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Better legal institutions: An intertemporal effect on export composition

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Abstract

The quality of a country's legal institutions is an important source of comparative advantage, yet few studies look at how this source of comparative advantage develops over time. Using export data from 1996 - 2016, I examine the intertemporal effect of an improvement in a country's legal institutions on its export composition. I do this by exploiting variation in the quality of these institutions prompted by the conditionality of European Union membership. I find evidence that, in both the short and long run, countries that improve their legal institutions shift their export compositions towards industries more reliant on the attributes of good legal institutions. I also find evidence that this effect is weaker for countries where legal institutions were already strong.

1   Introduction

Studies on the relationship between legal institutions and economic outcomes primarily rely on the examination of their cross-country correlations, often using cross-country correlations from only a single year to draw inferences about this relationship.[1] However, legal institutions can change in their quality or implementation, and the effects of such changes cannot be studied using cross-country comparisons from a single year alone. Yet relatively few studies take the necessary approach of comparing countries across multiple years in order to study how changes to legal institutions affect economic outcomes. This paper aims to help fill this gap by examining the economic consequences of improvements to the quality of a country's legal institutions (hereafter "legal quality") on its export composition.

Good legal institutions have many attributes such as good contract enforcement, popular observance of the law, secure property rights, and fair courts. Since certain industries rely more on these attributes than others, countries with good legal quality have a comparative advantage in these industries over countries with poorer legal quality (Nunn 2007). Firms operating in industries that use inputs bought on thin markets typically enter into contracts with input producers. This mitigates the possibility that firms will be held up by input producers. Therefore, industries that source a greater proportion of their inputs from thin markets must rely on contracts and the legal institutions that enforce them to a greater degree relative to other industries (Nöldeke and Schmidt 1995). Following Nunn (2007), I refer to industries that source a high proportion of their inputs from thin markets as contract intensive.[2] Plausibly, one effect of an improvement in a country's legal quality is an increase in the export shares of its contract intensive industries, shifting the overall export composition of the country towards such industries; however, testing this hypothesis is difficult due to the endogenous nature of this relationship. Endogeniety in this setting is likely as causality could manifest in either direction. While countries that improve their legal quality may start exporting more in contract intensive industries, countries increasing their exports in contract intensive industries have a greater incentive to improve their legal quality. To overcome the likely presence of endogeniety, I exploit the variation in legal quality prompted by the conditionality of European Union (EU) membership.

The 2004-2007 enlargement of the EU constituted its largest expansion to date, growing the EU from 15 countries in 2003 to 27 in 2007. The 12 countries that joined the EU during this expansion (hereafter "candidate states") are Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, and Slovenia. In the early 1990s, the candidate states applied for EU membership and began working towards meeting the conditions for EU membership. These conditions broadly concern the development of strong and stable market, political, and legal institutions.[3] To this end, the candidate states greatly improved the quality of their institutions (Roland 2004, Fischer and Sahay 2000). On average, the candidate states saw larger improvements in legal quality as compared to other countries from 1996 to 2016 (Figure 1). These larger improvements in the legal quality of candidate states induced by EU membership requirements can serve as a natural experiment to test hypotheses about the effects of improved legal quality on economic outcomes. Utilizing the variation spurred by EU membership requirements is

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[1]La Porta et al. (2008) and Nunn and Trefler (2014) provide comprehensive overviews of this literature.

[2]Examples of contract intensive industries are musical instrument manufacturing, light truck manufacturing, and book publishing. Examples of non-contract intensive industries are poultry processing, primary aluminum production, and rice milling (Nunn 2007).

