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The Differential Impact of Legal Origins on Firm Productivity

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Abstract

This paper examines the differential impact of legal origins on the distribution of firm-level total factor productivity (TFP) using a novel grouped-quantile treatment model with group-level unobservable characteristics. Using firm-level data across 51 countries from the World Bank Enterprise Survey, we find that firm-level TFP is higher on average in countries with common-law systems, especially in low-income countries. This impact is not uniform across the TFP distribution, with stronger impacts among high-productivity firms. Given the relatively low levels of international competitiveness among firms in low-income countries, this finding has important implications for their capability to break into export markets and create high-quality jobs. For the possible mechanisms of how legal origins affect firms' TFP, we find that common-law countries have lower business obstacles as reflected in more favorable legal rules and regulations for access to finance, less corruption, less crime, less informality, and better tax administration.

1. Introduction

The world's two predominantly secular legal traditions are common law and civil law.[1] Common law has its roots in British law while civil law has its origin in French law. These two legal traditions expanded to the rest of the world primarily through conquest and colonialization, and many countries kept their legal traditions after independence (La Porta, Lopez-de-Silanes, and Shleifer 2008). In the last few decades, following the seminal studies by La Porta et al. (1997, 2002), several studies have demonstrated the pervasive influence of legal origins on the quality of legal rules and regulations, and these in turn affect various economic

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[1] The civil law has its own subtraditions: French, German, socialist, and Scandinavian.

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outcomes. Compared with civil-law countries, common-law countries are associated with improved financial development, less state interventionism in the economy, lower formalism of judicial procedures, greater judicial independence, better contract enforcement, and greater security of property (Mahoney 2001; Beck, Demirgüç-Kunt, and Levine 2003; Djankov et al. 2002; Botero et al. 2004; Mulligan and Shleifer 2005; Pistor 2005). However, few studies explore the effect of legal origins at the micro level, for example, on firm-level productivity.

In this paper, we investigate the impact of legal origins on firms' total factor productivity (TFP) across countries. We also examine whether its effect varies across the firms' productivity distribution, which has important implications for their access to export markets and the creation of high-quality jobs, among other productivity-related outcomes (Atkin, Khandelwal, and Osman 2017; Girma, Greenaway, and Kneller 2004; Van Biesebroeck 2005; Bigsten and Gebreeyesus 2009). Furthermore, we examine the possible mechanisms of how legal origins affect firms' TFP. The literature has highlighted that a country's legal origin influences many spheres of laws and regulations that govern the economy and affect its business climate. We explore these potential mechanisms by emphasizing seven business environment indicators: access to finance, informality, crime, tax rates, tax administration, political instability, and corruption.

Identifying the impact of legal origins on firms' productivity is econometrically challenging for at least two reasons. First, the legal origin is measured at the country level, while our outcome variable—firm productivity—is measured at the firm level. Therefore, the effect of legal origin cannot be identified using standard country fixed-effect estimation techniques as the within-group transformation removes the firm-invariant legal origin. Second, the substantial heterogeneity in firm productivity implies the need to use a distribution-type approach such as quantile regression. However, because of the presence of group-level unobservable characteristics such as country fixed effects, standard quantile regression methods will be inconsistent as they do not address the confounding effects of such unobservables. Therefore, we employ the novel grouped-quantile regression approach recently proposed by Chetverikov, Larsen, and Palmer (2016). The method estimates the effect of group-level treatment (legal origin) that varies at the group level (country) on a micro-level outcome of interest (firm TFP in each country), while controlling for group-level unobservables (country fixed effects).

We find that firms in countries with common-law systems have a higher TFP level, on average, than firms in countries with other legal systems. This finding is in line with the existing literature that firms in countries with common-law systems are more productive on average (Mahoney 2001). The impact is not uniform across the TFP distribution, however, and is higher for more productive firms. And these findings hold specifically for low-income countries, where weak property rights and contract enforcement are the rule, and the stronger property

rights and more efficient contract enforcement following from common law will be especially beneficial.[2]

These results hold while controlling for a wide range of firm-level and country-level characteristics that have been shown to be correlated with firm-level productivity and country fixed effects.[3] This suggests that legal status remains an important explanatory factor even after controlling for a wide range of other factors affecting firm-level productivity.[4]

We run several exercises to check the robustness of the paper's findings. First, we include a measure of institutional quality to check whether legal origin is merely a proxy for better institutions. We further include the country's governmental system (presidential or parliamentary) to control for another possible confounder. Second, we also examine whether this result is robust to excluding European countries. Finally, we redo the analysis with an alternative measure of TFP. These analyses suggest a robust common-law effect on the most productive firms in low-income countries.

To explore the potential mechanisms that can explain the effect of legal origins on firms' productivity, we estimate the relationship between legal origins and business environment measures. We consider seven business constraints: access to finance, informality, crime, tax administration, tax rates, political instability, and corruption. For each constraint the coefficient on common law is negative, and it is also statistically significant for most constraints (and for the average constraint). Therefore, firms operating in countries with common-law systems appear to be less likely to face constraints on their operations, consistent with the literature on legal origins. While we do not exclude the possibility that other mechanisms are also at play, this finding suggests that the business environment is one channel through which legal origins affect firms' productivity.

This study contributes to the literature on the economic consequences of legal origins. The literature documents that legal origins influence legal rules and rules on market regulation, labor laws, and so on, which in turn affect various economic outcomes. La Porta, Lopez-de-Silanes, and Shleifer (2008) summarize the literature on the economic consequences of legal origins. Fisman and Allende (2010) show that entry regulations, influenced by legal origins, distort industry structure and promote concentration. Klapper, Laeven, and Rajan (2006) and Djankov, McLiesh, and Shleifer (2007) show that high entry regulations in civil

[2] We are grateful to the editor for pointing out the importance of this source of heterogeneity.

[3] Firm-level controls included in the base specification are for firm size, firm age, exporting status, and foreign ownership. Country-level controls are for whether the country is landlocked, per capita income, gross domestic product (GDP), education level, openness, and (ethnic, linguistic, and religious) fractionalization.

[4] Legal status may have indirect effects as well, for example by affecting GDP, but we are not trying to disentangle how much of the firm-level productivity effects can be attributed to indirect legal origin effects. This would involve estimating a (large) system of equations not only for total factor productivity (TFP) but also for each control variable, which would involve many additional structural assumptions. Hence, it is important to note that our legal origin effect is conditional on important other factors that may also directly affect firm productivity, that is, unexplained firm-level productivity differentials.

law hamper firms' entry. Beck, Demirgüç-Kunt, and Levine (2003) present evidence that legal origins matter for financial development because legal traditions differ in their ability to adapt efficiently to evolving economic conditions. This study contributes to the literature by analyzing whether the impact of a country's legal origin varies across the firm productivity distribution, which has implications for access to export markets, high-quality jobs, and other outcomes. We also contribute to the literature by using highly disaggregated firm-level data and applying a novel econometrics approach from Chetverikov, Larsen, and Palmer (2016) to estimate the impact of legal origins on firms' productivity.

This study is also related to the strand of literature that attempts to explain the large and sustained productivity differences across countries (Hsieh and Klenow 2009; Syverson 2011). At the macro level, the existing literature has highlighted several factors that might account for the differences in the level of productivity across countries, including geography, climate, institutions, and culture (Acemoglu, Johnson, and Robinson 2001, 2002). More recent literature argues that the variation in TFP across countries could be driven by the misallocation of inputs across firms and industries (Hsieh and Klenow 2009, 2010; Bartelsman, Haltiwanger, and Scarpetta 2013; Restuccia 2019; Midrigan and Xu 2014). This paper contributes to this literature by focusing on the role of legal origins in explaining productivity differences.

The remainder of the paper is organized as follows. Section 2 presents the empirical approach. It starts by discussing the econometrics specification of the grouped-quantile regression approach. It then discusses the data sources used for the empirical analysis and presents methods used to estimate firm-level TFP. Section 3 presents the main empirical results. Section 4 presents the potential mechanisms that can explain the effect of legal origins on firms' productivity. Section 5 provides several robustness checks to confirm the validity of the main empirical results. Section 6 concludes.

2. Methodology

We use the grouped-quantile regression approach developed by Chetverikov, Larsen, and Palmer (2016). The methodology is appropriate with data for a group-level treatment and microdata on the outcome of interest within each group. The approach estimates the distributional effects of a group-level treatment on the within-groups micro-level outcome of interest while controlling for group-level unobservables. In our case, the group is a country, and the within-group micro-level outcome of interest is the firm's TFP.[5] Our group-level treatment is legal origin, which varies across countries but is the same for a firm's TFP. In addition to the group-level treatment variable legal origin, variables are divided into two categories. The first is the group-level variables, such as gross domestic product

[5] For clarity we ignore here (without loss of generality) that we have TFP estimates for a number of countries across multiple (survey) years. In the empirical analysis we can and will define groups as country-year pairs and control for country-year fixed effects.

(GDP) and institutional quality. The second is the individual-level variables (also known as micro-level covariates), such as firm age, ownership, and so on.

