Do natural resources and foreign direct investment tend to erode or support the development of national institutions?

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Do natural resources and foreign direct investment tend to erode or support the development of national institutions?

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Abstract

This paper explores the relationships between natural resources, foreign direct investment (FDI) and the quality of national institutions, also known as "the rules of the game". Using a data set of 69 developing countries over the period 1970–2015 to estimate a dynamic panel data model, we find negative and significant effects of natural resources use or extraction on the development of national institutions. We focus on legal and property rights, but these findings also apply to the quality of some other national institutions. Our results align with a theory that abundant natural resources lead to weakened institutions because of the potential for firms to secure monopoly rents. Furthermore, we find that the effects of FDI inflows on institutional development are not robust to controlling for natural resources rents. This suggests that the latter tend to erode institutions regardless of whether those resources are exploited alongside increased foreign investment into the local economy.

KEYWORDS

foreign direct investment, institutional quality, natural resources abundance

1 | INTRODUCTION

Foreign direct investment (FDI) can be an essential source of funds, especially when developing countries suffer from financing constraints (Jude & Levieuge, 2017; Mody & Murshid, 2005). FDI is also associated with several benefits, including technology transfer, job creation, access to international markets and economic growth (Jude & Levieuge, 2017; Poelhekke & van der Ploeg, 2013). In most developing countries, natural resources abundance is the primary driver of FDI and is a potential catalyst for economic growth (Sachs & Warner, 1999). Yet, the evidence shows that countries with abundant natural resources are also generally among the poorest and slowest growing, suggesting that natural resources can be more of a curse than a blessing for some countries (e.g., Frankel, 2010; Havranek et al., 2016; Sachs & Warner, 1995, 1999; Torvik, 2002).

Not all resource-rich economies are necessarily cursed (Mehlum et al., 2006); this is more likely to happen in countries with poor institutions – the 'rules of the game in a society or, more formally, the humanly devised constraints that shape human interaction' (North, 1990, p. 3).[1] Natural resources owners can especially take advantage of weak institutions to disadvantage the growth of other sectors (e.g., Bulte et al., 2005; Torvik, 2002). For example, corruption can create barriers to entry for new investors by increasing the costs attached to FDI (Bénassy-Quéré et al., 2007; Wei, 2000).

Central to these issues is the fact that most resource-rich countries are typically dependent on a single sector or resource, which is also the dominant destination for FDI (Poelhekke & van der Ploeg, 2013). The MNEs or very large local or state-backed enterprises that tend to dominate such sectors can undermine the prevailing quality of domestic institutions, and any prospects of improving them, through lobbying and exerting undue pressure on policy makers in government (Long et al., 2015). For instance, there are several cases on the United States Department of Justice's website revealing that a number of European MNEs have been found guilty of engaging in corrupt practices in global South countries.[2]

In this paper, we empirically examine these viewpoints and relationships using a data set of 69 developing countries over the period 1970–2015. First, we find negative and significant effects of natural resources use or extraction on the development of national institutions, focusing especially on legal and property rights. Second, we find no effect of net FDI inflows on institutional quality after conditioning on natural resources abundance, which suggests that the latter tends to result in eroded institutions regardless of whether the resources are exploited through increased foreign investment into the local economy. Third, we find that well-known national measures of government size, freedom to trade internationally, regulation, political stability and the absence of violence and terrorism, all appear to respond negatively to an increased share of natural resources in a country's output.

[1]Institutions are referred to differently throughout the related literature. For instance, in Persson (2005) they are called *social infrastructure*, in Hall and Jones (1999) they are referred to as *structural policies*, while in Rodrik et al. (2004) the concept used is *institutions*, and in Acemoglu et al. (2005) they are referred to as *economic institutions*. In this work, we use the general term institutions in the same manner as Rodrik et al. (2004).

[2]A typical example is the case of a multinational financial services firm, Deutsche Bank Aktiengesellschaft (Deutsche Bank), headquartered in Frankfurt, Germany, agreeing to pay the United States $130 million for falsifying records to conceal bribes and other corrupt payments that were made to third-party intermediaries, as well as concerning a commodities scheme. See press release issued by the United States Department of Justice on Friday, January 8, 2021: "Deutsche Bank Agrees to Pay over $130 Million to Resolve Foreign Corrupt Practices Act and Fraud Case".

The effects of FDI on different types of institutional development have been explored extensively (e.g., Dang, 2013; Garretsen & Peeters, 2007; Long et al., 2015; Pan et al., 2020). Similar to ourselves, Ali et al. (2011) empirically tested the relationship between FDI and property rights within a panel data set of 70 developing countries for the period 1981–2005. They found a positive and statistically significant effect of FDI inflows on property rights. Compared with Ali et al., we extend the sample period, study multiple institutional measures as dependent variables, and focus on testing the role of natural resources abundance, as well as FDI, in institutional development.

Several researchers have explored whether the resource curse manifests through the quality of institutions (e.g., Mehlum et al., 2006). For instance, Demir (2016) found that FDI flows from developed countries to resource-rich developing countries tended to improve institutions, while FDI flows between developing countries harmed institutional development. Demir (2016) argued that there is a high likelihood that foreign investors treat resource-rich countries differently in order to access resources. However, not all studies have concluded that there is generally a negative relationship between natural resources rents and all aspects of institutional quality. For example, Haber and Menaldo (2011), by examining 168 countries over the period 1800–2006, showed that increased reliance on natural resources was not associated with authoritarianism but rather tended to generate resource blessings in terms of long-term political development.

We contribute to the existing literature in two main ways. First, we provide new evidence on the average relationships across countries between natural resources, FDI, and institutional quality, which could be helpful for future policy formulation in resource-rich developing countries. For instance, our results suggest that policymakers whose objectives include the strengthening of domestic institutions should be wary (and possibly renew their resolve) when their countries develop new opportunities for natural resources rents. We also provide empirical evidence on the effects of the dominant natural resources sector on institutions across countries. Second, we provide new evidence on the impact of FDI inflows on institutional development while also controlling for natural resources rents. This suggests that the latter tend to erode institutions regardless of whether those resources are exploited alongside increased foreign investment into the local economy.

2 | METHODOLOGY AND DATA

2.1 | Methodology

Our regression analysis and estimation methods somewhat follow and extend those used by Ali et al. (2011), Demir (2016) and La Porta et al. (1999). We estimate dynamic panel data models of the following form:

$$\begin{aligned} Inst_{i,t} = {} & \alpha + \beta_1 Inst_{i,t-5} + \beta_2 Growth_{i,t} + \beta_3 NetFDI_{i,t} \\ & + \beta_4 NatRes_{i,t-5} + \beta_5 \left(NetFDI_{i,t} \times NatRes_{i,t-5}\right) + \phi_i + \lambda_t + \psi_{R(i,t)} + \varepsilon_{i,t}, \end{aligned} \tag{1}$$

where $Inst_{i,t}$ denotes a measure of the level of institutions in a country as the dependent variable. The subscripts i and t denote countries (e.g., $i = 1, 2, \ldots, 69$) and periods ($t = 1975, 1980, \ldots, 2015$), respectively. We incorporate a lagged institutions term, $Inst_{i,t-5}$, to address the persistence of institutional change (Kotschy & Sunde, 2017; North, 1990). α and $\beta_{1,2,\ldots,5}$ are parameters to be estimated. Dictated in part by data availability, which is described in the next section, our analysis will look at the institutional development within countries over the period 1970–2015, using some lagged

values of variables when estimating our models. Like Barro (1999), Bénassy-Quéré et al. (2007), Cingano (2014) and Glaeser et al. (2004), we study yearly data at 5-year intervals, dropping any observations for years that are not multiples of 5 or 10, and thus we will not be concerned with very short-run dynamics in our model estimations. We also adopt 5-year periods because our primary institutional factors data from the Fraser Institute are only available for years that are multiples of five for the initial part of our sample period, from 1970 to 2000. In addition, these 5-year intervals and lags should help to neutralise short-term business cycles and some endogeneity.

We include GDP growth over the previous 5 years in the model, denoted by $Growth_{i,t}$, to capture the particular effects of recent economic development on institutions. $NetFDI_{i,t}$ represents net FDI inflows, measured as a percentage of GDP to account for country size (Ali et al., 2010). We will also later consider gross FDI flows (*GrossFDI*) measured in current United States dollars as an alternative. $NatRes_{i,t-5}$ denotes a measure of national natural resources abundance lagged by 5 years, captured by natural resources rents as a percentage of GDP. Later, we consider the sensitivity and robustness of the model estimates to using lags of 1–4 years instead of 5 years for natural resource rents. We also consider two variants of this measure. First, we consider the total sum of rents from coal, forestry, minerals, natural gas and oil. Second, we consider the maximum percentage of GDP attributed to any one of these sectors. In this way, we distinguish the effects of single-sector natural resource dependence on institutions. $NetFDI_{i,t} \times NatRes_{i,t-5}$ models the potential interaction effects between contemporaneous net FDI inflows and lagged total natural resources rents, to admit the possibility that FDI flows in resource dependent countries could impact institutions differently. ϕ_i and λ_t denote host country and period fixed effects, respectively. To address any region-specific trends in institutional development, $\psi_{R(i,t)}$ captures region-year fixed effects, where $r = R(i,t)$ is an indicator function denoting that country i and period t relate to region-year r (see Table A1 for the six region groupings of the countries in the estimation sample). The remaining unobserved heterogeneity in the quality of institutions is in the residual, $\epsilon_{i,t}$.

We start by estimating Equation (1) using least squares, excluding the year fixed effects, and computing standard errors robust to country-level clusters. However, these estimates will surely suffer from endogeneity bias in a dynamic panel model setup such as Equation (1) because of the lagged dependent variable, which is evident later in our results. To address this and the possibility of other endogeneity, we apply a two-step system GMM estimator. The excluded instruments are all possible lags of the levels and differences of the variables treated as plausibly endogenous, $\{Inst_{i,t-5}, Growth_{i,t}, NetFDI_{i,t}, NatRes_{i,t-5}, (NetFDI_{i,t} \times NatRes_{i,t-5})\}$. We use the common method of 'collapsing' to reduce the instrument count (Roodman, 2009a, 2009b). As a robustness check of overfitting the endogenous variables, we also later consider estimates where $NatRes_{i,t-5}$ is assumed to be exogenous. The year fixed effects are always treated as exogenous, which we include instead of the year-region dummy variables. This system GMM estimator corrects for weaknesses that can arise when using only the lagged levels of the first differences of variables as instruments, i.e., when instead applying difference GMM (Baum, 2006). We report standard errors and specification test results that use the Windmeijer (2005) finite-sample correction for the covariance matrix of two-step GMM estimators.

