# How does rule of law affect firm performance? – Comparing the effect of rule of law in companies located in countries with different level of development

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## Abstract

Employing a sample of 29,839 firms located in 22 European countries, the current study examines the relation between rule of law and firm performance. The results show strong evidence that there is a positive and significant relation between rule of law and sales growth for the whole sample of firms which is in line with previous literature. We further find a stronger effect of rule of law on sales growth for firms located in Eastern European countries than in firms located in Western Europe. These results are in line with previous studies focused on assessing the effect of rule of law in countries' economic growth where it has been empirically proven that the relation is positive. Also, the current results support previous findings that the initial level of economic development of a country, measured as initial GDP per capita, has a positive impact on the effect of rule of law on sales growth.

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## 1. Introduction

Although, a country's economic growth mostly depends on government policy and the quality of economic and political institutions, another major driver is the country's legal environment and the quality of its legal institutions. It has been empirically proven that a country's legal framework plays a key role in boosting economic growth and development (Demirguc-Kunt & Maksimovic, 1998, King & Levine, 1993).

The legal environment strongly influences business activity within a country, since investors will tend to seek places where contracts are enforced and clear, as it guarantees effective business relations with the parties involved in the commercial transaction. Well-defined property rights encourage business activities, since investors will only encounter risks if the likelihood of recovering their funds and owning the results obtained is reasonable (Acemoglu, Johnson and Robinson, 2001). For instance, investments tend to be lower in countries with high risk of expropriation and insecure property rights. Likewise, crime and violence constitute factors that negatively impact investment and economic growth. Anderson (1999) observed that these two factors are costly for individuals and institutions since public expenditure intended for promoting growth and productivity are reallocated to fund crime prevention and treatment. The factors mentioned above are measured by the level of a country's rule of law that captures the likelihood of crime, violence and level of corruption, as well as the quality of contract enforcement and property rights.

The positive relation between rule of law and economic growth has been empirically tested by Barro (2000). His results portray evidence that better rule of law enhances the GDP per capita growth rate. In addition, his study proves that the starting level of real GDP per capita has a negative effect on the level of growth of a country. This is strongly supported by convergence model.

The main research question of my thesis is "How does rule of law affect firm performance?". The main focus of my study is on evaluating whether the positive effect that rule of law has on country level is extended at enterprise level.

The current study contributes to the growing literature which analyzes the effect of rule of law on economic growth at country level. Nevertheless, it aims to observe the effect of changes in

rule of law and growth at firm level. To assess this relationship, I have employed the Rule of Law index developed by the World Bank and the sales growth of firms located in 22 European countries from 2005 until 2014. The index captures the confidence of agents in the rules of the society imposed by the government and regulatory authorities. It assesses, in particular, the quality of contract enforcement and property rights, and the likelihood of crime, violence and corruption. The index is dynamic over time and thus I can exploit the time varying effect of the score through panel data regressions.

Throughout my study I posit that the effect of rule of law on firm performance, measured as the growth in sales for the 29,839 firms in my sample from 2005 to 2014, can be captured by the sign and significance of the effect of rule of law on sales growth. Previous studies suggest that the effect is positive and significant since strong rule of law is associated with optimal political institutions, civil and justice system. Under these conditions, citizens are willing to accept laws determined by the government and regulatory authorities since they perceive law as clear and just. Therefore, we expect a favorable business environment fostered by the protection of legal rights and promotion of financial stability.

The examination of the effect of rule of law on sales growth of firms located in Western and Eastern European countries provides important findings. Countries located within the same region share similar conditions such as level of income, based on the income groupings defined by the World Bank based on the GNI (Gross National Income per capita) and initial income as a proxy of the level of development. The neoclassical convergence mechanism provides an academic basis that countries with lower income experience a higher marginal product of capital which implies strong incentives for investors to fund projects that will promote growth (F. Caselli and J. Freyrer, 2005). In addition, this model observes that growth is negatively associated with the initial level of real GDP per capita. For instance, countries with historically lower levels of GDP per capita are more likely to experience higher growth than rich countries since the growth rate depends on the relation between the initial level of the country, and on the legal environment (Barro, 2009). Therefore, the effect mentioned above predicts that the effect of rule of law may be stronger (more positive) for countries with lower initial level of GDP per capita, meaning Eastern European countries, than for countries with higher level of GDP Percapita (Western European countries).

The rest of this research proceeds as follows. Section 2 revises the background literature on which we build the referred hypothesis. Section 3 describes the corresponding empirical analysis and describes the data implemented in this study and Section 4 provides concluding remarks.

## 2. Current state of literature

Law and finance literature has recognized the fact that legal framework plays a key role in the development of financial markets (La Porta et al., 1998). Therefore, in well-developed financial markets firms have a better access to external financing in order to fund potentially profitable growth opportunities (Demirguc-Kunt & Maksimovic, 1998).

