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Key determinants of elite rivalry: theoretical insights and empirical evidence

Elena Sochirca* and Francisco José Veiga†

Abstract

In this paper we empirically examine the key determinants of elite rivalry and identify their main channels of transmission, thus contributing to the sparse literature on the topic. Our results clearly indicate that the income level, human capital, the system of checks and balances, natural resources rents, and colonization experience (or, alternatively, the identity of a country's colonizer) are strong determinants of the observed elite rivalry levels. The determining effect of the first three factors is highly significant and positive, while that of the last two factors is highly significant and negative. These results imply that higher levels of education and income per capita and a more efficient separation of powers contribute to reduce the elite rivalry level, while past experience as a colony and higher rents from natural resources contribute to aggravate it. As regards the transmission channels, the quantification of effects shows that about 60% of the determining factors' overall effect on elite rivalry is transmitted through the legal system and property rights and the political risk channels, mainly coming from the income level and natural resources rents, which cumulatively account for around 45% of the total effect. In sum, our empirical findings indicate that a more efficient institutional model and specific historical and economic factors, can in fact determine the level of elite rivalry in the long run.

Keywords: Elite rivalry; Institutions, Economic growth and development; Inequality; Transmission channels.

JEL codes: O1, O4, P16, P5

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1 Introduction

Modern economic theory and empirics relate economic growth and development to inclusive economic and political institutions. Extensive research shows that high quality institutions are one of the primary determinants of economic prosperity and that differences in institutions are among the main causes of cross-country differences in income and development levels (North, 1990; Easterly & Levine, 1997; Rodrik, 2000; Acemoglu, 2006). It is not surprising thus, that the question of what determines one of the fundamentals of long-term prosperity and development of a nation - institutions, also receives increasing attention from social scientists. In this paper, we address this question and contribute to the literature by empirically examining the key determining factors of a specific institutional feature, namely, elite rivalry, a relatively under-researched topic.

Referring to the literature on institutions and on the political economy of growth, elite rivalry can be seen to reflect the negative form of competition for power, which arises when the political group in power - political elite - is more concerned with keeping control of political power for their own benefit, rather than serving the society (Sochirca & Veiga, 2017; Acemoglu, 2006). Elite rivalry can then be expected to have a negative impact, both on institutional quality and economic performance. In particular, it can harm economic growth and development by reducing the incentives of the political elite to implement policies promoting welfare and growth, motivating instead the implementation of distortionary policies so as to prevent political rival groups from rising to power.[1] Several researchers have focused on the retarding effects of rivalry between the political elite and other political groups. For example, Rodrik (1999) suggests that investment and growth opportunities can be lost in the disagreements between political groups, creating a burden of extra costs on the economy; Acemoglu (2006) argues that the political elite's pursuit of power induces them to choose economically inefficient policies, which on its turn compromises long-term investments and leads to poor economic performance. The negative impact of elite rivalry is then induced through constraints on the choice and implementation of policies and the resulting inefficient resource allocations, with general growth-retarding effects (see, for example, Sochirca *et al.*, 2016; Acemoglu, 2006; Acemoglu & Robinson, 2006; Lizzeri & Persico, 2005; Dixit & Londregan, 1995). In fact, working with a panel dataset covering a large number of countries, and using a composite indicator of elite rivalry, Sochirca & Veiga (2017) identify a highly significant negative impact of elite rivalry on economic growth.

Given the relevance of elite rivalry, both for the quality of institutions and for economic performance, it is

[1] Elite rivalry would then have the opposite impact of (positive) political competition, which is generally associated with the implementation of growth-enhancing policies (see, for example, Besley *et al.*, 2010 and Wittman, 1989).

important to understand what influences the elite rivalry itself. This is the focus of the present paper. With this objective, we will make use of the composite elite rivalry indicator constructed in Sochirca & Veiga (2017). The authors use factor analysis to aggregate data on selected variables, the state of which could indirectly indicate the possibility of a higher or lower elite rivalry level. Considering both the political and economic dimensions as jointly determining the degree of rivalry between the political elite and other political groups, the constructed composite indicator includes data on the effectiveness of legislature, government efficiency and responsiveness, quality of bureaucracy, general regime effects, strength and integrity of the legal system (political dimension), and also on the protection of property rights, legal enforcement of contracts, and regulatory restrictions (economic dimension). Higher institutional quality in any of the referred dimensions would make it more difficult for the elite to appropriate or misuse resources, and thus the implied level of elite rivalry would be lower.[2] The obtained indicator was then compiled in a data set with elite rivalry levels for 124 countries between 1984-2012, which we will use in our current work to empirically assess the key factors that determine the observed elite rivalry levels across countries, and their main channels of transmission.

Our empirical study contributes to the literature on the determinants of institutional quality,[3] by focusing on the specific institutional feature of elite rivalry. Besides employing elite rivalry as a new institutional quality measure and covering a large sample of countries, we also consider several determinants that, although reported important in the related literature, have not been evaluated previously. Namely, we introduce foreign direct investments and frontier distance as potential new determining factors and find that, while the latter appears to have a moderate impact on the observed level of elite rivalry, the former does not significantly influence it.