2.2 | Data

Descriptions of all the variables and the countries included in our estimation samples are provided in Tables A1 and A2. We arrived at our final sample of 69 developing countries over the period 1975–2015 based on the contemporaneous availability of data for our three main

variables: FDI flows, natural resources rents, and institutional factors.[3] We obtained the aggregate net FDI inflows data from the World Bank, World Development Indicators database, covering the period 1970–2015.[4] The FDI data are expressed as a percentage of GDP to account for country size (Ali et al., 2010). We obtained data on natural resources rents from the same source.[4] Natural resources rents are measured as a percentage of domestic GDP.

The main data on institutional factors are obtained from the Fraser Institute.[5] These components collectively can be summarised into a composite index, of which the key ingredients are freedom of choice, the protection of private property and the autonomy of the individual (Gwartney et al., 1996; Gwartney & Lawson, 2003). Detailed descriptions of the Fraser Institute institutional factors are given in Appendix 1. These data are available in 5-year intervals from 1970, 1975, 1980, 2000, and annually thereafter through to 2015. Despite some concerns about measurement and validity associated with the Fraser Institute data set, it has been widely used for research (e.g., Ali et al., 2010; Azman-Saini et al., 2010; Gwartney et al., 2006; Rode & Coll, 2012).[6] The data set is also fairly easy to verify because it is transparently constructed based on sound theoretical considerations, using distinct variables and published secondary data sources (Berggren, 2003; Rode & Coll, 2012).[7] Furthermore, our motivation for using the Fraser Institute indicators is driven by the fact they are available in 5-year intervals from 1970 to 2000 and every year since 2000. In addition, the data set covers up to 123 countries and is available freely and easily to researchers. Nonetheless, we also consider the World Governance Indicators (WGI) from the World Bank, covering the narrower available period of 1996–2016.[8] The WGI comprise six composite measures of different dimensions of governance (Kaufmann et al., 2005, 2010), which are also detailed in Appendix 1. The main institutional factor that our analysis focuses on is the Fraser Institute component of the 'Legal system and the security of property rights'. Ensuring the protection of private property and enforcement of contracts is one of the fundamental functions of government in an economically free society (De Haan et al., 2006). One justification for focusing on the property rights index over the WGI rule of law measure is that the former has a longer consistent time series of 1970–2015, compared to the latter's shorter series of 1996–2016.

2.3 | Descriptive statistics

Summary statistics for the main variables and estimation samples used in our analysis are reported in Table A3. Our main estimation sample will contain 558 country-year observations at

[3]We restricted our sample selection to developing countries with at least data for the key variables: FDI flows, natural resources rents, and institutional factors in every study period. The list of developing countries was accessed from the United Nations website on 30 April 2021.

[4]Accessed from the World Bank website on 25 April 2021.

[5]Accessed from the Fraser Institute website on 2 May 2021.

[6]De Haan et al. (2006) provide a critical analysis of the Fraser Institute indicators. Azman-Saini et al. (2010) argue that that the Fraser Institute's indicators show several reasons to expect that countries with greater levels of them will have higher prosperity and absorptive capacity.

[7]The data set is constructed using sources that include the PRS Group International Country Risk Guide (ICRG), the World Economic Forum Global Competitiveness Report, and IMF International Financial Statistics.

[8]Accessed from the World Bank website on 15 September 2021; https://databank.worldbank.org/source/worldwide-governance-indicators.

5-year intervals, $t = 1975, 1980, \ldots, 2015$ (i.e., with at most nine 5-yearly observations for each country), but this sample size will be reduced when we consider sub-categories of natural resources rents and particular measures of institutions, due to small numbers of missing values. We list the variables in Table A3 as used in our model estimations, including the variables that enter lagged by 5-years, i.e., for the period 1970–2010. Since our models will later be estimating the dynamic effects of FDI and natural resources use or extraction on institutional development within countries (i.e., using models with country fixed effects), we also present in Table A3 the descriptive statistics of 5-year changes for all variables, providing a reference point for the amount of variation that countries tend to experience in these variables over 5-year periods. In addition, Table A4 reports pairwise correlations between all the main variables used in our work. The correlation between property rights and the considered explanatory variables is positive except for lag natural resources rents (total, % of GDP), lag coal rents, lag oil rents and lag forest rents.

The median extent of net FDI inflows as a percentage of GDP in the analysis dataset is 1.4%, and the standard deviation is 2.7 percentage points (ppts). The median 5-year change in net FDI inflows is 0.1 ppts of GDP, while the standard deviation is 3.6 ppts. The maximum value of total natural resources rents as a percentage of GDP in the estimation sample is 56.9% (Republic of Congo in 2000), the median is 4.1%, and the standard deviation is 8.1%. The maximum 5-year change in natural resources rents is 33.8 ppts of GDP (Uganda in 1985), with a median of 0.0 and a standard deviation of 6.1 ppts. The maximum level of the property rights index in the estimation sample is 8.0 (Singapore in 2000), with a median of 4.4 and a standard deviation of 1.2.

To demonstrate the within-country variation in the key variables, Figure 1 shows histograms of the empirical distribution of levels and 5-year changes in net FDI inflows, natural resources rents and the property rights index. Each histogram pools all 69 countries and 5-year intervals, representing our main estimation sample. Figure 1a shows the distribution of pooled net FDI inflows for all countries for the period 1975–2015. The peak is concentrated around the 0%–2% range, with the majority of countries in the sample and period having reported positive net FDI inflows. Figure 1b shows that the peak in 5-year changes of pooled net FDI inflows is concentrated around zero. Nonetheless, the majority of countries recorded a positive change in net FDI inflows for the 5-year periods in the sample. Figure 1c shows that a nontrivial number of countries and periods in the estimation sample reflected large shares of natural resources rents in GDP. However, Figure 1d shows that about half of the country-years in the sample had relatively small 5-year changes of $\leq \pm 3\%$ in the contribution of natural resources rents to GDP. Figure 1e displays the pooled property rights levels for all 69 countries for the period 1975–2015. But, more importantly, Figure 1f demonstrates that there is considerable variation within the pooled estimation sample for 5-year changes in the property rights measure.

Figure 2 displays scatter plots for the property rights measure against net FDI inflows and natural resources rents. As in the case of the histograms, we show two plots for each pair of variables: one for levels and one for 5-year changes, over all countries and periods in the estimation sample. Figure 2a shows a positive correlation between net FDI inflows and property rights in the dataset, driven by a small number of cases with very high net FDI inflows as a share of GDP that also correspond to high values of the property rights index. Figure 2b shows that this correlation disappears when instead comparing 5-year changes of these two variables. Figure 2c,e show negative correlations between the property rights index and both contemporaneous and 5-year lagged natural resources rents as a share of GDP. These correlations diminish in Figure 2d,f when instead comparing 5-year changes in these variables, and in the latter case, the correlation between the change in property rights and the change in natural resources rents becomes marginally positive.

