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Raúl Bajo

University of Navarra
Rice University

Navarra Center for International Development
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Raúl Bajo-Buenestado*

Department of Economics, University of Navarra
Baker Institute for Public Policy, Rice University

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Abstract

In his seminal paper, Nunn (2007) finds that countries with good contract enforcement have a comparative advantage and, therefore, specialize in exporting goods for which relationship-specific investments are most important. We argue that this result cannot be extrapolated to all industries: there is substantial heterogeneity regarding the effect of contract enforcement on exports. In particular, we empirically demonstrate that there is a disconnection between judicial quality and exporting in relationship-specific natural resource related industries. Due to the lack of input factor mobility, for such industries, the quality of contract enforcement cannot explain the pattern of trade, but rather other factors that are widely discussed in the literature. We discuss some relevant implications of this disconnection between judicial quality and relationship-specific industries in terms of the natural resource curse and the impact of natural resources trade on economic development.

Keywords: Natural resources; International trade; Contract enforcement; Resource curse; Replication study.

JEL Classification Numbers: C21, F14, K12, O13, Q00.

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1 Introduction

There is an abundant and well-established literature documenting that underinvestment in relationship-specific industries occurs in the presence of poor judicial institutions –see Klein et al. (1978), Williamson (1979), Grossman and Hart (1986), Hart and Moore (1990). Since industries requiring relationship-specific assets are more vulnerable to the so-called 'hold-up' problem, contract enforcement becomes crucial for these industries. Based on this well-established idea, Nunn (2007) tests and provides evidence that the presence of better legal institutions give firms a competitive advantage when producing goods that require relationship-specific investments. This evidence, which is robust to a battery of alternative specifications and extensions (including both instrumental variables and propensity score matching techniques), empirically shows that countries with higher judicial quality have a comparative advantage in 'contract-intensive' (relationship-specific) industries. However, does this evidence hold equally for all industries?

For industries that require a relatively high level of relationship-specific investment, the quality of contract enforcement is definitely a source of comparative advantage, as Nunn (2007) finds. However, industries that require relatively low contract intensity may respond differently to the quality of contract enforcement simply because they may rely on some other sources of comparative advantage. Based on this idea, we argue that Nunn (2007)'s results may mask heterogeneity across different industries, depending on the degree of input specificity required for each industry. Indeed, we document such a heterogeneous effect by providing evidence that the top quartiles of the distribution of relationship-specific industries drive Nunn's results, and not the bottom quartiles of the distribution of relationship-specific industries (which is comprised mostly of primary sector activities and their secondary derivatives).

Once this heterogeneous effect is unmasked, we conjecture that there are some industries –specifically, industries within the primary sector– for which Nunn's evidence might be potentially challenged. In particular, we focus on natural resource related industries (mining minerals and coal, extracting oil and gas, etc.). We do so for two main reasons. First, because most of these industries lie in the bottom half of the distribution of relationship-specific industries. Therefore, while being somewhat important, judicial quality is not a critical source of comparative advantage for these industries.

The second, more important reason is due to the immobility of factors of production. The idiosyncratic feature of natural resource industries is their lack of input-factor mobility and the difficulty, often impossibility, of production re-location. Country-specific natural resources, such as mines and oil and gas reserves, cannot be moved out of a country. Thus, we expect that countries' natural resource endowment (rather than judicial quality) influence the geographical distribution of comparative advantage in these kinds of industries.

Let us consider the following hypothetical example. A manufacturing industry that intensively uses inputs requiring relationship-specific investments will relocate its production facilities to countries with relatively good contract enforcement and judicial systems. Therefore, good contract enforcement is a country's comparative advantage for such a manufacturing industry. However, this cannot be true for a natural resource extractive industry, let us say, coal mining. Coal must be extracted in countries with relatively large coal reserves, regardless how relationship-specific the investment required to exploit a coal mine is, and regardless how good (or bad) the judicial system in the country is in which the mine is located.[1]

Using Nunn's regression model augmented with an indicator variable for natural resource industries, we find evidence of the opposite effect. That is, we find that relationship-specific natural-resource industries export more in countries with poor judicial quality and contract enforcement. To understand the disconnection between judicial quality and specialization in relationship-specific natural-resource industries, we discuss a few stylized facts, some of which are related to the so-called resource curse, and are connected to the relationship between trade and economic development. We support some of these facts with further empirical evidence.

The first stylized fact is that, for natural resource industries, a country's ability to enforce contracts is not an important determinant of comparative advantage, but there are other key determinants. In particular, there is a consensus in the literature that abundance of natural resources is actually a source of comparative advantage, and that countries which are relatively rich in natural resources export more in natural-resource intensive industries. See, for instance, Gerlagh and Mathys (2011), Michielsen (2013), Grether et al. (2014), Mathys and Michielsen (2015) and Arezki et al. (2016), for the case of energy resources; Debaere (2014) for the case of water abundance;

[1] If anything, poor contract enforcement makes a natural resource extractive facility less profitable if the investment return and costs are 'country-risk' adjusted.

and Aydin and Tilton (2000) for the case of mining resources.

Second, our empirical findings also contribute to foster the thesis that natural resource abundance (and dependence) has a negative impact on governance and institution indicators –see, for instance, Isham et al. (2005). Some authors claim that the quality of institutions determines whether a country ends up specializing in natural resources, i.e. that weaker institutions leads to natural resource specialization –see Snyder (2002), Smith (2004) and Humphreys (2005). We argue instead that the relationship might also go in the other direction.[2] Since natural resource extraction cannot be relocated to other countries, natural resource industry exports are ensured, no matter how sophisticated the investment required is for the exploitation and extraction of these natural resources or regardless of the quality of the institutions. This, in turn, generates a disincentive to improve the institutions and the rule of law and, moreover, increases corruption in countries rich in natural resources with relatively weak rule of law, to gain the control of the natural resources –see Cabrales and Hauk (2011)–, feeding back once more to further deterioration in the rule of law.[3]

Third, according to Nunn (2007) and to our results, a country with a poor judicial system and with a weak rule of law does not attract relationship-specific industries which are unrelated to natural resources. Unfortunately for such a country, these non-natural-resources relationship-specific industries typically generate greater value added (and, as a consequence, contribute more to GDP growth) than natural resource extractive industries. That is, such a country misses out on the industries that can potentially contribute to a greater extent to GDP growth. This further amplifies the gap between countries which are rich in natural resources with weak institutions and countries with strong institutions, and serves as an additional explanation behind the resource curse.

Fourth, we also show that countries with poor judicial quality which export natural resources are 'resource dependent', that is, their exports (and domestic income) depend heavily on natural resource extraction. As we discuss later, these countries tend to develop powerful and sophisticated extraction and exploitation industries which are usually government-controlled, as is the case,

[2]Notice that this argument opens the possibility for a reverse causality problem, leading to erroneous (biased) estimations of these authors.

[3]This idea agrees with the well-documented Russian case explained by van der Marel and Dreyer (2014). See Section 5 for further details.

for instance, in the so-called 'petro-states' –see Karl (2007). This idea of the natural resource dependency of countries with weaker-institutions has been empirically validated by many authors –including Dunning (2005), Anthonsen et al. (2012) and Couttenier (2008), among others.

The rest of the paper is organized as follows. Section 2 summarizes the main ideas and findings in Nunn (2007), replicates his main results, and provides evidence of the heterogeneity across the distribution of industry input specificity. Section 3 describes the "augmented" regression models to study natural resource industries, and provides some information about these industries. In Section 4 we include the main results of the "augmented" models. In Section 5 we discuss some implications of our main findings for the resource curse and economic development. Finally, Section 6 concludes.

