealand	4161	1.27	2.51
Luxembourg	4110	1.26	2.23
Chile	3802	1.16	1.23
Argentina	3755	1.15	-1.04
South Africa	3743	1.15	-0.13
Other	57,157	17.52	-0.82
Total	326,371	100	-0.02
Panel B: Years			
Country	Freq.	%Sample	Mean PR
1996	13,627	4.18	-0.01
1997	15,046	4.61	-0.03
1998	17,010	5.21	0.01
1999	17,751	5.44	0.02
2000	18,528	5.68	0.02
2001	18,369	5.63	0.02
2002	19,042	5.83	0.01
2003	19,217	5.89	-0.01
2004	19,718	6.04	0.04
2005	20,488	6.28	0.08
2006	20,821	6.38	0
2007	21,235	6.51	0.02
2008	21,156	6.48	0.03
2009	21,026	6.44	-0.03
2010	21,112	6.47	0
2011	20,740	6.35	0
2012	21,485	6.58	0.01
Total	326,371	100.00	0.01

Table 2

Descriptive statistics, univariate sorts, and pairwise correlations.

This table presents descriptive statistics, univariate sorts, and pairwise correlations of the major variables in our analysis. The sample includes a panel of 2,882,744 firm-year-subsidiary country observations during the period 1996–2012 of 6869 US multinational companies. *Presence* is an indicator variable taking the value of one if a firm reports operations (subsidiaries) in a given country during a given year, and zero otherwise. *NSub* is a proxy measure of the number of subsidiaries a firm has in a given country during a given year. It is calculated as a count variable of the number of times a country's name is mentioned in Exhibit 21 of a company's 10-K report (description of material foreign operations). *Property rights* measures the quality of property rights institutions in a country and is calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability). *Rule of law* is a country-level index that captures rule of law. *Control of corruption* is a country-level index that captures control of corruption. *Voice and accountability* is a country-level index that captures voice and accountability. *Anti-self-dealing* and *Anti-director* measure the strength of legal protection of minority shareholders against self-dealing by controlling shareholders and the legal protection of minority shareholders in the corporate decision process, respectively, and are from Djankov et al. (2008). *Ln(GDP)* is a natural log transformation of country annual GDP. *GDPGr* is a country's annual GDP growth rate. *Ln(Trade)* is a natural log transformation of annual trade (imports and exports) between the US and a given country. *Tax haven* is an indicator variable of whether a country is a tax haven (Dyreg and Lindsey, 2009). *Colony* is an indicator variable taking the value of one if the US has ever had a colonial link with a given country, and zero otherwise. *Contiguous* is an indicator variable taking the value of one if the US is contiguous to a given country, and zero otherwise. *Ln(Distance)* is a natural log transformation of the average great circle distance (in kilometers) between Washington, DC and the capital city of a given country. *Language* is an indicator variable taking the value of one if the US shares a common language with a country, and zero otherwise. *Legal origin* is an indicator variable taking the value of one if a country's legal origin is the same as the one of the US (English), and zero otherwise. *Settler mortality* measures European settler deaths per annum (Acemoglu, Johnson and Robinson, 2001). *Democracy 1900* measures the strength of democracy in a country in the early twentieth century (Gurr, 1999). *Neighbor property rights* measures neighboring countries' median quality of property rights. For further details regarding the construction of our variables, refer to Appendix A. Panel A presents descriptive statistics. Panel B presents univariate sorts of *Presence* into terciles based on *Property rights*, *Rule of law*, *Control of corruption*, and *Voice and accountability*. Panel C presents pairwise correlations.

Panel A: Descriptive statistics					
Variable	Mean	(Std. Dev.)	Min.	Max.	N
Presence	0.113	(0.317)	0	1	2,882,744
NSub	0.337	(2.24)	0	416	2,882,744
Property rights	0	(1.66)	-3.564	2.807	2,882,744
Rule of law	0.458	(1.003)	-1.842	2	2,882,744
Control of corruption	0.496	(1.126)	-1.376	2.586	2,882,744
Voice and accountability	0.444	(0.881)	-1.682	1.826	2,882,744
Anti-self-dealing	0.436	(0.24)	0.075	1	2,882,744
Anti-director	3.344	(1.132)	1	5	2,882,744
Ln(GDP)	25.648	(1.614)	22.207	29.189	2,882,744
GDPGr	0.036	(0.04)	-0.18	0.337	2,882,744
Ln(Trade)	22.578	(1.94)	17.347	27.104	2,882,744
Tax haven	0.103	(0.304)	0	1	2,882,744
Colony	0.06	(0.237)	0	1	2,882,744
Contiguous	0.03	(0.171)	0	1	2,882,744
Ln(Distance)	8.933	(0.494)	6.603	9.702	2,882,744
Language	0.252	(0.434)	0	1	2,882,744
Legal origin	0.282	(0.45)	0	1	2,882,744
Settler mortality	0.146	(0.341)	0.003	2.004	1,490,933
Democracy 1900	1.696	(1.821)	0	4.615	1,275,026
Neighbor property rights	0.396	(1.433)	-2.002	3.412	2,803,608

Panel B: Sorts					
	Low	Middle	High	(3)-(1)	p-value
Property rights	0.054	0.085	0.204	0.150***	0.000
Rule of law	0.039	0.075	0.168	0.129***	0.000
Control of corruption	0.033	0.076	0.174	0.141***	0.000
Voice and accountability	0.048	0.086	0.152	0.105***	0.000

Panel C: Correlations							
Variables	Presence	Property rights	Rule of law	Control of corruption	Voice and acctbilty	Anti-self-dealing	Anti-director
Presence	1.000						
Property rights	0.184*** (0.000)	1.000					
Rule of law	0.183*** (0.000)	0.978*** (0.000)	1.000				
Control of corruption	0.191*** (0.000)	0.968*** (0.000)	0.957*** (0.000)	1.000			
Voice and accountability	0.154*** (0.000)	0.928*** (0.000)	0.851*** (0.000)	0.822*** (0.000)	1.000		
Anti-self-dealing	0.124*** (0.000)	0.212*** (0.000)	0.260*** (0.000)	0.288*** (0.000)	0.054*** (0.000)	1.000	
Anti-director	0.095*** (0.000)	0.221*** (0.000)	0.243*** (0.000)	0.239*** (0.000)	0.149*** (0.000)	0.574*** (0.000)	1.000

Following [Acemoglu and Johnson \(2005\)](#), we define property rights institutions as the rules and regulations protecting citizens against the power of the government and elites. To capture this broad definition, we rely on three indicators from [Kaufman, Kraay and Mastruzzi \(2009\)](#): rule of law, control of corruption, and voice and accountability. *Rule of law* measures the extent to which citizens abide by the rules of society with a particularly strong focus on contract enforcement, property rights (intellectual and private property) and expropriation, the police (violent and organized crime), and the courts (fairness and speediness of judicial process). *Control of corruption* captures the extent to which public power is exercised for private gain (i.e., corruption among public officials). Both petty and grand forms of corruption are considered, including state “capture” by private interests. *Voice and accountability* captures the process by which governments are selected, monitored, and replaced as well as the accountability of public officials.¹⁰ The above measures are conceptually aligned with our definition, capturing different dimensions of property rights institutions.

Using the above indicators, we next construct our main aggregate property rights institutions measure. *Property rights* is defined as the first principal component of *Rule of law*, *Control of corruption*, and *Voice and accountability*.¹¹ As reported in Panel A of [Table 2](#), *Property rights* has a mean of 0, a standard deviation of 1.7, a minimum of -3.6, and a maximum of 2.8. The rich representation of countries, the mean, the standard deviations, and the spread between the minimum and maximum values of *Property rights* suggest adequate sample variation in the quality of property rights institutions in our sample.

3.4. Investor protection from expropriation by insiders

We employ two well-known and widely used minority investor protection measures: the anti-director index constructed by [La Porta et al. \(1997\)](#) and [La Porta et al. \(1998\)](#) and revised by [Djankov et al. \(2008\)](#) and the anti-self-dealing index constructed by [Djankov et al. \(2008\)](#). The anti-director index summarizes the legal protection of minority shareholders in the corporate decision-making process, including the right to vote. The anti-self-dealing index measures the strength of minority shareholder protection against self-dealing by the controlling shareholders. The two indices are available for a total of 72 countries.

3.5. Other country factors that affect location decisions

A number of country factors have been shown to affect corporate location decisions. Since such factors are likely correlated with the strength of property rights institutions, we control for them in our multivariate regression tests. We control for a country’s size of economic activity using

gross domestic product (GDP) from the World Bank Development Indicators series. In addition, we include GDP growth as a measure of economic growth. [Barrios et al. \(2012\)](#) show that country taxation affects location decisions of MNCs. To control for differential tax treatment, we include an indicator variable of whether a foreign country is considered a tax haven following definitions in [Dyreng and Lindsey \(2009\)](#). We also control for several variables used in the trade literature to explain resistance to cross-border trade flows, which we obtain from [Mayer and Zignago \(2011\)](#). These include indicator variables for countries that share the same language, have had a colonial link, and share a border. Similarly, we also account for common legal origin ([La Porta et al., 1997](#)). To better control for distance, we include the average great circle distance between Washington, DC and the capital cities of the host countries. Finally, we also obtain bilateral trade data from the IMF Direction of Trade Statistics to measure bilateral trade (the sum of imports and exports) between the United States and other countries. Names and definitions of all variables can be found in [Appendix A](#).