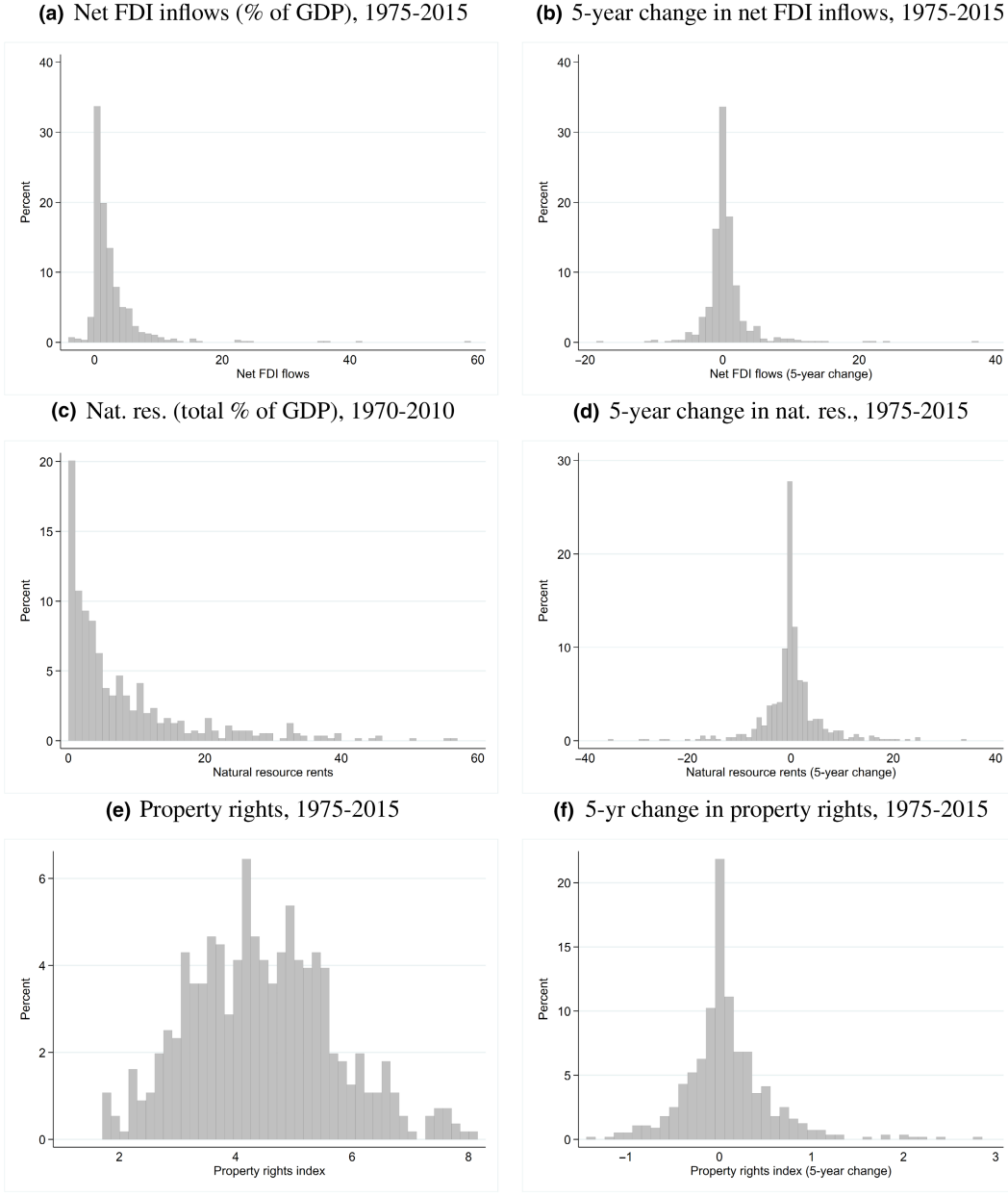

FIGURE 1 Distributions of levels and 5-year changes in net foreign direct investment (FDI) inflows, natural resources rents and property rights, pooled, all years and countries in the estimation sample. *Note*: Author calculations using data from the World Bank, World Development Indicators and The Fraser Institute. (a), (c) and (e) show, respectively, the pooled distributions for all sample countries at 5-year intervals of: net FDI inflows measured as a percentage of GDP, natural resources rents measured as a percentage of GDP, and a measure of property rights taking values between 0 and 10. The (b), (d) and (f) show pooled distributions over the sample countries and period for 5-year changes in the aforementioned variables. The bin sizes are 1 for (a–d), with the bin to the right of zero containing values which are positive but not >1. The bin size is 0.15 for (e), and is 0.1 for (f).

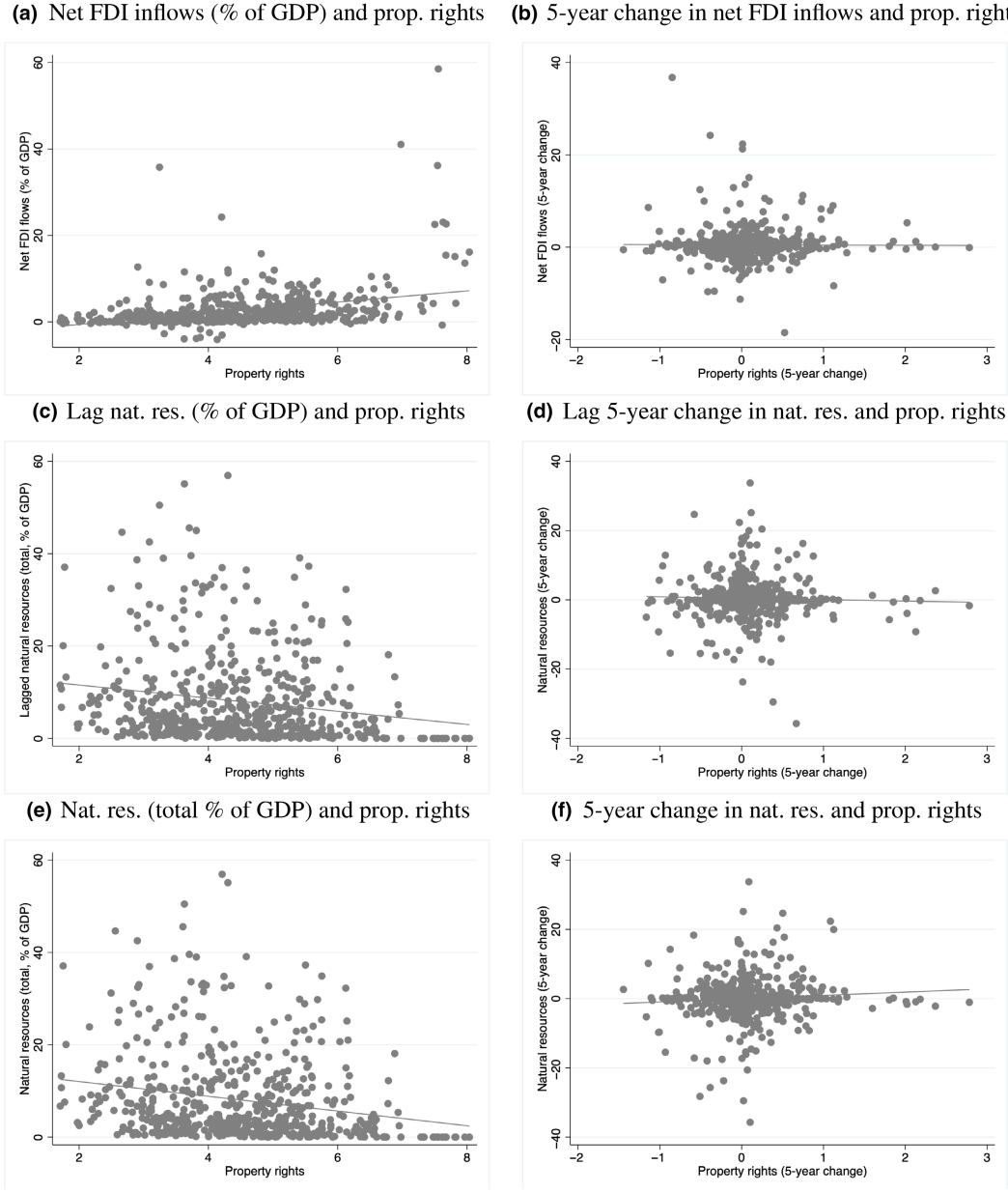

FIGURE 2 Correlations of net foreign direct investment inflows and natural resources rents with a measure of property rights, levels and 5-year changes, all years and countries in the estimation sample, 1975–2015. *Note*: Author calculations (see Table A3 for sample descriptives). (a) The corresponding values for all country-year observations in our sample of the levels of net FDI inflows and the property rights measure. Likewise, (c) the corresponding values of lagged natural resources rents and the property rights measure. (e) The corresponding contemporaneous levels of natural resources rents and the property rights measure. (b), (d) and (f) Corresponding values of 5-year changes in the respective variables shown in (a), (c) and (e). The estimated line of best fit is displayed in each sub-figure.

In summary, there is substantial variation in our main estimation sample, both between and within countries over time, in the importance of FDI and natural resources rents relative to total economic activity, as well as in the development of property rights. The data show some positive correlation between net FDI inflows and property rights, but this disappears when looking at 5-year changes in these variables and thus at within developing country patterns only. Similarly, although there is negative correlation between the levels of natural resources abundance and property rights in our sample period and set of developing countries, this approximately disappears when looking at the changes in these variables within countries. To unpick these dynamic within-country patterns more robustly, and to test whether on average there were significant relationships between the aforementioned variables between 1975 and 2015, in the next section, we estimate dynamic panel models as described above by Equation (1).

3 | RESULTS

3.1 | Main results – property rights

Focusing on the Fraser Institute property rights index, estimates of Equation (1) are presented in Table 1. Column (I) reports least squares estimates with country and year-region fixed effects and the lagged dependent variable. In columns (II)–(IV), we report the system GMM estimates while varying how natural resources abundance enters the model.

In column (I) of Table 1, the least squares estimated effect of natural resources abundance on property rights is negative and statistically significant at the 5% level; an increase in the use or extraction of natural resources by 10 percentage points of GDP on average relates to a decline of 0.11 in the property rights index 5 years later, which is equivalent to about one-quarter of a standard deviation in the 5-year change in this measure within the estimation sample (see Table A3 and Figure 1). This suggests a general association of natural resources abundance with weak or lower quality property rights in the estimation sample and period, conditional on the level and speed of a country's economic development. Net FDI inflows and economic growth have positive coefficients in the least squares estimates of Equation (1), but the former is statistically insignificant.

To address the endogeneity of the least squares parameter estimates of Equation (1), columns (II)–(IV) of Table 1 show results using the system GMM estimator described above. For each model estimated, we report *p*-values for the Hansen test of overidentifying restrictions and for the Arellano-Bond AR(2) test of the differenced residuals, in both cases not rejecting the null hypothesis for all models at standard levels of statistical significance. In column (II), with the total 5-year lagged natural resources rents as an explanatory variable, the estimates suggest a substantial degree of persistence in property rights quality within developing countries. The estimated effect of natural resources rents on institutional development is negative and significant at the 5% level; an increase in the use or extraction of natural resources by 10 percentage points of GDP is on average associated with a decline of 0.07 in the measure of property rights 5 years later, which is equivalent to about one-seventh of a standard deviation in the 5-year change in the property rights measure within the estimation sample. This suggests that omitted variables correlated with natural resources richness tend to bias the OLS estimates of β_4 downward, even after accounting for country and region-year fixed effects and lagging the natural resources rents by 5 years.

TABLE 1 Estimated effects of foreign direct investment and natural resources rents on property rights, 5-year periods in 1975–2015.

Dep. variable: property rights	(I)	(II)	(III)	(IV)
Lagged property rights	0.681***	0.903***	0.909***	0.879***
	(0.045)	(0.063)	(0.067)	(0.065)
Economic growth (5 year, %)	0.212***	0.135*	0.149**	0.130**
	(0.071)	(0.071)	(0.073)	(0.065)
Net FDI inflows (% of GDP)	−0.005	0.005	0.005	0.005
	(0.004)	(0.007)	(0.006)	(0.007)
Lag nat. res. (total % of GDP)	−0.011**	−0.007**		
	(0.004)	(0.003)		
Lag nat. res. (max. sector, % of GDP)			−0.009***	−0.007*
			(0.003)	(0.004)
FDI × nat. res. (×100)				−0.027
				(0.027)
Constant	1.514***	0.511*	0.474	0.586**
	(0.187)	(0.281)	(0.295)	(0.277)
5-year FEs	No	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
Year × region FEs	Yes	No	No	No
N of countries	68	69	69	69
N of country-5-year obs.	549	558	558	558
R^2	.907			
Arellano-Bond AR(2) test, *p*-value		.327	.306	.422
Hansen test of overid., *p*-value		.145	.146	.158
Number of instruments		46	46	55

Note: The table reports the results for varying estimates of Equation (1) for the period 1970–2015, in 5-year intervals, where the dependent variable is the property rights measure, using Stata's xtabond2 (see Roodman, 2009b; Table A3 and Figure 1 for sample descriptives, including for levels and 5-year changes). Column (I): least squares estimates, standard errors robust to country-level clusters (excludes Turkey as it is the only sample country in its region). Columns (II)–(IV): two-step system GMM estimates with lagged differences and levels of endogenous variables (all except the 5-year fixed effects) used as instruments (collapsed). ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided sided tests, with (cluster) robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction for the GMM estimators.