2 Relationship-specificity, Judicial Quality and the Pattern of Trade

2.1 Estimation, data and replication of main results in Nunn (2007)

A country's factor endowment –be it in terms of capital, skilled labor, or intangible institutions which are critical to markets– affects trade by creating a comparative advantage only insomuch as these factors are not mobile. If factors were perfectly mobile, neoclassical economics would predict that they would flow between regions so as to eventually equalize prices and productivity. This would imply no comparative advantage in the long-term. Country-specific institutions like courts are, by definition, unable to be moved outside of the country. Thus, we would expect these factors to influence the geographical distribution of comparative advantage and, therefore, trade.

Based on this idea, the central question of Nunn (2007) is whether the presence of better legal institutions in certain countries gives firms in these countries a competitive advantage when producing goods that require relationship-specific investments. This is because better contract enforcement reduces hold-up problems and under-investment in relationship-specific investments.

Estimating equation

To test if countries with better contract enforcement export relatively more in industries for which relationship-specific investments are important, Nunn (2007) uses the following equation:

$$\ln x_{ic} = \beta_1 z_i^{rs} Q_c + \beta_2 h_i H_c + \beta_3 k_i K_c + \mathbf{X}_{ic} + \alpha_i + \alpha_c + \varepsilon_{ic} \tag{1}$$

where x_{ic} represents total exports in industry i from country c to all other countries, z_i^{rs} represents industry i's contract intensity, Q_c is country c's quality of contract enforcement, h_i represents skill intensity of production in industry i, H_c is country c's endowment of skilled labor, h_i represents industry i's capital intensity of production, K_c denotes country c's endowments of capital, $\mathbf{X}_{ic}$ is a set of control variables, and α_i and α_c denote industry and country fixed-effects, respectively.

Data

Nunn (2007)'s dataset includes data observations for 222 industries for 159 countries on trade flows, factor endowments, factor intensities of production and contract intensity measures.

To measure the importance of relationship-specific investments in an industry, Nunn (2007) built a 'contract-intensity' variable. He uses Rauch (1999)'s commodity classification to identify industries using inputs that are sold on an organized exchange and industries using inputs that are reference priced in a trade publication. An industry that requires inputs that are purchased on an organized exchange market is considered not relationship-specific, whereas an industry that requires inputs that are not purchased on an organized exchange nor have a reference-price is considered highly relationship-specific. This is combined with data from the 1997 United States I-O Use Table on the proportion of intermediate inputs that are used in the production of each final good in different industries. Using this data, Nunn (2007) constructs a measure of the proportion of intermediate inputs that are relationship-specific for each industry:

$$z_i^{rs} = \sum_j \theta_{ij} R_j^{\text{neither}}$$

where θ_{ij} is the weight of input j used in the production of the final good in industry i, and R_j^{neither} is the proportion of input j that is not sold on an organized exchange, nor has a reference price.[4]

[4] As an alternative measure of 'contract-intensity', Nunn (2007) builds the following variable, which he uses for

Data on quality of contract enforcement comes from the 'Rule of Law' in Kaufman et al. (2003), which measures confidence in the judiciary system and in law enforcement in country c. Trade flow data comes from Feenstra et al. (2002)[5] and data on countries' endowment of skills and capital (used as primary control variables) was obtained from Antweiler and Trefler (2002).

The dataset also includes observations for additional control variables used for robustness checks. These control variables are the following: an interaction of log income per capita (by country) with the share of industries' value added, the amount of intra-industry trade (Grubel-Lloyd index) and the total factor productivity growth in the previous twenty years (by industry); an interaction of the log ratio of private bank credit to GDP (by country) with capital intensity (by industry); and an interaction of log income (by country) with one minus the Herfindal index of input concentration (by industry).[6]

Main Estimation Results (replication)

Following Nunn (2007), we estimate equation 1 using z_i^{rs} as the measure of contract intensity. The main estimation results are included in Table 1. This table is a replication of the main table in Nunn (2007) (Table IV), which displays his main estimation results.[7]

Column (1) captures the estimated coefficients for the judicial quality interaction for all industries. Column (2) contains the estimated coefficients for the same baseline model specification using the subset of the sample for which factor endowments data is available. Column (3) contains the estimation results including the capital and labor intensities interacted with the factor endowments variables as controls. In the estimation displayed in column (4) other determinants of trade flows in high income-countries are included as controls, such as an industry's share of value added in shipments, TFP growth and intra-industry trade, interacted with countries' per capita income; and the interaction of industries' capital intensity with a measure of financial development. Finally, in column (5), the model is estimated including the full set of control variables.

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additional robustness checks:

$$z_i^{rs'} = \sum_j \theta_{ij}(R_j^{\text{neither}} + R_j^{\text{ref price}})$$

where $R_j^{\text{ref price}}$ is the proportion of input j that is not sold on an organized exchange but has a reference price.

[5] The 4-digit SITC codes were transformed to the BEA's 1997 I-O industry classifications.

[6] We refer to the reader to Appendix A in Nunn (2007) for a detailed description of the sources of these control variables.

[7] As Nunn (2007) does, missing observations and zero observations were dropped.

Table 1: The Determinants of Comparative Advantage (Table IV, Nunn 2007)

	(1)	(2)	(3)	(4)	(5)
Judicial quality interaction: $z_i^{rs}Q_c$	0.289**	0.318**	0.326**	0.235**	0.296**
	(0.0127)	(0.0200)	(0.0225)	(0.0165)	(0.0236)
Skill interaction: h_iH_c			0.0849**		0.0631**
			(0.0165)		(0.0173)
Capital interaction: k_iK_c			0.105**		0.0737
			(0.0307)		(0.0406)
Log income × value added: $va_i \ln y_c$				-0.117*	-0.137*
				(0.0465)	(0.0666)
Log income × intra-industry trade: $iit_i \ln y_c$				0.576**	0.546**
				(0.0402)	(0.0562)
Log income × TFP growth: $\Delta tpf_i \ln y_c$				0.0242	-0.00981
				(0.0329)	(0.0500)
Log credit/GDP × capital: k_iCR_c				0.0199	0.0210
				(0.0118)	(0.0183)
Log income × input variety: $(1 - hi_i) \ln y_c$				0.446**	0.522**
				(0.0753)	(0.103)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	22598	10976	10976	15737	10816
R^2	0.723	0.759	0.760	0.766	0.762

Robust standard errors in parentheses

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

In all the model specifications included in the five columns, the estimated coefficients for the judicial quality interaction are positive and statistically significant at the one percent level. These coefficients range from 0.24 (in the fourth column) to 0.33 (in the third column). These results support the hypothesis that, on average, countries with better judicial institutions and contract enforcement tend to export more in industries that are relatively more dependent on relationship-specific contractual arrangements.

2.2 Heterogeneity across the distribution of industries' contract intensity (z_i^{rs})

Nunn (2007)'s results capture the "mean effect" of the coefficient for the judicial quality interaction with the measure of contract intensity on a country's export. Based on this positive and significant estimated "mean effect", he states that judicial quality and contract enforcement are sources of comparative advantage for industries that require relationship-specific inputs.

In this section, we argue that this positive and significant effect might not be extrapolated to all the industries along the distribution of industries' contract intensity. The reason is that, among the industries in which relationship-specific investments are relatively less important, there might be some other sources of comparative advantage. That is, industries that require lower contract intensity may respond differently to the quality of contract enforcement simply because they rely on some other sources of comparative advantage. On the other hand, for industries that require relatively more relationship-specific investments, judicial quality becomes a crucial feature and, as a consequence, becomes an important source of comparative advantage. If this reasoning is correct, then, we should find that the top quartiles of the distribution of relationship-specific industries drive Nunn (2007)'s results.