The following two sub-sections present literature concerning the effect of rule of law in economic growth and outline the effect of the three main factors identified as the dominant lines of theoretical analysis in the relationship between rule of law and economic growth: Property rights, contract enforcement and corruption.

### *2.1. Property rights and contract enforcement*

The term property rights refers to the legal ownership of an asset which confers the ability to decide the use of it (consumption, income generation and/or transfer to a third party). Well-enforced private property rights are associated with high level of GDP per capita, since it encourages firms to reinvest their profits in productive activities instead of retaining their earnings to avoid their expropriation by the government (Johnson, McMillan, Woodruff, 2002). Therefore, investors have more incentives to invest in markets where property rights are well-defined and secure.

Property rights protection is often measured in current literature through survey data of risk expropriation from the International Country Risk Guide ICRG. In order to measure the impact of property rights on economic growth, Knack and Keefer (1995) use the risk of expropriation and level of contract enforceability as independent variables. Their findings strongly support the literature of law and finance since the results suggest that institutions that protect property rights are crucial for the progress of economic growth and investment. In addition, the security of property rights affects not only the size of investment, but also the efficiency in the way resources

are allocated. The economic reasoning behind these findings is that investors associate low property rights with a likelihood of losing the profits from their investment, or the investment itself. Consequently, investors may reduce the amount that they are willing to invest and/or reallocate their funds into activities that they perceive as more secure even if they are less profitable than riskier deals.

More recent literature suggests a positive relation between the development of institutions and long-term growth since the conception of institutions is considered as a measure of property right protection (e.g., Acemoglu et al. 2001). As an extension of the previously mentioned results, Acemoglu and Johnson (2005) suggest that the effect of property rights on financial development and economic growth is stronger than the effect of institutions that look after the quality of contracts.

Furthermore, weak contract enforcement has an impact on investment through multiple channels. On the one hand, it increases the level of unpredictability surrounding a project, and therefore it may lead investors to rise their project's cost since the risk of losing their profits and the investment itself is higher (Dixit & Pyndick, 1994). On the other hand, weak enforcement may have an indirect influence on investor's willingness to commit their wealth to fund projects; preventing them from setting business relations that may result in successful transactions when those are based on contracts. In addition, Acemoglu and Johnson (2005) state that changes in laws and the way they are implemented affects the cost of enforcing contracts. This leads to the conclusion that a functional legal system plays a key role in contracting institutions. For instance, the World Bank supports this posit by providing as an example the cost of enforcing a commercial debt contract in two countries with different legal systems: Dominican Republic and New Zealand, where the cost and duration is 440 percent of income per capita and 495 days, respectively, for Dominican Republic, and less than 12 percent of income per capita and 50 days, respectively, for New Zealand.

Acemoglu and Johnson (2005) analyze the effect of contracting institutions and property rights institutions in economic growth. Three measures are used to proxy for contracting institutions. The first one corresponds to the index of legal formalism developed by Djankov at al. (2003). The next two measures are associated with the complexity of resolving a court case measured by two indices developed by the World Bank (2004). For the case of the property rights institutions, three measures are used. The first captures the degree of restrictions on politicians and

government elites. The second index measures the risk of expropriation by the government developed by Political Risk Services. Finally, the third measure corresponds to the Heritage Foundation's private property index. The findings provide evidence that property rights institutions have a stronger effect on the long-term economic growth than contracting institutions.

*2.2 Corruption*

Corruption refers to the acquisition of private benefits by abusing entrusted power. Therefore, it is considered as an unethical behavior that induces significant direct and indirect costs to the society. Corruption is, in essence, the outcome of individuals entering in the political sphere trying to take advantage of their position. One of the reasons is attributed to the intervention of the government in economic activities such as trade restrictions. For instance, in presence of trade restrictions importers may be willing to bribe the correspondent authority to be able to get the products through custom controls.

Different studies have shaped the current state of literature regarding the impact of corruption on economic growth though different dimensions. According to Hung (2000), a 1% increase in the corruption level reduces the growth rate by 0.72%. Keefer and Knack (1995) suggest that weak institutions encumber economic growth. Stone, Levy & Paredes (1996) provide evidence that actions of corruption bring high deal costs that negatively affect the transparency of transactions. As a result, investors' willingness to engage in projects and creditors' willingness to provide loans decrease.

In order to test the relationship between investment and corruption, Mauro (1995) conducts a cross-country analysis employing as a proxy of Corruption the analysts' perspective on risk and efficiency factors measured by the Business International Indices of Corruption and Institutional Efficiency. His findings suggest that corruption has a negative effect on private investments; thus, negatively affecting economic growth at a considerable scale since one standard deviation improvement in the corruption index causes an increase in investment by 5%. Additionally, Mauro (1996) provides further details on the relationship between corruption and the structure of government spending. For this, he uses two indices of corruption strongly correlated among each other (r=0.81): International Country Risk Guide and Business International. By conducting similar cross-country regressions to those in Mauro (1995), his findings suggest that when a

given country improves its corruption index by 2 points then its investment/GDP ratio and GDP growth would increase by 4 percentage points and half a percentage point respectively.