We note that we do not control for GDP per capita in our main results because it is highly correlated with our property rights measure, and property rights have been shown to be a strong determinant of income (e.g., [Mauro, 1995](#); [Acemoglu, Johnson and Robinson, 2001](#)). To mitigate omitted variable concerns and to show the distinct effect of property rights, however, we show in our Online Appendix that our results are robust (and are in fact stronger) when we include GDP per capita as an additional control.

4. Empirical results

4.1. Subsidiary locations and property rights institutions

We start with a visual inspection of our data. [Fig. 2](#) presents a scatter plot with a linear fit of the relation between US MNC presence and the quality of country property rights institutions. The plot suggests that, on average, US MNCs tend to have operations in countries with stronger property rights. Additionally, [Fig. 3](#) presents bar charts of US MNC presence and the quality of country property rights institutions. Again, on average, the countries where US MNCs operate tend to have better property rights. Besides visualizing the relation across all countries in our sample, [Fig. 3](#) also provides results with country splits along two dimensions: 1) Organization for Economic Cooperation and Development (OECD) versus Non-OECD countries; 2) and countries with above/below median economic development (as measured by GDP per capita).¹² Consistently, we find that US MNCs tend to have material operations in countries with stronger property rights.

We next quantify the relation between subsidiary location and the quality of property rights institutions. We start with simple univariate sorts. In particular, we examine subsidiary location groups formed on our composite measure of property rights, *Property rights*, and each

¹⁰ Additional details, including methodology, data sources, and measurement error analysis, among others, can be found in [Kaufman, Kraay and Mastruzzi \(2004\)](#) and [Kaufman, Kraay and Mastruzzi \(2009\)](#).

¹¹ We obtain quantitatively similar results if we use an equal-weighted average of the three governance indicators instead of their first principal component.

¹² A country is classified as an “OECD” country if the country is an OECD member as of the last year in our sample, 2012.

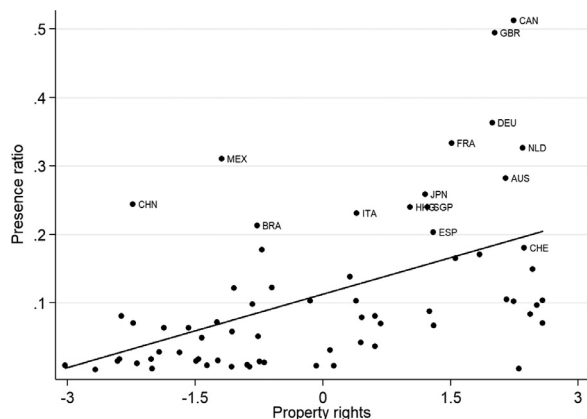


Fig. 2. Subsidiary locations and property rights across countries.

This figure presents a scatter plot with a linear fit of the relation between US MNC presence and the quality of country property rights institutions. The sample is a panel of 2,882,744 firm-year-subsubsidiary country observations during the period 1996–2012 of 6869 US multinational companies with operations in 68 countries. *Presence* is an indicator variable taking the value of one if a firm reports material operations (subsidiaries) in a given country during a given year, and zero otherwise. *Property rights* measures the quality of property rights institutions in a country and is calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability). Country nomenclature for top 15 countries in terms of subsidiary presence is as follows: CAN-Canada, GBR-United Kingdom, DEU-Germany, FRA-France, NLD-Netherlands, MEX-Mexico, AUS-Australia, JPN-Japan, CHN-China, SGP-Singapore, HKG-Hong Kong, ITA-Italy, BRA-Brazil, ESP-Spain, and CHE-Switzerland.

of its components separately. Every year, we sort company subsidiary-country observations into terciles based on property rights rankings for that year. Next, we calculate the incidence of presence as a proportion of all observations in a given tercile and test for mean difference between the two extreme terciles. Table 2, Panel B has the results.

Subsidiary presence increases monotonically with the quality of property rights. The portfolio of countries with the strongest property rights also has the highest subsidiary presence, while the portfolio of countries with the poorest property rights also has the weakest subsidiary presence. Notably, the difference between the extreme terciles is significant at the 1% level. Such results suggest that countries with stronger property rights attract more foreign direct investment by US MNCs.

We provide confirmatory results from pairwise correlations presented in Table 2, Panel C. Consistent with the results from the univariate sorts, subsidiary presence is significantly (at the 1% level) positively correlated with all property rights variables. We also note that the pairwise correlations between the three World Bank governance indicators are quite high, ranging from 0.82 between *Voice and accountability* and *Control of corruption* to 0.96 between *Rule of law* and *Control of corruption*. The correlation between investor protection and the World Bank indicators, on the other hand, is quite low, ranging from 0.05 between *Anti-self-dealing* index and *Voice and accountability* to 0.29 between *Anti-self-dealing* index and *Control of corruption*. Such relatively low correlations highlight the

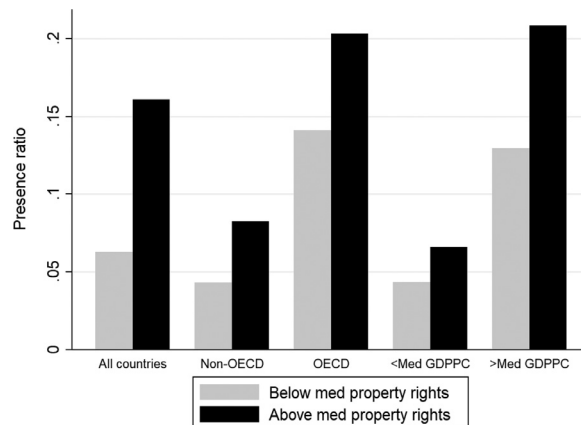


Fig. 3. Subsidiary locations and property rights: country splits.

This figure presents a bar chart of US MNC presence and the quality of country property rights institutions. The sample is a panel of 2,882,744 firm-year-subsubsidiary country observations during the period 1996–2012 of 6869 US multinational companies with operations in 68 countries. *Presence* is an indicator variable taking the value of one if a firm reports material operations (subsidiaries) in a given country during a given year, and zero otherwise. *Property rights* measures the quality of property rights institutions in a country and is calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability). “All countries” denotes that all countries in the sample are used for sorting into below/above median quality of country property rights institutions. “Non-OECD” denotes that only non-OECD countries in the sample are used for sorting into below/above median quality of country property rights institutions. “OECD” denotes that only OECD countries in the sample are used for sorting into below/above median quality of country property rights institutions. “<Med GDPPC” denotes that only countries with below median GDP per capita in the sample are used for sorting into below/above median quality of country property rights institutions. “>Med GDPPC” denotes that only countries with above median GDP per capita in the sample are used for sorting into below/above median quality of country property rights institutions.

importance of distinguishing minority investor protection from property rights institutions. For example, countries like Malaysia, Thailand, and China rank among the top ten in the anti-director and anti-self-dealing indices, but the property rights protection in these countries is not particularly strong. In what follows, we show that the two forms of institutions have very different effects on a firm’s foreign investment decisions.

As a next step, we explore the relation between MNCs’ subsidiary location and the quality of property rights institutions in a more rigorous multivariate regression setting. We focus on the locations of foreign subsidiaries within firms, analyzing the impact of property rights on the location choice among competing foreign locations. An MNC comprises a parent firm in the United States and foreign subsidiaries in one or more foreign countries. Accordingly, for every firm-year, we construct instances of a binary variable that take on a value of one if a firm reports presence in a certain foreign country, and zero otherwise. Regarding each potential subsidiary location for each firm-year, there thus is a binary choice. Location choice is assumed to be determined by the quality of property rights institutions and a range of other location or country characteristics.

In addition to examining subsidiary presence in a foreign market, we also link property rights to the intensity of

foreign presence—whether a US MNC tends to have greater exposure to countries with good property rights institutions. We build a proxy for the number of subsidiaries a firm has in a given country during a given year by counting the number of times a country's name is mentioned in a company's Exhibit 21 of its annual 10-K statement. Admittedly, this approach to infer numbers of subsidiaries is subject to measurement error.¹³ Despite such problems, we believe that our proxy for the number of subsidiaries is informative. Importantly, there is no reason to believe that the measurement error is systematic in any way.

In our first set of results, to account for the fact that country institutions are persistent over short periods of time, we collapse our sample at the firm-country level. We then estimate a cross-sectional regression of the following form:

$$Y_{ij} = \alpha_i + \beta_1 \times \text{Property Rights}_{ij} + \beta_2 \times \text{Ctrls}_{ij} + \epsilon_{ij}, \quad (1)$$

where i indexes companies, and j indexes countries. The dependent variable is either *Presence* or $\ln(\text{NSub})$. *Presence* is an indicator variable taking the value of one if a firm reports material operations (subsidiaries) during any year over the 1996–2012 period, and zero otherwise. $\ln(\text{NSub})$ is a proxy measure of the number of subsidiaries a firm has in a given country. It is calculated as a natural log transformation of the maximum number of times a country's name is mentioned in Exhibit 21 of a company's 10-K reports in any year over the period 1996–2012.¹⁴ When available, all right-hand side variables, including property rights, are measured as of 1996, the beginning year of our sample period.¹⁵ The specifications used to estimate Eq. (1) are linear probability models with firm fixed effects (α_i) and standard errors clustered at the firm level. Table 3, Columns (1) and (2) report the results.