To investigate the potential heterogeneous effect on exports according to the ranking of industries' contract intensity, we estimate equation 1 for different quantiles of the distribution of industries' contract intensity (z_i^{rs}). This approach provides more information on the distribution of the effect of the quality of contract enforcement on export than Nunn (2007)'s estimation, by characterizing the heterogeneous effect on exports across various positions in the distribution of industries' contract intensity.[8]

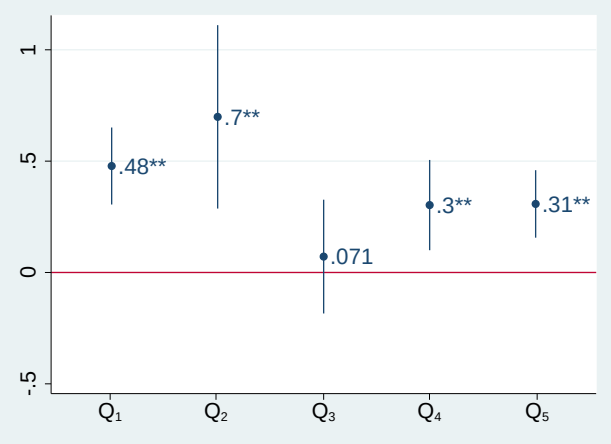
[8] Ding et al. (2016) and Zhu et al. (2016) use a similar approach to explore the heterogeneity in the relationship between crude oil prices and stock market returns –see Figures 2 and 3 in Zhu et al. (2016) and Table 4 in Ding et al. (2016).

Figure 1 displays the estimated coefficients for the contract intensity-judicial quality interaction of the regression model used by Nunn (2007) for different quintiles of the distribution of industries' contract intensity. Each subfigure included in Figure 1 captures a different specification of the main regression model, corresponding to the model specifications included in each column in Table 1. Subfigure 1a contains the estimated coefficients for the judicial quality interaction for all industries. Subfigure 1b captures the estimated coefficients for the same baseline specification using the subset of the sample for which factor endowments data is available. Subfigure 1c displays the estimation results including the capital and labor intensities interacted with the factor endowment variables as controls. Subfigure 1d contains the estimation results after controlling for other determinants of trade flows. Finally, Subfigure 1e includes the estimation results using the full set of control variables.

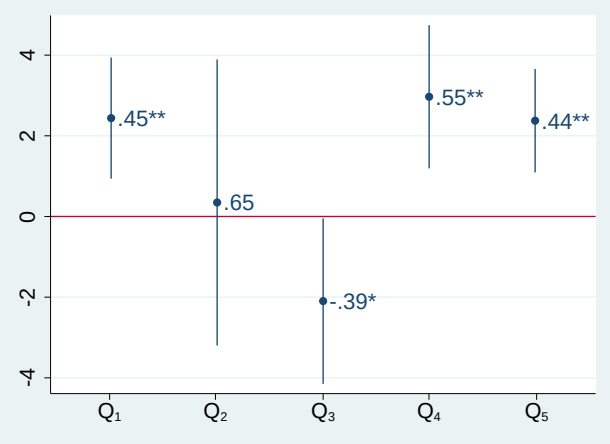
According to our estimation results, the coefficients for the judicial quality interaction with the measure of contract intensive is positive and significant at the one percent level in all the model specifications only for the fourth and fifth quintiles of the distribution of relationship-specific industries. On the other hand, the coefficients for the judicial quality interaction for the first, and especially for the second and third quintile, are unstable, non significant and even negative in some specifications –see the coefficient for the third quintile in subfigures 1b and 1c. In the most restrictive model specification, included in Subfigure 1e, the coefficients for the judicial quality interaction for the fourth and fifth quintiles are the only positive and significant ones (0.61 and 0.44, respectively).

As we conjectured, when looking at the heterogeneous effect on exports of industries with a different degree of relationship-specific inputs, the results suggest that it is the top quintiles of the distribution of relationship-specific industries which drives Nunn (2007)'s result, and not the bottom quintiles.

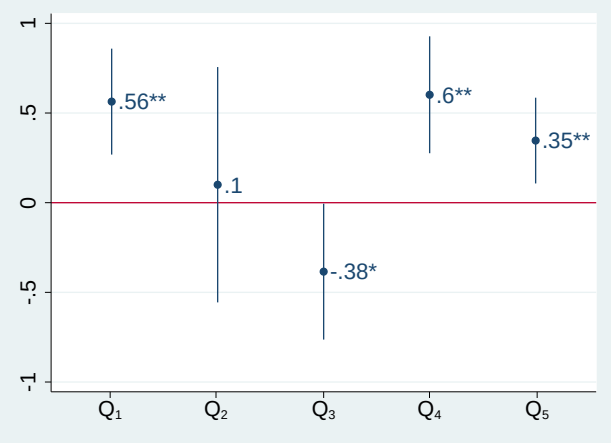
Figure 1: Estimation results of the different model specifications for different quintiles of z_i^{rs}



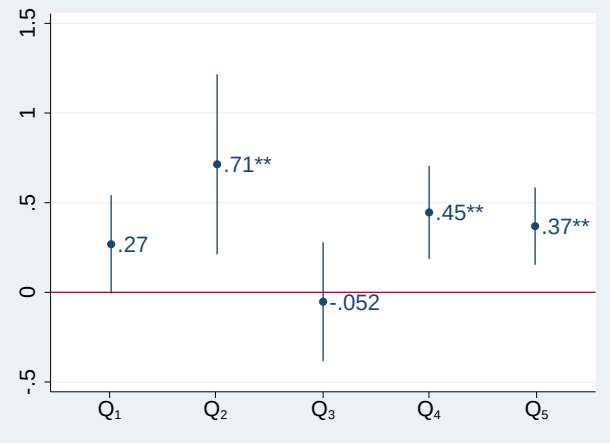
(a) Column (1): full sample, no controls



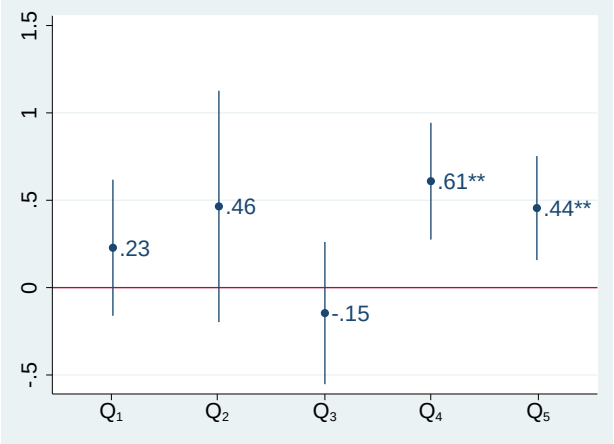
(b) Column (2): restricted sample, no controls



(c) Column (3): capital and labor intensities controls



(d) Column (4): other determinants of trade controls



(e) Column (5): full set of controls

3 Relationship-specificity and Judicial Quality in Natural Resource industries

3.1 Background

In the previous Section we show that the top quintiles of the distribution of relationship-specific industries appear to drive Nunn (2007)'s main results. However, his main findings are no longer relevant if we consider industries that belong to the bottom and middle quintiles of the distribution of contract intensive industries. Therefore, for industries that require relatively low relationship-specific assets (specifically, industries within the primary sector), Nunn (2007)'s evidence might be challenged.