Column (III) of Table 1 shows the estimates of a similar model to column (II), only changing the natural resources variable to be the maximum percentage of GDP attributed to one of the relevant sectors within a country and period, thus addressing the potential effects of single-sector economic dependence on institutional development. We find that a change in the maximum percentage of GDP focused within a single natural resource sector has a marginally greater negative effect on property rights development within countries than the overall share of GDP derived from natural resources. Column (IV) shows further results after including the interaction of contemporaneous FDI and lagged total natural resources in the model $\left(NetFDI_{i,t} \times NatRes_{i,t-1}\right)$. Although the estimates of this interaction effect are negative

for property rights, they are not statistically significant. The system GMM estimates of Equation (1) also show that net FDI inflows on their own have no significant effects on property rights across all our model specifications. The coefficient estimate of at least 0.9 for the 5-year lagged dependent variable in the model implies that the any changes in natural resources richness within a country have persistent negative effects on the development of property rights.[9]

These results for property rights generally support the endowments view of institutional development of Engerman and Sokoloff (2002), among others. Moreover, the results align with a theory that the presence of natural resources generates incentives for investments that facilitate increased extraction of monopoly rents by a few state or private actors. In other words, there is motivation for actors involved in the use or extraction of natural resources to affect the weakening of institutions (e.g., through corruption, Malesky et al., 2015), to drive up monopoly rents regardless of whether those resources are increasingly exploited alongside foreign investment into the local economy. In Appendix 2, we also show that our main results are robust to using gross FDI flows or FDI stocks, instead of net FDI inflows, as explanatory variables in the models.

Table C1 shows that the system GMM estimates of Equation (1), with property rights as the dependent variable, are robust to limiting the possibility of over-fitting by treating $NatRes_{i,t-5}$ as exogenous and thus reducing the instrument set. To consider some heterogeneity, Table C2 reports equivalent results to Column (IV) of Table 1, in turn replacing the maximum sector-specific percentage contribution of natural resources rents to GDP with the contributions from only gas, forestry, coal, minerals, and oil. Although imprecisely estimated and not generally statistically significant, the magnitudes and directions of the effects of natural resources rent from each of these sectors on the development of property rights are consistent with the main results. Only oil rents have a statistically significant effect on property rights, at the 10% level (column (V), Table C2), suggesting that the use or extraction of oil especially is associated with the erosion of national institutions. This is consistent with some evidence that only oil dependence, and not other extractive resources, tends to erodes political institutions in Africa (Andersen & Aslaksen, 2013; Omgba, 2009).

To test the geographical stability of our estimates, Table C3 shows further model estimates equivalent to the main results in column (IV) of Table 1, dropping in turn one of the six regional groupings of countries from the estimation sample. The effect of a change in the maximum contribution of a single natural resource sector to GDP on property rights is negative in each case. This effect is smallest when excluding the six Middle East & North African (MENA) countries from the sample and is then not statistically significant at standard levels. Taken together, these results suggest that although the relationship between natural resources rents and property rights are likely to be negative within a country, the estimated average effects obtained from our simple model are somewhat sensitive to the sample of countries or regions studied.

Finally, to check the sensitivity and robustness of our results to the model specification, specifically the lag length for natural resource rents, Table C4 shows estimates that vary this. We

[9]We also considered system GMM estimates of Equation (1) where net FDI flows, lagged natural resources and 5-year fixed effects were the the only independent variable besides the lagged dependent variables, to address the possibility that the economic growth control variable absorbs part of the influence of our main variables of interest on institutional development. However, we find that the coefficient estimates for the variables of interest in these models are attenuated towards zero.

prefer a 5-year lag in our initial model specification because of the greater possible endogeneity of shorter lags for natural resource rents with lags of <5 years for institutional quality, which we cannot observe in our data. Instead of $NatRes_{i,t-5}$ on the right-hand-side of Equation (1), we consider a single lagged value, $NatRes_{i,t-x}$, where $x = \{1,2,3,4,5\}$. Table C4 shows both least squares and system-GMM estimates, thus comparable to columns (I) and (II) of Table 1. The estimated relationship between natural resource rents and property rights generally gets weaker and less statistically significant as the lag length used in the model gets shorter for $x = \{2,3,4,5\}$. For $x = 1$, where the likelihood of reverse causality is greater due to similarly recent lags for the level of institutions being missing from the model, the sign of the relationship between natural resource rents switches to positive and is statistically significant. In the final two columns of Table C4, we estimate the model with both $NatRes_{i,t-5}$ and $NatRes_{i,t-1}$ included. This highlights the expected problem and difficulty of interpretation when considering shorter lags of natural resources in the model, since the coefficient for the former longer lag is negative, significant, and larger than in the main results, whereas the coefficient for the shorter lag is positive, also significant, and attenuated in the system-GMM estimates compared with when the longer lag is excluded. In our view, these estimates show that our preferred model specification, lag structure and estimator are well-justified, given the limitation of only observing the institutional quality measures at 5-year intervals for most of our sample period.

3.2 | Other aspects of institutional development

In this section, we explore whether other aspects of the Fraser Institute's measures of institutional quality and the WGI dimensions of governance are associated with net FDI inflows or natural resources rents. Table 2 reports the system GMM estimation results of Equation (1) comparable to those shown in column (IV) of Table 1, replacing the previous dependent variable, property rights (prop. rights – repeated for comparison in column (I) of Table 2), with each of the other four Fraser Institute measures: size of government (gov. size), column (II); sound money (money), column (III); freedom to trade internationally (free. trade), column (IV); and business regulation (reg.), column (V). The model estimates show that these other institutional measures are substantially less persistent within countries than property rights. Net FDI inflows tend to have more positive effects on other aspects of institutional quality compared with property rights, but these effects are only statistically significant at standard levels for free trade and regulation. The effect of a change in natural resources richness on institutional development 5 years later has the smallest magnitude for property rights out of the five different measures, although the effect on sound money is not statistically significant. The largest negative effects of natural resources rents are estimated for the freedom to trade internationally; an increase in the maximum single-sector use or extraction of natural resources by 10 percentage points of GDP leads to a decline of 0.30 in the freedom to trade internationally measure 5 years later, which is equivalent to about one-quarter of a standard deviation in the 5-year change in this measure within the estimation sample (see Table A3). Across all the Fraser Institute measures of institutional quality, we find no significant evidence that net FDI inflows moderate or exacerbate the extent to which natural resources richness tends to erode institutional development.

We also broaden our analysis and present model estimates using the WGI dimensions of governance as dependent variables. Table 3 displays system GMM estimates of Equation (1), which

TABLE 2 Estimated effects of foreign direct investment and natural resources rents on individual institutional factors, 5-year periods in 1970–2015.

	Prop. rights	Gov. size	Money	Free. trade	Reg.
Dep. variables	**(I)**	**(II)**	**(III)**	**(IV)**	**(V)**
Lagged institutional factors	0.879***	0.578***	0.670***	0.550***	0.484***
	(0.065)	(0.070)	(0.052)	(0.084)	(0.057)
Economic growth (5 year, %)	0.130**	0.444***	0.929***	0.270	0.525***
	(0.065)	(0.160)	(0.277)	(0.250)	(0.113)
Net FDI inflows (% of GDP)	0.005	0.012	0.020	0.022***	0.023***
	(0.007)	(0.008)	(0.012)	(0.008)	(0.006)
Lag nat. res. (max. sector, % of GDP)	−0.007*	−0.028***	−0.015	−0.030**	−0.014**
	(0.004)	(0.008)	(0.012)	(0.013)	(0.007)
FDI × nat. res. (×100)	−0.027	0.072	0.058	−0.016	−0.045
	(0.027)	(0.062)	(0.080)	(0.068)	(0.034)
Constant	0.586**	2.944***	2.217***	3.173***	2.909***
	(0.277)	(0.528)	(0.447)	(0.568)	(0.410)
5-year FEs	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes
N of countries	69	69	69	69	69
N of country-5-year obs.	558	558	558	537	540
Arellano-Bond AR(2) test, *p*-value	422	.735	.068	.861	.126
Hansen test of overid., *p*-value	.158	.464	.577	.248	.570
Number of instruments	55	55	55	55	55

Note: Two-step system GMM estimates of Equation (1) for the period 1975–2015, in 5-year intervals, where the dependent variables are property rights (prop. rights), government size (gov. size); sound money (money), freedom to trade internationally (free. trade), and regulation (reg.), using Stata's xtabond2 (see Roodman, 2009b; Table A3 and Figure 1 for sample descriptives, including for levels and 5-year changes). Model estimates with lagged differences and levels of endogenous variables (all except 5-year fixed effects) used as instruments (collapsed). ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided tests, with robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction.

repeat the analysis in the previous sections by replacing the dependent variable with: control of corruption (con. corr.), column (I); rule of law (rule/law), column (II); government effectiveness (gov. eff.), column (III); regulatory quality (regul.), column (IV); political stability and absence of violence/terrorism (stab. vio.), column (V); and voice and accountability (voice), column (VI). The effect of net FDI inflows is only positive and significant at the 10% level on regulatory quality and voice, which aligns with the findings of Pan et al. (2020). Dependence on a single natural resource sector has a significant negative association with political stability and absence of violence/terrorism. This is consistent with the notion that the wealth derived from natural resources provides an incentive for political survival (e.g., Andersen & Aslaksen, 2013). Overall, due to the more limited sample period, our tests of whether natural resources affect the WGI dimensions of governance are underpowered.

