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# Reforming Economic Institutions in Transition Economies: What Determines the Speed of Reform?

PRELIMINARY DRAFT

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# Abstract

*This paper studies the institutional divergence among two groups of transition economies: (1) the former socialist economies of Central and Eastern Europe, which have gradually been converging to European levels of institutional quality, and (2) the countries of the Former Soviet Union, which have, on average, made much less progress with institutional reform. Our aim is to explain this difference in the speed of institutional reform, which we measure as improvements in four Worldwide Governance Indicators (WGI): government effectiveness, regulatory quality, rule of law (including property rights), and control of corruption. Our analysis reveals two robust factors connected to institutional divergence: cultural/religious roots (Huntington's definition of "civilization") and the number of years under a socialist regime. This finding underlines that economic institutions are embedded in political as well cultural history and are, therefore, necessarily difficult to change. Other, less significant variables are imperial history (whether a country used to be a member of the Russian empire) and the prospect of EU membership (as proxied by the distance to Brussels, an exogenous variable in order to avoid common endogeneity problems). Our research also relates to the literature on the "natural resource curse". Many papers (mainly theoretical, but also empirical) have argued that natural resources a country's have a negative impact on its institutional quality, which in turn leads to lower economic growth. We, however, find no significant causal effect of natural resource rents on institutions, at least not for three out of four WGI indicators. Only if we use regulatory quality as the dependent variable, the presence of natural resources has a significant, negative effect.*

*Disclaimer: This is a discussion paper, not a finished report. The contents of this paper are not yet finalised.*

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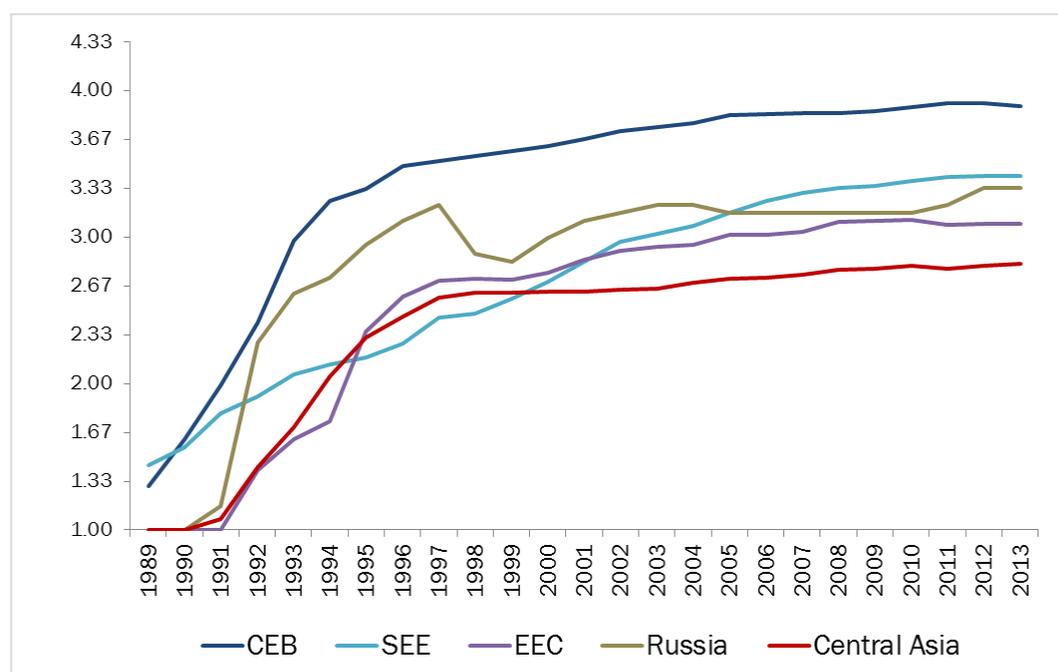


# 1 Introduction

Formerly centrally planned economies have now had nearly 25 years to ‘transition’ from plan to market. Despite the fact that all implemented market reforms, there are large differences in the speed with which they reformed and also in the extent of market reform that has taken place in each country.

Figure 1.1 shows the overall extent and speed of market reforms, as measured by the EBRD Transition Indicator. This indicator takes on the value 1 for a perfectly centrally controlled economy, and the value 4.33 for an advanced market economy. As Figure 1.1 shows, the countries of the Central Europe and Baltics (CEB) region have always been ahead. Second in line are the countries of Southeastern Europe (SEE), which started more slowly but have continued to make steady progress. Russia was one of the first countries to introduce rapid reforms, sometimes referred to as “shock therapy”, but had a backlash in 1998 and has not proceeded much further since then with market reforms. Other countries of the Former Soviet Union (Eastern Europe and Caucasus (EEC), Central Asia) started late with reforms and are still behind other transition economies.