In particular, in this Section we put under the microscope natural resource related industries. We choose these industries for two main reasons. First, because all these industries belong to the bottom and middle quintiles of the distribution of relationship-specific industries.[9] Therefore, while having certain importance, judicial quality is not a critical source of comparative advantage for these industries.

Second, and more importantly, due to the immobility of their input factors, the main, idiosyncratic feature of the natural resource industries is the lack of input-factors mobility and production relocation. A country's natural resource endowment, such as forests, iron ore mines and oil and gas reserves, cannot be moved out of a country. Consequently, we expect that countries' natural resource endowments, rather than judicial quality, influence the geographical distribution of comparative advantage in natural resource related industries.

To further illustrate this idea, let us consider the following real-world example. According to data, the 'Pharmaceutical and medicine manufacturing' has a value of z_i^{rs} (recall that this variable measures the importance of relationship-specific investments in an industry) equal to 0.503, that is, this industry belongs to the third quintile of the distribution of the "contract-intensity" variable. This means that this industry uses intensively inputs requiring relationship-specific investments. Thus, countries with relatively good judicial institutions and contract enforcement will attract pharmaceutical and medicine manufacturers. According to the same dataset, the 'Fishing' industry

[9] Tables with the natural resources related industries considered and their contract intensities (z_i^{rs}) are included in Subsection 3.3.

has a very similar level of contract intensity – in particular, the value of z_i^{rs} is 0.517 (it also belongs to the third quintile). However, in order to attract fishing companies, a country must have fish resources and, more trivially, it must be by the sea, regardless how good or bad the contract enforcement is in such a country. This is illustrated in Figure 2. As Nunn (2007) predicted, countries with relatively good contract enforcement export more pharmaceuticals and medicines. However, among the countries exporting fish, there are countries with relatively poor judicial systems as well as countries with relatively good judicial systems.

Figure 2: Judicial quality vs. Total exports to all other countries for selected industries

3.2 Augmented regression models

Following a similar strategy as the one employed by Nunn (2007), we test two main hypothesis. First, we study for both natural resource industries and non-natural resource industries whether there is evidence that countries with better contract enforcement specialize in exporting goods that require relatively high relationship-specific assets. For that purpose, we estimate the following two simple equations:

$$\bar{Z}_c^{\mathrm{NR}} = \alpha Q_c + \varepsilon_c^{\mathrm{NR}} \tag{2}$$

and

$$\bar{Z}_c^{\text{Other}} = \beta Q_c + \varepsilon_c^{\text{Other}} \tag{3}$$

where Q_c is country c's quality of contract enforcement, and $\bar{Z}_c^{\text{NR}}$ and $\bar{Z}_c^{\text{Other}}$ denote country c's average importance of relationship-specific investments (contract intensity) in natural resource industries and in all other industries respectively, where $\bar{Z}_c^{\text{NR}} = \sum_i \phi_{ic}^{\text{NR}} z_i^{\text{NR}}$, ϕ_{ic}^{NR} is natural-resource industry i's share of total exports in country c, and z_i^{NR} is natural-resource industry i's contract intensity. The variable $\bar{Z}_c^{\text{Other}}$ is built in a similar way but using non-natural-resource industries data.[10]

Second, we test whether countries exporting natural resources with good contract enforcement specialize in exporting natural resource goods for which relationship-specific investments are more important. For that purpose, we augment equation 1 in Nunn (2007) by introducing a natural-resources industry indicator. That is, we estimate the following equation:

$$\ln x_{ic} = \beta_1 z_i^{rs} Q_c + \mathbb{1}_{i\in\{\text{NR}\}} \beta_2 z_i^{rs} Q_c + \mathbf{X}_{ic} + \alpha_i + \alpha_c + \varepsilon_{ic} \tag{4}$$

where x_{ic} represents total exports in industry i from country c to all other countries, z_i^{rs} represents industry i's contract intensity, Q_c is country c's quality of contract enforcement, $\mathbb{1}_{i\in\{\text{N.R.}\}}$ is an indicator that equals one if i is a natural resource industry, $\mathbf{X}_{ic}$ is a set of control variable, and α_i and α_c denote industry and country fixed-effects, respectively.

3.3 Data

To examine the effect of judicial quality on relationship-specific natural-resource-related industries we employ the cross sectional dataset from 1997 used by Nunn (2007), which contains data for 222 industries for 159 countries.[11] We augment such a dataset by including specific natural resource industry indicators. We construct an indicator variable that equals one if industry i is a natural resource related industry and zero otherwise. We identify 'natural resource' industries as those

[10] Notice that the unit of observation in this regression model is a country c. Therefore, it is awkward to replicate this regression model for different quartiles of the distribution of relationship-specific industries. That is, it is not that informative to check for industries in different quartiles of the distribution of industries' inputs' specificity whether there is evidence that countries with better contract enforcement specialize in exporting goods that require relatively high relationship-specific assets.

[11] The dataset is available at `http://scholar.harvard.edu/files/nunn/files/qje_contracts_final1.zip` [last access: February 12, 2018].

belonging to the primary sector of the economy dedicated to the extraction of raw material and to the exploitation of natural resources including soil resources, mineral and energy resources and water resources – see UN (1997). In particular, in our dataset, natural resource industries are those that belong to one of the following groups: agricultural (BEA's 1997 IO codes beginning in 111), forestry (BEA's 1997 IO codes beginning in 113A), fishing (BEA's 1997 IO codes beginning in 114) and mining (BEA's 1997 IO codes beginning in 21). A list of these industries is provided in Table 2, in which the value of z_i^{rs} for these industries is also included along with the quintile of the distribution of z_i^{rs} to which these industries belong.

Table 2: Natural resource industries (full sample)

Industry description	$\mathbf{z_i^{rs}}$	**Quintile of** $\mathbf{z_i^{rs}}$
Oilseed farming	0.368	2nd
Grain farming	0.203	1st
Vegetable and melon farming	0.396	2nd
Fruit farming	0.420	3rd
Tree nut farming	0.506	3rd
Greenhouse and nursery production	0.502	3rd
Tobacco farming	0.411	3rd
Cotton farming	0.302	2nd
Sugarcane and sugar beet farming	0.337	2nd
All other crop farming	0.291	2nd
Forestry	0.481	3rd
Fishing	0.517	3rd
Oil and gas extraction	0.171	1st
Coal mining	0.466	3rd
Iron ore mining	0.298	3rd
Copper, nickel, lead, and zinc mining	0.353	2nd
Gold, silver, and other metal ore mining	0.400	3rd
Stone mining and quarrying	0.525	3rd
Sand, gravel, clay, and refractory mining	0.333	2nd
Other nonmetallic mineral mining	0.397	3rd

Table 2 includes a diverse spectrum of industries, from what is known as diffuse natural resource sectors, such as agriculture, to point resource sectors (extractives) such as oil and gas extraction. Under this ample criterion, natural resource sectors and extractive industries are used more or less interchangeably. However, extractive industries (e.g., mining minerals and coal, extracting oil and gas, etc.) are very different to agricultural sectors (cash and food crops). For instance, agricultural sectors generally require having arable land and a country being relatively agro-climatically suitable

for a particular type of agriculture plus existing agricultural technology (such as available seeds). These are two relatively flexible "endowments" compared to mineral, coal, oil, and gas deposits, which, for obvious reasons, cannot be moved.