Contrarily to previous findings, our results indicate that both colonization experience and colonizer identity are significant determinants of the level of elite rivalry, while religious fractionalization and population density are not. We also find that the level of development (measured by GDP *per capita* and human capital) and the checks and balances system are strong and persistent determinants of the elite rivalry level. Finally, besides identifying the factors that are significant determinants of elite rivalry, our data allows us to also evaluate their main channels of transmission and to quantify the individual contribution effects by channel and by factor. Regarding this, we find that the income level, human capital, and the system of checks and balances are the strongest determinants of elite rivalry. Additionally, the empirical results indicate that the composite measure of the legal system integrity, protection of property rights and contract enforcement, is

[2] As argued in the literature, one important characteristic of elite rivalry is inefficient resource use and expropriation by the elite, which becomes more difficult when institutional failures are weak (see, for example, Acemoglu, 2009).

[3] For previous studies of the determinants of various aspects of institutional quality, see La Porta *et al.* (1999), Islam & Montenegro (2002), Hauner & Kyobe (2010), and Rodriguez & Garcimartin (2013).

the strongest transmission channel for the determining factors' influence on the observed elite rivalry level.

The remainder of this paper is structured as follows: Section 2 reviews the literature on the determining factors and summarizes those to be considered in our analysis; Section 3 presents the empirical analysis and results on identifying the key determining factors and their transmission channels; Section 4 presents the conclusions.

2 Exploring the literature: potential factors determining the level of elite rivalry

In this section, we include a brief description of the elite rivalry indicator we will use in our empirical study and, based on the insights from a preliminary analysis of the indicator and the related literature, we also explore and discuss the factors that may have a determining influence on the observed level of elite rivalry. The impact of these factors will be tested in section 3.

In this work, we employ the composite elite rivalry indicator from Sochirca & Veiga (2017), constructed using factor analysis and including specific institutional quality aspects identified as fundamental for defining elite rivalry. In particular, the results of the data reduction exercises in Sochirca & Veiga (2017) identified *legal system and property rights*, *effectiveness of legislature*, *general regime effects,* and *political risk* as institutional features that jointly represent the absolute elite rivalry level of a country, the higher being the indicator's value, the lower the corresponding level of elite rivalry.[4] The constructed composite indicator was found to exhibit considerable variations by subgroups of countries with similar characteristics. For example, disaggregation of the initial sample of 124 countries into subgroups by income level and geographical location revealed that countries from the high-income and advanced economies groups exhibit the highest mean values of the elite rivalry indicator, meaning that they have the lowest elite rivalry levels, compared to all other groups. On the contrary, countries from the low-income and Sub-Saharan Africa groups have the highest average levels of elite rivalry. These statistics indicate that elite rivalry is inversely related to income and development levels, and that location can, in fact, imply significant differences in institutional organization, thus providing in our current research a starting point for the pre-selection of factors which may determine the observed elite rivalry levels.

In fact, the selection of the elite rivalry determinants is a rather difficult task given that: *(i)* both the theoretical and empirical existing literature on elite rivalry is scarce, and our best available proxy is

[4]See Appendix A on the composition of the constructed elite rivalry indicator.

institutions and institutional quality, and *(ii)* related research commonly studies the effect of institutions on other (macroeconomic) variables, rather than the effect of specific factors on institutional quality and institutional change. Nevertheless, based on the insights from both the elite rivalry indicator preliminary analysis in Sochirca & Veiga (2017) and the related literature, we identify a number of potential factors, which may determine the observed elite rivalry level. These are: the level of development, foreign direct investments, income inequality, checks and balances, proximity to historical frontiers, historical population density, religious fractionalization, colonization experience and identity of colonizers, and legal origins of company and commercial rules.

Regarding the level of development, various authors refer the importance of different development dimensions for determining the quality of institutions. For example, Rodrik (2004) sustains that institutions are a result of economic prosperity, and La Porta *et al.* (1999) show a positive relation between income and institutional quality. The effect of human capital on institutions was referred to in early works by Lipset (1960) and North (1990). In particular, Lipset (1960) argued that human capital accumulation contributes to efficient policies, less violence, and more political stability. North (1990) sustained that the skills and knowledge fostered by the structure of an economy will shape the direction of change and gradually alter the institutional framework. Similar views are supported in later studies by Glaeser *et al.* (2004), who provide empirical evidence indicating that human capital positively affects political institutions, and by Castello-Climent (2008) who finds evidence that an educational improvement for the majority of the population leads to both implementation and sustainability of democracies. More recently, Jones & Potrafke (2014) empirically assess whether higher human capital implies better institutions, and conclude that cognitive abilities are robust predictors of overall institutional quality. Using both theoretical and empirical analyses, Fortunato & Panizza (2015) study how the interaction between democracy and education affects the quality of government, and find that the marginal effect of education is positive and statistically significant in countries with high levels of democracy. On the contrary, Acemoglu *et al.* (2005) and Acemoglu *et al.* (2014) argue that, accounting for country heterogeneity, education has no effect on democracy, and that there is no evidence of a significant effect of human capital on institutions.