[3]Details about these conditions are available on the European Neighbourhood Policy And Enlargement Negotiations website at https://ec.europa.eu/neighbourhood-enlargement/policy/conditions-membership_en
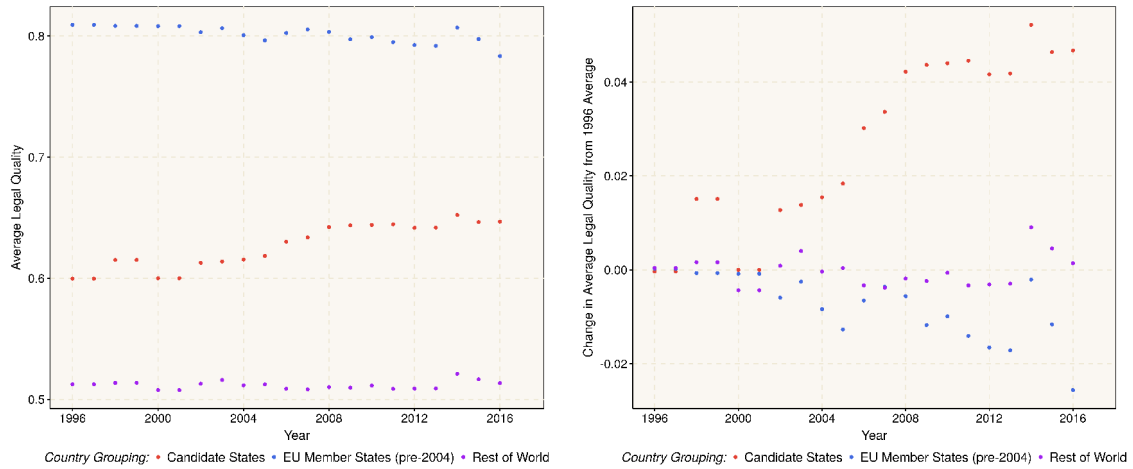
Figure 1. Average legal quality (left) and change in average legal quality from the 1996 average (right) by country grouping. Blue, red, and purple dots indicate the average legal quality (left) and change in average legal quality relative to the 1996 average (right) of pre-2004 EU member states, candidate states, and all other countries respectively.

attractive in this context, as the endogeniety caused by reverse causality is not likely here; rather, these increases in legal quality are components of larger political projects in candidate states to implement the necessary reforms to meet the conditions for EU membership (Schimmelfennig 2008). Although assignment to EU candidacy status is not random, using propensity score matching, I can use this variation in legal quality to compare changes in the export shares of candidate states to those of countries with similar characteristics other than changes to their legal quality.

2   The Data

The data consists of export values, country characteristics, and industry characteristics spanning the years 1996-2016 for 148 countries. The data on exports comes from UN Comtrade, data on GDP per capita and factor endowments comes from Penn World Table, and trade openness data comes from the World Bank. My country-level measure of legal quality is the "rule of law" indicator from the World Governance Indicators, normalized to range from 0 to 1. This indicator is an aggregate measure of the quality of contract enforcement, popular observance of the law, strength of property rights, and judicial impartiality (Kaufmann et al. 2009). Larger values indicate higher legal quality. For my measure of financial development, I use the comprehensive IMF Financial Development Index. The methodology used to create this index is outlined in Svirydzenka (2016). My industry-level measure of reliance on domestic legal quality is the widely adopted contract intensity measure developed by Nunn (2007). Contract intensity ranges from 0 to 1, with larger values indicating a higher degree of reliance on legal quality. Since contract intensity is computed using the 1997 BEA Input-Output Tables, I aggregate the exports data to the industry classification used in these tables. There are 252 industries at this level of disaggregation.

3   Estimation strategy

I estimate propensity score matched regressions following the methodology used in Nunn (2007) and Ma et al. (2010). First, I estimate the propensity score for each country using the probit model in equation (1), where Φ denotes the cumulative distribution function of the Normal$(0, 1)$ distribution and EU_c denotes a dummy variable equal to 1 if country c is a candidate state. $\mathbf{X}_c$ is a vector of country-level covariates that will be used to match countries.

$$\mathbb{P}(\text{EU}_c = 1 | \mathbf{X}_c) = \Phi(\mathbf{X}_c' \beta) \tag{1}$$

I then match each candidate state j to a non-candidate state k by the formula below, where $\hat{\mathcal{F}}_c$ denotes the estimated propensity score for country c.

$$k = \underset{c : \text{EU}_c = 0}{\text{argmin}} |\hat{\mathcal{F}}_j - \hat{\mathcal{F}}_c|$$

I denote the percentage of the value of country j's total exports in year s that is produced by industry i as $\text{ExportShare}_{i,j,s}$. Define $y^t_{i,(j,k)}$, where i denotes an industry, (j, k) a matched country pair where $\text{EU}_j = 1$ and $\text{EU}_k = 0$, and t a year as follows.