With the currently available agricultural biotechnology and the fact that most countries have some land, the case could be made that many types of agriculture could be conducted in numerous types of countries nowadays. Therefore, one potential concern is that, if the argument is to center the discussion on resource endowments, then these should be genuine endowments (i.e., stocks) that really cannot be moved. Coal, oil, gas, and minerals all fit this conceptual definition. Forests could arguably also be included, as could fisheries. However, the idea of fruit, vegetable, and, in general, grain farming, being unable to be moved may be far-fetched.

Given these differences, one might argue that it does not make sense to evaluate the two (agriculture and non-agriculture industries) together under the same narrative. To address this potential concern, we did also consider a more restrictive definition of natural resources industries, in which agriculture is excluded from our analysis. The restricted group of natural resources industries is included in Table 3.

Table 3: Natural resource industries (restricted sample)

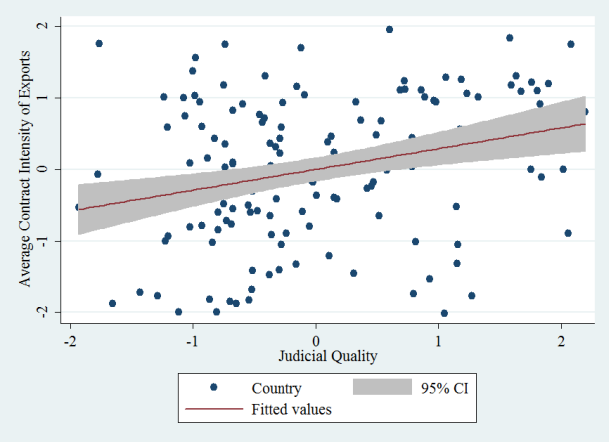
Industry description	$\mathbf{z_i^{rs}}$	**Quintile of** $\mathbf{z_i^{rs}}$
Forestry	0.481	3rd
Fishing	0.517	3rd
Oil and gas extraction	0.171	1st
Coal mining	0.466	3rd
Iron ore mining	0.298	3rd
Copper, nickel, lead, and zinc mining	0.353	2nd
Gold, silver, and other metal ore mining	0.400	3rd
Stone mining and quarrying	0.525	3rd
Sand, gravel, clay, and refractory mining	0.333	2nd
Other nonmetallic mineral mining	0.397	3rd

4 Empirical results

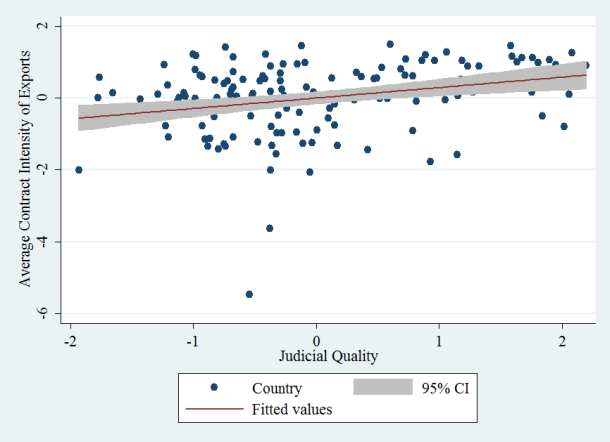
In this section we provide our main estimation results. First, we analyze the relationship between contract enforcement and relationship-specific industries. We provide point estimates of equations 2 and 3 (see Table 5) and a plot with the visual analysis of the relationship between contract

enforcement and relationship-specific industries (see Figure 3).

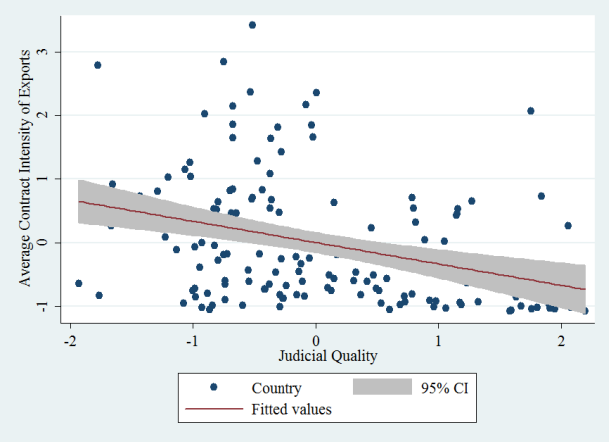
Figure 3: Judicial quality vs. Average contract intensity



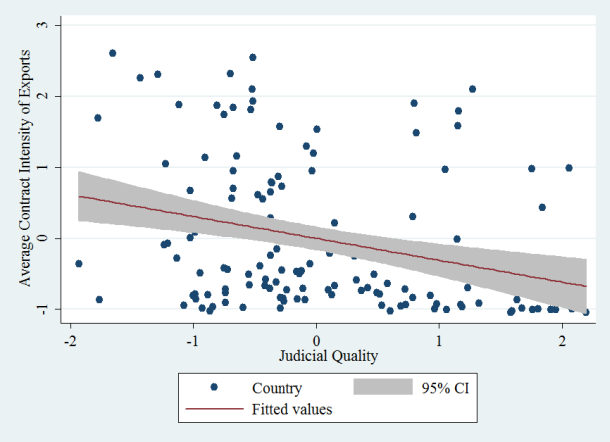
(a) All industries, using z_i^{rs}



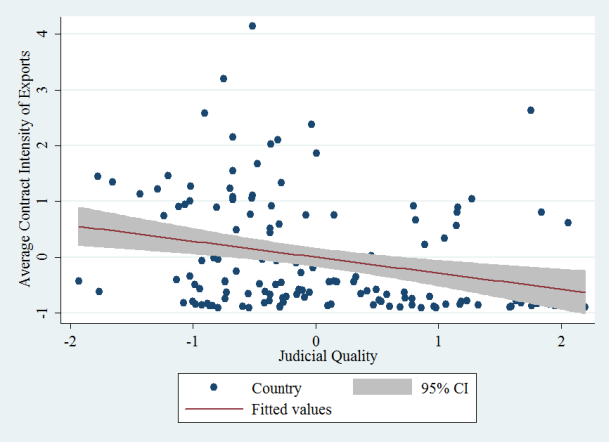
(b) All industries, using $z_i^{rs'}$



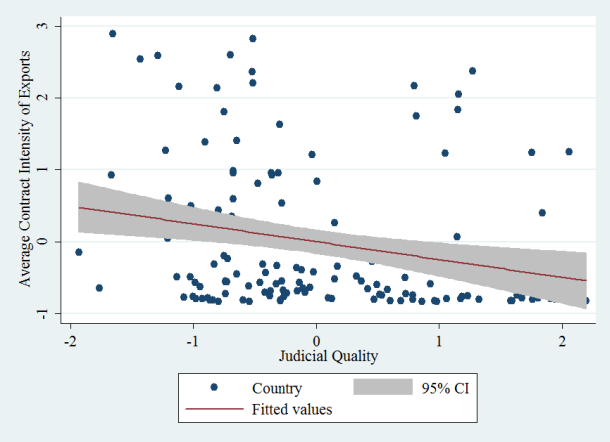
(c) Natural resource industries (full sample), using z_i^{rs}



(d) Natural resource industries (full sample), using $z_i^{rs'}$



(e) Natural resource industries (restricted sample), using z_i^{rs}



(f) Natural resource industries (restricted sample), using $z_i^{rs'}$

Figure 3 captures each country's average contract intensity of exports (using both z_i^{rs} and $z_i^{rs'}$) and judicial quality, including the linear regression prediction and 95% confidence intervals. The top subfigures include the average contract intensity of exports from all the industries in the dataset. The fitted regression shows a positive impact of judicial quality on the average contract intensity of exports, which holds for both measures of contract intensity, z_i^{rs} (subfigure 3a) and $z_i^{rs'}$ (subfigures 3b). These two subfigures show the empirical evidence found by Nunn (2007), that is, that countries with better contract enforcement specialize in exporting goods for which relationship-specific investments are more important. However, the results that we obtain are actually the opposite when we perform the same analysis using data solely on natural resource industries. This is reflected in subfigures 3c and 3d –in which we use the full sample of natural resource related industries– and subfigures 3e and 3f –in which we use the restricted sample of natural resource related industries. That is, we find an inverse relationship between judicial quality and contract intensity of exports from relationship-specific natural-resource-related industries.