Various studies assess the impact of foreign direct investments (FDI) on various aspects of institutional quality. For example, Larrain & Tavares (2007) study the empirical effect of FDI inflows on corruption and find a strong negative impact, as FDI significantly decreases corruption in the host country. Demir & Hu (2016) explore the effects of bilateral FDI flows on institutional development gaps between countries and whether such effects are conditional on the direction of flows. While this study finds no significant

convergence or divergence effect of FDI flows on the institutional distance between host and home countries, it concludes that North–South FDI flows may positively influence institutional development in natural resource-rich countries, and that this influence may be harmful for South-South flows. Ahlquist & Prakash (2008) examine the relationship between foreign direct investment and host countries' contracting institutions in developing countries, and find that FDI is more likely to influence institutions in host countries with a greater dependence on foreign capital markets.

The negative effect of natural resources rents, often referred to as the "resource curse", has been emphasized in related research. For example, Couttenier (2008) analyses the relation between natural resources and institutions and finds that more abundant natural resources lead to lower quality institutions, due to an increased expected profitability of rent-seeking. Other researchers consider the natural resources dependence as a decisive factor that decreases institutional quality and has a negative impact on growth (see, for example, Isham & Busby, 2005, Boschini & Roine 2007and Sala-i Martin & Subramanian, 2003). Similarly, Acemoglu (2009) argues that the political struggle between the political elite and other political groups can be aggravated by the presence of natural resources rents, available only to the political group in power.

As regards income inequality, the related literature refers its negative effect on institutional quality and development. For example, Easterly (2007) finds that inequality causes underdevelopment, as it acts as a large and statistically significant barrier to prosperity, good quality institutions and high schooling. Chong & Galdstein (2007) present a model in which inequality and institutions are dynamically interdependent and use empirical tests to show a double causality between institutional strength and lower inequality. Empirical results in Kotschy & Sunde (2017) show that excessive inequality reduces the efficiency and quality of economic and political institutions, disabling the implementation of good institutional environments. Engermann & Sokoloff (2006) argue that societies with higher inequality levels tend to build inefficient institutions, which will further increase inequality, and conclude on the existence of a vicious cycle between income inequality and inefficient institutions.

Although Acemoglu (2009) does not consider a democratic regime as a guarantee of absence of elite rivalry, in general, democratic states do have better institutions, and several authors sustain that there is a positive relation between democracy and good institutions. For example, Meon & Sekkat (2016) find that both partial and full democratic transitions improve institutional outcomes and specific institutional features, and Islam & Montenegro (2002) find that checks and balances are positively associated with institutional quality. Fortunato & Panizza (2015) find a positive correlation between democracy and the quality of government in countries with high levels of education; Rodrik (2000) sustains that democracy is a meta-institution for

building good quality institutions.

Using spatial lag models to test for the impact of institutional quality in neighboring countries on the quality of domestic institutions, Faber & Gerritse (2009) analyze the influence of exposure and relative location on the quality of local institutions, and find that both have a significant positive impact. Similarly, Kelejian *et al.* (2013) consider spatial spillovers between countries in the development of institutions and find that institutional quality in one country is affected by that of another country. Moreover, their empirical results show that such spillover effects not only spread between all bordering countries, but also to considerably greater distances. More generally, Ashraf & Galor (2013) refer that spatial proximity to global and regional technological frontiers not only facilitates the diffusion of new technologies, but also implies sociocultural and geopolitical influences among countries.

Historical population density has been considered an important factor influencing institutional development since the colonial times. For example, Acemoglu *et al.* (2002) and Acemoglu & Robinson (2012) refer that, although throughout history population density has been positively correlated with contemporaneous income *per capita*, among former colonies the relation is inverted. The authors argue that densely inhabited colonies were more attractive for exploitation and less attractive for settlement. This motivated creating or maintaining extractive institutions to facilitate the exploitation of resources and the collection of tax revenue. On the contrary, colonies with lower population density prospered only when incentives and a broader set of rights were given to European settlers, which promoted the creation of better institutions. Thus, during the colonization period, population density influenced the strategy of institutional development and the quality of the resulting institutions.

Regarding religion, Basten & Betz (2011) explore its effect on politics and the economy, finding that religion can significantly define people's political preferences, with far-ranging implications for the choice of political institutions. Focusing on redistribution in the United States, Guiso *et al.* (2006) show that differences in redistribution preferences are associated with different religious affiliations and ethnic background, which actually affect the U.S. state-level fiscal policy.