2.1. Model Specification

We now specify the quantile treatment model with group-level unobservables as proposed by Chetverikov, Larsen, and Palmer (2016) to identify the effect of legal origins on firm-level TFP with cross-country firm-level data. Let $\text{TFP}_{i\tau c}$ be the TFP of firm i in industry τ in country c, and let μ denote the set of quantile indices. The μth quantile main empirical specification for the response variable $\text{TFP}_{i\tau c}$ can be represented as

$$Q_{\text{TFP}_{i\tau c}|L_c, \boldsymbol{X}_{i\tau c}, Z_c, \varepsilon_c(\mu)} = L_c\beta(\mu) + \boldsymbol{X}'_{i\tau c}\boldsymbol{\gamma}(\mu) + \boldsymbol{Z}'_c\delta(\mu) + \varepsilon_c(\mu),\ \mu \in U(0, 1), \quad (1)$$

where $Q_{\text{TFP}_{i\tau c}|L_c, \boldsymbol{X}_{i\tau c}, Z_c, \varepsilon_c(\mu)}$ is the μth conditional quantile of $\text{TFP}_{i\tau c}$ given (L_c, $\boldsymbol{X}_{i\tau c}$, $\boldsymbol{Z}_c$, ε_c), L_c, is a group-level indicator of legal origin equal to one if the country has a common-law legal origin and equal to zero if it has another origin, and $\boldsymbol{Z}_c$ is a vector of observable group-level covariates (that is, country-level variables) that also contains a constant. The group-level covariates include GDP, per capita income, whether the country is landlocked, education, trade openness, and various measures of fractionalization in the base specification (see Section 2.4 for more detail). The unobserved term ε_c is a set of group-level random scalar shifters, and U is a set of quantile indices of interest. Our parameter of interest $\beta(\mu)$ measures the effect of the legal origin on the firm TFP distribution at the μth conditional quantile.

As specification (1) is cross-sectional, we interpret $\beta(\mu)$ as the common effect of the legal origin (treatment variable) at the μth quantile of firm TFP for all countries in the sample. The vector $\boldsymbol{\gamma}(\mu)$ represents the effect of individual-level covariates $\boldsymbol{X}_{i\tau c}$.

2.2. Quantile Regression for Group-Level Treatments

We implement the grouped-quantile methodology with two steps as follows:

Step 1. The first stage consists of using a grouped-quantile approach to regress the dependent variable $\text{TFP}_{i\tau c}$ on individual-level covariates for each group and a constant. For each group and quantile, the resulting constant is saved, and the data are collapsed at the group level. In other words, for each country c with N_c firm-level observations and each quantile μ from the set of U of indices of interest, we estimate the μth quantile regression of $\text{TFP}_{i\tau c}$ on $\boldsymbol{X}_{i\tau c}$ using the data $\{(\text{TFP}_{i\tau c}, \boldsymbol{X}_{i\tau c}): i = 1, \ldots, N_c\}$ and adding a constant term α by the classical quantile regression estimator of Koenker and Bassett (1978):

$$\{\hat{\alpha}_c(\mu), \hat{\boldsymbol{\gamma}}(\mu)\} = \underset{\alpha,\gamma\in R}{\arg\min} \sum_{i=1}^{N_c} p_\mu(\text{TFP}_{i\tau c} - \boldsymbol{X}'_{i\tau c}\boldsymbol{\gamma}(\mu) - \alpha_c(\mu)), \quad (2)$$

where $p_\mu(x) = (\mu - 1[x < 0])x$ for $x \in \mathbb{R}$. In this stage, we obtain estimates of

$\hat{\boldsymbol{\gamma}}(\mu)$ and the country-specific effects $\hat{\alpha}_c(\mu)$ capturing $L_c\beta(\mu) + \boldsymbol{Z}_c'\delta(\mu) + \varepsilon_c(\mu)$.[6] The country-specific effects $\hat{\alpha}_c(\mu)$ represent each country's μth conditional quantile estimate after washing out the effects from firm-level observable covariates. Hence, the first stage uses only data for one country at a time, where the unit of observation is the firm. Given that there is no country variation in the single first-stage regressions, $E[L_c\varepsilon_c(\mu)] = E[\boldsymbol{Z}_c\varepsilon_c(\mu)] = 0$, and $\hat{\alpha}_c(\mu)$ and $\hat{\boldsymbol{\gamma}}(\mu)$ are consistent.

Step 2. In the second stage, the constants from the first stage, $\hat{\alpha}_c(\mu)$, are regressed on the variable of interest, legal origin, with an ordinary least squares (OLS) model with one observation per group. Hence, for the second stage we assume $E[L_c\varepsilon_c(\mu)] = 0$ for all $\mu \in U$, that is, legal origin is uncorrelated with unobserved country-specific effects. This has been commonly assumed in the literature, with the common-law tradition, originating in England, spreading through conquest and colonization to various countries, including the United States, Australia, Canada, and several African and Asian nations. Similarly, the civil-law tradition, rooted in Roman law and adopted by continental states like France, was exported through conquest, colonization, and the influence of Napoleon to regions such as Europe, Latin America, Africa, and Asia (Glaeser and Shleifer 2002; La Porta, Lopez-de-Silanes, and Shleifer 2008). In this sense, legal origin can be seen as an exogenous variable to the current business activities and productivity of firms shaped by historical processes.

However, legal origin may also proxy for other factors such as culture, religion, and institutions affecting firm-level productivity (Beck, Demirgüç-Kunt, and Levine 2003), and therefore we control for a wide range of potentially confounding group-level factors (and a constant) in the second-stage regression ($\boldsymbol{Z}_c$). Also, we verify whether the estimation results are robust to excluding European countries, where the legal traditions originated.[7]

In this study, we focus on 51 countries ($C = 51$) with at least 100 firms ($N_c \geq 100$), which is considerably larger than the sample sizes examined in the simulation exercises of Chetverikov, Larsen, and Palmer (2016). There, the authors demonstrate that the estimator performs well in terms of bias with even smaller samples than ours.

Compared with a mean regression approach and fixed-effects estimation, the grouped-quantile regression approach of Chetverikov, Larsen, and Palmer (2016) to identify the effect of legal origin on firm-level TFP with cross-country firm-level data is advantageous for two reasons. First, classic fixed-effects estimation is not

[6] Because of the country-by-country estimation, the estimates for γ are country specific, but Chetverikov, Larsen, and Palmer (2016) note that the potential loss of efficiency allows for a computationally much less demanding estimation method.

[7] The grouped-quantile treatment model also suggests the use of internal instruments (for example, the mean of firm-level covariates). For this one needs to assume that at least one of the firm-level control variables $\boldsymbol{X}_{irc}$, say $X_{irc,k}$, is uncorrelated with the unobserved group-level effects, that is, $E[X_{irc,k}\varepsilon_c(\mu)] = 0$ for all $\mu \in U$. In that case, for example, $N_c^{-1}\sum_{i=1}^{N_c} X_{irc,k}$ can be used as an instrument (Chetverikov, Larsen, and Palmer 2016, p. 814). It is not a priori clear, however, that our firm-level covariates firm size, firm age, ownership, and exporting status can be assumed to be uncorrelated with the unobserved country-year effects, considering that countries have very different industrial structures plausibly reflecting omitted factors. Hence, we have not opted for the use of internal instruments.

feasible in our setting because the main explanatory variable of legal origin is firm invariant and is eliminated by the within-group transformation. In the presence of country-level unobservables, the use of standard quantile regression techniques, such as the methodology of Koenker and Bassett (1978), is also inconsistent (Chetverikov, Larsen, and Palmer 2016). This is true even if the country-level treatment variable (L_c) is exogenous. Recently Kato, Galvao, and Montes-Rojas (2012) and Galvao and Kato (2016) expand the regression approach of Koenker and Bassett (1978), but their focus is on estimating the coefficient of an individual-level explanatory variable, rather than a group-level treatment variable. As such they apply a within-group transformation to eliminate the country-level unobservable. In our setting, however, the variable of interest is a group-level variable, legal origin. Therefore, the methodology in Chetverikov, Larsen, and Palmer (2016) allows for the estimation of the effects of legal origins on firm productivity in the presence of country-level unobservables.

Second, in contrast to the mean regression approach, quantile regression allows for heterogeneous effects of legal origins across the distribution of TFP by estimating $\beta(\mu)$, using several values of μ, $\mu \in U(0, 1)$. Common-law countries tend to have more dynamic private sectors, and this will affect firms' productivity through selection, reallocation, and efficiency effects (Backus 2020). While selection effects suggest that the productivity of firms at the lower tail of the TFP distribution will be higher, improved reallocation effects will tend to benefit firms at the upper tail of the TFP distribution. Hence, while the net distributional effect is a priori unknown, there is no reason to expect the effect of the common-law legal system to be uniform over the TFP distribution.

2.3. Estimating Firm-Level Total Factor Productivity

Data on TFP—the portion of output that cannot be directly attributed to the inputs utilized—are obtained from the World Bank Enterprise Survey (WBES), which has been widely employed (see, for example, Şeker and Saliola 2018; Grazzi and Pietrobelli 2016). The estimation of TFP consists of two stages.