The previous idea also found in Table 4, in which we include the estimation results of equations 2 and 3. Panel a) included the estimated coefficient considering the ample criteria for the natural resources industries (full sample), while panel b) captures the results for the restricted sample of natural resources industries. Columns (1) and (2) include the estimated relationship between quality of contract enforcement and average contract intensity for natural resource industries (equation 2). The coefficients obtained using both measures of contract intensity and both samples of natural resource related industries are negative (around -0.3) and significant at the 1% level. These coefficients suggest that countries with worse contract enforcement export more natural resource goods for which relationship-specific inputs are more important. These results contrast with Nunn's findings. In fact, if we estimate the relationship between quality of contract enforcement and average contract intensity for all the industries, excluding natural resource industries, the coefficients become more positive and more significant in comparison to Nunn's original estimated coefficients that include all the industries – Columns (3) and (4) in Table 4 versus Columns (3) and (4) in Table III in Nunn (2007). This fact supports that Nunn's hypothesis is true when all industries are considered, but not when natural resource industries are tested alone.

Finally, we estimate equation 1, using z_i^{rs} as the measure of contract intensity.[12] The estimation

[12] We drop missing observations and zero observations in our estimation.

Table 4: Judicial Quality and the Average Contract Intensity of Exports (natural resource industries vs. all other industries)

Panel a): Natural Resource industries (full sample)

	Natural resource industries		All other industries	
	(1) $\bar{Z}_c^{rs}$	(2) $\bar{Z}_c^{rs'}$	(3) $\bar{Z}_c^{rs}$	(4) $\bar{Z}_c^{rs'}$
Judicial Quality: Qc	-0.336**	-0.308**	0.365**	0.371**
	(0.0733)	(0.0796)	(0.0802)	(0.0773)
Observations	146	146	146	146
R^2	0.113	0.095	0.133	0.138

Panel b): Natural Resource industries (restricted sample)

	Natural resource industries		All other industries	
	(1) $\bar{Z}_c^{rs}$	(2) $\bar{Z}_c^{rs'}$	(3) $\bar{Z}_c^{rs}$	(4) $\bar{Z}_c^{rs'}$
Judicial Quality: Qc	-0.287**	-0.249**	0.339**	0.324**
	(0.0740)	(0.0823)	(0.0815)	(0.0800)
Observations	146	146	146	146
R^2	0.082	0.062	0.115	0.105

Robust standard errors in parentheses

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

results are provided in Table 5 for the full sample of natural resources industries.[13]

Column (1) captures the estimated coefficients for the judicial quality interaction for both all industries (first row) and for natural resource industries only (second row). For the former, the coefficient is positive (0.24) and statistically significant at the one percent level, as in Nunn (2007). However, Nunn's hypothesis disappears for the natural resource related industries. The coefficient for these particular industries become negative (-0.19) and significant at the one percent level, suggesting that countries with good judicial systems do not export more in natural-resource contract-intensive industries. Column (2), which contains the estimated coefficients for the same baseline specification using the subset of the sample for which factor endowment data is available, yields a very similar result.

[13] We do not include the estimation results for the restricted sample of natural resource related industries because the coefficients obtained are similar to those included in Table 5. In fact, for some model specifications, the coefficients are exactly the same (this happens in the model specifications included in columns (2)-(5)). This is due to the limited available data for the control variables for some of the natural resources industries. In both cases, the results are similar if we use $z_i^{rs'}$ instead of z_i^{rs} as the measure of contract intensity. These additional tables are provided in the Online Appendix.

Table 5: The Determinants of Comparative Advantage, augmented model

	(1)	(2)	(3)	(4)	(5)
Judicial quality interaction: $z_i^{rs}Q_c$	0.244**	0.319**	0.326**	0.235**	0.296**
	(0.0119)	(0.0200)	(0.0225)	(0.0165)	(0.0236)
Judic. quality Nat. Res.: $\mathbb{1}_{i\in\{\text{NR}\}}z_i^{rs}Q_c$	-0.194**	-0.0828**	-0.0778**	-0.0681**	-0.0745**
	(0.0115)	(0.0191)	(0.0192)	(0.0151)	(0.0197)
Skill interaction: h_iH_c			0.0814**		0.0629**
			(0.0165)		(0.0173)
Capital interaction: k_iK_c			0.101**		0.0674
			(0.0306)		(0.0404)
Log income × value added: $va_i \ln y_c$				-0.152**	-0.176**
				(0.0463)	(0.0665)
Log income × intra-industry trade: $iit_i \ln y_c$				0.571**	0.542**
				(0.0402)	(0.0563)
Log income × TFP growth: $\Delta tpf_i \ln y_c$				0.00143	-0.0339
				(0.0326)	(0.0496)
Log credit/GDP × capital: k_iCR_c				0.0160	0.0194
				(0.0118)	(0.0183)
Log income × input variety: $(1-hi_i)\ln y_c$				0.470**	0.546**
				(0.0751)	(0.103)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	22598	10976	10976	15737	10816
R^2	0.729	0.759	0.760	0.766	0.763

Robust standard errors in parentheses

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

Column (3) contains the estimation results including the capital and labor intensities interacted with the factor endowment variables as control. Again, the judicial quality interaction is positive and significant in the first row (0.33), but it is negative and significant for the natural resource industries (-0.08). Very similar results are obtained in columns (4) and (5). In the former, we include as control other determinants of trade flows in high income-countries, such as industries' share of value added in shipments, TFP growth and intra-industry trade, interacted with countries' per capita income; and the interaction of industries' capital intensity with a measure of financial development. In the latter, we include the full set of control variables. In all the model specifications, the coefficients for the judicial quality interaction for the natural resource related industries are negative and significant at the one percent level.

5 Discussion and implications for the resource curse and economic development

So far, we have provided empirical evidence that, for industries other than the natural resource related ones, countries with relatively good contract enforcement tend to attract relationship-specific (contract-intensive) industries, while less contract-intensive industries tend to stay in countries with relatively poor contract enforcement (see Figure 3). This creates a comparative advantage for countries with better contract enforcement in relationship-specific (contract-intensive) industries. However, we show that this relationship does not hold natural resource related industries. In fact, we provide empirical evidence supporting the opposite idea: for the natural resource industries, countries with better judicial quality specialize in extractive industries that require relatively higher relationship-specific investments.

In this section, we discuss some stylized facts regarding economic development and the resource curse which emerge from our empirical findings. We support some of these stylized facts with further empirical results.

- **Stylized fact #1: Resource abundance as a source of comparative advantage**

The relationship between judicial quality and relationship-specific investments is a classic topic in the international trade literature. Indeed, many authors have empirically shown that strong

judicial institutions and good contract enforcement are a country's comparative advantage for relationship-specific industries –see Levchenko (2007), Nunn (2007), Head et al. (2004), among others. However, previous papers exploring this comparative advantage implicitly assume that input factors can move from one country to another, and that production relocation is possible. Based on input-factor mobility and production relocation, industries with relationship-specific assets tend to locate in countries with better institutions.