TABLE 3 Estimated effects of foreign direct investment and natural resources rents on World Governance Indicators institutional factors, 4-year periods in 2000–2016.

Dependent variables	Con. corr. (I)	Rule/ law (II)	Gov. eff. (III)	Regul. (IV)	Stab. vio. (V)	Voice (VI)
Lagged institutional factors	0.644***	0.951***	0995***	0.847***	0.959***	0.685***
	(0.206)	(0.091)	(0.075)	(0.161)	(0.107)	(0.126)
Economic growth (5 year, %)	0.023	0.071	0.069	0.085	0.363***	0.137**
	(0.065)	(0.072)	(0.088)	(0.070)	(0.127)	(0.061)
Net FDI inflows (% of GDP)	0.002	0.001	−0.007	0.010*	−0.014	−0.010*
	(0.007)	(0.005)	(0.006)	(0.006)	(0.009)	(0.006)
Lag nat. res. (max. sector, % of GDP)	−0.000	−0.001	−0.002	−0.003	−0.011**	0.003
	(0.005)	(0.004)	(0.007)	(0.005)	(0.005)	(0.004)
Constant	−0.140	−0.072	0.047	−0.067	−0.065	−0.071
	(0.086)	(0.047)	(0.072)	(0.066)	(0.082)	(0.052)
4-year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
N of countries	67	67	67	67	67	67
N of country-4-year obs.	258	258	258	258	258	258
Arellano-Bond AR(2) test, *p*-value	.610	.791	.768	.453	.601	.147
Hansen test of overid., *p*-value	.562	.482	.202	.044	.415	.606
Number of instruments	26	26	26	26	26	26

Note: Two-step system GMM estimates of Equation (1) for the period 2000–2016, in 4-year intervals, where the dependent variables are WGI: control of corruption (con. corr.), rule of law (rule/law), government effectiveness (gov. eff.), regulatory quality (regul.), political stability and absence of violence/terrorism (stab. vio.), and voice and accountability (voice), using Stata's xtabond2 (see Roodman, 2009b). Model estimates with lagged differences and levels of endogenous variables (all except 5-year fixed effects) used as instruments (collapsed). ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided sided tests, with robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction.

4 | CONCLUSION

We have explored the relationships between natural resources, FDI inflows and institutions in developing countries using a dynamic panel data model. When focusing on legal property rights, we found negative and significant effects of natural resources use or extraction on the development of these particular national institutions. This aligns with a theory that abundant natural resources generally lead to the weakening of institutions because of the potential to secure and capitalise on monopoly rents. Further, we found that the effect of FDI inflows on institutions is not robust to controlling for natural resources abundance. This suggests that the latter is associated with eroded institutions regardless of whether those resources are exploited through increased foreign investment into the local economy.

Looking more widely, we found some evidence that not only a country's property rights but also the size of its government, the freedom it gives to trade internationally, regulation, political

stability and the absence of violence/terrorism are all other institutional factors that appear to respond negatively to the increased share of natural resources in a country's output. While our estimates are quite robust to the different model specifications and estimation samples that we considered, this does not imply that the selected variables are the only important predictors of institutional development.

Our findings could be helpful for future policy formulation in resource-rich countries. For instance, our results suggest that policymakers with objectives to strengthen domestic institutions should be wary (and possibly renew their resolve) when their countries develop new opportunities to extract rents from natural resources. They would be advised to discourage, dismantle or robustly regulate natural monopoly industries, which have strong incentives to invest in political pressure or other measures that can secure and ensure monopoly rents. In this light, Botswana is an example of a developing country that has successfully managed to regulate its natural resources sectors to avert excessive monopoly rents. The country's remarkable story in mining and the trade of diamonds has been made possible through the creation of strong institutions and state management that stands against corruption (Acemoglu et al., 2015; Ghebremusse, 2018).

Finally, although the focus of the study by Poelhekke and van der Ploeg (2013) was different from ours, since they explore the importance of subsoil assets as a predictor of resource and non-resource FDI, their work provided new evidence on the mechanism of the resource curse. However, their measure of natural resources is somewhat narrow or limited. In this regard, extending their approach, by using broader measures of natural resources and further exploring the influence of new discoveries not only on FDI but also on institutional development, would be an interesting and valuable avenue for further study.

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DATA AVAILABILITY STATEMENT

The data used in this study are openly available in the World Bank (https://data.worldbank.org/) and Fraser Institute (https://www.fraserinstitute.org/economic-freedom) data depositories.

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REFERENCES

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. In P. Aghion & S. Durlauf (Eds.), *Handbook of economic growth* (pp. 385–472). Elsevier, Chap. 6.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2015). An African success story: Botswana. In D. Rodrik (Ed.), *In search of prosperity: Analytic narratives on economic growth* (pp. 80–120). Princeton Princeton University Press.

Ali, F., Fiess, N., & MacDonald, R. (2010). Do institutions matter for foreign direct investment? *Open Economies Review*, *21*(2), 201–219.

Ali, F., Fiess, N., & MacDonald, R. (2011). Climbing to the top? Foreign direct investment and property rights. *Economic Inquiry*, *49*(1), 289–302.

Andersen, J. J., & Aslaksen, S. (2013). Oil and political survival. *Journal of Development Economics*, *100*(1), 89–106.

Azman-Saini, W., Baharumshah, A. Z., & Law, S. H. (2010). Foreign direct investment, economic freedom and economic growth: International evidence. *Economic Modelling*, *27*(5), 1079–1089.

Barro, R. J. (1999). Determinants of democracy. *Journal of Political Economy*, *107*(S6), 158–183.

Baum, C. F. (2006). *An introduction to modern econometrics using Stata*. Stata Press.

Bénassy-Quéré, A., Coupet, M., & Mayer, T. (2007). Institutional determinants of foreign direct investment. *The World Economy*, *30*(5), 764–782.

Berggren, N. (2003). *The benefits of economic freedom: A survey*. Ratio Working Papers 4. The Ratio Institute.

Bulte, E. H., Damania, R., & Deacon, R. T. (2005). Resource intensity, institutions, and development. *World Development*, *33*(7), 1029–1044.

Cingano, F. (2014). *Trends in income inequality and its impact on economic growth*. OECD Social, Employment and Migration Working Papers 163. OECD Publishing.

Dang, D. A. (2013). How foreign direct investment promote institutional quality: Evidence from Vietnam. *Journal of Comparative Economics*, *41*(4), 1054–1072.

De Haan, J., Lundström, S., & Sturm, J. (2006). Market-oriented institutions and policies and economic growth: A critical survey. *Journal of Economic Surveys*, *20*(2), 157–191.

Demir, F. (2016). Effects of FDI flows on institutional development: Does it matter where the investors are from? *World Development*, *78*, 341–359.

Engerman, S. L., & Sokoloff, K. (2002). Factor endowments, inequality, and paths of development among new world economies. *Economía Journal*, *3*(1), 41–110.

Frankel, J. (2010). *The natural resource curse: A survey*. NBER Working Papers 15836. National Bureau of Economic Research, Inc.

Garretsen, H., & Peeters, J. (2007). Capital mobility, agglomeration and corporate tax rates: Is the race to the bottom for real? *CESifo Economic Studies*, *53*(2), 263–293.

Ghebremusse, S. (2018). Good governance and development in Botswana – The democracy conundrum. *The Law and Development Review*, *11*(2), 913–938.

Glaeser, E. L., Porta, R. L., de Silanes, F. L., & Shleifer, A. (2004). Do institutions cause growth? *Journal of Economic Growth*, *9*(3), 271–303.

Gwartney, J., & Lawson, R. (2003). The concept and measurement of economic freedom. *European Journal of Political Economy*, *19*(3), 405–430.

Gwartney, J. D., Holcombe, R. G., & Lawson, R. A. (2006). Institutions and the impact of investment on growth. *Kyklos*, *59*(2), 255–273.

Gwartney, J. D., Lawson, R. A., & Block, W. (1996). *Economic freedom of the world, 1975–1995*. Fraser Institute.

Haber, S., & Menaldo, V. (2011). Do natural resources fuel authoritarianism? A reappraisal of the resource curse. *American Political Science Review*, *105*(1), 1–26.

Hall, R. E., & Jones, C. I. (1999). Why do some countries produce so much more output per worker than others? *The Quarterly Journal of Economics*, *114*(1), 83–116.

Havranek, T., Horvath, R., & Zeynalov, A. (2016). Natural resources and economic growth: A meta-analysis. *World Development*, *88*, 134–151.

Jude, C., & Levieuge, G. (2017). Growth effect of foreign direct investment in developing economies: The role of institutional quality. *The World Economy*, *40*(4), 715–742.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2005). *Measuring governance using cross-country perceptions data*. MPRA Paper 8219. University Library of Munich.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). *The worldwide governance indicators: Methodology and analytical issues*. Policy Research Working Paper Series 5430. The World Bank.

Kotschy, R., & Sunde, U. (2017). Democracy, inequality, and institutional quality. *European Economic Review*, *91*, 209–228.

Kwok, C. C. Y., & Tadesse, S. (2006). The MNC as an agent of change for host-country institutions: FDI and corruption. *Journal of International Business Studies*, *37*(6), 767–785.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., & Vishny, R. (1999). The quality of government. *Journal of Law, Economics, and Organization*, *15*(1), 222–279.

Long, C., Yang, J., & Zhang, J. (2015). Institutional impact of foreign direct investment in China. *World Development*, *66*, 31–48.

Malesky, E. J., Gueorguiev, D. D., & Jensen, N. M. (2015). Monopoly money: Foreign investment and bribery in Vietnam, a survey experiment. *American Journal of Political Science*, *59*(2), 419–439.

Mehlum, H., Moene, K., & Torvik, R. (2006). Cursed by resources or institutions? *The World Economy*, *29*(8), 1117–1131.

Mody, A., & Murshid, A. P. (2005). Growing up with capital flows. *Journal of International Economics*, *65*(1), 249–266.

North, D. C. (1990). Institutions, institutional change and economic performance. In *Political economy of institutions and decisions*. Cambridge University Press.