Stage 1. The Cobb-Douglas production function is estimated for each industry, grouped by two-digit industry codes[8] over pooled economies. To accommodate heterogeneity, the elasticities of output with respect to capital, labor, and raw materials are allowed to vary by income-level grouping of the corresponding economy. The income levels are grouped according to the World Bank classification as of the year in which each survey was conducted. To account for economy-level and time-specific effects, dummy variables for each country and year are included:

$$\ln(Y_{i\tau c}) = C_{\tau} + \alpha_1 \ln(L_{i\tau c})\boldsymbol{I}_c + \alpha_2 \ln(K_{i\tau c})\boldsymbol{I}_c + \mathrm{FE}_c + \mathrm{FE}_y + \omega_{i\tau c}, \qquad (3)$$

where $\ln(Y_{i\tau c})$ is the log value of output (real annual sales of establishment); $\ln(L_{i\tau c})$ is the log value of labor inputs (proxied by total annual cost of labor); $\ln(K_{i\tau c})$ is the log value of capital (proxied by the replacement value of machinery,

[8] International Standard Industrial Classification of All Economic Activities rev. 2.

vehicles, and equipment); $\boldsymbol{I}_c$ is a vector of dummy variables for income group of the economy, indicating whether country c is in the high- or low-income group; FE_c and FE_y capture country and year fixed effects; C_τ is an industry-specific effect; and $\omega_{i\tau c}$ captures idiosyncratic shocks. We have also used the estimates of TFP based on an extension of the model that includes raw material $M_{i\tau c}$:

$$\begin{aligned}\ln(Y_{i\tau c}) = C_\tau + \alpha_1 \ln(L_{i\tau c})\boldsymbol{I}_c + \alpha_2 \ln(K_{i\tau c})\boldsymbol{I}_c + \alpha_3 \ln(M_{i\tau c})\boldsymbol{I}_c \\ + \text{FE}_c + \text{FE}_y + \omega_{i\tau c}.\end{aligned} \tag{4}$$

Stage 2. Data on firms' TFP are obtained as a Solow residual plus the fixed effects:

$$\widehat{\text{TFP}}_{i\tau c} = \hat{\omega}_{i\tau c} + \hat{C}_\tau + \widehat{\text{FE}}_c + \widehat{\text{FE}}_y, \tag{5}$$

where $\widehat{\text{TFP}}_{i\tau c} \in (\widehat{\text{TFP}}^{YKLM}_{i\tau c}, \widehat{\text{TFP}}^{YKL}_{i\tau c})$. Hence, we use two measures of productivity available from the WBES database: $\text{TFP}^{YKL}_{i\tau c}$, which is obtained from estimating equation (3) and does not include intermediate raw material inputs in the production function, and $\text{TFP}^{YKLM}_{i\tau c}$, a productivity measure that includes raw material inputs in the estimation (compare equation [4]).

2.4. Data

In our model, we use firm-level micro-level covariates and country-level macro-level covariates. The firm-level micro-level covariates are drawn from the WBES. The survey data are collected between 2006 and 2016 from more than 30,000 manufacturing firms in 93 countries in staggered waves by region.

The sampling design of the survey is based on a random sample of manufacturing firms with, mostly, at least five employees and stratified by sector, size, and geographic region. Inferences derived from the sample are thus representative of the manufacturing economy except for very small firms. The survey contains identical questions for all countries and industries. It provides exhaustive information on firms' commencement year, size, export status, sales, labor, capital, raw materials, and other relevant variables. The survey also provides revenue-based firm-level productivity estimates (World Bank 2017).

While the WBES database includes 93 countries and 149 country-year pairs (because some countries have surveys for multiple years), the survey sample size is rather small for some country-year observations. For the main analysis we work with the sample of 52 countries for which at least 100 observations are available in each survey (multiple surveys may be available), which results in 71 country-year pairs and 27,644 firm-level observations.[9]

The macro-level variables are collected from different sources. The treatment variable (that is, legal origin) is from La Porta et al. (1998). Data on GDP, per

[9] The precision of our results increases with the cutoff point for minimum sample size (results available on request). However, because of a trade-off between country coverage and precision we choose a conservative cutoff point of 100 observations to maximize country coverage while maintaining sufficient precision.

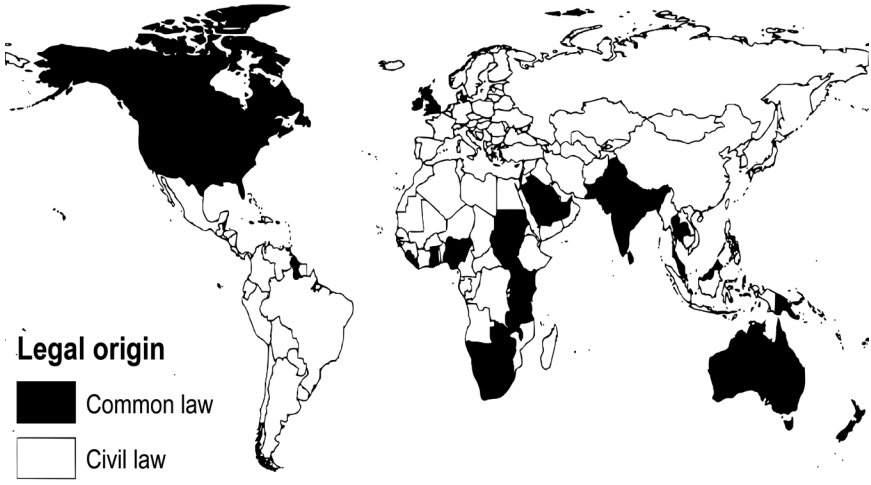

Figure 1. Distribution of legal origins

capita income, education, and openness are obtained from the World Development Indicators database. Ethnic, religious, and linguistic fractionalization measures are collected from the Center for Prospective Studies and International Information. Country-level controls include measures of institutional quality and governmental system (presidential or parliamentary) from the World Bank website.[10] Because of a few missing values among the country- and firm-level control variables, the actual estimations are carried out on a firm-level sample for 51 countries (69 country-year and 27,087 firm observations).[11]

Figure 1 shows the distribution of legal origin across countries and demonstrates that colonial history has played a major role in shaping legal systems. Most of the former French/Spanish colonies have civil-law systems, while most of the former British colonies have common-law systems. In Africa, the legal systems are nearly equally divided. In Latin America and the Caribbean, civil law is dominant. Civil law is also dominant in mainland Europe, central Europe, and central Asia.

3. Baseline Results

This section presents the results from estimating equation (1). Initially, we estimate the impact of common law with an OLS model that omits country fixed effects and the macro-level controls. Country fixed effects are omitted with the OLS model because they would wash out the common-law effect. Table 1 reports

[10] World Bank Group, Data Catalog, Database of Political Institutions (https://datacatalog.worldbank.org/search/dataset/0039819).

[11] The observations are primarily for low-income (20 country-year observations), lower-middle-income (23 country-year observations), and upper-middle-income countries (24 country-year observations).

the results.[12] Standard errors are robust and are clustered by country in all regressions.[13] We observe a statistically significant positive association between common law and firm TFP, and hence firms in common-law countries tend to have higher TFP on average. Comparison of the estimates in column 1 suggests that the common-law effect does not reflect firm-level differences in age, exporting status, foreign ownership, or firm size.

The grouped-quantile regression estimates in Table 1 allow for the inclusion of country fixed effects (columns 2–10). The chosen quantiles are deciles. Table 1 also includes the results from joint significance tests (p-values) of the common-law coefficients in terms of whether they are jointly different from zero and whether they are equal across the deciles. Considering the size of the coefficients and the very low p-values for both tests, we find a positive common-law effect on TFP that appears to be larger toward the upper tail of the TFP distribution, regardless of whether we control for firm-level differences in age, exporting status, foreign ownership, or firm size. Thus, the OLS regression approach would have missed these heterogeneous effects.

The results in Table 1 may suffer from two sources of omitted variable bias. First, apart from the common-law dummy, no country-level variables are included that may be correlated with common law while also affecting TFP. Second, the impact of common law is not necessarily the same across countries and especially across countries at different levels of institutional development. Poorer countries with weak institutions in particular can be expected to benefit from the advantages of common-law legal systems. Hence, there is no reason to expect an equal common-law effect in, say, the United States and Uganda. Also we allowed for technological heterogeneity across income groups in the estimation of TFP (Section 2.3), and similarly we may allow for heterogeneous common-law effects by level of development.

Therefore in Table 2 we estimate the effect of legal origin on TFP with the grouped-quantile regression model while including macro-level (country-level) covariates, namely, whether a country is landlocked (dummy); income per capita (log); GDP (log); education (tertiary enrollment rate); trade openness (ratio of exports plus imports to GDP); and measures of ethnic, linguistic, and religious fractionalization.[14] Moreover, an interaction term between common law and the per capita income level (log) is included. Also, the same firm-level controls as in Table 1 are included. First, the estimated common-law effects in Table 2 are strongly jointly significant (p-value = .006) with a monotonically increasing pat-

[12] The included firm-level covariates are the firm's age (log), whether the firm has any exports (dummy), whether the firm has at least 10 percent foreign ownership (dummy), whether the firm is of medium size (between 20 and 99 employees; dummy), and whether the firm is of large size (at least 100 employees; dummy).