$$y^t_{i,(j,k)} = \left(\text{ExportShare}_{i,j,t} - \text{ExportShare}_{i,j,1996} \right) - \left(\text{ExportShare}_{i,k,t} - \text{ExportShare}_{i,k,1996} \right) \tag{2}$$

We can think of $y^t_{i,(j,k)}$ as a difference-in-difference, comparing the changes in export shares for industry i between similar countries differing by their changes in legal quality. Lastly, I estimate equation (3) by OLS, where $\alpha_{(j,k)}$ is a country pair fixed effect, z_i is the contract intensity of industry i, and $\varepsilon_{i,(j,k)}$ is an error term. I primarily focus on sign of β. Positive β suggests countries respond to improved legal quality by exporting more in contract intensive industries.[4] I expect low R^2 from the regressions as most export shares in the sample are very persistent across time, hence $y^t_{i,(j,k)}$ will be close to 0 for most observations.

$$y^t_{i,(j,k)} = \alpha_{(j,k)} + \beta z_i + \varepsilon_{i,(j,k)} \tag{3}$$

10 of the 12 candidate states were transition economies in the 1990s.[5] In making their transitions, these countries reformed their market and political institutions, implementing policies of market liberalization, price stabilization, and government reform. I chose the year 1996 as a point of comparison since, by 1996, the economic and political conditions in the transitioning candidate states had stabilized (Fischer and Sahay 2000, Roland 2004). The non-transition candidate states did not pursue these policies and already possessed sufficiently high legal quality.[6]

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[4]Due to how z_i is constructed, β likely captures the effect of a change in legal quality rather than changes in the quality of other institutions. z_i is computed as the fraction of inputs used by industry i which are sold on thin markets. Typically, firms enter into contracts with producers in input markets that are thin to avoid the possibility of being held-up by the input producers. (Nöldeke and Schmidt 1995, Nunn 2007). The higher z_i is, the more firms in industry i must rely on contracts and the legal institutions that enforce them.

[5]Transition economies are countries making the transition from a planned economy to a market economy. The only non-transition candidate states are Cyprus and Malta.

[6]In 1996, Cyprus and Malta had legal quality comparable to Spain.

4 Results and concluding remarks

Estimates of the coefficient β in equation (3) are presented in table 1. The dependent variables in my regressions are $y_{i,(j,k)}^{2016}$ and $y_{i,(j,k)}^{2003}$. Regressions using $y_{i,(j,k)}^{2003}$ as the dependent variable are intended to control for the benefits of EU membership.[7] In the top half of the table, countries are matched by the long-run growth of GDP per capita, financial development, factor endowments, and trade openness in columns 1, 2, 3, and 4 respectively.[8] In the fifth column, countries are matched using the long-run growth of all the variables used in columns 1-4. However, this specification neglects important information contained in the initial 1996 levels of these variables. To account for this, in the bottom half of the table, countries are matched both by the long-run growth and the 1996 level of GDP per capita, financial development, factor endowments, and trade openness in columns 1, 2, 3, and 4 respectively. In the fifth column, countries are matched using the long-run growth and the 1996 levels of all the variables used in columns 1-4.

I take the estimates from column 5 to be the most reliable since, intuitively, matching on several key country characteristics will produce better country matches as compared to matching on just a single country characteristic. This model comparison intuition is confirmed by the results of likelihood ratio tests that compare, for each half of table 1, the probit used in column 5 to probits used in other columns. In table 2, I use the estimates in the fifth column of table 1 obtained using the both 1996 levels and long-run growth as baselines. In columns 2 and 3, I estimate β separately for transition and non-transition candidate states. In columns 4 and 5, to avoid comparing industries in which matched countries have negligible export shares, I restrict the regressions for transition and non-transition candidate states to industry-country pairs where the industry export shares in both matched countries are above the sample median in either 1996 or 2016 when $y_{i,(j,k)}^{2016}$ is the dependent variable and in either 1996 or 2003 when $y_{i,(j,k)}^{2003}$ is the dependent variable.