Both specifications indicate that the quality of property rights institutions is a significant determinant of firms' subsidiary locations. Specifically, countries with weaker property rights are less likely to attract US MNC subsidiaries. Coefficient estimates are statistically significant at the 1% level. Based on Specification (1), a one standard deviation decrease in the quality of a country's property rights environment decreases the propensity of subsidiary presence by 1.8 ($=1.660 \times 0.011$) percentage points, an economically significant effect given that the unconditional probability of subsidiary presence is only 11.3%. Specification (2) shows that our results are robust to using $\ln(\text{NSub})$ as the dependent variable and suggests that countries with stronger governance tend to attract a greater number of firm subsidiaries.

¹³ For example, there will be double counting of countries for a number of companies. The reason is that it is not uncommon for companies to include country names in the names of their subsidiaries (e.g., "Microsoft Ireland") and then state the location of subsidiary (e.g., "Ireland"). In such cases, since our program just counts words, it will double count some country names (in this example, Ireland).

¹⁴ Before the log transformations, we first add one to *NSub* to deal with zero values.

¹⁵ For three countries in our sample (Luxembourg, Kazakhstan, and South Africa), values of some right-hand side variables are not available for 1996. We assign the earliest nonmissing values of respective variables for such countries.

While country institutions are persistent through time, to capture compositional changes in our subsidiary data and better align company organizational structure with country-level variables, we next return to our full sample, where the unit of observation is at the firm-year-subsidiary country level. We estimate the following specification:

$$Y_{ijt} = \alpha_i \times \alpha_t + \beta_1 \times \text{Property Rights}_{ijt-1} + \beta_2 \times \text{Ctrls}_{ijt-1} + \epsilon_{ijt}, \quad (2)$$

where i indexes companies, t indexes years, and j indexes countries. Again, the dependent variable is either *Presence* or $\ln(\text{NSub})$, both measured in year t . We lag property rights indicators and control variables one year. Specifically, a firm filing a financial report in year t is assigned property rights values for its subsidiary locations as of year $t - 1$. This is done to assuage information availability concerns so that location choices are based on information available to the firms. We include firm \times year fixed effects $\alpha_i \times \alpha_t$ to control for a variety of unobservable firm characteristics that might otherwise confound the analysis and cluster standard errors at the firm-country level to account for the persistence in subsidiary locations of firms across time. Columns (3) and (4) report the results. We obtain slightly larger, but very close, point estimates using the full sample. This is not surprising, given that our property rights variable is relatively persistent through time.^{16,17}

In Columns (5) to (8), we test the effects of minority investor protection on MNC investment. The evidence is somewhat mixed. Anti-self-dealing is not significantly correlated with MNC subsidiary location decisions, while the anti-director variable shows a significantly negative effect on MNC investment. Untabulated results show that the unconditionally positive association between minority investor protection and subsidiary location variables shown in Table 2, Panel C disappears and eventually flip signs as more control variables are included in regression specifications. The significantly negative coefficient of the anti-director index is consistent with the findings of Kelley and Woidtke (2006) and may suggest that the competition effect discussed in Hypothesis 3 outweighs the financing effect. However, Djankov et al. (2008) argue that the anti-self-dealing index is better grounded in theory and has stronger predictive power over financial market development. Therefore, we view the effect of the anti-director measure as tentative. Overall, the results shown here suggest that MNC foreign investment is a good laboratory to study the distinctly important effects of property rights protection, and that it is important to consider the unique effect of each type of institutions, as emphasized by Acemoglu and Johnson (2005).

The signs of the other control variables are also in accordance with previous findings in the literature. US MNCs

¹⁶ We note that all three components used to construct our property rights measure, *Rule of law*, *Control of corruption*, and *Voice and accountability*, are consistently significantly and positively correlated with MNC presence. Such results are presented in our Online Appendix.

¹⁷ In untabulated results, we reestimate Eq. (2) for OECD vis-à-vis non-OECD countries separately. Property rights quality is consistently associated with higher probability and intensity of operations in both subsamples.

Table 3

Subsidiary location and property rights institutions.

This table reports coefficients from regressions of firms' subsidiary locations on the quality of country property rights institutions and control variables. The sample is a panel of 2,882,744 firm-year-subsidiary country observations during the period 1996–2012 of 6869 US multinational companies. *Property rights* measures the quality of property rights institutions in a country and is calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability). Columns (1)–(2), we collapse the data into a single firm-subsidiary country cross-section with 467,092 firm-subsidiary country observations. Right-hand side variables are measured as of 1996. *Presence* is a binary variable equal to one if a multinational firm reported a subsidiary in a given country during any year over the 1996–2012 period, and zero otherwise. *Ln(NSub)* is a proxy measure of the number of subsidiaries a firm has in a given country. It is calculated as a natural log transformation of the maximum number of times a country's name is mentioned in Exhibit 21 of a company's 10-K reports in any year over the period 1996–2012. Specifications include firm fixed effects and cluster standard errors at the firm level. In Columns (3)–(8), we use the full sample of 2,882,744 firm-year-subsidiary country observations. *Presence* is a binary variable equal to one if a multinational firm has a subsidiary in a given country during a given year, and zero otherwise. *Ln(NSub)* is a proxy measure of the number of subsidiaries a firm has in a given country during a given year. It is calculated as a natural log transformation of a count variable of the number of times a country's name is mentioned in Exhibit 21 of a company's 10-K report. Right-hand side variables are lagged one year. Specifications include firm \times year fixed effects and cluster standard errors at the firm \times country level. The definitions of all variables are reported in [Appendix A](#). *P*-values are presented in parentheses.

	Collapsed sample		Full sample					
	(1) Presence	(2) Ln(NSub)	(3) Presence	(4) Ln(NSub)	(5) Presence	(6) Ln(NSub)	(7) Presence	(8) Ln(NSub)
Property rights	0.011*** (0.000)	0.014*** (0.000)	0.013*** (0.000)	0.015*** (0.000)	0.013*** (0.000)	0.015*** (0.000)	0.014*** (0.000)	0.017*** (0.000)
Anti-self-dealing					−0.002 (0.512)	−0.002 (0.612)		
Anti-director							−0.012*** (0.000)	−0.018*** (0.000)
Ln(GDP)	0.041*** (0.000)	0.052*** (0.000)	0.038*** (0.000)	0.044*** (0.000)	0.038*** (0.000)	0.044*** (0.000)	0.039*** (0.000)	0.045*** (0.000)
GDPGr	0.013 (0.162)	0.084*** (0.000)	−0.084*** (0.000)	−0.085*** (0.000)	−0.083*** (0.000)	−0.084*** (0.000)	−0.085*** (0.000)	−0.087*** (0.000)
Ln(Trade)	0.005*** (0.000)	0.006*** (0.000)	0.008*** (0.000)	0.010*** (0.000)	0.009*** (0.000)	0.010*** (0.000)	0.009*** (0.000)	0.010*** (0.000)
Contiguous	0.131*** (0.000)	0.198*** (0.000)	0.138*** (0.000)	0.192*** (0.000)	0.138*** (0.000)	0.192*** (0.000)	0.142*** (0.000)	0.198*** (0.000)
Ln(Distance)	−0.034*** (0.000)	−0.055*** (0.000)	−0.029*** (0.000)	−0.043*** (0.000)	−0.029*** (0.000)	−0.043*** (0.000)	−0.024*** (0.000)	−0.036*** (0.000)
Tax haven	0.052*** (0.000)	0.057*** (0.000)	0.040*** (0.000)	0.041*** (0.000)	0.040*** (0.000)	0.041*** (0.000)	0.042*** (0.000)	0.043*** (0.000)
Colony	0.078*** (0.000)	0.122*** (0.000)	0.081*** (0.000)	0.118*** (0.000)	0.081*** (0.000)	0.118*** (0.000)	0.091*** (0.000)	0.134*** (0.000)
Language	0.018*** (0.000)	0.019*** (0.003)	0.009*** (0.000)	0.007*** (0.003)	0.009*** (0.000)	0.007*** (0.003)	0.009*** (0.000)	0.007*** (0.004)
Legal origin	0.041*** (0.000)	0.068*** (0.000)	0.045*** (0.000)	0.067*** (0.000)	0.045*** (0.000)	0.068*** (0.000)	0.059*** (0.000)	0.088*** (0.000)
Observations	467,092	467,092	2,882,744	2,882,744	2,882,744	2,882,744	2,882,744	2,882,744
Adjusted R ²	0.334	0.371	0.325	0.346	0.325	0.346	0.326	0.348

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

are more likely to have subsidiaries in countries with large economies and countries that have strong trade relations with the United States. Moreover, US MNCs are more likely to have subsidiaries in tax haven countries, countries that are contiguous to the United States (Canada and Mexico), countries with a colonial link to the United States, as well as countries with the same legal origin (English).

A potential problem with estimating Eqs. (1) and (2) is that the relation between subsidiary presence and the quality of property rights institutions could be contaminated by reverse causality or other endogeneity problems and thus can be spurious. For instance, countries may improve their governance following a wave of foreign direct investment (perhaps due to pressure from investors and their country governments). Alternatively, property rights could proxy for omitted country-level factors. For example, one could argue that property rights are positively correlated with future growth opportunities.

Consequently, companies could invest in countries with good governance not because of low expropriation risk but because of greater future growth opportunities. We use instrumental variables (IV) to address such concerns. For robustness, we use three different instruments.