Omgba, L. D. (2009). On the duration of political power in Africa: The role of oil rents. *Comparative Political Studies*, *42*(3), 416–436.

Pan, C., Wei, W. X., Muralidharan, E., Liao, J., & Andreosso-O'Callaghan, B. (2020). Does China's outward direct investment improve the institutional quality of the belt and road countries? *Sustainability*, *12*(1), 1–21.

Persson, T. (2005). *Forms of democracy, policy and economic development*. Working Paper 11171. National Bureau of Economic Research.

Poelhekke, S., & van der Ploeg, F. (2013). Do natural resources attract nonresource FDI? *The Review of Economics and Statistics*, *95*(3), 1047–1065.

Rode, M., & Coll, S. (2012). Economic freedom and growth. Which policies matter the most? *Constitutional Political Economy*, *23*(2), 95–133.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: The primacy of institutions over geography and integration in economic development. *Journal of Economic Growth*, *9*(2), 131–165.

Roodman, D. (2009a). Note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, *71*(1), 135–158.

Roodman, D. (2009b). How to do xtabond2: An introduction to difference and system gmm in stata. *Stata Journal*, *9*(1), 86–136.

Sachs, J. D., & Warner, A. (1999). The big push, natural resource booms and growth. *Journal of Development Economics*, *59*(1), 43–76.

Sachs, J. D., & Warner, A. M. (1995). *Natural resource abundance and economic growth*. NBER Working Papers 5398. National Bureau of Economic Research, Inc.

Torvik, R. (2002). Natural resources, rent seeking and welfare. *Journal of Development Economics*, *67*(2), 455–470.

Wei, S.-J. (2000). How taxing is corruption on international investors? *The Review of Economics and Statistics*, *82*(1), 1–11.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics*, *126*(1), 25–51.

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APPENDIX 1

DESCRIPTION OF THE DATA AND VARIABLES

The main data on institutional factors are obtained from the Fraser Institute.[10] These components collectively are summarised into a composite index, with sub-parts measuring the following:

1. Legal system and the security of property rights – a government's function of protecting persons and private property rightfully acquired. This indicator is associated with sub-components such as impartiality of courts, judicial independence, military interference in the rule of law and politics, the protection of property rights, legal enforcement of contracts, the integrity of the legal system and reliability of police. A higher value implies greater protection of private property.
2. Size of government – reflects how countries depend on the government to distribute resources, goods, and services. It includes indicators such as tax rates, transfers and subsidies, government consumption and government enterprises and investment. A higher score means that the government is effective in distributing resources, goods and services.
3. Sound money – includes components such as money growth, freedom to own foreign currency bank accounts and inflation.
4. Freedom to trade internationally – designed to measure a wide variety of limitations that affect international exchange. It includes components such as tariffs, regulatory trade barriers, black-market exchange rates and controls of the movement of capital and people. A higher value indicates higher freedom to trade internationally.
5. Regulation – focuses on regulatory limitations that restrain the freedom of exchange in labour, credit, bureaucracy costs and product markets.

The World Governance Indicators (WGI) from the World Bank comprise six composite measures of different dimensions of governance (Kaufmann et al., 2005, 2010)[11]:

1. Control of corruption – summarises perceptions of the extent to which public power is applied for private gain, including all forms of corruption, and state "capture" by private interests and elites.
2. Rule of law – measures perceptions of the extent to which agents have trust in and follow the rules of society, particularly, the police, property rights, the quality of contract enforcement, and the courts, as well as the possibility of violence and crime.
3. Government effectiveness – captures perceptions of the quality of the civil service, quality of public services and the level of its independence from political influence, the degree of policy formulation and implementation, and the integrity of the government's commitment to such policies.
4. Regulatory quality – measures perceptions of the capacity of the government to formulate and implement sound policies and regulations that allow and encourage private sector development.
5. Political stability and absence of violence/terrorism – measures perceptions of the possibility of political instability and/or politically induced violence, including terrorism.

[10]Accessed from the Fraser Institute website on 2 May 2021; https://www.fraserinstitute.org/economic-freedom.

[11]Accessed from the World Bank website on 15 September 2021; https://databank.worldbank.org/source/worldwide-governance-indicators.

6. Voice and accountability – captures perceptions of the extent to which a country's citizens can participate in electing their government, including freedom of association, freedom of expression and a free media.

TABLE A1 List of countries included in the analysis.

East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
Hong Kong	Turkey	Argentina	Egypt	Bangladesh	Angola
Indonesia		Bolivia	Iran	India	Benin
Korea, Rep.		Brazil	Jordan	Pakistan	Botswana
Malaysia		Chile	Morocco	Sri Lanka	Burkina Faso
Papua New Guinea		Colombia	Syria		Cameroon
Philippines		Costa Rica	Tunisia		Congo, DR
Singapore		Dominican Rep.			Congo, Rep.
Thailand		Ecuador			Cote d'Ivoire
		El Salvador			Ethiopia
		Guatemala			Gabon
		Guyana			Ghana
		Haiti			Kenya
		Honduras			Lesotho
		Jamaica			Madagascar
		Mexico			Malawi
		Nicaragua			Mali
		Panama			Mauritius
		Paraguay			Mozambique
		Peru			Namibia
		Trinidad and Tobago			Niger
		Uruguay			Nigeria
		Venezuela, RB			Senegal
					Sierra Leone
					South Africa
					Tanzania
					Uganda
					Zambia
					Zimbabwe

TABLE A2 Definitions of variables.

Variable	Definition	Source
Net FDI flows (% of GDP)	Net FDI inflows as percentage of GDP indicators	World Bank, World Development
Economic growth (5-year %)	Percentage change in GDP	Calculated from World Bank data, World Development Indicators
Forest rents (% of GDP)	Forest rents as percentage of GDP	World Bank, World Development Indicators
Gas rents (% of GDP)	Mineral rents as percentage of GDP	World Bank, World Development Indicators
Government size	Measure of size of government, scale 0–10	Fraser Institute
Legal system and property rights	Measure of legal system and property rights, scale 0–10	Fraser Institute
Coal rents (% of GDP)	Coal rents as percentage of GDP	World Bank, World Development Indicators
Minerals rents (% of GDP)	Oil rents as percentage of GDP	World Bank, World Development Indicators
Oil rents (% of GDP)	Mineral rents as percentage of GDP	World Bank, World Development Indicators
Natural resources rents (total, % of GDP)	Total natural resources rents as percentage of GDP	World Bank, World Development Indicators
Sound money	Measure of sound money, scale 0–10	Fraser Institute
Freedom to trade internationally	Measure of freedom to trade internationally, scale 0–10	Fraser Institute
Regulation	Measure of economic freedom present in regulation, scale 0–10	Fraser Institute
Voice and accountability	Measures perceptions of the extent to which a country's citizens are able to participate in selecting their government	World Bank, Worldwide Governance Indicators
Political stability and absence of violence/ terrorism	Measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism	World Bank, Worldwide Governance Indicators
Government effectiveness	Captures perceptions of the quality of public services and civil service and the degree of its independence from political pressures	World Bank, Worldwide Governance Indicators
Regulatory quality	Captures perceptions of the ability of the government to formulate and implement sound policies	World Bank, Worldwide Governance Indicators
Rule of law	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society	World Bank, Worldwide Governance Indicators
Control of corruption	Captures perceptions of the extent to which public power is used for private gain	World Bank, Worldwide Governance Indicators

TABLE A3 Descriptive statistics, all years and countries in the estimation sample, 1975–2015.

	Obs.	Std. dev.	Mean	Min.	Median	Max.
Model variables						
Economic growth (5-year, %)	558	0.27	0.38	−1.09	0.26	1.80
Net FDI (% of GDP)	558	2.65	4.80	−4.09	1.37	58.52
Lag nat. res. (total % of GDP)	558	8.06	9.81	0.00	4.14	56.94
Lag coal rents (% of GDP)	493	0.12	0.49	0.00	0.00	6.09
Lag forest rents (% of GDP)	558	2.65	4.43	0.00	0.79	44.60
Lag gas rents (% of GDP)	520	0.16	0.53	0.00	0.00	6.65
Lag mineral rents (% of GDP)	558	1.42	3.63	0.00	0.08	35.20
Lag oil rents (% of GDP)	522	4.00	8.68	0.00	0.01	53.21
Lag freedom to trade	541	5.45	2.12	0.00	5.69	9.97
Lag government size	558	6.47	1.43	1.46	6.60	9.46
Property rights	558	1.23	4.45	1.71	4.38	8.04
Lag property rights	558	1.24	4.38	1.71	4.29	8.04
Lag sound money	558	6.43	2.17	0.00	6.60	9.79
Lag regulation	541	5.78	1.20	2.94	5.71	9.43
Within-country 5-year changes						
Economic growth (% of GDP)	509	0.56	−0.06	−1.83	−0.06	2.39
Net FDI	556	3.58	0.50	−18.50	0.10	36.77
Nat. res. (% of GDP)	558	6.05	0.06	−35.72	0.00	33.75
Coal rents (% of GDP)	493	0.27	−0.01	−3.30	0.00	2.71
Forest rents (% of GDP)	558	3.24	−0.03	−35.66	−0.01	33.92
Gas rents (% of GDP)	520	0.36	0.06	−1.87	0.00	5.50
Mineral rents (% of GDP)	558	2.20	0.00	−25.30	0.00	11.44
Oil rents (% of GDP)	522	4.89	0.03	−28.56	0.00	28.91
Freedom to trade	537	1.36	0.28	−6.20	0.15	5.18
Government size	558	1.00	0.09	−3.65	0.07	3.63
Property rights	558	0.47	0.08	−1.45	0.02	2.78
Sound money	558	1.64	0.20	−5.98	0.15	6.50
Regulation	540	0.64	0.19	−2.18	0.13	3.27

Note: The data were compiled from the World Bank, World Development Indicators, The Fraser Institute and Authors' calculations. Observations for each country are all separated by 5 years, i.e., 1970 (for lagged values), 1975, 1980, ..., 2010, 2015.

TABLE A4 Pairwise correlations.