[13] The clustering is done at the country level to account for possible within-country correlation across time for countries for which multiple survey waves are available.

[14] Several studies document that ethnic, linguistic, and religious fragmentation have a significant effect on the quality of government, policies, and business environment that in turn affect economic growth and firm-level productivity (Alesina and La Ferrara 2005; Bellini et al. 2013).

Table 1
The Effect of Legal Origin on Firm Productivity by Quantile

	OLS (1)	.1 (2)	.2 (3)	.3 (4)	.4 (5)	.5 (6)	.6 (7)	.7 (8)	.8 (9)	.9 (10)
No firm-level covariates:										
Common Law	.086*	.089	.066	.041	.055	.066	.082	.110	.154+	.193+
	(.040)	(.071)	(.055)	(.049)	(.047)	(.052)	(.057)	(.069)	(.084)	(.101)
Constant	1.711**	.957**	1.237**	1.416**	1.551**	1.677**	1.816**	1.979**	2.205**	2.571**
	(.026)	(.047)	(.034)	(.028)	(.024)	(.025)	(.029)	(.031)	(.038)	(.051)
R^2	.003	.023	.022	.011	.023	.028	.033	.044	.055	.051
χ^2-test joint significance (p-value)		.005								
χ^2-test equal effects (p-value)		.003								
Firm-level covariates:										
Common Law	.091*	.113	.098	.112+	.076	.085	.149+	.085	.176+	.166
	(.040)	(.119)	(.091)	(.066)	(.064)	(.082)	(.076)	(.071)	(.103)	(.153)
Constant	1.706**	.920**	1.202**	1.386**	1.510**	1.628**	1.746**	1.904**	2.091**	2.490**
	(.041)	(.065)	(.044)	(.038)	(.034)	(.033)	(.030)	(.040)	(.037)	(.080)
R^2	.011	.015	.020	.038	.022	.026	.083	.022	.058	.018
χ^2-test joint significance (p-value)		.006								
χ^2-test equal effects (p-value)		.005								
Country-year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. Robust standard errors clustered by country are in parentheses. Countries = 51; country-year pairs = 69; firms = 27,087. OLS = ordinary least squares.
+ $p < .10$.
* $p < .05$.
** $p < .01$.

tern across the TFP deciles (p-value = .046), which suggests that the impact of the common-law effect is the highest toward the upper tail. Second, the effect is significantly different across countries at different levels of development as shown by the joint significance of the interaction effects (p-value = .001). And third, the interaction terms show the opposite pattern from the individual common-law effects, which suggests that the increasing pattern of the common-law effect across the TFP distribution becomes less pronounced as countries develop.

Figure 2 shows the sign, size, and significance of the common-law effect across the TFP distribution by income group. The estimated common-law effect is shown by the solid lines, along with a pointwise 90 percent confidence interval around each grouped-quantile regression estimate. Here we estimate a smooth (linearized) version of the regression reported in Table 2 to capture the key patterns by country income group.[15] For each income group we take the average per capita income for the countries included in that group in the sample. Because the sample includes very few high-income countries, Figure 2 includes the estimated common-law effects for low-, lower-middle-, and upper-middle-income countries only.

The common-law effect is positive and significant in the top 25 percent of the TFP distribution in low-income countries; that is, the top quarter of most productive firms benefit from a country's common-law origin.[16] Also, the effect is increasing across the distribution, and the very best firms benefit the most from the presence of a common-law system. Specifically, the estimated marginal effect of legal origin at the 75th quantile of TFP is .225, while at the 95th quantile it is .341, about a 50 percent difference.

The patterns for the other income groups are strikingly different. A common-law system does not appear to benefit the more productive firms, and the estimated effects are not significant. Hence, while Figure 2 supports the finding in Table 1 that firms in countries with common-law systems tend to be more productive and that this effect is enhanced for more productive firms, it also clearly shows that this effect occurs especially in low-income countries.

4. Mechanisms: Legal Origins and the Business Climate

In this section, we examine the potential mechanisms that can explain the effect of legal origins on firms' productivity. The literature highlights some mechanisms through which common law may positively affect a firm's performance relative to civil law. A possible explanation (among others) is that a common-law system may increase the productive capacity of enterprises by relaxing the busi-

[15] Specifically, we estimate a pooled regression of all deciles with interaction terms for all independent variables, a variable representing the decile, and robust standard errors clustered by country. This effectively provides smooth (linear) distributional effects by income group. See Table A1 in the Appendix for the regression estimates.

[16] If we limit the estimation to country-year pairs with a sample size of at least 125 instead of 100 firms, the common-law effect is positive, increasing, and significant for the top 70 percent of the firms in low-income countries (results available on request). See note 9.

Table 2

The Effect of Legal Origins on Firm Productivity with Firm- and Country-Level Covariates by Quantile

	.1 (1)	.2 (2)	.3 (3)	.4 (4)	.5 (5)	.6 (6)	.7 (7)	.8 (8)	.9 (9)
Common Law	−1.000	−.718	.133	.161	.205	.409	.639	.890	1.796
	(.891)	(.669)	(.448)	(.483)	(.566)	(.620)	(.519)	(.589)	(1.166)
Common Law × PCI (log)	.126	.092	−.015	−.022	−.022	−.038	−.074	−.098	−.227
	(.113)	(.084)	(.055)	(.058)	(.070)	(.081)	(.070)	(.077)	(.154)
Landlocked	−.302*	−.106	−.027	−.001	−.052	.016	.071	−.067	−.026
	(.146)	(.165)	(.108)	(.099)	(.098)	(.100)	(.106)	(.128)	(.254)
PCI (log)	−.106	−.022	−.027	−.009	−.012	−.003	.017	.028	.209
	(.115)	(.075)	(.057)	(.051)	(.053)	(.054)	(.073)	(.076)	(.160)
GDP (log)	−.002	−.015	−.008	−.013	−.016	−.007	−.008	−.013	−.035
	(.050)	(.032)	(.024)	(.021)	(.021)	(.025)	(.029)	(.033)	(.064)
Education	.004	.003	.005+	.004+	.004+	.003	.003	−.000	−.004
	(.005)	(.003)	(.003)	(.002)	(.002)	(.002)	(.003)	(.003)	(.005)
Openness	−.143	.039	.040	−.003	.013	.063	.132	.107	.236
	(.129)	(.102)	(.077)	(.079)	(.089)	(.096)	(.093)	(.106)	(.193)
Ethnic Fractionalization	.251	.268	.178	−.009	−.090	−.068	−.071	−.124	−.064
	(.289)	(.210)	(.160)	(.166)	(.181)	(.162)	(.170)	(.189)	(.361)
Linguistic Fractionalization	.492*	.221	.243+	.257	.162	.070	.062	.119	.317
	(.235)	(.169)	(.141)	(.162)	(.176)	(.139)	(.164)	(.161)	(.345)
Religious Fractionalization	−.203	.224	.213	.213	.322*	.291+	.297+	.185	.229
	(.327)	(.206)	(.140)	(.133)	(.147)	(.151)	(.152)	(.194)	(.308)
Constant	2.010+	1.280	1.317+	1.665*	1.859**	1.584*	1.361+	1.810*	.869
	(1.167)	(.995)	(.686)	(.659)	(.680)	(.740)	(.732)	(.827)	(1.248)
R^2	.250	.217	.260	.213	.221	.218	.212	.120	.121

Note. All regressions include firm-level covariates and country-year fixed effects. Robust standard errors clustered by country are in parentheses. χ^2-test joint significance of Common Law effects (p-value) = .006; χ^2-test equal Common Law effects (p-value) = .046; χ^2-test Common Law × PCI interaction effects (p-value) = .001. Countries = 51; country-year pairs = 69; firms = 27,087.

+ $p < .10$.

* $p < .05$.