Colonization experience and the identity of colonizing countries have been also considered as factors historically determining the type of a country's institutions. Studies by Acemoglu *et al.* (2001)and Acemoglu & Robinson (2012) show that different types of colonization policies create different sets of political and economic institutions, which are time-persistent. Distinguishing between colonization conditions and the identity of colonizer, Bennett *et al.* (2017) find that the impact of settlement conditions on institutional development is much stronger among former British colonies than colonies of the other major European

colonizers.

Finally, studying the influence of legal systems on the rule of law, Joireman (2004) finds that, in colonized countries, the adoption of the English common law system provides more efficient legal institutions than the adoption of other forms of civil law. With a more general approach, La Porta *et al.* (2008) conduct an overview of an extensive body of research on the relation between historical legal origins and rules and regulations of a country, and conclude that differences in legal origins have significant consequences for the legal and regulatory framework of the society, as well as for economic outcomes. Similarly, the empirical findings in Amin & Haidar (2012) suggest that different legal traditions in fact imply different institutional preferences as regards private freedom and state control, strength of the judicial system, and overall governance quality.

Table 1 below briefly describes the variables collected to reflect each of the above-referred potential determining factors of elite rivalry.

Table 1: **Potential determining factors of elite rivalry**

Factor	**Source**	**Description**
GDP per capita	Penn World Tables 9	Expenditure-side real GDP per capita (at chained PPPs) used to compare relative living standards.
Human Capital Index	Penn World Tables 9	A human capital index, based on the years of schooling and returns to education.
Foreign Direct Investment	World Bank	Investments reflecting a lasting interest by a foreign direct investor; the lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the enterprise (expressed as a share of GDP).
Gini index	World Income Inequality Database (WIID)	Gini Index, as a measure of the income distribution of a population.
Checks and balances	DPI (Database of Political Institutions)	A composite indicator of institutionalized democracy evaluated by openness and competitiveness of executive recruitment, constraints on chief executive, and competitiveness of participation.
Population density in 1500 A.D.	Ashraf & Galor (2013)	Population density in 1500 A.D. at the country level for regions defined by contemporary national borders.
Frontier distance in 1500 A.D.	Ashraf & Galor (2013)	The great circle distance, measured in km, from a country's capital city to the closest regional technological frontier (given by the most populous city belonging to a civilization or sociopolitical entity, from each of Africa, Europe, Asia, and the Americas) in the year 1500 A.D..
Religious fragmentation	World Religion Dataset	Effective number of religions based on religious shares in the population.
Natural resources rents	World Bank	Sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents (expressed as a share of GDP).
Colonization experience	Wikipedia	Dummy variable assuming value 1 if a country has been colonized and 0 otherwise.

3 Empirical analysis

In this section we check for empirical evidence concerning the potential determining factors (listed in Table 1) of elite rivalry levels across countries. In particular, we will perform a set of regressions to assess if and how the elite rivalry level is influenced by the variables identified in the previous section, i.e. GDP per capita, human capital index, foreign direct investment, Gini index, checks and balances, proximity to historical frontiers, historical population density, religious fragmentation, natural resources rents, colonization experience, colonizers' identity, and legal origins of company and commercial rules of a country.[5]

3.1 Elite rivalry level - determining factors

In order to assess the influence of the selected variables on the elite rivalry level, we use cross-sectional data[6] and estimate by *OLS* several linear regressions based on the following model:

$$ER_i = c + \beta \mathbf{X_i} + \varepsilon_i \tag{1}$$

where ER_i denotes the elite rivalry indicator for country i, $\varepsilon_{i,t}$ is the usual error term and the vector $\mathbf{X_i}$ includes the mean values of the variables considered as determining factors of elite rivalry for each country i (presented above in Table 1).

We estimate a set of five regressions. The first regression - baseline regression - estimates model (1) with the explanatory variables of Table 1, using contemporary values, both for the dependent and explanatory variables, calculated as simple means for the period 1984-2012, for a sample of 108 countries. In the second and third regressions, we additionally check if differences in the identity of the colonizing countries and in the business framework legal characteristics have a significant impact on elite rivalry. Concretely, in the second regression we replace the variable *Colonization experience* by a set of dummy variables indicating the identities of the colonizing countries (i.e. *England*, *Spain*, *Portugal*, *France, Holland* and *Other colonizers*), and, in the third regression, we add to the baseline regression a set of dummies identifying the legal origins of company and commercial rules (UK, France, Germany, Scandinavia and Socialist countries), as additional institutional quality controls.[7] The fourth regression assesses the contemporary impact of the baseline explanatory variables on the elite rivalry level in a restricted-period sample, considering the mean values for

[5] The selected variables' descriptive statistics and correlations are summarized in Appendix B.

[6] We use cross-section data because most of the variation of the elite rivalry indicator is cross-sectional (the between variation, 0.83, is considerably higher than the within variation, 0.37) and, in addition, several of our explanatory variables are constant or highly persistent over time, which would generate problems of collinearity in panel data models that accounted for country fixed effects.