Our first instrument is the mortality rates of European settlers in colonies between the seventeenth and nineteenth centuries from [Acemoglu, Johnson and Robinson \(2001\)](#). [Acemoglu, Johnson and Robinson \(2001\)](#) show that European settlers set up institutions that protected private property rights in colonies with favorable environments to European settlement. On the other hand, in places where Europeans faced high mortality rates, the colonizers tended to set up extractive institutions mostly used to exploit the native populations. While European settler mortality rates should be correlated with current property rights quality since institutions tend to be persistent over time, they can be considered largely exogenous, and their

effect on MNCs' subsidiary location choices should not be through spurious effects contemporaneous with firms' location decisions or reverse causality.

Based on similar arguments, our second instrument measures the strength of country democracy in the early twentieth century (based on the Polity III data set described in Gurr, 1999). The variable captures three dimensions of democratic rule: the competitiveness of political participation, the competitiveness of executive recruitment, and the constraints on chief executives. We again argue that while the strength of a country's democratic principles in the early 1900s should be related to the protection of citizens from the power of the government and elites, the effect of the instrument on MNCs' location choices is unlikely to materialize through spurious factors correlated with firms' locational choices.

For our third instrument, we follow the logic in Demirgüç-Kunt and Detragiache (2002), who interpret cross-country trends in regulation as a source of exogenous variation to a specific country's law and regulation manifested through regulatory spillovers. We further refine this idea in view of findings from Abiad and Mody (2005), Persson and Tabellini (2009), Buera, Monge-Naranjo and Primiceri (2011), and Masciandaro and Romelli (2017) emphasizing the influence of neighboring countries over a country's institutional environment. The conjecture here is that the rules and regulations in a given country are influenced by the institutional choices of neighboring countries, which are oftentimes socially, politically, and economically related. Based on this argument, we use a given country's neighboring countries' median quality of property rights as an instrument for the country's own quality of property rights. While neighboring countries' strength of property rights should be related to a country's own environment through regulatory spillover, its effect on US MNC subsidiary locations is unlikely to be through host country-specific omitted variable effects. Table 4 reports the results.¹⁸

The second stage estimations in Panel B show that the association between subsidiary location and property rights institutions is directionally and statistically robust to accounting for endogeneity concerns. Panel A, Columns (1)–(3) show that all three instruments have strong predictive power for our property rights measure. The instrumental variable coefficients have the expected signs and are highly statistically significant, which is consistent with the evidence and arguments of Acemoglu, Johnson and Robinson (2001) and Demirgüç-Kunt and Detragiache (2002). The adjusted R^2 s are high and the F -statistics are well above the threshold of ten prescribed by Stock, Wright and Yogo (2002). Such evidence supports the claim that our IV estimations do not suffer from weak instrumental variable problems. Altogether, the evidence from the IV estimations mitigates reverse causality and potential omitted variable concerns.

4.2. Property rights and MNC valuation

So far we have established a positive association between a country's strength of property rights institutions and the foreign direct investment by US MNCs. We next investigate whether host country property rights of subsidiary locations affect the valuation of US MNCs. As discussed in Section 2, we argue that changes in the quality of property rights at locations where MNCs operate affect the values of US MNCs. Consequently, our empirical strategy would utilize firm fixed effects to focus on within-firm variations in value and expropriation risk exposure. We also conduct analysis in the spirit of Lamont and Polk (2002), where we fix a firm's country exposure and examine how property right changes in these countries affect firm value.

To test our hypothesis, we combine country-level data with firm-level variables. For our purposes, we focus on a subset of the data, conditioning on only locations that indicate company presence. Our test sample consists of 273,128 firm-year-subsidary country observations with requisite data of 5045 US MNCs over the period 1996–2012.¹⁹ Table 5 presents descriptive statistics.

As we are faced with multiple instances per firm-year (one observation for every country of exposure), we use three schemes to weight observations: (1) we weight each country exposure within a firm-year equally, firm-years having equal weight among each other; (2) we weight each country exposure within a firm-year proportionately to the number of times the country's name is recorded in a given company's annual Exhibit 21 (which we use as a proxy for the number of subsidiaries a firm has in a given country), then weighting firm-years equally; and (3) we weight each country exposure within a firm-year proportionately to the GDP of the country in a given year, then weighting firm-years equally. We run weighted least squares (WLS) using the above weighting schemes, with year and firm fixed effects. Standard errors are clustered at the firm level. The dependent variable is firm value, measured by *Tobin's Q* and defined as the ratio of market value of assets to book value of assets. Table 6 presents the results. For brevity, we present results with the second weighting scheme but note that we obtain similar results with the first and third weighting schemes (reported in our Online Appendix).

Column (1) indicates that there is a strong association between firm value and the quality of property rights in subsidiary locations. Specifically, improvements in country property rights are associated with higher *Tobin's Q* of MNCs. A one standard deviation increase in the quality of property rights increases firm value by 2.0% $(=(1.618 \times 0.024)/1.955)$. In contrast, Columns (2) and (3) suggest the minority shareholder protection measures, *Anti-self-dealing* and *Anti-director*, are not significantly related to the values of MNCs.²⁰

¹⁸ We report results using our time-collapsed sample, as two out of our three instruments are time-invariant. Similar results are obtained if the full sample is used instead.

¹⁹ Availability of data points required for the construction of firm-level variables reduces our initial sample of 326,371 firm-year-subsidary country observations (6869 firms) to 273,128 observations (5045 firms).

²⁰ In untabulated results, we reestimate the association between firm value and the quality of property rights for OECD vis-à-vis non-OECD countries separately. While positive and significant (at least at the 10%

Table 4

Instrumental variables estimations.

This table reports coefficients from instrumental variable regressions of firms' subsidiary locations on the quality of country property rights institutions and control variables. The sample is a panel of firm-year-subsidary country observations during the period [1996–2012] of 6869 US multinational companies, which is then collapsed into a single firm-subsidary country cross-section. *Presence* is a binary variable equal to one if a multinational firm reported a subsidiary in a given country during any year over the [1996–2012] period, and zero otherwise. *Ln(NSub)* is a proxy measure of the number of subsidiaries a firm has in a given country. It is calculated as a natural log transformation of the maximum number of times a country's name is mentioned in Exhibit 21 of a company's 10-K reports (description of material foreign operations) in any year over the period [1996–2012]. *Property rights* measures the quality of property rights institutions in a country. It is calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability) and is measured as of 1996. *Settler mortality* measures European settler deaths per annum (Acemoglu, Johnson and Robinson, 2001). *Democracy 1900* measures the strength of democracy in a country in the early twentieth century (Gurr, 1999). *Neighbor property rights* measures neighboring countries' median quality of property rights. We use settler mortality, strength of democracy in the early twentieth century, and neighboring countries' property rights as instrumental variables for the quality of property rights institutions. Specifications include firm fixed effects and cluster standard errors at the firm level. Panels A reports first stage results, while Panel B reports second stage results. Control variables are the same as used in Table 3. The definitions of all variables are reported in Appendix A. *P*-values are presented in parentheses.

Panel A: IV regressions – first stage						
	(1)		(2)		(3)	
	Property rights		Property rights		Property rights	
Settler mortality	–0.204*** (0.000)					
Democracy 1900			0.659*** (0.000)			
Neighbor property rights					0.829*** (0.000)	
Controls	Yes		Yes		Yes	
Observations	240,415		206,070		453,354	
Adjusted <i>R</i> ²	0.555		0.696		0.637	
* <i>p</i> < 0.10, ** <i>p</i> < 0.05, *** <i>p</i> < 0.01						
Panel B: IV regressions – second stage						
	(1)	(2)	(3)	(4)	(5)	(6)
	Presence IV: settler mortality	Ln(NSub) IV: settler mortality	Presence IV: democracy 1900	Ln(NSub) IV: democracy 1900	Presence IV: neighbor property rights	Ln(NSub) IV: neighbor property rights
Property rights	0.034*** (0.000)	0.045*** (0.000)	0.021*** (0.000)	0.028*** (0.000)	0.015*** (0.000)	0.020*** (0.000)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	240,415	240,415	206,070	206,070	453,354	453,354
Adjusted <i>R</i> ²	0.352	0.389	0.334	0.368	0.336	0.373
* <i>p</i> < 0.10, ** <i>p</i> < 0.05, *** <i>p</i> < 0.01						

A potential concern over the results shown in Table 6 is that coefficients are identified not only through time-series variation in country property rights but also reflect potential changes to the countries in which firms operate. To exclude the latter source of information in identification, we adopt an approach similar to Lamont and Polk (2002). Specifically, for each firm-subsidary country pair, we difference the values of variables corresponding to the last and first years when a firm reports exposure to a given country. We then run difference regressions of changes in *Tobin's Q* on changes in *Property rights* and control variables.²¹ Such estimations isolate the valuation effects of changes in property rights that do not reflect changes in a

firm's exposure to different countries. Standard errors are clustered at the firm level. Table 7 reports the results.

To mitigate concerns over the persistence of country property rights through time, we estimate specifications requiring progressively longer intervals between the first and last observations within a firm-subsidary country pair. In Column (1), we require the first and last observations within a firm-subsidary country pair, over which the differences are taken, to be at least one year apart. In Column (2), we require the first and last observations within a firm-subsidary country pair, over which the differences are taken, to be at least three years apart. In Column (3), we require the first and last observations within a firm-subsidary country pair, over which the differences are taken, to be at least five years apart. We emphasize that the one-, three-, and five-year thresholds are the lower bounds for how far apart the first and last observations within a firm-subsidary country pair are. For example, in the case of the 1-year minimum threshold, the first and last observations within a firm-subsidary country pair are

level) in both cases, the association is economically more pronounced for subsidiaries in non-OECD countries.