Since the countries were matched along various important determinants of trade, I can compare candidate states to countries with similar relevant characteristics. The statistically significant and positive estimates of β in the fifth column of table 1 provide evidence that countries that improve their legal quality increase their export shares in contract intensive industries. Even in the short-run (7 years), my estimates for β are significant and positive, demonstrating the speed with which changes in legal quality can affect export shares. These changes shift the overall export compositions of countries towards contract intensive industries. The generally larger estimates of β when $y_{i,(j,k)}^{2016}$ is the dependent variable suggest further improvements in legal quality, potentially combined with the benefits of EU membership, further increased export shares in contract intensive industries. Turning to table 2, the larger estimates of β for the transition candidate states compared to the non-transition candidate states, where legal quality was already high in 1996, corroborates the idea that improved legal quality produced the observed shift in export shares. In fact, estimates of β on regressions using only non-transition candidate states are not statistically different from 0. Lastly, restricting the regressions to non-negligible export shares in columns 4 and 5 produces similar results.

This paper finds evidence that the export composition of a country is responsive to changes in its legal quality in the short and long run. Using variation in legal quality induced by the conditions of EU membership, I find countries that improve their legal quality increase their export shares in industries more reliant on their domestic legal institutions. Since a country's export often mirrors its output, my findings suggest improved legal quality has similar effects on output composition.

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[7]The year 2003 is the final year before any of the candidate states joined the EU.

[8]I use the 20-year difference (1996 to 2016) to compute long-run growth.

Table I. Estimates of β in equation (3)

	(1) GDP per Capita	(2) Financial Development	(3) Factor Endowments	(4) Trade Openness	(5) All variables
Countries matched by the long-run growth of:					
Independent variable: $y_{i,(j,k)}^{2016}$					
Contract Intensity: z_i	0.361* (0.197)	0.085 (0.271)	0.352 (0.266)	0.579** (0.268)	0.699** (0.347)
R^2	0.0008	0.0001	0.0014	0.0037	0.0032
Independent variable: $y_{i,(j,k)}^{2003}$					
Contract Intensity: z_i	0.321 (0.198)	-0.226 (0.430)	0.156 (0.139)	0.054 (0.187)	0.533** (0.271)
R^2	0.0016	0.0005	0.0004	0.0001	0.0023
Likelihood ratio statistic	23.433	25.958	23.488	13.618	-
p-value	0.000	0.000	0.000	0.003	-

	(1) GDP per Capita	(2) Financial Development	(3) Factor Endowments	(4) Trade Openness	(5) All variables
Countries matched by the long-run growth and 1996 level of:					
Independent variable: $y_{i,(j,k)}^{2016}$					
Contract Intensity: z_i	0.460** (0.231)	0.226 (0.224)	0.666*** (0.231)	0.532 (0.330)	0.956** (0.435)
R^2	0.0026	0.0004	0.0082	0.0040	0.0111
Independent variable: $y_{i,(j,k)}^{2003}$					
Contract Intensity: z_i	0.193 (0.173)	-0.099 (0.319)	0.149 (0.107)	0.192 (0.300)	0.421** (0.200)
R^2	0.0009	0.0001	0.008	0.0006	0.0061
Likelihood ratio statistic	46.846	54.989	36.018	39.852	-
p-value	0.000	0.000	0.000	0.000	-

The covariate(s) used to estimate the propensity score indicated below the column number. The number of observations in each regression is 3024. Heteroskedasticity robust standard errors adjusted for industry-level clustering in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level respectively. For each half of the table and in each column, likelihood ratio statistic is computed as twice the difference of the log-likelihoods of the probit model including all variables and probit model including only the variables indicated below the column number.

Table II. Estimation of β in equation (3) by subsamples

	(1)	(2)	(3)	(4)	(5)
				Transition &	Non-Transition &
	Baseline	Transition	Non-Transition	Top 50%	Top 50%
Independent variable: $y_{i,(j,k)}^{2016}$					
Contract Intensity: z_i	0.956**	1.164**	-0.084	2.293**	1.211
	(0.435)	(0.492)	(0.627)	(0.949)	(2.854)
R^2	0.0111	0.0192	0.0001	0.0391	0.0153
Observations	3024	2520	504	1192	122
Independent variable: $y_{i,(j,k)}^{2003}$					
Contract Intensity: z_i	0.421**	0.543**	-0.187	1.243**	0.005
	(0.200)	(0.239)	(0.151)	(0.554)	(0.997)
R^2	0.0061	0.0099	0.0014	0.0245	0.0171
Observations	3024	2520	504	1062	122

Heteroskedasticity robust standard errors adjusted for industry-level clustering in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level respectively.

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