Campos, Lien and Pradhan (1999) provide important evidence related to the effect of the predictability of corruption on economic growth. Predictability of corruption indicates the degree to which firms are confident that the only way of obtaining the "products" they required to operate is by paying bribes. This variable is measured by the result of a survey where firms are asked the following two questions: "Firms in my line of business usually know in advance about how much 'additional payment' they must pay to operate." And "If a firm pays the required 'additional payment' the service is usually also delivered as agreed.". The answers of these two questions allow the "predictability of corruption" variable to be included in the OLS regression to assess its relation with economic growth. The results suggest that whatever the degree of predictability, more corruption inevitably means less investment.

## 3. Empirical analysis and Results

### *3.1. Main research focus and hypothesis*

The main analysis of my thesis focuses on testing the relationship between the change in rule of law and sales growth for firms located in Eastern and Western Europe. The rule of law is measured by the "Rule of law" index developed by the World Bank. Sales growth is measured as $(Sales_t - Sales_{t-1})/Sales_{t-1,}$ in order to obtain the percentage difference of sales between consecutive years for the firms in my sample. In my study, I prove that the macroeconomic positive effects of rule of law (at country level) extend to a microeconomic level (at firm level), by measuring the effect of rule of law on sales growth.

I consider the panel data regression technique and the use of firm level data as important specifications of my thesis as by employing the time variant Rule of law index and controlling for firm fixed effects all the country and firm level characteristics that may affect firm growth are being removed, to avoid possible biases in the result. This enables us to asses the net effect of the main independent variable of interest, change in rule of law on firm level growth.

Several studies have tested the effect of rule of law on economic growth, where findings suggest that the relationship is positive and significant. This effect has been observed by using the Rule of Law index developed by the World Bank and ICGR. Also, the relationship between rule of law and economic growth has been observed independently by each one of the elements composing rule of law (e.g. Property rights, Corruption, Contract enforcement).

The economic reasoning behind findings of previous studies suggests that rule of law is associated with institutional development and economic growth which benefits the environment for firms to make business (Haggard, 2010). Therefore, a favorable business environment boosts growth by ensuring protection of legal rights, and financial stability.

In line with this, I hypothesize that there is a positive and significant relationship between rule of law and sales growth for firms located in Eastern and Western European countries. I formulate Hypothesis 1 as follows:

H1) There is a positive and significant relation between rule of law and sales growth

For the case of the second hypothesis, the relationship between rule of law and sales growth is being further observed. I distinguish companies located in Western and Eastern Europe in order to test separately the effect of rule of law in both groups. It is important to mention that from the 22 countries, 12 are located in Western Europe and 10 in Eastern Europe, representing an evenly split sample between the two regions.

According to the neoclassical growth model, poorer countries should grow faster than rich ones. The model observes that growth is negatively associated to the initial level of real GDP per capita. According to Barro (2000), countries with historically lower levels of GDP per capita are expected to experience higher growth than rich countries since growth rate depends on the relation between the initial level of the country but also on government policies. For instance, growth is a function of the initial condition of the country captured by GDP per capita but also depends on the legal framework since the main barriers of economic growth are attributed to corruption and judicial independence. Therefore, the second hypothesis is defined as follows:

H2) The effect of rule of law on firm performance is stronger for countries located in Eastern Europe (representing countries with lower level of initial GDP per capita).

*3.2. Description of the data*

Sales information and various other financial information at firm level have been downloaded from AMADEUS. AMADEUS is a pan-European financial database containing information on over 10 million public and private companies from 41 countries, including all the EU countries and Eastern Europe. My sample consists of 22 European countries (Italy, France, Spain, Sweden, Switzerland, Norway, Poland, Germany, Ukraine, Czech Republic, Finland, Portugal, Greece, Hungary, Romania, Belgium, Netherlands, Slovak Republic, Bulgaria, Croatia, Latvia, and Lithuania) covering a 9-year period from 2005 to 2014. Within the dataset, I classified the 22 countries as "West" and "East" depending on their geographic location or historical background. I used this classification into regions in order to test my second hypothesis. I excluded data with missing observations for the following variables: sales, fixed assets, total assets and rule of law. Also, I eliminated observations with negative values for sales and total assets. The final database consists of 200,672 firm-year observations, among which 164,377 and 36,295 correspond to companies located in Western and Eastern European countries respectively. Summary statistics can be found in Table 1.