[7] The data on the colonizer identities were collected from Wikipedia and data on the legal origins were taken from Ashraf & Galor (2013).

the years between 1990 and 2008.[8] The fifth regression uses initial values for the explanatory variables, given by their simple means for the 4-year period of 1995-1998, and mean values for the dependent variable across the rest of the period under analysis, that is, 1999-2012. For all the regressions, we conduct diagnostic testing by performing the usual heteroscedasticity and multicollinearity (VIF) tests. The estimation results are reported in Table 2:

[8] We exclude earlier years with less observations (1984-1989) and years since the beginning of the last international financial crisis (2009-2012).

Table 2: **Estimation results**

Explanatory variables	***(1)***	***(2)***	***(3)***	***(4)***	***(5)***
GDP per capita	2.51e-05***	2.53e-05***	2.44e-05***	3.01e-05***	3.66e-05***
	(4.398)	(4.340)	(3.244)	(5.161)	(5.088)
Human capital index	0.320***	0.347***	0.326**	0.279**	0.250*
	(3.118)	(2.917)	(2.518)	(2.628)	(1.690)
Foreign direct investments	0.00519	0.00284	0.00638	0.0166	0.00295
(% of GDP)	(0.537)	(0.311)	(0.570)	(1.049)	(0.103)
Gini index	0.00319	-0.000105	0.00462	0.00800	-0.00411
	(0.509)	(-0.0132)	(0.618)	(1.474)	(-0.691)
Checks and balances	0.149***	0.133***	0.147***	0.117***	0.0655**
	(4.175)	(3.500)	(4.016)	(4.212)	(2.494)
Frontier distance	0.00471*	0.00528*	0.00495*	0.00357	0.000356
(1500 AD)	(1.695)	(1.898)	(1.737)	(1.374)	(0.115)
Population density (1500	-0.00634	-0.00511	-0.00463	-0.00773*	-0.00974**
AD)	(-1.420)	(-1.158)	(-0.785)	(-1.900)	(-2.110)
Religious fragmentation	0.000704	0.00899	0.0145	-0.0142	0.0238
	(0.0182)	(0.211)	(0.338)	(-0.378)	(0.564)
Natural resources rents	-0.0202***	-0.0213***	-0.0205***	-0.0184***	-0.0172***
(% of GDP)	(-4.869)	(-5.272)	(-4.764)	(-4.815)	(-2.774)
Colonization experience	-0.294**	-	-0.255*	-0.300***	-0.128
	(-2.375)		(-1.923)	(-2.773)	(-0.948)
Colonizer_ England	-	-0.309**	-	-	-
		(-2.057)			
Colonizer_ Spain	-	-0.174	-	-	-
		(-1.036)			
Colonizer_ Portugal	-	0.145	-	-	-
		(0.553)			
Colonizer_ France	-	-0.237	-	-	-
		(-1.364)			
Colonizer_ Holland	-	-0.675***	-	-	-
		(-4.006)			
Other colonizers	-	0.0615	-	-	-
		(0.331)			
Legal origin (UK)	-	-	-0.0923	-	-
			(-0.495)		
Legal origin (France)	-	-	-0.0194	-	-
			(-0.119)		
Legal origin (Germany)	-	-	0.0363	-	-
			(0.146)		
Legal origin (Scandinavia)	-	-	0.139	-	-
			(0.709)		
Constant	-1.343***	-1.282***	-1.449***	-1.301***	-0.623
	(-3.730)	(-2.789)	(-3.634)	(-3.697)	(-1.494)
Number of observations	*108*	*108*	*108*	*105*	*92*
Adjusted R-squared	*0.803*	*0.803*	*0.796*	*0.809*	*0.766*
Mean VIF	*2.08*	*2.26*	*2.94*	*2.02*	*2.12*
Periods for which averages are calculated:					
Dependent variable	*1984-2012*	*1984-2012*	*1984-2012*	*1990-2008*	*1999-2012*
Explanatory variables	*1984-2012*	*1984-2012*	*1984-2012*	*1990-2008*	*1995-1998*

Estimation method: *Ordinary Least Squares* with White robust standard errors;
Socialist legal origin is the reference category in the regression reported in column (3);
*** , ** and * denotes the level of significance of 1%, 5% and 10% respectively; t-statistics are reported in brackets.

The results presented in column (1) for the baseline regression show that GDP *per capita*, human capital, the system of checks and balances, natural resources rents and colonization experience are strong determinants of the elite rivalry level. All these variables are statistically significant at 1% or 5%, and have the expected signs. More specifically, higher income *per capita*, more years of schooling and higher returns to education, and a more efficient system of checks and balances contribute to reducing elite rivalry (corresponding to higher indicator values). On the contrary, higher levels of elite rivalry (corresponding to lower indicator values) are found in countries that have been colonized in the past and in countries with high shares of natural resources rents in GDP. These results suggest that elite rivalry is a rather complex phenomenon, as it is strongly influenced by economic, political, and historical factors. Regarding the proximity to historical frontiers, it has a marginally significant (at 10%) effect on elite rivalry, implying that the institutional quality in one country is moderately affected by that of a neighboring country, and that greater distance contributes to avoiding (negative) external influences. Finally, income inequality, foreign direct investments, historical population density, and religious fragmentation do not appear significant in explaining differences in the observed elite rivalry levels across countries.