However, that is not the case for natural resource extractive industries. The key feature of these industries is the lack of input factor mobility, which impedes production relocation. As exemplified above, coal must be extracted in countries with coal reserves and fishing is only possible in countries that are by the sea and that have fish resources. In other words, coal mining and fishing (and the rest of industrial activities included in Table 2) occur in countries that are rich in the relevant natural resource, regardless of the quality of institutions of these countries.

Although typically weak institutions and weak contract enforcement make a natural resource extraction facility less profitable if the investment return and costs are 'country-risk' adjusted – see Nordal (2001) – in reality we observe that the key determinant of comparative advantage of natural resource extractive industries is natural resource abundance. Some evidence of this fact is given by the so-called 'petro-states'. The key features of 'petro-states' are precisely the abundance of oil in their ground, a heavy oil-export rent-dependence and the existence of weak institutions – see Karl (2007).

Moreover, many authors have previously found robust evidence that abundance of natural resources is a source of comparative advantage. This evidence has been found for different extractive industries, including the energy resource industry – see Gerlagh and Mathys (2011), Michielsen (2013), Grether et al. (2014), Mathys and Michielsen (2015) and Arezki et al. (2016) – the water resource industry – see Debaere (2014) – and the mining resource industry – see Aydin and Tilton (2000). Among these (and many other) papers, there is a consensus that countries relatively rich in natural resources export more in natural-resource intensive industries.

- **Stylized fact #2: Resource abundance as the cause of poor governance**

The empirical findings in Nunn (2007) suggest that there exists a positive relationship between judicial quality and comparative advantage for industries for which relationship-specific investments

are more important. That is, improving a country's contract enforcement helps this country to attract relationship-specific industries. The author provides the following example: 'if Thailand improved its contract enforcement to equal Taiwan's, then its exports of "electronic computer manufacturing" [which is a relatively high contract-intensive industry] would increase from 2.83 to 6.97 billion U.S. dollars per year' and 'Thailand's share of world production in these goods would increase from 1.6 to 4.0 percent' –see Nunn (2007), pp. 582-583.

Therefore, countries have an incentive to develop and improve governance and institutions as a way to attract industries that export goods for which relationship-specific investments are more important. Further evidence of this idea is provided by Faruq (2011) and Amiti and Khandelwal (2013), who provide evidence that corruption is associated with lower export quality, and better bureaucracy and property rights are associated with better export quality.

However, according to our empirical evidence, natural resource exports occur in countries no matter how good or bad the quality of their institutions is and regardless of how 'sophisticated' (contract intensive) the investment required is to exploit and extract these natural resources. Therefore, natural-resource-rich countries do not have an incentive to develop stronger institutions and, consequently, to attract relationship-specific industries (which generate greater value-added; see stylized fact #3) and to diversify their economies (see stylized fact #4).

While some authors support that the impact of natural resources depends mostly on the quality of institutions –see Snyder (2002), Smith (2004) and Humphreys (2005), among many others– our evidence suggests that the other direction is also possible. That is, natural resource specialization may lead to weaker institutions and judicial quality, as suggested by Isham et al. (2005). This relationship is based on the disincentive that natural-resource-rich countries have to improve judicial quality, contract enforcement and, in general, institutions and governance.[14]

This argument is in line with the particularly well-documented Russian case in van der Marel and Dreyer (2014). According to them, the rule of Law in Russia suffered a deterioration in 2007, which was accelerated in the following two years. Their empirical evidence suggests that Russians exports on technology-intensive manufactured goods – which require relatively high relationship-specific contracts – notably decreased after 2007. However, such a deterioration of the rule of law did not affect Russian's ability to export natural resources. Indeed, Russia became a natural-resource

[14] In line with this argument, Arezki and Brückner (2011) show that oil rents worsen corruption.

dependent country after 2007.

- **Stylized fact #3: Weak institutions (and resource abundance) are at the heart of the resource curse**

As Nunn (2007) shows and we further clarify, weak institutions and poor judicial quality hinder relationship-specific industries that are not based on natural resource extraction. Unfortunately for countries with weak institutions and poor judicial quality, these industries (non-natural-resource relationship-specific industries) generate greater value added.

Some empirical evidence of this fact is provided in Table 6. The first column captures the correlation between the two measures of contract intensity (z_i^{rs} and $z_i^{rs'}$) and the value added of non-natural resource industries. The evidence suggests that there is a positive and significant correlation between these variables, that is, industries that require greater relationship-specific investment tend to generate greater value-added.[15]

Table 6: Relationship between Contract Intensity and Value added

Variables	Value added	Contract intensity (z_i^{rs})	Contract intensity ($z_i^{rs'}$)
Value added	1.000		
Contract intensity (z_i^{rs})	0.323*	1.000	
Contract intensity ($z_i^{rs'}$)	0.518*	0.652*	1.000

* Correlation coefficients significant at the 1% level

Therefore, by increasing the presence of natural-resource industries[16] (to the detriment of non-natural resource industries) countries increase the presence of industries that generate less value added (to the detriment of industries that generate greater value added). That is, weak institutions and resource abundance prevent a country from attracting high-tech manufactures and, in general, industries with high sophistication, which tend to relocate in countries with stronger institutions (typically developed countries).

Ultimately, to generate value added and to boost GDP growth, the best alternative for the governments in these countries is maintain their focus on natural resource extraction. As a result, the fact that countries with weak institutions fail to attract industries that generate greater

[15] This was further illustrated by Nunn and Trefler (2013) who explain that while complex and sophisticated products (such as the airline industry) requires high levels of innovative effort and relationship-specific inputs, more standardized products (such as blue jeans) do not require any sophisticated relationship-specific, non-contractable inputs.

[16] Which ultimately implies resource specialization and dependence, as explained in the Stylized fact #4.

value-added in the presence of natural resources further contributes to increase the income gap between countries with good judicial system (developed) and countries with poor judicial systems (developing) countries, leading also to the idea of the 'resource curse'.

- **Stylized fact #4: Resource abundance and weak institutions lead to resource dependence**

As a final fact, and connecting with the previous stylized fact, we identify that the tradeoff for countries with weak judicial systems but rich in natural resources is between attracting fewer contract intensive industries (which, as shown Table 6, tend to generate less value added) and exploiting and focusing efforts on the natural resource related industries, which can potentially generate greater value added in comparison to the less contract intensive industries. As the reader might guess, these countries typically choose the second option.[17] Indeed, many authors have previously provided empirical evidence supporting this intuitive result, i.e. that dependence of natural resources tends to occur in countries with weak institutions.[18]

To further support this idea, we use our dataset to test whether countries with poor contract enforcement have a greater ratio of natural resource exports to overall export ratio. The estimations results are included in Table 7. The negative and significant coefficient (-0.31) suggests that countries with poor judicial quality do indeed choose to specialize in exporting natural resources.

Table 7: Judicial Quality and the Natural resource dependence

	Natural resource dependence
Judicial Quality: Qc	-0.307**
	(0.0733)
Observations	146
R^2	0.094

Robust standard errors in parentheses

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

Therefore, as Hartley and Medlock (2008) state, these countries generate powerful natural resource industries, which are typically under the supervision of the government and politicians.