The key independent explanatory variable of my thesis is the "Rule of Law index" developed by the World Bank. The index captures the confidence of agents in the rules of society imposed by the government and regulatory institutions, the quality of contract enforcement, as well as the likelihood of crime and violence (In Appendix 2 all measures that compose the index are listed). Based on these aspects, a score is assigned to the countries in the sample. The index ranges from -2.5 to 2.5. Nevertheless, prior to run the regressions, I modified the scale of the index to range from 0 to 5 in order to normalize it. The country level scores with new scale can be found in Table 2.

In addition, I downloaded from the World Justice Project (WJP) three additional indices, in order to further observe the effect of the three main factors identified as the dominant lines of theoretical inquiry on the relationship between rule of law and economic growth: Property rights, contract enforcement and Corruption. The data cover a 5-year period from 2010 until 2015 for

the 22 countries in my sample. The WJP index relies on over 100,000 household and expert's surveys to measure how rule of law is experienced around the world. The Absence of Corruption factor measures the non-presence of corruption in government agencies in three forms: bribery, improper influence by public and private interests, and misuse of public funds on other resources. Furthermore, the Regulatory enforcement factor measures quality of contract enforcement as well as risk of expropriation of private property by the government.

*3.3 Empirical analysis*

To test the relationship and significance of rule of law on sales growth for the 29,839 firms in my dataset, and to investigate whether the effect is stronger for countries with lower starting level of development (Eastern European countries in my sample), I am conducting panel data regressions with firm and year fixed effects. Firm fixed effects control all time invariant heterogeneity at the firm level, while year fixed effects control for aggregate shocks. The objective of controlling these variables is to remove any possible effect of them that may bias the final output.

The advantage of testing the effect of rule of law in micro level lies on the fact that by controlling for firm fixed effects, all firm and country specific characteristic that may affect my results are removed, thus avoiding possible biases. This is allowed by using panel data regressions to measure how the change in rule of law affects sales growth, something that would not be possible using a cross country regression. The importance of using panel data over cross sectional studies where data is analyzed at a specific point of time (T=1) lies on the inclusion of time variant observations that improve the efficiency of results. Finally, by studying the effect of rule of law in micro level where I am able to control all firm and country characteristics, I can observe the net effect of the independent variable of interest, change in rule of law on sales growth.

Relevant literature observes the effect of rule of law on a country's economy (S. Haggard and L. Tiede, 2010, Barro, 1997). Barro (1997) relies on the International Country Risk Guide Data, which provides various measures of country's risk. This index measures separately law and order where law assesses the quality of the legal system, and order refers to adherence to the law. His

findings regarding this relationship suggest evidence of a positive effect of rule of law in GDP growth. Raising the rule of law variable by one point leads to a 0.5% increase in the growth rate over the period. On the other hand, Haggard and Tiede (2010) conduct an OLS regression to replicate Barro's work. In this paper, the effect of rule of law on GDP growth is observed from 1985 to 2004 by using the Rule of law index developed by the World Bank and results come in agreement with previous findings.

In order to observe the relation between rule of law and economic growth, I run panel data regressions where the dependent variable is Sales growth, which I measure for the companies in my dataset by obtaining the percentage difference of sales between consecutive years for the companies in the sample. Sales growth was calculated separately for companies located in Western and Eastern European countries to measure the effect of rule of law in countries with different starting level of economic development. My independent variable is the Rule of law Index (measured by the World Bank) which has been used in previous studies (Haggard and Tiede (2010). The index varies over time and scores countries with estimates that range from -2.5 to 2.5 which are the lowest and highest scores respectively. Prior running the regressions, I modified the scale of the index to range from 0 to 5 in order to normalize it.

In order to complement the above-mentioned study; I ran a panel data regression including the effect of two of the main factors of rule of law identified in current literature as the main drivers on shaping economic development: Corruption and Property rights. The dependent variable is Sales Growth and the independent variables are Corruption and Regulatory enforcement, measured by the Absence of Corruption and Regulatory enforcement index developed by The World Justice Project. This will provide further insights on the separate effect of each factor on firm's sales growth.

The following panel data regressions are being conducted:

1. $$Sales\ Growth_{j,i,t} = \propto_1 + \beta_1\, Rule\ of\ law\ Index_i + \beta_2\, Size_{j,i,t} + \beta_3\, GDP\ Growth_{j,i,t} + \beta_4\, Inflation_{j,i,t} + \gamma_1 + \gamma_2 + \varepsilon 1$$

2. $Sales\ Growth\ firms\ in\ Western\ Europe_{j,i,t} = \propto_1 + \beta_1\ Rule\ of\ law\ Index_i + \beta_2\ Size_{j,i,t} + \beta_3\ GDP\ Growth_{j,i,t} + \beta_4\ Inflation_{j,i,t} + \gamma_1 + \gamma_2 + \varepsilon 1$