These results are generally confirmed in regressions (2)-(5), as the significant variables from the baseline regression maintain their coefficients' signs and levels of significance, and the remaining variables continue statistically insignificant.[9] In addition, the results reported in Column (2) show that the magnitude of the impact of colonization experience on a country's level of elite rivalry varies according to the identity of its colonizer. For example, the average elite rivalry indicator values are lower by 0.309 and 0.675 (implying greater elite rivalry) in countries colonized by England (at 5%) and Holland (at 1%), respectively, compared to the average level of elite rivalry in countries that have not been colonized. Finally, the coefficients of the legal origins of company and commercial rules, reported in Column (3), do not appear statistically significant in determining the elite rivalry levels.

3.2 Transmission channels

Based on the empirical evidence obtained from the analysis in the previous section, we perform several regressions in order to identify the main transmission channels through which the selected variables may affect elite rivalry. Given that the elite rivalry indicator in Sochirca & Veiga (2017) includes four components, namely *legal system & property rights*, *effectiveness of legislature*, *general regime effects* and *political risk*, each representing specific institutional features, we can consider them as potential transmission channels

[9] The only exceptions are: variable *Population density* (1500*AD*), which becomes significant, and variable *Frontier distance* (1500*AD*), which becomes insignificant, in regressions (4)-(5); variable *Colonization experience*, which becomes insignificant in regression (5).

through which the previously identified determining factors may act to influence the elite rivalry level. The designations of the first two channels give a clear idea about their nature, i.e. integrity of the legal system, protection of property rights and effectiveness of legislature; the other two channels – *political risk* and *general regime effects* – relate to overall institutional strength, quality of bureaucracy and general authority patterns.[10]

To study the transmission channels, we include in separate regressions one of the elite rivalry components as the dependent variable and the factors considered in the baseline regression as explanatory variables. Thus, we perform four different regressions, one for each component of the elite rivalry indicator:

$$ERcomponent_i = c + \beta \mathbf{F_i} + \varepsilon_i \tag{2}$$

where $ERcomponent_i$ denotes the elite rivalry component for country i, $\varepsilon_{i,t}$ is the usual error term and the vector $\mathbf{F_i}$ includes the nine independent variables considered in the baseline regression in Section 3.

We consider the sample with contemporary values, both for the dependent and explanatory variables, calculated as the averages between the years of 1984 to 2012, as in the baseline regression of the previous section. In order to determine the relative contribution of each variable in each transmission channel, we standardize all variables of equation (2).[11] The estimation results are presented in Table 3:

[10] For more details see Sochirca & Veiga (2017).

[11] To standardize variables, we apply the usual procedure of subtracting the variable's mean and dividing by its standard error.

Table 3: **Transmission channels**

Explanatory variables / Transmission channels	***Legal system & property rights***	***Effectiveness of legislature***	***General regime effects***	***Political risk***
GDP per capita	0.779***	0.296**	0.00418	0.562***
	(10.62)	(2.376)	(0.0431)	(4.665)
Human capital index	0.0689	0.293***	0.333***	0.181**
	(0.835)	(2.879)	(4.049)	(2.379)
Foreign direct investments	-0.0179	-0.0307	0.0677	0.0562
(% of GDP)	(-0.202)	(-0.450)	(1.195)	(0.808)
Gini index	-0.110	0.190***	0.206***	-0.132
	(-1.298)	(2.662)	(2.789)	(-1.542)
Checks and balances	0.0101	0.291***	0.496***	0.0275
	(0.131)	(3.662)	(6.071)	(0.444)
Frontier distance (1500 AD)	0.113*	0.0754	0.0989	0.0854
	(1.661)	(0.897)	(1.372)	(1.347)
Population density (1500	-0.113**	-0.00640	-0.0161	-0.0491
AD)	(-2.028)	(-0.113)	(-0.374)	(-1.005)
Religious fragmentation	0.118***	-0.0657	-0.106**	0.0491
	(2.655)	(-0.984)	(-2.054)	(1.239)
Natural resources rents	-0.308***	-0.213**	-0.244***	-0.296***
(% of GDP)	(-6.759)	(-2.554)	(-3.675)	(-4.379)
Colonization experience	-0.171**	-0.132	-0.0808	-0.0758
	(-2.450)	(-1.449)	(-0.936)	(-1.212)
Number of observations	*108*	*107*	*108*	*108*
Adjusted R-squared	*0.811*	*0.644*	*0.720*	*0.792*
Mean VIF	*2.08*	*2.09*	*2.08*	*2.08*

Estimation method: *Ordinary Least Squares* with White robust standard errors; Sample period 1984-2012;
All variables have been previously standardized;
***, ** and * denotes the level of significance of 1%, 5% and 10% respectively; t-statistics are reported in brackets.