	Prop. rights	Lag prop. rights	Net FDI	Gross FDI	FDI stock	Econ. growth	Lag nat. res.	Lag gas	Lag coal	Lag mineral	Lag oil	Lag forest
Property rights	1.000											
Lag property rights	0.929	1.000										
Net FDI flows (% of GDP)	0.348	0.369	1.000									
Gross FDI flows (cur., USD)	0.295	0.324	0.644	1.000								
FDI stock (% of GDP)	0.352	0.365	0.642	0.944	1.000							
Econ. growth (%)	0.087	0.068	0.001	0.005	0.035	1.000						
Lag nat. res. (total % of GDP)	−0.181	−0.155	0.030	−0.095	−0.117	−0.032	1.000					
Lag gas (% of GDP)	0.023	0.043	0.088	0.009	0.003	−0.006	0.209	1.000				
Lag coal (% of GDP)	−0.043	−0.064	−0.056	0.011	0.032	−0.014	−0.041	−0.011	1.000			
Lag mineral (% of GDP)	0.121	0.123	0.038	−0.022	−0.029	0.014	0.242	−0.039	0.116	1.000		
Lag oil (% of GDP)	−0.158	−0.158	−0.011	−0.060	−0.066	0.038	0.671	0.168	−0.091	−0.105	1.000	
Lag forest (% of GDP)	−0.211	−0.223	0.002	−0.114	−0.135	−0.1578	0.278	−0.068	−0.077	0.100	−0.097	1.000

Note: See Tables A2 and A3 and the text for descriptions and sources of the variables.

APPENDIX 2

ALTERNATIVE MEASURES OF FDI

In this section, we estimate Equation (1) using gross FDI inflows and FDI stocks as an alternative to net FDI inflows. Figures B1 and B2 show the distributions of these variables, in levels and first differences, as well as their correlations with property rights. We report the estimation results using gross FDI inflows in Table B1 that are comparable with Table 1 in the main text. The results are quantitatively and qualitatively similar to those in Table 1. Next, we consider FDI stocks, in line with previous studies (e.g., Ali et al., 2011; Kwok & Tadesse, 2006). The FDI stock is obtained from the United Nations Conference on Trade and Development (UNCTAD) and is

TABLE B1 Estimated effects of *gross* foreign direct investment and natural resources on property rights, 5-year periods in 1975–2015.

Dep. variable: property rights	(I)	(II)	(III)	(IV)
Lagged property rights	0.682***	0.933***	0.927***	0.939***
	(0.044)	(0.055)	(0.054)	(0.056)
Gross FDI flows (US$ million)	−0.002	0.000	0.000	0.000
	(0.001)	(0.002)	(0.002)	(0.002)
Economic growth (5-year, %)	0.211***	0.132*	0.142*	0.146*
	(0.070)	(0.073)	(0.076)	(0.074)
Lag nat. res. (total % of GDP)	−0.011**	−0.008***		
	(0.004)	(0.003)		
Lag nat. res. (max. sector, % of GDP)			−0.010***	−0.006
			(0.003)	(0.004)
Gross FDI × nat. res. (×100)				−0.023
				(0.031)
Constant	1.505***	0.435*	0.456*	0.343
	(0.187)	(0.268)	(0.264)	(0.263)
5-year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
Year × region FEs	Yes	No	No	No
N of countries	69	69	69	69
N of country-5-year obs.	549	558	558	558
R^2	.907			
Arellano-Bond AR(2) test, *p*-value		.296	.284	.397
Hansen test of overid., *p*-value		.129	.107	.122
Number of instruments		46	46	55

Note: Two-step system GMM estimates of Equation (1) for the period 1975–2015, in 5-year intervals, where the dependent variable is property rights, using Stata's xtabond2 (see Roodman, 2009b; Table A3, Figures B1 and B2 for sample descriptives, including for levels and 5-year changes). Model estimates with lagged differences and levels of endogenous variables (all except 5-year fixed effects) used as instruments (collapsed). Column (I): least squares estimates, standard errors robust to country-level clusters. Columns (II)–(IV): system GMM estimates with lagged differences and levels of endogenous variables (all except the 5-year fixed effects) used as instruments. ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided sided tests, with (cluster) robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction for the GMM estimators.

measured as a percentage of GDP. FDI inflows capture the degree of change in FDI in developing countries, which could mount pressure on host governments to improve institutions (Ali et al., 2011). However, it is plausible that support for the development of national institutions in each host developing country could largely rely on FDI stocks instead of flows. FDI flows quantify the rise in the investment of foreign investors, whereas FDI stocks measure the total of that investment. Therefore, it is possible that FDI flows may capture new investors in a host country; FDI flows could be induced by institutional improvements, while the current FDI stock could influence institutional quality. Table B2 presents model estimation results using FDI stocks instead of net inflows, comparable with Table 1 in the main text. Using FDI stocks instead of flows in the models also yields quantitatively and qualitatively similar results to those shown in Table 1.

TABLE B2 Estimated effects of foreign direct investment *stocks* and natural resources on property rights, 5-year periods in 1975–2015.

Dep. variable: property rights	**(I)**	**(II)**	**(III)**	**(IV)**
Lagged property rights	0.677***	0.917***	0.924***	0.941***
	(0.040)	(0.041)	(0.042)	(0.041)
FDI stock (% of GDP)	−0.000	0.001	0.001	−0.001
	(0.001)	(0.001)	(0.001)	(0.009)
Economic growth (5-year, %)	0.124*	0.089	0.109	0.092
	(0.070)	(0.079)	(0.084)	(0.080)
Lag nat. res. (total % of GDP)	−0.009*	−0.010***		
	(0.004)	(0.003)		
Lag nat. res. (max. sector, % of GDP)			−0.010**	−0.006**
			(0.004)	(0.003)
FDI stock × nat. res. (×100)				−0.021
				(0.135)
Constant	1.566***	0.456**	0.426**	0.263
	(0.176)	(0.209)	(0.213)	(0.182)
5-year FEs	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes
Year × region FEs	Yes	No	Yes	Yes
N of countries	67	68	68	68
N of country-5-year obs.	486	494	494	494
R^2	.911			
Arellano-Bond AR(2) test, *p*-value		.915	.877	.887
Hansen test of overid., *p*-value		.202	.147	.364
Number of instruments		43	43	51

Note: Two-step system GMM estimates of Equation (1) for the period 1975–2015, in 5-year intervals, where the dependent variable is property rights, using Stata's xtabond2 (see Roodman, 2009b; Table A3, for sample descriptives, including for levels and 5-year changes). Model estimates with lagged differences and levels of endogenous variables (all except 5-year fixed effects) used as instruments (collapsed). Columns (I): least squares estimates, standard errors robust to country-level clusters. Columns (II)–(IV): system GMM estimates with lagged differences and levels of endogenous variables (all except the 5-year fixed effects) used as instruments. ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided sided tests, with (cluster) robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction for the GMM estimators.

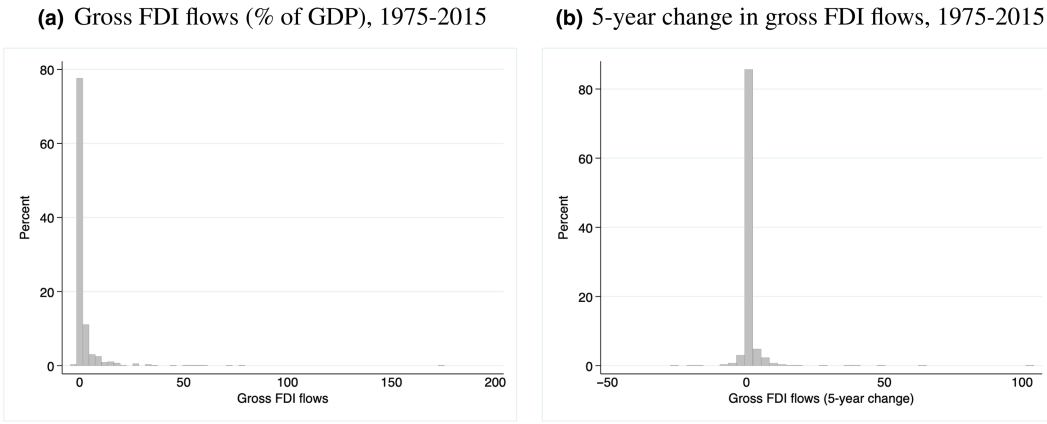

FIGURE B1 Distributions of levels and 5-year changes in gross FDI inflows, pooled, all years and countries in the estimation sample. *Note*: Author calculations using data from the United Nations, UNCTADstat and The Fraser Institute. (a) The pooled distribution for all sample countries at 5-year intervals of gross FDI inflows measured in current United States dollars. The (b) pooled distributions over the sample countries and period for 5-year changes in the aforementioned variables. The bin sizes are 3 for both (a, b), with the bin to the right of zero containing values which are positive but not >3.

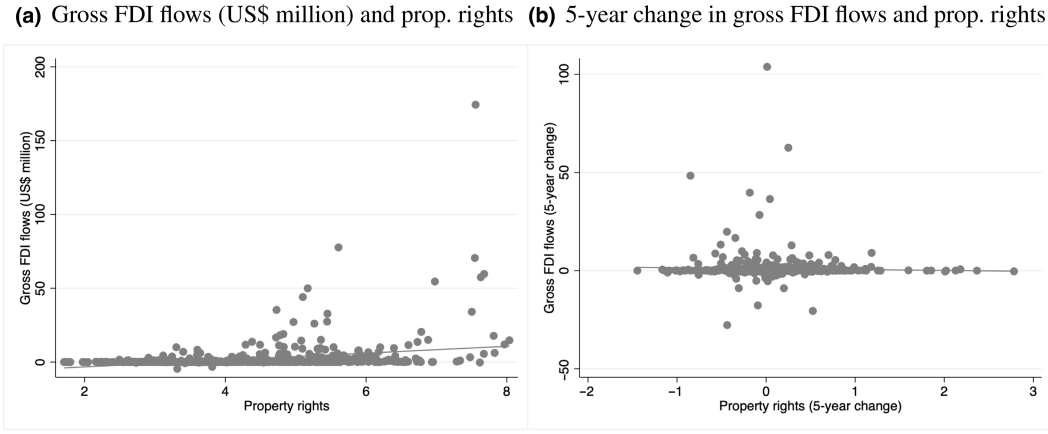

FIGURE B2 Correlations of gross FDI inflows with a measure of property rights, levels and 5-year changes, all years and countries in the estimation sample, 1975–2015. *Note*: Author calculations. (a) The corresponding values for all country-year observations in our sample of the levels of net FDI inflows and the property rights measure. Likewise, (b) corresponding values of 5-year changes in the respective variables shown in (a). The estimated line of best fit is displayed in each sub-figure.