** $p < .01$.

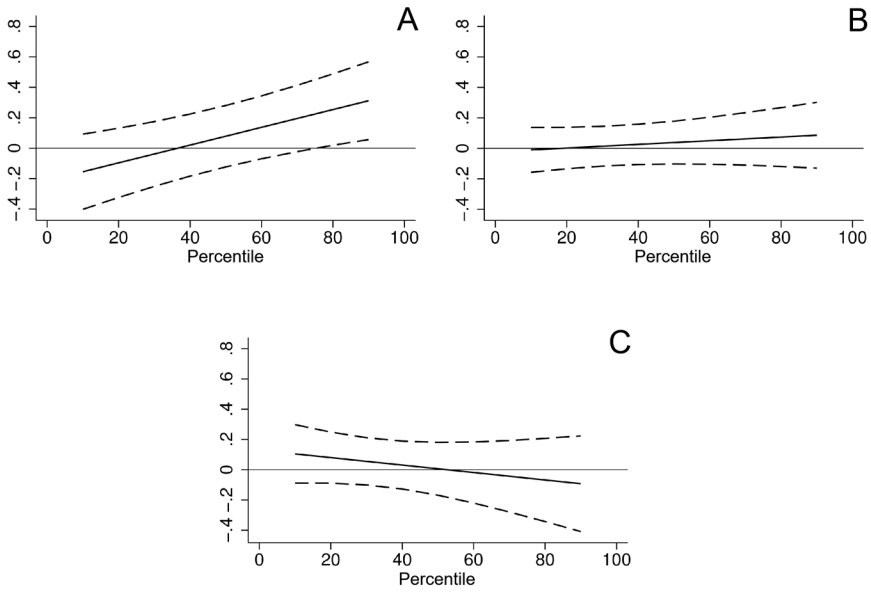

Figure 2. The effect of common law on firm total factor productivity (TFP). *A,* Low-income countries; *B,* lower-middle-income countries; *C,* upper-middle-income countries.

ness obstacles they face. A country's legal origin influences many spheres of law and regulations that govern investors and affect the business climate. We explore these potential mechanisms by emphasizing seven business environment indicators: access to finance, informality, crime, tax rates, tax administration, political instability, and corruption.

A growing literature suggests that cross-country differences in legal origin partly explain cross-country differences in financial development and access to credit. La Porta et al. (1998) and Beck, Demirgüç-Kunt, and Levine (2003) show that a country's legal origin affects commercial law, the development of banking and stock markets, and creditor rights. They argue that common law is associated with better investor protection and the ability to adapt efficiently to evolving economic conditions, which in turn are associated with improved financial development and better access to finance. In contrast, civil-law systems tend to promote the development of institutions that advance state power, which negatively impacts financial development. Similar studies also show that legal origins affect firms' debt maturity structure, access to external finance (Demirgüç-Kunt and Maksimovic 1996, 1998), and cross-firm capital allocation (Beck, Demirgüç-Kunt, and Levine 2003; Claessens and Laeven 2003). In addition, legal origins differ in terms of their responsiveness to changing socioeconomic conditions. Levin and Nicholson (2005) argue that common-law countries give greater respect for jurisprudence as a source of law compared with civil-law countries, which sug-

gests that a common-law system will be more adaptable to changing circumstances. The influence of legal origins is not restricted to finance but also affects property rights, regulation, and formalism of judicial procedures, which are in turn associated with better functioning labor markets, more secure property rights, and better contract enforcement (Djankov et al. 2002; La Porta et al. 2004).

In Table 3, we estimate the relationship between legal origins and business environment measures using OLS. Survey respondents were asked about the degree to which a specific aspect of the business environment formed an obstacle to the current operation of the firm, with possible responses of 0 ("no obstacle"), 1 ("minor obstacle"), 2 ("moderate obstacle"), 3 ("major obstacle"), or 4 ("very severe obstacle").[17] To reduce endogeneity concerns and also considering that the business environment is not firm specific, we estimate the regression at the country-year-industry level with robust standard errors clustered at the country level.[18] As a dependent variable we use a dummy for whether firms on average report a value of 2 or higher (corresponding to an average response of moderate, major, or very severe obstacle).

All seven regressions show a negative coefficient on common law as the legal origin that is statistically significant for five of these constraints (columns 1–7). Specifically, firms report statistically significant lower obstacles in terms of access to finance, informality, crime, tax administration, and corruption. Column 8 reports the result for the mean value across all constraints, which also shows a negative and statistically significant effect of common law. Therefore, firms operating in countries with common-law systems appear to be less likely to face constraints on the operation of their firms, consistent with the literature on legal origins. Specifically, compared with firms in civil-law countries, firms in common-law countries are 17.4 percentage points less likely to face moderate to severe constraints on average on their current operations. Interestingly, the coefficient for informality is the largest, which suggests that firms in common-law countries are 25.6 percentage points less likely to report that practices of competitors in the informal sector are a problem for the operation of their businesses, which indeed should be more of a problem for firms in the more regulated civil-law countries.[19]

5. Robustness Checks

In this section, we run several exercises to check the robustness of the paper's main finding. First, in Section 5.1, we include a measure of institutional quality to check whether legal origin is merely a proxy for something else, such as better institutions. As an alternative institutional measure, we also include the country's

[17] If respondents answered "don't know" or "does not apply" or refused to answer we recoded the response as missing. Alternatively recoding "does not apply" as 0 ("no obstacle") does not affect the results in any significant way.

[18] Estimation at the country-year level gives almost the same results. We also note that we use a larger sample for 80 countries with at least 50 observations here as the estimation of mean rather than distributional effects (as in Tables 1 and 2) is less demanding (because of missing values for the control variables 76 countries are included in the estimation sample).

[19] The World Bank Enterprise Surveys tend to cover formal sector firms.

Table 3

Legal Origins and the Business Environment

	Access to Finance (1)	Informality (2)	Crime (3)	Tax Rates (4)	Tax Administration (5)	Political Instability (6)	Corruption (7)	Average Constraint (8)
Common Law	−.117+	−.256**	−.105*	−.050	−.093+	−.134	−.142+	−.174**
	(.061)	(.051)	(.051)	(.078)	(.048)	(.103)	(.077)	(.061)
Landlocked	.009	−.021	.020	.035	−.023	−.021	−.104	−.028
	(.059)	(.063)	(.058)	(.089)	(.056)	(.096)	(.080)	(.059)
PCI (log)	−.028	.068*	.050	.001	−.007	−.101*	−.042	.020
	(.040)	(.030)	(.038)	(.045)	(.035)	(.047)	(.050)	(.040)
GDP (log)	−.055**	−.052**	−.034+	−.026	−.008	−.004	−.005	−.025
	(.018)	(.016)	(.018)	(.021)	(.018)	(.024)	(.029)	(.020)
Education	.001	−.004*	−.001	.007**	.003+	.003	−.002	.001
	(.002)	(.001)	(.002)	(.002)	(.001)	(.002)	(.002)	(.002)
Openness	−.098+	−.085	−.038	−.142+	−.092+	−.190*	−.035	−.113*
	(.054)	(.051)	(.047)	(.082)	(.054)	(.079)	(.078)	(.055)
Ethnic Fractionalization	.087	.137	.208*	.440**	.262*	−.021	−.072	.196+
	(.119)	(.140)	(.100)	(.154)	(.115)	(.173)	(.187)	(.110)
Linguistic Fractionalization	−.066	−.035	−.158+	−.231+	−.139	−.499**	−.193	−.159
	(.115)	(.114)	(.085)	(.128)	(.099)	(.140)	(.143)	(.098)
Religious Fractionalization	.179	.115	.356**	.232	.141	−.006	.029	.284**
	(.109)	(.096)	(.082)	(.143)	(.110)	(.178)	(.144)	(.106)
Constant	2.259**	1.394**	.594	1.130+	.613	2.123**	1.10	.961*
	(.479)	(.418)	(.387)	(.625)	(.453)	(.683)	(.756)	(.468)
R^2	.080	.083	.074	.091	.051	.167	.067	.069

Note. All regressions include firm-level covariates. Robust standard errors clustered by country are in parentheses. Countries = 76; country-year pairs = 104; country-year-industry pairs = 1,438.

+ $p < .10$.

* $p < .05$.

** $p < .01$.

governmental system (presidential or parliamentary). Second, in Section 5.2, we exclude the European countries from the sample. And third, in Section 5.3, we redo the analysis with an alternative measure of TFP. Each test confirms the robustness of the finding that common law affects firm productivity in low-income countries and especially the most productive firms.

5.1. Adding Institutional Quality and System of Government

One may suspect that legal origin is merely a proxy for something else, such as institutional quality or culture. According to Acemoglu and Dell (2010), there is a strong association between a country's institutional quality and its productivity. Moreover, various studies show the role institutional settings play in both product and labor markets for firm productivity (Scarpetta et al. 2002; LiPuma, Newbert, and Doh 2013; Aralica, Svilokos, and Bacic 2018). It is therefore important to explore the influence of countries' institutional quality on our point estimates. We adopt the World Bank's worldwide governance indicators as a proxy for institutional quality. The governance indicators capture six dimensions of governance: voice and accountability, political stability and absence of violent government, government effectiveness, regulatory quality, the rule of law, and control of corruption. These indices are aggregate indicators based on over 30 data sources from institutes, think tanks, nongovernmental organizations, international organizations, and private-sector firms. Thus, it includes the views of a large number of enterprises, citizens, and experts from developing and developed countries. We take the average of the six governance indicators to create the institutional quality proxy. In addition, as an alternative institutional measure, we include the country's governmental system (presidential or parliamentary).

Table 4 reports the results across all quantiles and shows that legal origin is not simply a proxy for institutional quality as the tests for joint significance, equal effects across deciles, and interactions of country income remain very significant (La Porta, Lopez-de-Silanes, and Shleifer 2008). The grouped-quantile regression results in Figure 3 show that after controlling for institutional qualities and system of government, we confirm the main finding that the common-law effect arises primarily in low-income countries and that the magnitudes of the effect are larger for the right tail of TFP than for the left tail, which suggests that the impact of legal origin is mostly focused on the most productive firms.