The results in Table 3 show that all elite rivalry components act as important transmission channels for the impacts of the five variables found highly significant in the baseline regression in column (1) of Table 2 (that is, *GDP per capita*, *Human capital index*, *Checks and balances*, *Natural resources rents*, and

Colonization experience). More specifically, the effect of variable *GDP per capita* is highly significant in the *Legal system & property rights* and *Political risk* channels, and the effect of variable *Checks and balances* is highly significant in the *Effectiveness of legislature* and *General regime effects* channels, all at 1% of significance. Moreover, the effects of variables *Human capital*, *GDP per capita* and *Natural resources rents* are present in most or all channels, at 1% and 5% of significance. Thus, while the income level, human capital and rents received from natural resources affect practically all aspects of elite rivalry, the system of checks and balances and colonization experience clearly act on specific dimensions: the former strongly determines legislative effectiveness and regime authority patterns, and the latter essentially affects legal system integrity and the protection of property rights.

Our next step is to quantify the relative effect for each of the five significant variables. For that, we use the estimated coefficient of each variable reported in Table 3, together with the weights of each of the elite rivalry components (obtained from the factor analysis performed for constructing the elite rivalry indicator in Sochirca & Veiga (2017), as explained in Section2). Table 4 below summarizes the calculated effects:

Table 4: **Quantified effects on elite rivalry**

Explanatory variables // Transmission channels		***(1) Legal system & property rights***	***(2) Effectiveness of legislature***	***(3) General regime effects***	***(4) Political risk***	***(5) % of total effect on elite rivalry, by factor***
GDP per capita	*Estimated coefficient*	0,779***	0,296**	0,00418	0,562***	**28,07%**
	Effect on elite rivalry	0,286002	0,070415	0,000932	0,159423	
	Total effect, by channel	55,34%	13,63 %	0,18%	30,85%	
Human capital index	*Estimated coefficient*	0,0689	0,293***	0,333***	0,181**	**11,98%**
	Effect on elite rivalry	0,025296	0,069702	0,074259	0,051344	
	Total effect, by channel	11,47%	31,60%	33,66%	23,28%	
Checks and balances	*Estimated coefficient*	0,0101	0,291***	0,496***	0,0275	**10,39%**
	Effect on elite rivalry	0,003708	0,069226	0,110608	0,007801	
	Total effect, by channel	1,94%	36,18%	57,81%	4,08%	
Natural resources rents (% of GDP)	*Estimated coefficient*	0,308***	0,213**	0,244***	0,296***	**16,41%**
	Effect on elite rivalry	0,113079	0,050671	0,054412	0,083966	
	Total effect, by channel	37,43%	16,77%	18,01 %	27,79%	
Colonization experience	*Estimated coefficient*	0,171**	0,132	0,0808	0,0758	**7,26%**
	Effect on elite rivalry	0,062781	0,031401	0,018018	0,021502	
	Total effect, by channel	46,96%	23,49%	13,48 %	16,08%	

Estimated coefficients and significance levels are obtained from Table 3;
The effect of each variable on elite rivalry was obtained by multiplying its estimated coefficient by the following factor scores of each channel (as predicted in the factor analysis):
legal system & property rights - 0.36714, *effectiveness of legislature* - 0.23789, *general regime effects* - 0.223 and *political risk* - 0.28367;
The reported percentages are calculated based on the regression (2) with nine explanatory variables, but we only present the calculated effects for the baseline significant variables (see column (1) of Table (2));
All the percentages were calculated considering the absolute values of the estimated coefficients.

As we can see from the values presented in the last column, the five significant determining factors account for three quarters of the total effect of all nine variables. The strongest influence on the elite rivalry level comes from *GDP per capita*, responsible for around one third of the total effect, followed by natural resources rents and human capital, with around 16% and 12%, respectively (see Column (5)). We can also see that variables *GDP per capita* and $Natural resources rents$ act primarily through the *Legal system&property*

rights and *political risk* channels (accounting for about 85% and 65%, respectively, of their total effects through all channels), while variables *Human capital index* and *Checks and balances* act mostly through the *Effectiveness of legislature* and *General regime effects* channels (accounting for around 65% and 95% respectively, of their total effects through all channels). Regarding the variable *Colonization experience,* its strongest influence is transmitted through the *Legal system&property rights* channel (almost 50% of its total effect on elite rivalry) and to a lesser extent through the *Effectiveness of legislature* channel (almost 25% of its total effect).

4 Conclusions

In this paper we have empirically examined the key determining factors of elite rivalry and their main channels of transmission, contributing to the sparse literature on the topic. Compared to previous related studies, we perform an enriched analysis on the key determinants of institutions by employing elite rivalry as a new institutional quality measure for a large sample of countries, as well as adding foreign direct investment and frontier distance as potential new determining factors, which, although reported important in the related literature, have not been considered in previous studies.