APPENDIX 3

ROBUSTNESS CHECKS

TABLE C1 Estimated effects of foreign direct investment and natural resources rents on property rights, 5-year periods in 1975–2015: treating lagged natural resources rents as exogenous.

Dep. variable: property rights	(I)	(II)	(III)
Lagged property rights	0.901***	0.902***	0.877***
	(0.062)	(0.063)	(0.072)
Economic growth (5-year, %)	0.126*	0.126*	0.133*
	(0.070)	(0.071)	(0.063)
Net FDI inflows (% of GDP)	0.006	0.007	0.005
	(0.007)	(0.007)	(0.006)
Lag nat. res. (total % of GDP)	−0.005**		
	(0.002)		
Lag nat. res. (max. sector, % of GDP)		−0.006**	−0.006**
		(0.003)	(0.003)
FDI × nat. res. (×100)			−0.026
			(0.019)
Constant	0.491*	0.485	0.591
	(0.276)	(0.276)	(0.311)
5-year FEs	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes
N of countries	69	69	69
N of country-5-year obs.	558	558	558
Arellano-Bond AR(2) test, *p*-value	.336	.324	.430
Hansen test of overid., *p*-value	.117	.113	.057
Number of instruments	38	38	47

Note: Columns (I)–(III) show comparable model estimates to those in Table 1 columns (II)–(IV), respectively with the only methodological difference being that here 'Lag nat. res.' is treated as exogenous, thus reducing the instrument set. ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided sided tests, with (cluster) robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction.

TABLE C2 Estimated effects of sector-specific natural resources rents on property rights, 5-year periods in 1975–2015.

Dep. variable: property rights	(I)	(II)	(III)	(IV)	(V)
Lag property rights	0.884***	0.902***	0.918***	0.867***	0.883***
	(0.082)	(0.070)	(0.066)	(0.066)	(0.069)
Economic growth (5-year, %)	0.086	0.125	0.075	0.114	0.071
	(0.067)	(0.077)	(0.074)	(0.072)	(0.065)
Net FDI flows (% of GDP)	0.006	0.004	−0.000	0.006	0.006
	(0.006)	(0.007)	(0.005)	(0.007)	(0.006)
Lag gas rents (% of GDP)	−0.012				
	(0.019)				
Lag forest rents (% of GDP)		−0.003			
		(0.010)			
Lag coal rents (% of GDP)			−0.010		
			(0.151)		
Lag mineral rents (% of GDP)				−0.012	
				(0.015)	
Lag oil rents (% of GDP)					−0.006**
					(0.003)
FDI × nat. res. (×100)	−0.052**	−0.054**	−0.038**	−0.055**	−0.027
	(0.022)	(0.027)	(0.019)	(0.023)	(0.020)
Constant	0.542	0.461	0.392	0.597**	0.589*
	(0.347)	(0.311)	(0.)	(0.278)	(0.295)
5-year FEs	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes
N of countries	69	69	68	69	69
N of country-5-year obs.	520	558	493	558	522
Arellano-Bond AR(2) test, *p*-value	.442	.906	.592	.442	.906
Hansen test of overid., *p*-value	.178	.169	.334	.178	.169
Number of instruments	55	55	53	55	55

Note: Two-step system GMM estimates of Equation (1) for the period 1975–2015, in 5-year intervals, where the dependent variable is the property rights, using Stata's xtabond2 (see Roodman, 2009b; Table A3 and Figure 1 for sample descriptives, including for levels and 5-year changes). Model estimates with lagged differences and levels of endogenous variables (all except 5-year fixed effects) used as instruments (collapsed). ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided tests, with robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction.

TABLE C3 Estimated effects of foreign direct investment and natural resources on property rights, 5-year periods in 1975–2015, excluding one region in turn from the estimation sample.

	EAP	ECA	LAC	MENA	SA	SSA
Excluding	**(I)**	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**
Lag property rights	0.842***	0.893***	0.842***	0.888***	0.890***	0.925***
	(0.071)	(0.062)	(0.063)	(0.068)	(0.066)	(0.061)
Economic growth (5-year, %)	0.076	0.121*	0.218**	0.126*	0.146**	0.196*
	(0.055)	(0.064)	(0.093)	(0.070)	(0.067)	(0.103)
Net FDI (% of GDP)	0.019*	0.004	0.008	0.004	0.004	−0.003
	(0.010)	(0.006)	(0.007)	(0.007)	(0.006)	(0.014)
Lag nat. res. (max. sector, % of GDP)	−0.005	−0.006*	−0.011**	−0.004	−0.007*	−0.011
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.007)
FDI × nat. res. (×100)	−0.073*	−0.027	−0.021	−0.039	−0.022	−0.076
	(0.039)	(0.026)	(0.030)	(0.039)	(0.024)	(0.220)
Constant	0.736***	0.564*	0.797***	0.562*	0.553*	0.569**
	(0.319)	(0.269)	(0.290)	(0.294)	(0.285)	(0.279)
5-year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
N of countries	61	68	47	63	65	41
N of country-5-year obs.	487	549	366	507	523	358
Arellano-Bond AR(2) test, *p*-value	.782	.496	.220	.376	.573	.405
Hansen test of overid., *p*-value	.269	.184	.421	.277	.278	.811
Number of instruments	55	55	55	55	55	55

Note: Two-step system GMM estimates of Equation (1) for the period 1975–2015, in 5-year intervals, where the dependent variable is property rights, using Stata's xtabond2 (see Roodman, 2009b; Table A3 and Figure 1 for sample descriptives, including for levels and 5-year changes). Model estimates with lagged differences and levels of endogenous variables (all except 5-year fixed effects) used as instruments (collapsed). ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided tests, with robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction.

Variable definitions: EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and Caribbean; MENA = Middle East and North Africa; SA = South Asia; SSA = Sub-Saharan Africa.

TABLE C4 Estimated effects of foreign direct investment and natural resources rents on property rights, 5-year periods in 1975–2015: varying the lag length of natural resources rents.

Lag length of nat. res. (*x*)	**Main: 5 years**		**4 years**		**3 years**		**2 years**		**1 year**		**5 years & 1 year**	
Estimator	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**
Dep. variable: property rights	**(I)**	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**	**(IX)**	**(X)**	**(XI)**	**(XII)**
Lagged (5-years) property rights	0.681***	0.903***	0.680***	0.942***	0.680***	0.971***	0.679***	0.978***	0.673***	0.945***	0.671***	0.944***
	(0.045)	(0.063)	(0.044)	(0.062)	(0.045)	(0.068)	(0.046)	(0.061)	(0.045)	(0.069)	(0.045)	(0.069)
Economic growth (5-year, %)	0.212***	0.135*	0.199***	0.147**	0.186***	0.161**	0.181***	0.168**	0.177**	0.132*	0.219***	0.181***
	(0.071)	(0.071)	(0.072)	(0.061)	(0.074)	(0.069)	(0.075)	(0.073)	(0.076)	(0.075)	(0.069)	(0.064)
Net FDI inflows (% of GDP)	−0.005	0.005	−0.005	0.006	−0.005	0.003	−0.006	0.002	−0.007*	0.005	−0.006*	0.004
	(0.004)	(0.007)	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)	(0.009)	(0.004)	(0.005)
Lagged nat. res. ($t-x$, total % of GDP)	−0.011**	−0.007**	−0.008*	−0.009**	−0.004	−0.004	−0.003	−0.004	0.008*	0.016***	−0.014***	−0.011***
	(0.004)	(0.003)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.008)	(0.004)	(0.005)	(0.004)	(0.003)
Lagged nat. res. ($t-1$, total % of GDP)											0.013***	0.008**
											(0.004)	(0.004)
Constant	1.514***	0.511*	1.489***	0.377	1.470***	0.190	1.462***	0.157	1.410***	0.190	1.482***	0.293
	(0.187)	(0.281)	(0.190)	(0.275)	(0.187)	(0.309)	(0.187)	(0.265)	(0.201)	(0.296)	(0.187)	(0.243)
5-year FEs	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year × region FEs	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
N of countries	68	69	68	69	68	69	68	69	68	69	68	69
N of country-5-year obs.	549	558	548	557	548	557	549	558	549	558	549	558
R^2	.907		.906		.905		.905		.906		.908	

(Continues)

TABLE C4 (Continued)

Lag length of nat. res. (x)	Main: 5 years		4 years		3 years		2 years		1 year		5 years & 1 year	
Estimator	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**	**LS**	**GMM**
Dep. variable: property rights	**(I)**	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**	**(IX)**	**(X)**	**(XI)**	**(XII)**
Arellano-Bond AR(2) test, *p*-value		.327		.293		.316		.311		.261		.296
Hansen test of overid., *p*-value		.145		.264		.293		.406		.251		.472
Number of instruments		46		47		47		47		47		56

Note: Columns (I) and (II) repeat the model estimates in columns (I) and (II) of Table 1, for comparison. Columns (III)–(X) show comparable model estimates, with the only methodological difference being that natural resource rents enter the model lagged by 4, 3, 2, and 1 years. Columns (XI) and (XII) show comparable model estimates with both 5-year and 1-year lags of natural resource rents. The lagged dependent variable remains lagged by 5 years, matching data availability. As such, instruments are always constructed using lags and differences for 5-year periods. ***, ** and *Statistically significant differences from zero at the 1%, 5% and 10% levels, respectively, two-sided sided tests, with (cluster) robust standard errors reported in parentheses, using the Windmeijer (2005) finite-sample correction for the GMM estimators.