²¹ Estimating differences regressions reduces the number of our controls. We lose static variables, such as geographic distance and language, which are differenced away.

Table 5

Descriptive statistics.

This table presents descriptive statistics. The sample includes a panel of 273,128 firm-year-subsidary country observations during the period 1996–2012 of 5045 US multinational companies. Firm-level variables are defined as follows. *Tobin's Q* is the ratio of market value of assets to book value of assets. *Foreign sales* is a firm's percentage of sales from international operations over a given fiscal year. *Ln(Size)* captures firm size, defined as a natural log transformation of firm assets. *Leverage* is a firm's book leverage. *Age* is the number of months since the stock first appears in the Center for Research in Security Prices (CRSP). *ROA* is a firm's return on assets, calculated as operating income before depreciation divided by total assets. *RDI* is a firm's research and development (R&D) intensity measured as research and development expenses divided by total assets, and set to zero if missing. *Dividends* is an indicator variable taking the value of one if dividends per share is positive, and zero otherwise. *ProdCon* is a Herfindahl–Hirschman index of sales, determined as the sum of squares of the shares of sales of all reported industry segments (product lines), where the shares are expressed as a percentage of total sales. The definitions of all other variables are reported in Table 2 and Appendix A.

Variable	Mean	(Std. Dev.)	Min.	Max.	N
Property rights	0.15	(1.618)	−4.647	2.251	273,128
Anti-self-dealing	0.521	(0.267)	0.075	1	273,128
Anti-director	3.651	(1.14)	1	5	273,128
Ln(GDP)	27.002	(1.307)	22.207	29.189	273,128
GDPGr	0.031	(0.034)	−0.18	0.337	273,128
Ln(Trade)	24.231	(1.54)	17.347	27.115	273,128
Tax haven	0.146	(0.353)	0	1	273,128
Colony	0.147	(0.354)	0	1	273,128
Contiguous	0.107	(0.309)	0	1	273,128
Ln(Distance)	8.804	(0.714)	6.603	9.702	273,128
Language	0.33	(0.47)	0	1	273,128
Legal origin	0.351	(0.477)	0	1	273,128
FX mean	86.626	(11.41)	70.834	109.526	273,128
FX range	9.816	(3.533)	3.44	16.683	273,128
Tobin's Q	1.955	(1.355)	0.596	8.588	273,128
Foreign sales	0.244	(0.199)	0	0.971	273,128
Ln(Size)	7.702	(1.969)	0.707	14.674	273,128
Leverage	0.212	(0.168)	0	0.835	273,128
Age	294.871	(255.942)	5	996	273,128
ROA	0.124	(0.098)	−0.312	0.366	273,128
RDI	0.042	(0.059)	0	0.293	273,128
Dividends	0.504	(0.5)	0	1	273,128
ProdCon	0.741	(0.287)	0.19	1	273,128

7.4 years apart on average (with a minimum of 1 year and a maximum of 17 years). Alternatively, in the case of the 3-year minimum threshold, the first and last observations within a firm-subsidary country pair are 9.1 years apart on average (with a minimum of 3 years and a maximum of 17 years). Finally, in the case of the 5-year minimum threshold, the first and last observations within a firm-subsidary country pair are 10.7 years apart on average (with a minimum of 5 years and a maximum of 17 years). All three specifications suggest that the improvement in countries' property rights institutions is positively related to the changes in firm values. Coefficients estimates are significant at the 10% level or better.

4.3. Evidence from FDI expropriation events

Expropriations are a direct manifestation of the failure of property rights institutions in our context and provide a good laboratory for examining the effects of host country property rights on MNCs' valuations. Expropriation events usually generate substantial publicity, raising uncertainty of potential contract terms renegotiation and fears of future expropriations of investor assets. To the extent that expropriation events are not fully anticipated by investors, they serve to update investors' information sets regarding expropriation risk and decrease the value of foreign

companies operating in the affected countries through an increased expropriation risk perception channel.

For example, the Russian government set off a firestorm of international condemnation when President Vladimir Putin recommended the cancellation of operational licenses for the controversial Sakhalin II oil and gas development project in Russia's Far East on September 18, 2006. Under the Sakhalin Project, an international consortium consisting of Royal Dutch Shell, Mitsubishi, and Mitsui had been developing infrastructure for the extraction of liquefied natural gas off the coast of Russia's Sakhalin Oblast since forming in the early 1990s. Ultimately, under legal and political pressure, the state-controlled Russian company OAO Gazprom took control of a 50%-plus-one-share stake in the project on December 21, 2006 (Bamberger, 2007).²² As Bamberger (2007) further suggests, the incident raised substantial "new questions for foreign investors in Russia's energy sector".

While the 2006 restructuring of the \$20 billion Sakhalin II project demonstrated that Russia had not stabilized from the country's turbulent privatizations in the 1990s, state expropriations have occurred in a number of other countries as well. For example, there has been a recent wave of

²² For additional information, see also The Economist: "After Sakhalin" (Dec 13th, 2006).

Table 6

Firm value and subsidiary country property rights. This table reports coefficients from weighted regressions of a firm's Tobin's Q on the quality of country property rights institutions and control variables. The sample includes a panel of 273,128 firm-year-subsidary country observations with requisite data during the period 1996–2012 of 5045 US multinational companies, which report foreign operations in their 10-K reports. *Tobin's Q* is defined as the ratio of market value of assets to book value of assets. *Property rights* measures the quality of property rights institutions in a country and is calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability). As a regression weighting scheme, we weight each country exposure within a firm-year proportionately to the number of times a country's name is recorded in a given company's annual Exhibit 21, then weighting firm-years equally. Specifications include year and firm fixed effects and cluster standard errors at the firm level. The definitions of all variables are reported in Appendix A. *P*-values are presented in parentheses.

	(1) Tobin's Q	(2) Tobin's Q	(3) Tobin's Q
Property rights	0.024*** (0.002)	0.023*** (0.002)	0.024*** (0.002)
Anti-self-dealing		-0.044 (0.311)	
Anti-director			-0.002 (0.822)
Ln(GDP)	0.013 (0.266)	0.008 (0.440)	0.013 (0.267)
GDPGr	0.792*** (0.003)	0.823*** (0.004)	0.782*** (0.003)
Ln(Trade)	0.002 (0.873)	0.007 (0.512)	0.002 (0.870)
Contiguous	0.016 (0.652)	-0.002 (0.947)	0.016 (0.659)
Ln(Distance)	0.009 (0.443)	0.009 (0.432)	0.009 (0.447)
Tax haven	-0.002 (0.931)	-0.006 (0.837)	-0.002 (0.955)
Colony	0.007 (0.610)	0.013 (0.361)	0.008 (0.581)
Language	-0.040** (0.043)	-0.043** (0.039)	-0.040** (0.042)
Legal origin	0.003 (0.869)	0.025 (0.410)	0.005 (0.813)
FX mean	-0.002 (0.807)	-0.002 (0.815)	-0.003 (0.806)
FX range	0.026** (0.010)	0.026** (0.010)	0.026** (0.010)
Foreign sales	-0.557*** (0.000)	-0.557*** (0.000)	-0.557*** (0.000)
Ln(Size)	-0.683*** (0.000)	-0.683*** (0.000)	-0.683*** (0.000)
Leverage	-0.916*** (0.000)	-0.916*** (0.000)	-0.916*** (0.000)
Age	-0.000 (0.325)	-0.000 (0.326)	-0.000 (0.326)
ROA	3.562*** (0.000)	3.562*** (0.000)	3.562*** (0.000)
RDI	1.574 (0.140)	1.574 (0.140)	1.574 (0.140)
Dividends	-0.038 (0.424)	-0.038 (0.425)	-0.038 (0.424)
ProdCon	0.298*** (0.002)	0.298*** (0.002)	0.298*** (0.002)
Observations	273,128	273,128	273,128
Adjusted R ²	0.666	0.666	0.666

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ **Table 7**

Firm value and changes in subsidiary country property rights. This table reports coefficients from weighted regressions of changes in a firm's Tobin's Q on changes in the quality of country property rights institutions and control variables. The sample includes a panel of 34,598 firm-subsidary country observations with requisite data during the period 1996–2012 of 5045 US multinational companies, which report foreign operations in their 10-K reports. *Tobin's Q* is defined as the ratio of market value of assets to book value of assets. *Property rights* measures the quality of property rights institutions in a country and is calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability). Within each firm-subsidary country pair, we difference value of variables corresponding to the last and first years when a firm reports exposure to the given country. We then run difference regressions of changes in *Tobin's Q* on changes in *Property rights* and control variables. We weight subsidiary country observations within a firm equally, then weighting firms equally. In Column (1), we require the first and last observations within a firm-subsidary country pair, over which the differences are taken, to be at least one year apart. In Column (2), we require the first and last observations within a firm-subsidary country pair, over which the differences are taken, to be at least three years apart. In Column (3), we require the first and last observations within a firm-subsidary country pair, over which the differences are taken, to be at least five years apart. In all specifications, standard errors are clustered at the firm level. The definitions of all variables are reported in Appendix A. *P*-values are presented in parentheses.