3. $Sales\ Growth\ firms\ in\ Eastern\ Europe_{j,i,t} = \propto_1 + \beta_1\ Rule\ of\ law\ Index_i + \beta_2\ Size_{j,i,t} + \beta_3\ GDP\ Growth_{j,i,t} + \beta_4\ Inflation_{j,i,t} + +\gamma_1 + \gamma_2 + \varepsilon 1$

4. $Sales\ Growth_{j,i,t} = \propto_1 + \beta_1\ Corruption_i + \beta_2 Regulatory\ enforcement_i + \beta_3\ Size_{j,i,t} + \beta_4\ GDP\ Growth_{j,i,t} + \beta_5\ Inflation_{j,i,t} + \gamma_1 + \gamma_2 + \varepsilon 1$

Where the dependent variable is indexed on firm j in country i in year t. The firm and year fixed effects are given by $\gamma_1\ and\ \gamma_2$ respectively. The parameters to estimate are $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$, while the coefficient of main interest is $\beta_1$ in the first three regressions and $\beta_1\ and\ \beta_2$ in the fourth regression.

In the regressions, above, I use the following control variables: Inflation, GDP growth and Size. Annual inflation rate is included as a control variable in order to detect possible biases from price level changes. GDP growth is included since it captures growth and prosperity in a country's economy. Size, captured by the natural log of total sales, is included among control variables to make the data comparable by avoiding possible biases in the result due to the size of the companies in the sample. The country level control variables included (Annual inflation rate and GDP Growth) have been collected from the World Bank Open Data.

Table 3 reports panel data regressions where the relation between rule of law and sales growth is tested. When looking at the results of the regression (1), the first insight that emerges is that there is a positive relation between rule of law and firms' sales growth at the 1% level of statistical significance on the whole sample with a beta coefficient of 0.129. This result suggests that an increase by 1 point in the rule of law index leads to an increase in sales growth by 0.129%. Among the control variables, firm size has a negative and significant effect of the firm's sales growth with a coefficient of -0.009. This effect comes in line with the findings of Evans (1987), which suggest that smaller sized firms experience higher growth of sales. On the other hand, GDP per capita growth has a positive and statistical significant effect with a beta

coefficient of 1.778. This was expected, since an increase in the GDP growth will lead to higher consumption among individuals and finally to an increased growth in sales from the side of the firms. Similarly, inflation drives prices upwards, which is realized in most cases as an increase in the firms' total sales. In addition to the control variables, the regression model also controls for year and firm fixed effects. The results are broadly in line with those in existing literature, where this relationship is observed at a country level by using as a dependent variable the country's GDP growth. Therefore, these previous results at a country level evidences that the effect is extended at enterprise level. The explanation for this is that a country with strong rule of law is considered as a place we expect a favorable business environment that will encourage growth by ensuring protection of legal rights, and financial stability. It is noteworthy to mention that the initial GDP level of firms located in Western Europe is higher on average than of the countries in Eastern Europe. By separating the observations into these two categories (countries in Eastern versus Western Europe) we gain additional insight on how the economic development of a country and the rate of the GDP growth influences the effect of rule of law on sales growth.

To complement these findings, in Table 4 regression (1), we observe the effect of Corruption and Regulatory enforcement on sales growth for firms in my sample. The number of observations is lower than the ones in Table 3 since the Absence of Corruption and Regulatory enforcement indexes are available from 2010 to 2015. However, the results are in line with previous findings suggesting that lower rates of corruption and risk of expropriation, as well as higher enforcement of legal and administrative regulations have a positive and significant effect in sales growth at the 1% level of statistical significance. It is noteworthy that the effect of Regulatory enforcement is stronger than Corruption, with coefficients 0.837 and 0.168 respectively. These finding are in line with previous studies (La Porta et al.,1999, Beck et al.,2003, Djankov el at. 2003) since contract enforcement and property rights are directly associated with the willingness of investors to commit their wealth to fund projects once they perceive a considerable probability to own and receive the return associated with their investment. Moreover, in presence of low contract enforcement, financial institutions may reduce their supply of loans resulting in the no occurrence of productive investments that may generate growth.

In table 3 regression (2) and (3) we observe the effect of rule of law on sales growth for firms located in Eastern and Western European countries respectively. Both beta coefficients are positive and significant at a 1% level. The fact that the beta coefficient for the East Europe region is higher than that for the West, with respective values of 0.322 and 0.057, confirms my second hypothesis. This implies that rule of law has a stronger effect on sales growth in countries located in Eastern Europe, that have a lower starting point (GDP per capita in 2005, presented in table 5), than countries in Western Europe. The economic reasoning behind is that in countries where the economic development is lower, rule of law, and therefore the strength of the legal environment play a more important role in enhancing firm level growth (captured by the dependent variable sales growth). These findings of regression (2) and (3) are also in line with current literature that states that a country's per capita growth rate is inversely related to its starting level of GDP per capita (J. Barro, 1991). In addition, control variables portray the same characteristics as in regression (1), with firm size having a negative impact on sales growth. This effect is stronger on the Eastern European region, with a beta coefficient of 0.322, comparing to a coefficient of 0.057 for the Western European region. This result suggests that an increase by 1 point in the rule of law index leads to an increase in sales growth in firms located in Eastern and Western countries by 0.322% and 0.057% respectively. Following the same trend, GDP per capita growth and Inflation portray bigger coefficients for the Eastern region.