5.2. Excluding Europe

As a second robustness check we exclude European countries from our sample, given that these countries typically have high productivity levels and similar legal origins. It is evident from a comparison of the estimates reported in Table 5 with those in Table 2 that our core results are unaffected by these considerations. Figure 4 also shows virtually the same patterns across TFP percentiles and income groups as in Figure 2.

Table 4
The Effect of Legal Origins on Firm Productivity after Controlling for Institutional Quality and Governmental System by Quantile

	.1 (1)	.2 (2)	.3 (3)	.4 (4)	.5 (5)	.6 (6)	.7 (7)	.8 (8)	.9 (9)
Common Law	−.837	−.497	.285	.214	.302	.504	.871	1.300*	2.179+
	(.944)	(.674)	(.436)	(.479)	(.590)	(.656)	(.526)	(.615)	(1.191)
Common Law × PCI (log)	.100	.062	−.030	−.022	−.031	−.047	−.101	−.153+	−.277+
	(.123)	(.086)	(.055)	(.059)	(.075)	(.087)	(.071)	(.083)	(.163)
Landlocked	−.348*	−.152	−.060	−.024	−.070	−.005	.040	−.115	−.104
	(.147)	(.163)	(.101)	(.094)	(.103)	(.100)	(.106)	(.126)	(.255)
PCI (log)	−.026	.063	.049	.057	.031	.046	.079	.105	.359*
	(.119)	(.088)	(.056)	(.050)	(.060)	(.057)	(.080)	(.087)	(.173)
GDP (log)	−.028	−.043	−.033	−.033	−.030	−.023	−.030	−.042	−.086
	(.047)	(.032)	(.023)	(.021)	(.023)	(.026)	(.030)	(.034)	(.065)
Education	.003	.002	.005+	.004+	.004+	.002	.003	.000	−.005
	(.005)	(.003)	(.002)	(.002)	(.002)	(.002)	(.003)	(.003)	(.006)
Openness	−.198+	.001	.028	−.010	.009	.054	.126	.087	.176
	(.118)	(.096)	(.070)	(.072)	(.087)	(.096)	(.092)	(.105)	(.200)

Ethnic Fractionalization	.212	.257	.178	−.026	−.085	−.069	−.041	−.067	−.077
	(.235)	(.183)	(.131)	(.147)	(.177)	(.165)	(.170)	(.194)	(.360)
Linguistic Fractionalization	.546*	.242	.224*	.236+	.147	.059	.040	.113	.342
	(.224)	(.150)	(.110)	(.132)	(.158)	(.125)	(.139)	(.141)	(.285)
Religious Fractionalization	−.000	.353+	.246+	.237+	.330+	.314+	.300+	.224	.427
	(.247)	(.185)	(.140)	(.141)	(.173)	(.173)	(.164)	(.205)	(.324)
Institutional Quality	−.003	−.012	−.020*	−.018*	−.012	−.012+	−.017*	−.017+	−.024
	(.020)	(.012)	(.008)	(.007)	(.007)	(.007)	(.007)	(.010)	(.019)
Parliamentary System	.736	.552+	.269	.219	.121	.179	.157	.293	.892**
	(.626)	(.289)	(.185)	(.158)	(.119)	(.133)	(.126)	(.196)	(.273)
Presidential System	.628	.429	.195	.193	.076	.132	.048	.095	.683**
	(.613)	(.275)	(.177)	(.149)	(.109)	(.119)	(.116)	(.185)	(.238)
Constant	1.548	.959	1.126+	1.449*	1.778*	1.456*	1.325+	1.799*	.346
	(1.246)	(.967)	(.664)	(.612)	(.677)	(.707)	(.686)	(.812)	(1.163)
R^2	.309	.292	.338	.290	.251	.258	.272	.184	.192

Note. All regressions include firm-level covariates and country-year fixed effects. Robust standard errors clustered by country are in parentheses. χ^2-test joint significance of Common Law effects (p-value) = .000; χ^2-test equal Common Law effects (p-value) = .009; χ^2-test Common Law × PCI interaction effects (p-value) = .000. Countries = 51; country-year pairs = 69; firms = 27,087.

$^+ p < .10$.

$^* p < .05$.

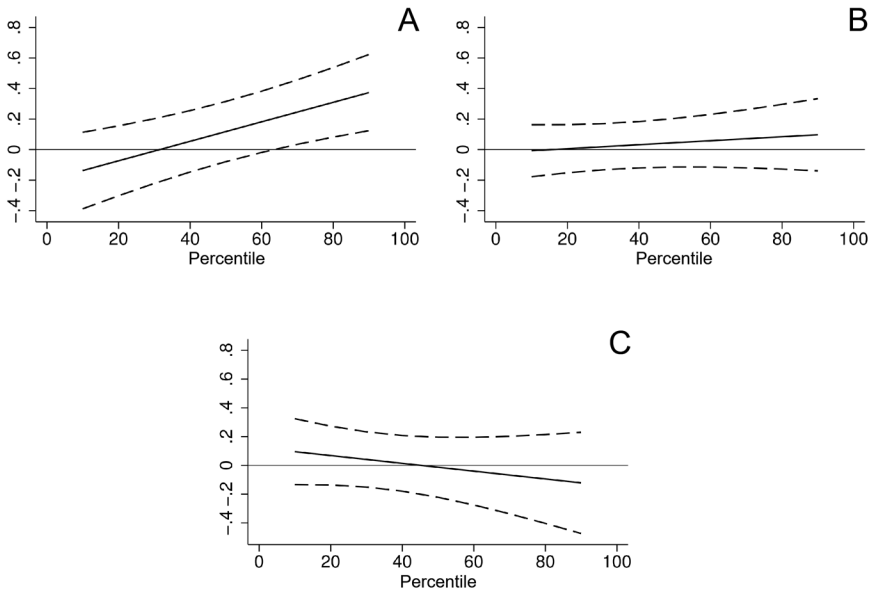

Figure 3. The effect of common law on firm total factor productivity (TFP) with controls for institutional quality and governmental system. *A,* Low-income countries; *B,* lower-middle-income countries; *C,* upper-middle-income countries.

5.3. Alternative Measure of Productivity

The benchmark results in Section 3 are based on TFP estimates from a production function that accounts for raw material inputs. Alternatively, as a robustness test, we use the World Bank 2017 measure of TFP that excludes material inputs. While this measure is less appropriate from a theoretical point of view, it has the advantage of being unaffected by possibly poorly measured usage of raw materials. Figure 5 presents the effect of legal origin on firm productivity using this alternative measure of TFP with the baseline specification reported in Table 2 (see Table A2). It shows an almost identical pattern for low-income countries: firms in low-income common-law countries tend to be more productive, especially at the upper tail, although the estimated effects lose precision.[20]

6. Conclusions

Over the last few decades, several studies have shown the pervasive influence of legal origins on the quality of legal rules and regulations, and these affect various economic outcomes. However, few studies explore the effect of legal origins at the micro level, for example, on a firm's productivity. In this paper, we investigate the

[20] The common-law impact now becomes more negative and even statistically significant for more productive firms in upper-middle-income countries. This is unintuitive and likely reflects nonclassical measurement error in the TFP measure, as raw material use is not accounted for.

Table 5

The Effect of Legal Origins on Firm Productivity Excluding Europe by Quantile

	.1 (1)	.2 (2)	.3 (3)	.4 (4)	.5 (5)	.6 (6)	.7 (7)	.8 (8)	.9 (9)
Common Law	−1.021	−.723	.114	.146	.196	.404	.619	.905	1.798
	(.927)	(.687)	(.454)	(.483)	(.561)	(.613)	(.517)	(.594)	(1.183)
Common Law × PCI (log)	.130	.093	−.012	−.020	−.021	−.037	−.071	−.100	−.228
	(.118)	(.087)	(.056)	(.058)	(.070)	(.080)	(.070)	(.078)	(.156)
Landlocked	−.290+	−.101	−.027	−.006	−.059	.008	.069	−.069	−.036
	(.154)	(.170)	(.112)	(.100)	(.096)	(.098)	(.107)	(.129)	(.253)
PCI (log)	−.041	.008	.022	.034	.022	.016	.055	.039	.176
	(.090)	(.069)	(.052)	(.053)	(.061)	(.065)	(.086)	(.091)	(.181)
GDP (log)	−.004	−.015	−.015	−.022	−.025	−.015	−.015	−.016	−.037
	(.048)	(.032)	(.024)	(.021)	(.022)	(.025)	(.031)	(.036)	(.066)
Education	−.001	.000	.001	.001	.002	.001	−.000	−.001	−.002
	(.004)	(.003)	(.002)	(.002)	(.003)	(.003)	(.004)	(.004)	(.008)
Openness	−.193	.016	.014	−.019	.004	.063	.117	.104	.270
	(.122)	(.103)	(.075)	(.078)	(.090)	(.099)	(.095)	(.110)	(.202)
Ethnic Fractionalization	.196	.242	.145	−.032	−.105	−.071	−.093	−.131	−.029
	(.268)	(.206)	(.145)	(.154)	(.177)	(.164)	(.169)	(.193)	(.382)
Linguistic Fractionalization	.514*	.230	.262*	.276+	.177	.080	.077	.123	.306
	(.207)	(.158)	(.118)	(.144)	(.164)	(.134)	(.150)	(.161)	(.372)
Religious Fractionalization	−.311	.177	.136	.153	.277+	.270+	.236	.178	.280
	(.363)	(.230)	(.148)	(.143)	(.158)	(.156)	(.163)	(.205)	(.333)
Constant	1.840	1.205	1.283+	1.696*	1.912**	1.661*	1.358+	1.821*	.999
	(1.155)	(1.011)	(.691)	(.654)	(.668)	(.736)	(.732)	(.839)	(1.276)
R^2	.264	.203	.223	.178	.169	.204	.168	.126	.130

Note. All regressions include firm-level covariates and country-year fixed effects. Robust standard errors clustered by country are in parentheses. χ^2-test joint significance Common Law effects (p-value) = .005; χ^2-test equal Common Law effects (p-value) = .056; χ^2-test Common Law × PCI interaction effects (p-value) = .001. Countries = 51; country-year pairs = 69; firms = 27,087.