Our empirical results clearly indicate that the income level, human capital, the system of checks and balances, natural resources rents, and colonization experience are strong determinants of the observed elite rivalry levels. Concretely, while the first three factors contribute to reducing elite rivalry, the last two factors contribute to aggravate it. Additionally, our results indicate that a country's level of elite rivalry can be also influenced by the identity of its colonizer, which, in line with the estimated negative impact of colonization experience and (to a less significant, but still relevant effect) proximity to historical frontiers, brings further support to the empirical relation between specific external influences and the level of elite rivalry. Finally, our results suggest that foreign direct investment, income inequality, historical population density, and the legal origins of company and commercial rules do not have a significant determining effect on the elite rivalry level.

Regarding the transmission channels, our empirical analysis shows that all elite rivalry components act as important channels for transmitting the effects of the five determining factors. The quantification of effects by factor across all channels showed that the level of income is responsible for about one third of the overall effect, followed by natural resources rents and human capital, thus accounting together for about two thirds of the overall effect on the observed elite rivalry levels.

In sum, the empirical results obtained in this work indicate that adopting a better institutional model can

in fact reduce the level of elite rivalry in the long run, and that external influences can help determine the quality of the institutions adopted. Our empirical findings on the key determining factors of elite rivalry also suggest that it is a complex phenomenon deserving further research, as it is strongly influenced by economic, political, and historical factors.

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Appendix A

Table 5: **Composition of the Elite Rivalry Indicator**

ER components	**Description**	**Component Weight**
Legal system & property rights (Economic Freedom of the World)	Nine sub-components reflecting the judicial independence and impartial courts, integrity of the legal system, legal enforcement of contracts, military interference in rule of law and politics, protection of property rights, regulatory restrictions, reliability of police, business costs of crime.	0.36714
Effectiveness of legislature (Cross National Time Series)	Ordinal-scaled data on legislative processes, coded as effective, partly effective, largely ineffective, or no legislature.	0.23789
General regime effects (POLITY IV)	General regime effects (ranging from democracy to autocracy) evaluated in terms of openness and competitiveness of executive recruitment, constraints on chief executive, and regulation and competitiveness of participation.	0.223
Political risk (International Country Risk Guide)	Five (out of twelve) factors, termed political risk components, such as: government's ability to carry out its declared programs and its ability to stay in office; strength of the legal system and public observance of the law; degree of government responsiveness to its people; overall institutional strength and bureaucracy quality.	0.28367

Note: Factor analysis was employed for identifying the elite rivalry components and their respective weights, see Sochirca & Veiga (2017).

Appendix B

Table 6: **Descriptive statistics**

Variables	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
GDP per capita	122	13998.77	14990.45	713.1891	86105.73
Human capital index	117	2.341193	0.6670116	1.08715	3.559204
Foreign direct investment (% of GDP)	123	3.663361	4.647385	-6.203491	41.03395
Gini index	118	40.39022	9.010059	24.59931	64.5725
Checks and balances	123	2.91722	1.378894	1	8.206897
Frontier distance (1500 AD)	120	23.87618	18.69328	0	108.0218
Population density (1500 AD)	120	6.513536	9.297991	0. 0219937	46.63923
Religious fragmentation	124	2.338622	1.185366	0.8711772	5.426222
Natural resources rents (% of GDP)	123	10.06412	12.43427	0.0014029	54.35196
Colonization experience	124	0.6451613	0.4804055	0	1

Table 7: **Correlation matrix**

Variables correlations	*Elite rivalry*	*GDP per capita*	*Human capital index*	*Foreign direct investment*	*Gini index*	*Checks and balances*	*Frontier distance*	*Popul. density*	*Religious fragm.*	*Natural resources rents*	*Coloniz. experience*
Elite rivalry	1.0000	-	-	-	-	-	-	-	-	-	-
GDP per capita	0.7459	1.0000	-	-	-	-	-	-	-	-	-
Human capital index	0.7921	0.6864	1.0000	-	-	-	-	-	-	-	-
Foreign direct investment	0.2772	0.4062	0.2016	1.0000	-	-	-	-	-	-	-
Gini index	-0.4387	-0.4880	-0.5095	-0.2135	1.0000	-	-	-	-	-	-
Checks and balances	0.6473	0.4517	0.5530	0.1227	-0.2937	1.0000	-	-	-	-	-
Frontier distance	-0.1679	-0.1934	-0.2246	-0.1356	0.3719	-0.1577	1.0000	-	-	-	-
Popul. density	0.3968	0.4201	0.3221	0.2694	-0.5438	0.4322	-0.3368	1.0000	-	-	-
Religious fragment.	-0.0382	0.0003	-0.0195	0.0414	0.0963	-0.1344	0.5775	-0.1764	1.0000	-	-
Natural resources rents	-0.5006	-0.1690	-0.3229	-0.0550	0.1291	-0.3949	0.1785	-0.3316	0.1845	1.0000	-
Colonization experience	-0.4922	-0.3938	-0.5763	-0.1717	0.6648	-0.2407	0.5235	-0.4441	0.2036	0.2344	1.0000

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