In order to support these findings, Table 5 contains information about the 22 European countries in my sample. It provides details of per capita GDP for the first and last period of the current study, fiscal years 2005 and 2015 respectively. From the table, we can observe that countries located in Eastern Europe have the lowest starting level of GDP per capita (GDP 2005). We can clearly observe the difference between the two regions from the fact that the Eastern European country with the highest GDP per capita on 2005 (Czech Republic) is still lower than the Western country with the lowest starting point (Portugal). In addition, we can observe that Eastern countries have the highest 10-year GDP Growth rate (Growth 10Y) which is calculated as GDP2015-GDP2005/GDP2005. This information supports the findings in regression (2) and (3). The fact that rule of law has a stronger effect on sales growth in Eastern Europe is in line with current literature indicating that the starting point of a country's economic level affects its growth (Barro, 1991).

## 4. Conclusion

The current study contributes to the growing law and finance literature on the implications of the rule of law in a country's economic development. Our findings consistently suggest that rule of law, captured by The World Bank index, positively affects firm performance for firms located in 22 European countries from 2005 until 2014. Overall, the results suggest that rule of law tends to raise the performance of firms since both the investor activity and firms' expanding activity is more encouraged under a safe and stable legal environment. This positive relationship is even stronger when a given country is located in the Eastern European region, suggesting that initial GDP, and the GDP growth inversely related to it has an effect of the relationship of rule of law and sales growth. The coefficient in the regressions for Eastern and Western Europe are 0.322 and 0.057 respectively. These results support Barros's findings that growth is negatively associated to the initial level of real GDP per capita, therefore, countries with historically lower levels of GDP per capita are expected to experience higher growth than countries with higher initial level of GDP.

A possible extension of the current study can be to further test the effect of rule of law in a larger number of countries, by extending the study to other continents such as Middle East and the United States.

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## Appendix

### Table 1. Summary statistics

The table reports summary statistics of the data used for analyzing the relationship between Rule of law and sales growth. The table reports the total number of observations, the average, standard deviation, min and max. All variables are described in detail in Appendix 1, Appendix 2 and Appendix 3. The sample consists of 22 European companies from 2005 to 2015, and includes in total 29,839 companies and 200,672 firm-year observations.

**Summary Statistics**

| Variable | Nr. of Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Rule of Law | 200,672 | 3.61 | 0.70 | 1.67 | 4.62 |
| Sales Growth | 200,672 | -0.01 | 0.25 | -0.90 | 0.90 |
| GDP Growth | 200,672 | 0.01 | 0.03 | -0.14 | 0.13 |
| Inflation | 200,672 | 0.02 | 0.03 | -0.01 | 0.25 |
| Size | 200,672 | 4.44 | 1.73 | 0.00 | 12.34 |
| Corruption | 112,081 | 0.75 | 0.15 | 0.25 | 0.96 |
| Regulatory Enforcement | 112,081 | 0.79 | 0.08 | 0.56 | 0.93 |

**Table 2.**

Strength rule of law captured by The World Bank index, 2005 – 2014 on country level