+ $p < .10$.

* $p < .05$.

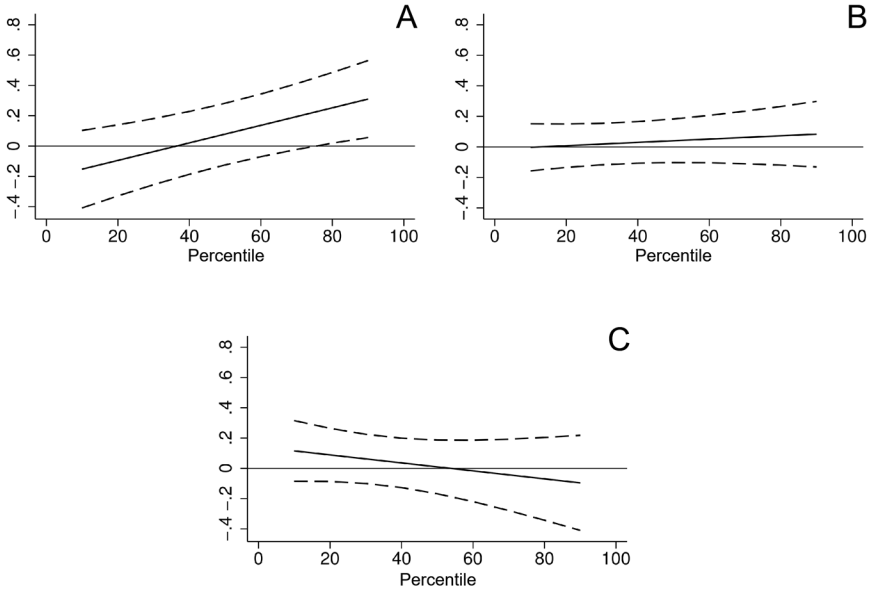

Figure 4. The effect of common law on firm total factor productivity (TFP) excluding Europe. *A,* Low-income countries; *B,* lower-middle-income countries; *C,* upper-middle-income countries.

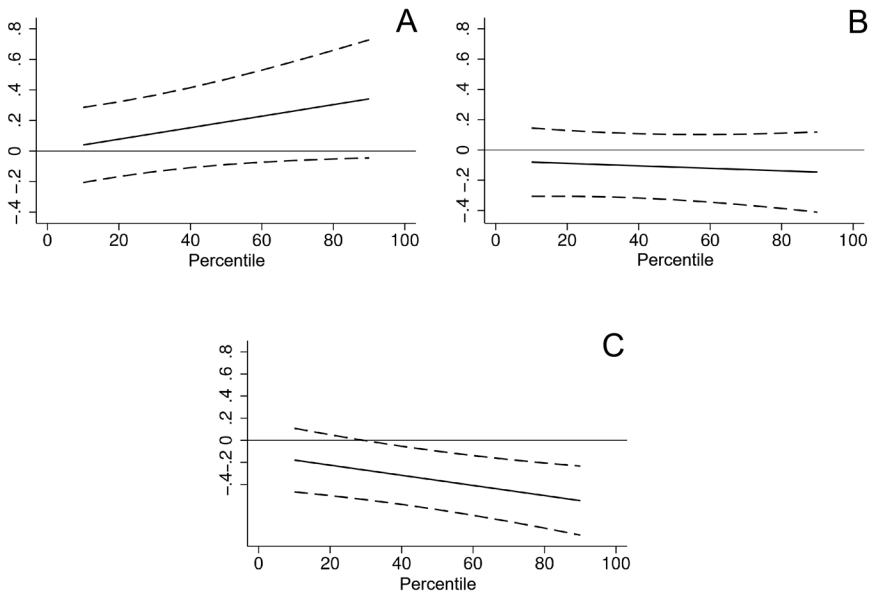

Figure 5. The effect of common law with an alternative measure of firm total factor productivity (TFP). *A,* Low-income countries; *B,* lower-middle-income countries; *C,* upper-middle-income countries.

impact of legal origins on firms' TFP across countries and examine whether its effect varies across the firms' productivity distribution using a recently proposed novel grouped-quantile regression approach by Chetverikov, Larsen, and Palmer (2016).

Using firm-level data from 51 countries from the WBES, we find that the effect of a common-law legal origin has a differential impact on firms' TFP distribution, even after controlling for a wide range of firm- and country-level covariates. Specifically, we find that the impact of common law is stronger on the right tail of the TFP distribution especially for firms in low-income countries. This suggests that, for low-income countries, the impact of legal origin is mostly focused on the most productive firms, which has important implications for exporting, high-quality jobs, and other firm-level outcomes. An OLS regression approach would have missed these heterogeneous effects. Furthermore, we also confirm the old literature finding with the new econometrics approach that a common-law system has a positive and statistically significant impact across the productivity distribution. Our results are robust across different specifications, samples, and alternative productivity estimations.

The main mechanism highlighted in this paper is that a country's legal origin plays a role in determining a firm's productivity, primarily through its impact on business environments. Thus, we explore the mechanisms emphasizing seven potential business constraints: access to finance, informality, tax administration, tax rates, corruption, crime, and political instability. We find evidence that common-law countries have lower business obstacles because of favorable legal rules and regulations for access to finance, less informality, less crime, improved tax administration, and less corruption.

Appendix

Additional Tables

Table A1
Linearized Effect of Legal Origins on Firm Productivity

	Value
Common Law	−1.159
	(.748)
Common Law × Decile	.029*
	(.012)
Common Law × PCI (log)	.145
	(.094)
Common Law × PCI (log) × Decile	−.004*
	(.002)
Landlocked	−.174
	(.149)
Landlocked × Decile	.002
	(.002)
PCI (log)	−.117
	(.088)
PCI (log) × Decile	.003+
	(.001)
GDP (log)	−.003
	(.036)
GDP (log) × Decile	−.000
	(.001)
Education	.006
	(.004)
Education × Decile	−.000
	(.000)
Openness	−.110
	(.106)
Openness × Decile	.003+
	(.002)
Ethnic Fractionalization	.280
	(.213)
Ethnic Fractionalization × Decile	−.005+
	(.003)
Linguistic Fractionalization	.345+
	(.173)
Linguistic Fractionalization × Decile	−.003
	(.002)
Religious Fractionalization	.042
	(.230)
Religious Fractionalization × Decile	.003
	(.003)
Decile	−.005
	(.010)
Constant	1.775*
	(.870)
Countries	51
Country-year pairs	69
Country-year-decile pairs	621
Firms	27,087
R^2	.682

Note. All regressions include firm-level covariates and country-year fixed effects. Robust standard errors clustered by country are in parentheses.

+ $p < .10$.

* $p < .05$.