	(1) Δ Tobin's Q GE 1 Yr	(2) Δ Tobin's Q GE 3 Yr	(3) Δ Tobin's Q GE 5 Yr
Δ Property rights	0.087** (0.023)	0.101** (0.024)	0.090* (0.051)
Δ Ln(GDP)	-0.063*** (0.000)	-0.063*** (0.000)	-0.044** (0.043)
Δ GDPGr	2.130*** (0.000)	1.695*** (0.000)	1.629*** (0.001)
Δ Ln(Trade)	0.025*** (0.008)	0.036*** (0.005)	0.032* (0.077)
Δ FX mean	0.004*** (0.008)	0.006*** (0.000)	0.004** (0.044)
Δ FX range	-0.023*** (0.000)	-0.028*** (0.000)	-0.011* (0.088)
Δ Foreign sales	-0.219* (0.067)	-0.314** (0.026)	-0.455*** (0.002)
Δ Ln(Size)	-0.290*** (0.000)	-0.248*** (0.000)	-0.213*** (0.000)
Δ Leverage	-0.729*** (0.000)	-0.739*** (0.000)	-0.645*** (0.000)
Δ Age	0.001** (0.015)	0.001** (0.005)	0.001** (0.013)
Δ ROA	1.586*** (0.000)	1.899*** (0.000)	2.126*** (0.000)
Δ RDI	2.010*** (0.000)	3.219*** (0.000)	4.511*** (0.000)
Δ Dividends	-0.106** (0.016)	-0.160*** (0.002)	-0.240*** (0.000)
Δ ProdCon	0.200*** (0.006)	0.273*** (0.001)	0.309*** (0.001)
Observations	34,598	26,916	21,071
Adjusted R ²	0.102	0.109	0.112

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

expropriations in Latin America—Bolivian and Venezuelan governments negated contracts with foreign investors or outright nationalized foreign subsidiaries of MNCs amidst allegations against previous allegedly corrupt contracting officials and the arguably exploitative nature of some foreign investment contracts (Hajzler and Rosborough, 2016).

We formally investigate the relation between explicit acts of expropriation and MNC valuations, using data on

Table 8

Expropriations through time.

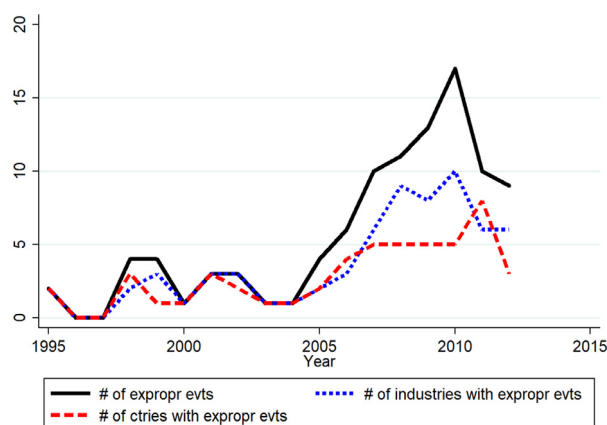
The sample includes 99 foreign direct investment expropriation events from 1995 to 2012. An act of expropriation is defined as the forced transfer of foreign direct investment assets at the industry-country-year level (Hajzler and Rosborough, 2016). The first and second columns list the number of events and the percentage among all events in the sample. The third column presents the number of industries where expropriations occur during a given year. The fourth column presents the number of countries where expropriations occur during a given year.

	Number of events	% Sample	Number of industries	Number of countries
1995	2	2.02	2	2
1996	0	0.00	0	0
1997	0	0.00	0	0
1998	4	4.04	2	3
1999	4	4.04	3	1
2000	1	1.01	1	1
2001	3	3.03	3	3
2002	3	3.03	3	2
2003	1	1.01	1	1
2004	1	1.01	1	1
2005	4	4.04	2	2
2006	6	6.06	3	4
2007	10	10.10	6	5
2008	11	11.11	9	5
2009	13	13.13	8	5
2010	17	17.17	10	5
2011	10	10.10	6	8
2012	9	9.09	6	3
All	99	100.00	21	21

international foreign direct investment expropriations initially compiled by Hajzler (2012) and updated by Hajzler and Rosborough (2016). We merge these data with our firm-year-subsidiary country panel. The combined data contains information on 99 expropriation events concerning the involuntary divestment of foreign direct investment assets of MNCs in 21 countries over the period 1995–2012. The data are collected through a thorough and systematic scanning of a wide range of international mainstream media outlets and published investment treaty arbitration claims. Hajzler and Rosborough (2016) collect data on a firm-by-firm basis and subsequently aggregate it into expropriation acts. The data include information on the country, year, industry, and firm of expropriation.²³

Table 8 provides information on the timing of expropriations from 1995 to 2012, which occurred in 21 of the 68 countries included in our study. There is a marked concentration of expropriation acts between 2005 and 2012. During that eight-year period, 80 acts (81% of the total) occurred. The number of acts per year averaged 1.9 during the period 1995–2004 and jumped to 10.0 during the period 2005–2012. The number of expropriating countries,

²³ The data focus on the frequency of expropriations and do not include a measure of the value of assets seized. As argued by Hajzler (2012), the latter information is often confidential or difficult to obtain, whereas the frequency-based measure facilitates a more complete global coverage of expropriations. As a result of an increasing use of investment dispute resolution through international arbitration claims, Hajzler (2012) draws on available investor claim information to compare sectoral and time patterns based on both the reported assets seized and the frequency of acts and finds that observed patterns are broadly the same.

**Fig. 4.** Expropriation events through time.

This figure presents a plot through time of the number of expropriation events, the number of industries, and the number of countries where expropriations occur in our sample over the period 1995–2012. An act of expropriation is defined as the forced transfer of foreign direct investment assets at the industry-country-year level (Hajzler and Rosborough, 2016).

which can be taken as a measure of breadth, averaged 1.4 and 4.6 per year during the periods 1995–2004 and 2005–2012, respectively. The pattern of the number of expropriated industries, defined according to the Fama-French 48 industry classification, behaves consistently, peaking over the latter part of the sample. Fig. 4 visualizes these patterns—one observes a relatively flat trend during the period 1995–2004 and a sharp increase and a peak during the period 2005–2012.

While Table 8 indicates that the expropriation events in our sample are from 21 (Fama-French 48) industries, they are heavily concentrated in few specific industries. Fig. 5, Panel A shows that *Precious metals*, *Agriculture*, *Utilities*, and *Petroleum & natural gas* account for more than half of the expropriation events in our sample, 55.6% of the total. The single industry accounting for most expropriations is *Petroleum & natural gas*, 17.2% of the total.

Similar to industry patterns, expropriation events are heavily geographically concentrated. Fig. 5, Panel B shows the distribution of expropriation events by geographic region. *Latin America & Caribbean* account for 72.7% of the expropriation acts in our sample.

We next examine the impact of expropriation events on MNCs' valuations. While we focus on the more direct setting of MNCs operating in the countries where the expropriation acts occur, we also examine a more "indirect" setting where MNCs do not operate in the countries where the expropriation acts occur. Our approach to measuring valuation effects relies on the information shocks to investors' expropriation risk information sets generated by the acts of expropriation. We ensure the availability and relevancy of information on expropriation events by focusing on acts that transpired over the calendar year prior to companies' fiscal year end dates. We use a binary categorization to identify "riskier" countries that have recently engaged in expropriation versus "safer" countries

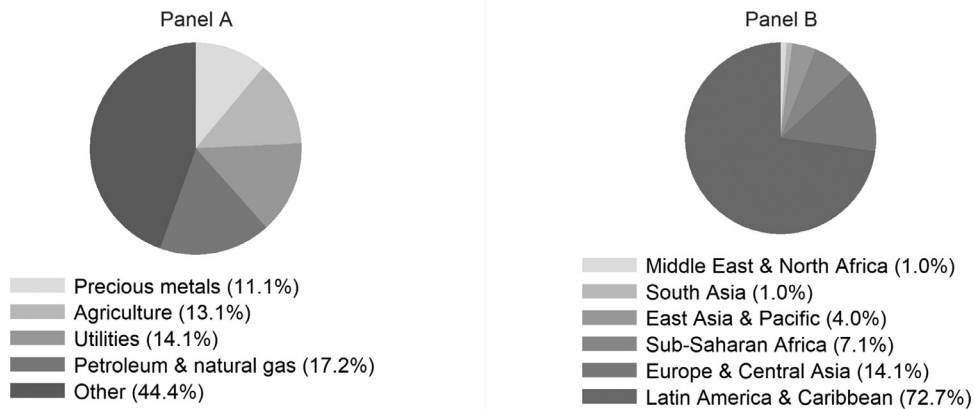


Fig. 5. Expropriation events by industry and geographic region.

This figure presents pie charts of the frequency of expropriation events in our sample by industry sector (top five sectors by representation) and geographic region over the period 1995–2012. An act of expropriation is defined as the forced transfer of foreign direct investment assets at the industry-country-year level (Hajzler and Rosborough, 2016).

that have not.²⁴ Specifically, we define an indicator, *ExprEvt SameCtry*, which assumes a value of one if an FDI expropriation act occurred in a country with an MNC's subsidiaries over the calendar year prior to the firm's fiscal year end date, and zero otherwise. As shown below, our results are also robust to longer measurement windows, such as $[-3, -1]$ and $[-5, -1]$ calendar years, where expropriation events are assumed to have a longer-lasting effect on MNC valuation.