| Country | Region | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bulgaria | East | 2.34 | 2.34 | 2.34 | 2.34 | 2.34 | 2.34 | 2.34 | 2.34 | 2.34 | 2.34 |
| Croatia | East | 2.59 | 2.59 | 2.59 | 2.59 | 2.59 | 2.59 | 2.59 | 2.59 | 2.59 | 2.59 |
| Czech Republic | East | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 |
| Hungary | East | 3.33 | 3.33 | 3.33 | 3.33 | 3.33 | 3.33 | 3.33 | 3.33 | 3.33 | 3.33 |
| Latvia | East | 3.09 | 3.09 | 3.09 | 3.09 | 3.09 | 3.09 | 3.09 | 3.09 | 3.09 | 3.09 |
| Lithuania | East | 3.08 | 3.08 | 3.08 | 3.08 | 3.08 | 3.08 | 3.08 | 3.08 | 3.08 | 3.08 |
| Poland | East | 2.92 | 2.92 | 2.92 | 2.92 | 2.92 | 2.92 | 2.92 | 2.92 | 2.92 | 2.92 |
| Romania | East | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 | 2.33 |
| Slovakia | East | 3.02 | 3.02 | 3.02 | 3.02 | 3.02 | 3.02 | 3.02 | 3.02 | 3.02 | 3.02 |
| Ukraine | East | 1.71 | 1.71 | 1.71 | 1.71 | 1.71 | 1.71 | 1.71 | 1.71 | 1.71 | 1.71 |
| Belgium | West | 3.74 | 3.74 | 3.74 | 3.74 | 3.74 | 3.74 | 3.74 | 3.74 | 3.74 | 3.74 |
| Finland | West | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 |
| France | West | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 |
| Germany | West | 4.16 | 4.16 | 4.16 | 4.16 | 4.16 | 4.16 | 4.16 | 4.16 | 4.16 | 4.16 |
| Greece | West | 3.28 | 3.28 | 3.28 | 3.28 | 3.28 | 3.28 | 3.28 | 3.28 | 3.28 | 3.28 |
| Italy | West | 2.97 | 2.97 | 2.97 | 2.97 | 2.97 | 2.97 | 2.97 | 2.97 | 2.97 | 2.97 |
| Netherlands | West | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 |
| Norway | West | 4.41 | 4.41 | 4.41 | 4.41 | 4.41 | 4.41 | 4.41 | 4.41 | 4.41 | 4.41 |
| Portugal | West | 3.70 | 3.70 | 3.70 | 3.70 | 3.70 | 3.70 | 3.70 | 3.70 | 3.70 | 3.70 |
| Spain | West | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 | 3.60 |
| Sweden | West | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 |
| Switzerland | West | 4.40 | 4.40 | 4.40 | 4.40 | 4.40 | 4.40 | 4.40 | 4.40 | 4.40 | 4.40 |

**Table 3.**

Effect of rule of law on sales growth on firms located in Western and Eastern European countries.

This table reports results of panel data regressions on the effect of rule of law on sales growth for firms located in Western and Eastern European countries, using firm level data from AMADEUS from 2005 to 2014 on 22 European companies. Specifications (1) shows the result for the total sample, specifications (2) and (3) for companies in Eastern and Western European countries respectively. The dependent variable is sales growth. Fixed effects for 9 calendar years and 29,839 firms are included in models as indicated, as well as time-variant firm and country level control variables that are known to affect growth. Robust standard errors are included in brackets. *Significant at 10%, **Significant at 5%, ***Significant at 1%.

| ***Dependent variable:*** | ***Sales Growth*** | | |
|---|---|---|---|
| | **(1)** | **(2)** | **(3)** |
| | **All Sample** | **East** | **West** |
| Rule of Law | 0.129*** | 0.322*** | 0.057*** |
| | (0.008) | (0.017) | (0.011) |
| Size | -0.009*** | -0.024*** | -0.007*** |
| | (0.001) | (0.005) | (0.001) |
| GDP growth | 1.778*** | 1.717*** | 1.331*** |
| | (0.039) | (0.065) | (0.05) |
| Inflation | 0.821*** | 0.851** | 0.591*** |
| | (0.043) | (0.057) | (0.111) |
| _cons | -0.551*** | -1.001*** | -0.277*** |
| | (0.031) | (0.045) | (0.041) |
| Firm Fixed Effects | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES |
| Observations | 200,672 | 36,295 | 164,377 |
| R-Squared | 0.303 | 0.396 | 0.264 |

**Table 4.**

Effect of rule of Corruption and Regulatory enforcement on sales growth of firms.

This table reports results of panel data regression on the effect of corruption and regulatory enforcement on sales growth for firms located in Western and Eastern European countries, using firm level data from AMADEUS on 22 European companies. Specification (1) shows the result for the total sample, where the dependent variable is sales growth. Fixed effects. Time-variant firm and country level control variables are included. Robust standard errors are included in brackets. *Significant at 10%, **Significant at 5%, ***Significant at 1%.

| ***Dependent variable:*** | ***Sales Growth*** |
|---|---|
| | **(1)** |
| | **All Sample** |
| Corruption | 0.168*** |
| | (0.049) |
| Regulatory Enforcement | 0.837*** |
| | (0.058) |
| Size | -0.001 |
| | (0.002) |
| Inflation | 0.338*** |
| | (0.076) |
| GDP growth | 0.032 |
| | (0.199) |
| Firm Fixed Effects | YES |
| Year Fixed Effects | YES |
| Observations | 112,081 |
| R-Squared | 0.443 |

**Table 5.**

Table 5 contains information for the 22 European countries in the sample. It contains details of GDP for the initial period and last period of the current study, 2005 and 2015 respectively. From the table we can observe that countries located in Eastern Europe have the lowest starting point (GDP 2005). We can see the difference between the two regions from the fact that the Eastern European country with the highest GDP per capita on 2005 (Czech Republic) is still lower than the Western country with the lowest starting point (Portugal). In addition, we can observe that Eastern countries have the highest GDP Growth rate (Growth 10Y) which is calculated as $GDP_{2015}$-$GDP_{2005}$/$GDP_{2005}$.