Table A2

The Effect of Legal Origins with an Alternative Measure of Total Factor Productivity by Quantile

	.1 (1)	.2 (2)	.3 (3)	.4 (4)	.5 (5)	.6 (6)	.7 (7)	.8 (8)	.9 (9)
Common Law	−.058	1.345*	1.312+	1.680*	1.641*	2.231**	2.405**	2.527*	2.401*
	(.666)	(.631)	(.715)	(.756)	(.664)	(.780)	(.877)	(.982)	(1.069)
Common Law × PCI (log)	.005	−.188*	−.183+	−.235*	−.227**	−.297**	−.322**	−.342**	−.327*
	(.088)	(.085)	(.093)	(.097)	(.085)	(.096)	(.110)	(.126)	(.134)
Landlocked	.091	−.027	.007	.063	−.079	−.051	−.016	.058	−.101
	(.203)	(.208)	(.159)	(.125)	(.125)	(.142)	(.188)	(.287)	(.257)
PCI (log)	.033	.088	.101	.180	.124	.158	.239	.263	.251
	(.117)	(.109)	(.115)	(.124)	(.109)	(.121)	(.151)	(.164)	(.176)
GDP (log)	−.015	−.021	−.012	−.036	−.036	−.018	−.038	−.033	−.011
	(.062)	(.054)	(.052)	(.054)	(.051)	(.054)	(.062)	(.070)	(.069)
Education	.005	.004	.002	.002	.002	.002	.002	.005	.005
	(.004)	(.003)	(.004)	(.004)	(.004)	(.005)	(.006)	(.006)	(.006)
Openness	−.053	−.034	−.003	.011	−.007	−.055	−.159	−.108	.022
	(.128)	(.126)	(.124)	(.129)	(.126)	(.136)	(.161)	(.171)	(.211)
Ethnic Fractionalization	.479	.097	.132	.076	−.101	.077	.071	.188	−.008
	(.292)	(.288)	(.284)	(.304)	(.314)	(.330)	(.386)	(.451)	(.547)
Linguistic Fractionalization	.461+	.356	.236	.242	.126	.041	.062	.090	.197
	(.253)	(.250)	(.284)	(.315)	(.304)	(.333)	(.389)	(.461)	(.503)
Religious Fractionalization	−.047	.266	.241	.437+	.293	.415	.476	.662+	.542
	(.261)	(.252)	(.231)	(.235)	(.233)	(.250)	(.295)	(.342)	(.359)
Constant	.285	.453	.322	.423	1.322	.830	1.248	.895	.596
	(1.474)	(1.398)	(1.316)	(1.265)	(1.206)	(1.301)	(1.636)	(2.067)	(1.901)
R^2	.157	.117	.088	.141	.107	.141	.149	.180	.199

Note. All regressions include firm-level covariates and country-year fixed effects. Robust standard errors clustered by country are in parentheses. χ^2-test joint significance Common Law effect (p-value) = .000; χ^2-test equal Common Law effects (p-value) = .000; χ^2-test Common Law × PCI interaction effects (p-value) = .000. Countries = 52; country-year pairs = 70; firms = 27,798.

+ $p < .10$.

* $p < .05$.

** $p < .01$.

References

Acemoglu, Daron, and Melissa Dell. 2010. Productivity Differences between and within Countries. *American Economic Journal: Macroeconomics* 2:169–88.

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review* 91:1369–1401.

———. 2002. Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *Quarterly Journal of Economics* 117:1231–94.

Alesina, Alberto, and Eliana La Ferrara. 2005. Ethnic Diversity and Economic Performance. *Journal of Economic Literature* 43:762–800.

Aralica, Zoran, Tonci Svilokos, and Katarina Bacic. 2018. Institutions and Firms' Performance in Transition Countries: The Case of Selected CESEE Countries. *South East European Journal of Economics and Business* 13:68–80.

Atkin, David, Amit K. Khandelwal, and Adam Osman. 2017. Exporting and Firm Performance: Evidence from a Randomized Experiment. *Quarterly Journal of Economics* 132:551–615.

Backus, Matthew. 2020. Why Is Productivity Correlated with Competition? *Econometrica* 88:2415–44.

Bartelsman, Eric, John Haltiwanger, and Stefano Scarpetta. 2013. Cross-Country Differences in Productivity: The Role of Allocation and Selection. *American Economic Review* 103:305–34.

Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine. 2003. Law and Finance: Why Does Legal Origin Matter? *Journal of Comparative Economics* 31:653–75.

Bellini, Elena, Gianmarco I. P. Ottaviano, Dino Pinelli, and Giovanni Prarolo. 2013. Cultural Diversity and Economic Performance: Evidence from European Regions. Pp. 121–41 in *Geography, Institutions, and Regional Economic Performance,* edited by Riccardo Crescenzi and Marco Percoco. New York: Springer.

Bigsten, Arne, and Mulu Gebreeyesus. 2009. Firm Productivity and Exports: Evidence from Ethiopian Manufacturing. *Journal of Development Studies* 45:1594–1614.

Botero, Juan C., Simeon Djankov, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2004. The Regulation of Labor. *Quarterly Journal of Economics* 119:1339–82.

Chetverikov, Denis, Bradley Larsen, and Christopher Palmer. 2016. IV Quantile Regression for Group-Level Treatments, with an Application to the Distributional Effects of Trade. *Econometrica* 84:809–33.

Claessens, Stijn, and Luc Laeven. 2003. Financial Development, Property Rights, and Growth. *Journal of Finance* 58:2401–36.

Demirgüç-Kunt, Ash, and Vojislav Maksimovic. 1996. Institutions, Financial Markets, and Firms' Choice of Debt Maturity. Working Paper No. 1686. World Bank, Policy Research Department, Washington, DC.

———. 1998. Law, Finance, and Firm Growth. *Journal of Finance* 53:2107–37.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2002. The Regulation of Entry. *Quarterly Journal of Economics* 117:1–37.

Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer. 2007. Private Credit in 129 Countries. *Journal of Financial Economics* 84:299–329.

Fisman, Raymond, and Virginia Sarria Allende. 2010. Regulation of Entry and the Distortion of Industrial Organization. *Journal of Applied Economics* 13:91–111.

Galvao, Antonio F., and Kengo Kato. 2016. Smoothed Quantile Regression for Panel Data. *Journal of Econometrics* 193:92–112.

Girma, Sourafel, Avid Greenaway, and Richard Kneller. 2004. Does Exporting Increase Productivity? A Microeconometric Analysis of Matched Firms. *Review of International Economics* 12:855–66.

Glaeser, Edward L., and Andrei Shleifer. 2002. Legal Origins. *Quarterly Journal of Economics* 117:1193–1229.

Grazzi, Matteo, and Carlo Pietrobelli, eds. 2016. *Firm Innovation and Productivity in Latin America and the Caribbean: The Engine of Economic Development*. New York: Palgrave Macmillan.

Hsieh, Chang-Tai, and Peter J. Klenow. 2009. Misallocation and Manufacturing TFP in China and India. *Quarterly Journal of Economics* 124:1403–48.

———. 2010. Development Accounting. *American Economic Journal: Macroeconomics* 2:207–23.

Kato, Kengo, Antonio F. Galvao Jr., and Gabriel V. Montes-Rojas. 2012. Asymptotics for Panel Quantile Regression Models with Individual Effects. *Journal of Econometrics* 170:76–91.

Klapper, Leora, Luc Laeven, and Raghuram Rajan. 2006. Entry Regulation as a Barrier to Entrepreneurship. *Journal of Financial Economics* 82:591–629.

Koenker, Roger, and Gilbert Bassett Jr. 1978. Regression Quantiles. *Econometrica* 48:33–50.

La Porta, Rafael, Florencio López-de-Silanes, Cristian Pop-Eleches, and Andrei Shleifer. 2004. Judicial Checks and Balances. *Journal of Political Economy* 112:445–70.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2008. The Economic Consequences of Legal Origins. *Journal of Economic Literature* 46:285–332.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1997. Legal Determinants of External Finance. *Journal of Finance* 52:1131–50.

———. 1998. Law and Finance. *Journal of Political Economy* 106:1113–55.

———. 2002. Investor Protection and Corporate Valuation. *Journal of Finance* 57:1147–70.

Levin, Avner, and Mary Jo Nicholson. 2005. Privacy Law in the United States, the EU, and Canada: The Allure of the Middle Ground. *University of Ottawa Law and Technology Journal* 2:357–95.

LiPuma, Joseph A., Scott L. Newbert, and Jonathan P. Doh. 2013. The Effect of Institutional Quality on Firm Export Performance in Emerging Economies: A Contingency Model of Firm Age and Size. *Small Business Economics* 40:817–41.

Mahoney, Paul G. 2001. The Common Law and Economic Growth: Hayek Might Be Right. *Journal of Legal Studies* 30:503–25.

Midrigan, Virgiliu, and Daniel Yi Xu. 2014. Finance and Misallocation: Evidence from Plant-Level Data. *American Economic Review* 104:422–58.

Mulligan, Casey B., and Andrei Shleifer. 2005. The Extent of the Market and the Supply of Regulation. *Quarterly Journal of Economics* 120:1445–73.

Pistor, Katharina. 2005. Legal Ground Rules in Coordinated and Liberal Market Economies. Working Paper No. 30/2005. European Corporate Governance Institute, Brussels.

Restuccia, Diego. 2019. Misallocation and Aggregate Productivity across Time and Space. *Canadian Journal of Economics/Revue canadienne d'économique* 52:5–32.

Scarpetta, Stefano, Philip Hemmings, Thierry Tressel, and Jaejoon Woo. 2002. The Role of Policy and Institutions for Productivity and Firm Dynamics: Evidence from Micro and Industry Data. Working Paper No. 329. Organization for Economic Co-operation and Development, Paris.

Şeker, Murat, and Federica Saliola. 2018. A Cross-Country Analysis of Total Factor Productivity Using Micro-Level Data. *Central Bank Review* 18:13–27.

Syverson, Chad. 2011. What Determines Productivity? *Journal of Economic Literature* 49:326–65.

Van Biesebroeck, Johannes. 2005. Exporting Raises Productivity in Sub-Saharan African Manufacturing Firms. *Journal of International Economics* 67:373–91.

World Bank. 2017. Firm Level Productivity Estimates. Enterprise Analysis Unit. https://www.enterprisesurveys.org/.