[17] In line with this argument, as explained by Dunning (2005), resource-dependent countries face a tradeoff between diversifying the economy, which reduces fiscal volatility and potentially leads to a better aggregate economic performance, versus remaining resource-dependent, and avoiding the rise of societal bases of power outside of the control of the political elite. In fact, less developed countries (which are usually less democratic) tend to avoid the emergence of powers outside the political elites by remaining resource-dependent.

[18] See, among many others, Dunning (2005), Couttenier (2008), Anthonsen et al. (2012) and van der Marel and Dreyer (2014).

Far from cutting an excessive expansion of resource-based activity, these powerful, government-related industries have an incentive to further invest in the extraction of these resources – see Asher (1999) (Chapter 6).[19] As a result, and as van der Marel and Dreyer (2014) illustrate in the light of the aforementioned Russian case, these countries end up being natural resource dependent.

6 Conclusions

Nunn (2007) tests whether a country's judicial quality is a source of comparative advantage. He finds that countries with good contract enforcement specialize in industries producing goods that require relationship-specific investments. In this paper, we argue that this evidence cannot be extrapolated to all the industries along the distribution of industries' contract intensity. The reason is because, among the industries in which relationship-specific investments are relatively less important, there might be some other sources of comparative advantage. Based on this argument, we show that Nunn (2007)'s result mask substantial heterogeneity across different industries, depending on the degree of input specificity required for each industry.

Moreover, Nunn (2007) does not acknowledge that judicial quality is a source of comparative advantage only for industries whose input-factors can be physically relocated. Conversely, this comparative advantage does not exist for industries with immobile inputs. This is the case for natural resource related industries. We augmented Nunn (2007)'s main regression model to show that, if anything, for natural resource industries the result is quite the opposite: countries with poor contract enforcement specialize in extractive industries producing goods that require relationship-specific investments.

Based on this finding, we discuss four stylized facts that further contribute not only to understanding our results, but also to support some ideas in previous literature regarding the resource curse and economic development. First, we discuss that, for natural resource industries, resource abundance is the key comparative advantage (instead of judicial quality). Second, natural resource abundance may also disincentivize the improvement of the institutions and the judicial system. Third, countries with weak institutions reduce the presence of industries that generate greater value added, thereby increasing the income gap between countries with strong institutions

[19] A more in-depth discussion on the battle of political elites to control the natural resources –which further weakens contract enforcement and the rule of law– is in Cabrales and Hauk (2011).

(typically developed countries) and weak institutions (typically developing countries). Fourth, we foster the idea of there being natural resource dependence in natural resource countries with weak institutions.

Our idea makes an important policy-relevant clarification: that the implicit view among policy makers and the development community that the potentially harmful effects of natural resource extraction are reversed in the presence of good institutions, and that these good institutions foster the development of relationship-specific advanced industries, is a simplistic one with limited utility because it ignores fundamental issues concerning the nature of extractives-led growth.

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Appendix A

Table A.1: The Determinants of Comparative Advantage, augmented model (restricted sample)

	(1)	(2)	(3)	(4)	(5)
Judicial quality interaction: $z_i^{rs}Q_c$	0.263**	0.319**	0.326**	0.235**	0.296**
	(0.0119)	(0.0200)	(0.0225)	(0.0165)	(0.0236)
Judic. quality Nat. Res.: $\mathbb{1}_{i\in\{\text{NR}\}}z_i^{rs}Q_c$	-0.105**	-0.0828**	-0.0778**	-0.0681**	-0.0745**
	(0.0110)	(0.0191)	(0.0192)	(0.0151)	(0.0197)
Skill interaction: h_iH_c			0.0814**		0.0629**
			(0.0165)		(0.0173)
Capital interaction: k_iK_c			0.101**		0.0674
			(0.0306)		(0.0404)
Log income × value added: $va_i \ln y_c$				-0.152**	-0.176**
				(0.0463)	(0.0665)
Log income × intra-industry trade: $iit_i \ln y_c$				0.571**	0.542**
				(0.0402)	(0.0563)
Log income × TFP growth: $\Delta tpf_i \ln y_c$				0.00143	-0.0339
				(0.0326)	(0.0496)
Log credit/GDP × capital: k_iCR_c				0.0160	0.0194
				(0.0118)	(0.0183)
Log income × input variety: $(1-hi_i)\ln y_c$				0.470**	0.546**
				(0.0751)	(0.103)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	22598	10976	10976	15737	10816
R^2	0.725	0.759	0.760	0.766	0.763

Robust standard errors in parentheses

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

Table A.2: The Determinants of Comparative Advantage, augmented model (using $z^{rs'}$)

	(1)	(2)	(3)	(4)	(5)
Judicial quality interaction: $z_i^{rs'}Q_c$	0.423**	0.417**	0.404**	0.337**	0.316**
	(0.0207)	(0.0339)	(0.0354)	(0.0307)	(0.0403)
Judic. quality Nat. Res.: $\mathbb{1}_{i\in\{\text{NR}\}}z_i^{rs'}Q_c$	-0.225**	-0.0850**	-0.0799**	-0.0731**	-0.0802**
	(0.0120)	(0.0191)	(0.0192)	(0.0151)	(0.0198)
Skill interaction: h_iH_c			0.111**		0.106**
			(0.0160)		(0.0168)
Capital interaction: k_iK_c			0.0608*		0.0238
			(0.0289)		(0.0387)
Log income × value added: $va_i \ln y_c$				-0.230**	-0.288**
				(0.0473)	(0.0674)
Log income × intra-industry trade: $iit_i \ln y_c$				0.550**	0.523**
				(0.0403)	(0.0565)
Log income × TFP growth: $\Delta tpf_i \ln y_c$				0.000198	-0.0525
				(0.0323)	(0.0488)
Log credit/GDP × capital: k_iCR_c				-0.00760	-0.000601
				(0.0114)	(0.0184)
Log income × input variety: $(1-hi_i)\ln y_c$				0.373**	0.492**
				(0.0769)	(0.106)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	22598	10976	10976	15737	10816
R^2	0.731	0.758	0.759	0.766	0.761

Robust standard errors in parentheses

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

Table A.3: The Determinants of Comparative Advantage, augmented model (using $z^{rs'}$) (restricted sample)

	(1)	(2)	(3)	(4)	(5)
Judicial quality interaction: $z_i^{rs'}Q_c$	0.436**	0.417**	0.404**	0.337**	0.316**
	(0.0209)	(0.0339)	(0.0354)	(0.0307)	(0.0403)
Judic. quality Nat. Res.: $\mathbb{1}_{i\in\{\text{NR}\}}z_i^{rs'}Q_c$	-0.135**	-0.0850**	-0.0799**	-0.0731**	-0.0802**
	(0.0121)	(0.0191)	(0.0192)	(0.0151)	(0.0198)
Skill interaction: h_iH_c			0.111**		0.106**
			(0.0160)		(0.0168)
Capital interaction: k_iK_c			0.0608*		0.0238
			(0.0289)		(0.0387)
Log income × value added: $va_i \ln y_c$				-0.230**	-0.288**
				(0.0473)	(0.0674)
Log income × intra-industry trade: $iit_i \ln y_c$				0.550**	0.523**
				(0.0403)	(0.0565)
Log income × TFP growth: $\Delta tpf_i \ln y_c$				0.000198	-0.0525
				(0.0323)	(0.0488)
Log credit/GDP × capital: k_iCR_c				-0.00760	-0.000601
				(0.0114)	(0.0184)
Log income × input variety: $(1-hi_i)\ln y_c$				0.373**	0.492**
				(0.0769)	(0.106)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	22598	10976	10976	15737	10816
R^2	0.726	0.758	0.759	0.766	0.761

Robust standard errors in parentheses

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