| Country | Region | GDP 2005 | GDP 2015 | Growth 10Y |
|---|---|---|---|---|
| Ukraine | East | 1,829 | 2,115 | 15.65% |
| Bulgaria | East | 3,853 | 6,820 | 77.00% |
| Romania | East | 4,676 | 8,973 | 91.88% |
| Latvia | East | 7,550 | 13,665 | 80.99% |
| Lithuania | East | 7,863 | 14,172 | 80.24% |
| Poland | East | 7,976 | 12,494 | 56.65% |
| Croatia | East | 10,224 | 11,536 | 12.83% |
| Hungary | East | 11,156 | 12,259 | 9.89% |
| Slovakia | East | 11,631 | 15,962 | 37.24% |
| Czech Republic | East | 13,318 | 17,231 | 29.39% |
| Portugal | West | 18,785 | 19,223 | 2.33% |
| Greece | West | 22,552 | 18,036 | -20.03% |
| Spain | West | 26,511 | 25,832 | -2.56% |
| Italy | West | 31,959 | 29,847 | -6.61% |
| Germany | West | 34,697 | 41,219 | 18.80% |
| France | West | 34,880 | 36,248 | 3.92% |
| Belgium | West | 36,967 | 40,231 | 8.83% |
| Finland | West | 38,969 | 41,921 | 7.57% |
| Netherlands | West | 41,577 | 44,433 | 6.87% |
| Sweden | West | 43,085 | 50,273 | 16.68% |
| Switzerland | West | 54,798 | 80,215 | 46.38% |
| Norway | West | 66,775 | 74,735 | 11.92% |

**Appendix 1**

Detailed definition of the variables included in the regression models

| Variable | Description | Source |
|---|---|---|
| Rule of Law | Rule of law index at country level | AMADEUS |
| Size | Natural logarithm of the yearly sales | AMADEUS |
| Sales growth | Sales growth for a firm in two consecutive years | AMADEUS |
| Inflation | Annual inflation rate on country level | The World Bank |
| GDP Growth rate | Annual GDP growth rate on country level | The World Bank |
| Initial level economic development | GDP in first year of the current study (2005) | AMADEUS |
| Corruption | Absence of Corruption index at country level | WJP |
| Regulatory Enforcement | Regulatory enforcement index at country level | WJP |

**Appendix 2**

Component of rule of law index developed by The World Bank

| Code | Description |
|---|---|
| EIU | Violent crime |
| | Organized crime |
| | Fairness of judicial process |
| | Enforceability of contracts |
| | Speediness of judicial process |
| | Confiscation/expropriation Intellectual property rights protection |
| | Private property protection |
| GCS | Business Cost of Crime and Violence |
| | Cost of Organized Crime |
| | Reliability of Police Services |
| | Judicial Independence |
| | Efficiency of Legal Framework for Challenging Regulations |
| | IPR protection |
| | Property Rights |
| | Informal Sector |
| GPW | Confidence in the police force |
| | Confidence in judicial system |
| HER | Property Rights |
| IPD | Degree of judicial independence vis-à-vis the State |
| | Degree of enforcement of court orders |
| | Timeliness of judicial decisions |
| | Equal treatment of foreigners before the law (compared to nationals) |
| | Practical ability of the administration to limit tax evasion |
| PRS | Law and Order |
| WMO | Expropriation. The risk that the state or other sovereign political authority will deprive, expropriate, nationalize, or confiscate the assets of private businesses, whether domestic or foreign |
| | Contract enforcement. The risk that the judicial system will not enforce contractual agreements between private-sector entities, whether domestic or foreign, due to inefficiency, corruption, bias, or an inability to enforce rulings promptly and firmly |
| ADB | Property rights and rule based governance |
| LBO | Trust in judiciary |
| | Trust in the police |

**Appendix 3**

Component of rule of Absence of Corruption and Regulatory enforcement indexes developed by The World Justice Project WJP

| Factor | Description | Measures |
|---|---|---|
| Regulatory Enforcement | The extent to which regulations are fairly and effectively implemented and enforced. Regulations, both legal and administrative, structure behaviors within and outside of the government | 1. Government regulations are effectively enforced<br>2. Government regulations are applied and enforced without improper influence<br>3. Administrative proceedings are conducted without unreasonable delay<br>4. Due process is respected in administrative proceedings<br>5. The Government does not expropriate without adequate compensation |
| Absence of Corruption | The absence of corruption in several government agencies. The factor considers three forms of corruption: bribery, improper influence by public or private interests, and misappropriation of public funds or other resources | 1. Government officials in the Executive Branch do not use public office for private gain<br>2. Government officials in the judicial branch do not use public office for private gain<br>3. Government officials in the police and the military do not use public office for private gain<br>4. Government officials in the legislative branch do not use public office for private gain |