We test *ExprEvt SameCtry* in the previously discussed weighted least squares regression framework, where we weight each country exposure within a firm-year proportionately to the number of times a country's name is recorded in a given company's annual Exhibit 21, then weighting firm-years equally. We also include firm and year fixed effects to ensure that coefficients are estimated on within-firm and within-year variation in *Tobin's Q* so that results are not driven by sample compositional changes or common, aggregate shocks to MNC valuations. We continue to cluster standard errors at the firm level. In addition, we identify and exclude all observations that are plausibly associated with firms directly affected in the expropriation acts to mitigate concerns that valuation effects are driven by the loss of assets as opposed to a deteriorating property rights environment (as a result of such exclusions, our estimation sample decreases from

273,128 observations to 269,483 observations). Thus, the coefficient of *ExprEvt SameCtry* should capture the valuation effect of a US MNC having material operations in a country that recently expropriated FDI assets, excluding directly expropriated MNCs. Table 9 presents the results.

Consistent with the arguments in this study, the coefficient of *ExprEvt SameCtry* in Column (1) is negative and statistically significant at the 1% level. On average, firms operating in countries that experience expropriations (but that are not themselves subject to expropriation) experience a 3.2% drop in value post expropriations relative to the mean. Columns (2) and (3) show this valuation effect is directionally and statistically robust to using longer measurement windows of expropriation risk. In Column (2), we extend the time horizon of tracking expropriation events in countries from one year to three years (i.e., $[-3, -1]$ calendar years prior to a company's fiscal year end). In Column (3), we extend the time horizon of tracking expropriation events in countries from one year to five years (i.e., $[-5, -1]$ calendar years prior to a company's fiscal year end). Both specifications show a consistent, significantly negative effect of FDI expropriation on MNC valuations. Overall, the results support the interpretation that investors are likely valuing assets of such MNCs at a discount to compensate for the increased ex-ante risk of expropriation. In unreported robustness checks, we confirm the robustness of our results using three- and five-year leading averages of *Tobin's Q* to mitigate concerns of spurious effects in annual data.

Expropriation acts within a country are oftentimes concentrated in time and specific industry sectors (Kobrin, 1984; Gadano, 2010; Hajzler, 2012). Consequently, expropriation events that specifically occur in an MNC's industry could signal higher risk of expropriation, and should potentially have larger valuation effects, relative to expropriation acts in different industries. To test this conjecture, we define an indicator variable, *ExprEvt SameCtry SameInd*, which takes the value of one if a foreign direct investment expropriation act is in the same industry as that of the MNC, and zero otherwise. We use the previously described

²⁴ The number of expropriation acts by a country is necessarily a noisy measure of ex-ante expropriation risk. For example, multiple expropriations in a short period of time might represent a country's nationalization of an industry, suggesting possibly contained ex-ante expropriation risk for FDI in other industries (Kobrin, 1985; Mahdavi, 2014). In contrast, a single act of selective expropriation potentially constitutes a stronger signal of a country's ex-ante propensity to opportunistically engage in property rights violations with respect to FDI. In addition, a potentially large discontinuity in the effect of the number of expropriations on a country's attractiveness for foreign direct investment exists. Specifically, the reputational cost to a hypothetical decision by a government to expropriate for the first time is likely larger than to a decision to engage in an additional act of expropriation conditional on having already recently expropriated. Such measurement issues motivate us to adopt a binary classification of countries for ex-ante expropriation risk.

Table 9

Evidence from FDI expropriation acts.

This table reports coefficients from weighted regressions of a firm's Tobin's Q on state expropriation risk measures and control variables. The sample includes a panel of 269,483 firm-year-subsidary country observations with requisite data during the period 1996–2012 of 5022 US multinational companies, which report foreign operations in their 10-K reports. *Tobin's Q* is defined as the ratio of market value of assets to book value of assets. *ExprEvt SameCtry* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred over the calendar year prior to a multinational firm's fiscal year end date in a country where the firm reports material subsidiaries, and zero otherwise. *ExprEvt SameCtry 3Yr* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred over the calendar-year period $[-3, -1]$ relative to a multinational firm's fiscal year end date in a country where the firm reports material subsidiaries, and zero otherwise. *ExprEvt SameCtry 5Yr* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred over the calendar-year period $[-5, -1]$ relative to a multinational firm's fiscal year end date in a country where the firm reports material subsidiaries, and zero otherwise. *ExprEvt SameCtry SameInd* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred in a multinational firm's industry over the calendar year prior to the firm's fiscal year end date in a country where the firm reports material subsidiaries, and zero otherwise. An act of expropriation is defined as the forced transfer of foreign direct investment assets (Hajzler and Rosborough, 2016). Companies that are deemed to be directly affected by the acts of expropriation are excluded from the sample. As a regression weighting scheme, we weight each country exposure within a firm-year proportionately to the number of times a country's name is recorded in a given company's annual Exhibit 21, then weighting firm-years equally. Control variables are the same as used in Table 6. We include year and firm fixed effects and cluster standard errors at the firm level. The definitions of all variables are reported in Appendix A. *P*-values are presented in parentheses.

	(1) Tobin's Q	(2) Tobin's Q	(3) Tobin's Q	(4) Tobin's Q	(5) Tobin's Q
<i>ExprEvt SameCtry</i>	-0.063*** (0.002)				-0.046** (0.024)
<i>ExprEvt SameCtry 3Yr</i>		-0.075*** (0.000)			
<i>ExprEvt SameCtry 5Yr</i>			-0.063*** (0.001)		
<i>ExprEvt SameCtry SameInd</i>				-0.280*** (0.006)	-0.241** (0.020)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	269,483	269,483	269,483	269,483	269,483
Adjusted R ²	0.665	0.665	0.665	0.665	0.665

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

WLS regression framework to estimate the effects of expropriations in MNCs' own industries. Table 9, Column (4) presents the results.

Consistent with intuition, the coefficient of *ExprEvt SameCtry SameInd* is negative and highly statistically significant. Notably, the magnitude of the coefficient is more than four times higher than that of *ExprEvt SameCtry*, suggesting that the valuation effects of expropriation acts are substantially more pronounced when they occur in the MNCs' industries. Finally, Column (5) suggests that, while valuation effects of expropriation acts are indeed higher when they occur in the MNCs' industries, FDI expropriation acts from other industries, different from those of the MNCs, have significant negative effect on MNC valuations as well. We again emphasize that these effects are not driven by directly expropriated firms, which are excluded from the sample.

So far, the results in Table 9 suggest that expropriation events have a "direct" effect—expropriations in a country affect valuations of MNCs operating in that particular country. We next examine whether expropriations could also have more indirect, spillover valuation effects. For example, expropriation events in one country could raise fears of expropriation events in neighboring countries. Alternatively, expropriation events in (other countries but) similar industries could also stoke foreign investors' fears. That is because "success" in expropriation in one

country could stimulate expropriation in other countries (e.g., Mahdavi, 2014), and industry similarity and geographic proximity are potentially amplifying characteristics conducive to "contagion" (e.g., Kobrin, 1984; Buera, Monge-Naranjo and Primiceri, 2011).

To test the spillover effects, we define three variables. *ExprEvt SameInd* is an indicator variable taking the value of one if a foreign direct investment expropriation act occurred in an MNC's industry (over the calendar year prior to the firm's fiscal year end date) in a country other than where the firm reports material subsidiaries, and zero otherwise. *ExprEvt NbrCtry* is an indicator variable taking the value of one if a foreign direct investment expropriation act occurred (over the calendar year prior to the firm's fiscal year end date) in a neighboring country to the country where an MNC reports material subsidiaries, and zero otherwise. Finally, *ExprEvt NbrCtry SameInd* is an indicator variable taking the value of one if a foreign direct investment expropriation act occurred in an MNC's industry (over the calendar year prior to the firm's fiscal year end date) in a neighboring country to the country where an MNC reports material subsidiaries, and zero otherwise. We again use the previously described WLS regression framework to test the statistical and economic significance of these variables. Table 10 presents the results.

Columns (1) and (2) show that while expropriation acts in the same industry outside the country of operation and

Table 10

Spillover effects from FDI expropriation acts.

This table reports coefficients from weighted regressions of a firm's Tobin's *Q* on state expropriation risk measures and control variables. The sample includes a panel of 269,483 firm-year-subsidiary country observations with requisite data during the period 1996–2012 of 5022 US multinational companies, which report foreign operations in their 10-K reports. *Tobin's Q* is defined as the ratio of market value of assets to book value of assets. *ExprEvt SameInd* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred in a multinational firm's industry over the calendar year prior to the firm's fiscal year end date in a country other than where the firm reports material subsidiaries, and zero otherwise. *ExprEvt NbrCtry* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred over the calendar year prior to the firm's fiscal year end date in a neighboring country to the country where a multinational firm reports material subsidiaries, and zero otherwise. *ExprEvt NbrCtry SameInd* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred in a multinational firm's industry over the calendar year prior to the firm's fiscal year end date in a neighboring country to the country where a multinational firm reports material subsidiaries, and zero otherwise. *ExprEvt SameCtry* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred over the calendar year prior to a multinational firm's fiscal year end date in a country where the firm reports material subsidiaries, and zero otherwise. *ExprEvt SameCtry SameInd* is defined as an indicator variable taking the value of one if a foreign direct investment expropriation act occurred in a multinational firm's industry over the calendar year prior to the firm's fiscal year end date in a country where the firm reports material subsidiaries, and zero otherwise. An act of expropriation is defined as the forced transfer of foreign direct investment assets (Hajzler and Rosborough, 2016). Companies that are deemed to be directly affected by the acts of expropriation are excluded from the sample. As a regression weighting scheme, we weight each country exposure within a firm-year proportionately to the number of times a country's name is recorded in a given company's annual Exhibit 21, then weighting firm-years equally. Control variables are the same as used in Table 6. We include year and firm fixed effects and cluster standard errors at the firm level. The definitions of all variables are reported in Appendix A. *P*-values are presented in parentheses.

	(1) Tobin's <i>Q</i>	(2) Tobin's <i>Q</i>	(3) Tobin's <i>Q</i>	(4) Tobin's <i>Q</i>	(5) Tobin's <i>Q</i>
<i>ExprEvt SameInd</i>	−0.017 (0.628)				
<i>ExprEvt NbrCtry</i>		−0.004 (0.643)			
<i>ExprEvt NbrCtry SameInd</i>			−0.040* (0.079)	−0.042* (0.067)	−0.043* (0.065)
<i>ExprEvt SameCtry</i>				−0.053** (0.010)	−0.038* (0.059)
<i>ExprEvt SameCtry SameInd</i>					−0.209** (0.040)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	269,483	269,483	269,483	269,483	269,483
Adjusted <i>R</i> ²	0.664	0.664	0.665	0.665	0.665

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

expropriation acts in neighboring countries have negative effects on MNCs' valuations, such effects are statistically indistinguishable from zero. In contrast, Column (3) shows *ExprEvt NbrCtry SameInd* is negative and statistically significant at the 10% level—acts of expropriation in neighboring countries and in the industry of the MNC have a negative and statistically significant effect on MNC valuation. On average, MNCs operating in a country whose neighbors engage in expropriation in the MNCs' industries experience a 2.0% drop in value post expropriation relative to the mean. Not surprisingly, this effect is smaller than when the acts of expropriation occur in the countries where MNCs operate. The results in Columns (4) and (5) suggest that the spillover effect of same industry expropriations in neighboring countries is not subsumed by expropriations in MNCs' countries of operation and is thus distinct.

5. Conclusion

There is little disagreement in the economics and finance literature with regards to the importance of a

country's legal institutions in promoting economic growth. There is less consensus, however, over what aspects of those institutions are more important. In an influential paper, Acemoglu and Johnson (2005) argue that it is the property rights institutions (the rules and regulations protecting citizens against the power of the government and elites), and not the contracting institutions (those governing contracting between ordinary citizens and protecting outside investors from expropriation by corporate insiders), that promote growth. Levine (2005) and Stulz (2005), on the other hand, suggest that these two aspects of legal institutions are deeply intertwined, and it is hard to separate their effects.

Our study takes on this problem and focuses on the effects of property rights institutions, distinct from contracting institutions, in the context of foreign direct investment by US multinational companies. Our setting allows for substantial separation of financing and investment. Specifically, we argue that US MNCs are regulated by the US law system, and hence their investors are subject to the same legal protection from expropriation by corporate insiders. Investment in host countries, on the other hand,

is inevitably subject to expropriation risk by the host countries' governments and other local agents and crucially depends on the strength of the host countries' property rights. We find that stronger property rights institutions promote foreign direct investment, while stronger legal protection of outside investors has a relatively unrobust and unstable effect. We further show that the deterioration of property rights in locations where MNCs operate significantly decreases the values of US multinational companies.

Our study thus highlights one important channel through which better property rights institutions promote country economic growth. [Acemoglu and Johnson \(2005\)](#) conclude their paper by saying “the effects of property rights institutions on economic outcomes, though highly robust, are still something of a black box...” Our study suggests that part of the effect is due to the ability of countries with better property rights protection to attract foreign direct investment.

Appendix A. Variable definitions

Age – a proxy for a firm's age, defined as the number of months since a stock first appears in CRSP.

Anti-director – a measure of the strength of legal protection of minority shareholders in the corporate decision process. Source: [Djankov et al. \(2008\)](#).

Anti-self-dealing – a measure of the strength of legal protection of minority shareholders against self-dealing by the controlling shareholders. Source: [Djankov et al. \(2008\)](#).

Colony – an indicator variable equal to one if the US has ever had a colonial link with a given country, and zero otherwise. Source: [Mayer and Zignago \(2011\)](#).

Contiguous – an indicator variable equal to one if the US is contiguous to a given country, and zero otherwise. Source: [Mayer and Zignago \(2011\)](#).

Control of corruption – a country-level index that captures “control of corruption.” Higher values indicate better quality. Source: World Bank.

Democracy 1900 – a measure of the strength of country democracy in the early twentieth century ([Gurr, 1999](#)). Higher values indicate more democracy.

Dividends – an indicator variable equal to one if dividends per share is positive, and zero otherwise.

ExprEvt NbrCtry – an indicator variable equal to one if an FDI expropriation act occurred (over the calendar year prior to the firm's fiscal year end date) in a neighboring country to the country where a multinational firm reports material subsidiaries, and zero otherwise.

ExprEvt NbrCtry SameInd – an indicator variable equal to one if an FDI expropriation act occurred in a multinational firm's industry (over the calendar year prior to the firm's fiscal year end date) in a neighboring country to country where a multinational firm reports material subsidiaries, and zero otherwise.

ExprEvt SameCtry – an indicator variable equal to one if an FDI expropriation act occurred (over the calendar year prior to a multinational firm's fiscal year end

date) in a country where the firm reports material subsidiaries, and zero otherwise.

ExprEvt SameCtry 3Yr – an indicator variable equal to one if an FDI expropriation act occurred (over the calendar-year period $[-3,-1]$ relative to a multinational firm's fiscal year end date) in a country where the firm reports material subsidiaries, and zero otherwise.

ExprEvt SameCtry 5Yr – an indicator variable equal to one if an FDI expropriation act occurred (over the calendar-year period $[-5,-1]$ relative to a multinational firm's fiscal year end date) in a country where the firm reports material subsidiaries, and zero otherwise.

ExprEvt SameCtry SameInd – an indicator variable equal to one if an FDI expropriation act occurred in a multinational firm's industry (over the calendar year prior to the firm's fiscal year end date) in a country where the firm reports material subsidiaries, and zero otherwise.

ExprEvt SameInd – indicator variable equal to one if an FDI expropriation act occurred in a multinational firm's industry (over the calendar year prior to the firm's fiscal year end date) in a country other than where the firm reports material subsidiaries, and zero otherwise.

Foreign sales – a firm's percentage of sales from international operations over a given fiscal year.

Language – an indicator variable equal to one if the US shares a language with a country, and zero otherwise. Source: [Mayer and Zignago \(2011\)](#).

Legal origin – an indicator variable equal to one if a country's legal origin is the same as that of the US (English), and zero otherwise. Source: [La Porta et al. \(1997\)](#).

Leverage – a firm's book financial leverage.

Ln(Distance) – a measure of distance calculated as natural log transformation of the average great circle distance (in kilometers) between Washington, DC and the capital city of a given country.

Ln(GDP) – a natural log transformation of a country's annual GDP. Source: World Bank.

GDPGr – a country's annual GDP growth rate. Source: World Bank.

Ln(Size) – firm size, defined as a natural log transformation of a firm's assets (AT).

Ln(Trade) – a natural log transformation of annual trade (imports + exports) between the US and a given country. Source: IMF Direction of Trade Statistics.

Neighbor property rights – the median quality of property rights (*Property rights*) of a country's neighbors. A country's neighbors (neighboring countries) are determined in accordance with [Anderson \(2003\)](#) and [Charney, Colson and Smith \(2005\)](#).

NSub – a count variable of the number of times a country's name is mentioned in a company's Exhibit 21 (description of material foreign operations). The data is gathered from 10-K filings through a text search program.

Presence – an indicator variable equal to one if a firm reports material operations (subsidiaries) in a given

country, and zero otherwise. The data is gathered from Exhibit 21 of 10-K filings through a text search program.

ProdCon – a Herfindahl-Hirschman index of sales, determined as the sum of squares of the shares of sales of all reported industry segments, where the shares are expressed as a percentage of total sales.

Property rights – a measure of the quality of property rights institutions in a country, calculated as the first principal component of three governance dimensions (rule of law, control of corruption, and voice and accountability).

RDI – a firm's R&D intensity, calculated as research and development expenses divided by total assets (set to zero if missing).

ROA – a firm's return on assets, calculated as operating income before depreciation divided by total assets.

Rule of law – a country-level index that captures “rule of law.” Higher values indicate better quality. Source: World Bank.

Settler mortality – potential settler mortality as used in Acemoglu, Johnson and Robinson, 2001, measured in terms of deaths per annum per 1,000 “mean strength” (raw mortality numbers are adjusted to what they would be if a force of 1,000 living people were kept in place for a whole year). We rescale original values from Acemoglu, Johnson and Robinson, 2001 by further division by 100 for presentation purposes.

Tax haven – an indicator variable of whether a country is a tax haven. Source: Dyreng and Lindsey (2009).

Tobin's Q – the ratio of market value of assets to book value of assets. It is calculated as $(AT-BE+ME)/AT$, where AT denotes a firm's total assets, BE is book value of equity, and ME is market value of equity.

Voice and accountability – a country-level index that captures “voice and accountability.” Higher values indicate better quality. Source: World Bank.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.jfneco.2019.03.001](https://doi.org/10.1016/j.jfneco.2019.03.001).

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