**Figure 1.1** Progress with Market Reforms (EBRD Transition Indicator)

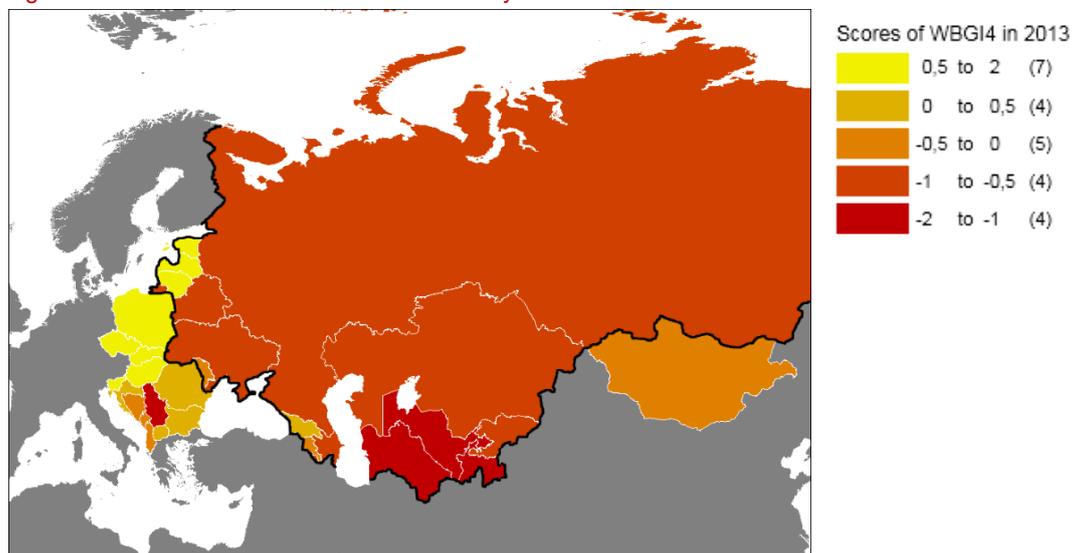


Source: European Bank for Reconstruction and Development

The speed and extent of market reform is closely related to the quality of economic institutions. As Figure 1.2 shows, there seems to be a particularly large difference in institutional quality between countries within Central and Eastern Europe (CEE) and those of the Former Soviet Union (FSU). Institutional quality here is measured by the Worldwide Governance Indicators, described in the next section. These indicators range from -2.5 to +2.5, with higher values corresponding to better economic institutions. While FSU countries almost all have negative, i.e., below-average scores

(with the exception of the Baltic states), Central and Eastern European countries virtually all have positive scores (with the exception of a few former Yugoslav republics).

Figure 1.2 Differences in Institutional Quality between FSU and CEE



Source: World Governance Indicators; SEO Amsterdam Economics

What explains these differences in institutional quality?

In the remainder of this paper we will consider the following explanations:

1. cultural/religious history
2. membership of empires
3. years under socialism
4. availability of natural resource rents
5. prospect of EU membership
6. quality of political institutions

We find that the main determinants are a country's cultural/religious roots (Huntington's definition of "civilization?"), imperial history (whether a country used to be under the control of the Russian empire), the number of years under a socialist regime, and the prospect of EU membership (as proxied for by the distance to Brussels). Contrary to earlier studies, natural resource rents do not appear to have a significant direct impact on institutional quality, but appear to influence economic institutions via their effect on political institutions.

## 2 Measuring economic institutions

To measure the quality of economic institutions, we use a commonly used measure, which is the average of the first four Worldwide Governance Indicators (WGIs). These are indicators compiled by the World Bank on (1) government effectiveness; (2) regulatory quality; (3) rule of law; and (4) control of corruption. We do not use the other two WGIs (on (5) voice and accountability and (6) political stability and absence of violence, because these are measures of the strength of political, rather than economic institutions. In what follows, we use the term “WGI4” to refer to the average of the first 4 economic indicators.

The WGI indicators are aggregate indicators for 215 economies over the period 1996–2014. They are based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms. The indicators therefore reflect the quality of institutions as perceived by enterprises, citizens, as well as expert survey respondents (rather than reflecting formal rules and regulations, like the IFC Doing Business Survey).

The World Bank's own description<sup>1</sup> of the 4 indicators is as follows:

- **Government Effectiveness (GE)** – capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
- **Regulatory Quality (RQ)** – capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
- **Rule of Law (RL)** – capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
- **Control of Corruption (CC)** – capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

As Figure 2.1 shows, the WGI indicators are all closely correlated and are also correlated with other measures of the quality of economic institutions (EBRD Transition Indicator and IFC Doing Business Report).<sup>2</sup> This suggests that it should not matter much which measure of institutional quality one uses in practice. All indicators are normalized here to range from -2.5 to +2.5, with higher values corresponding to better economic institutions. It is clear from the chart that the worst-

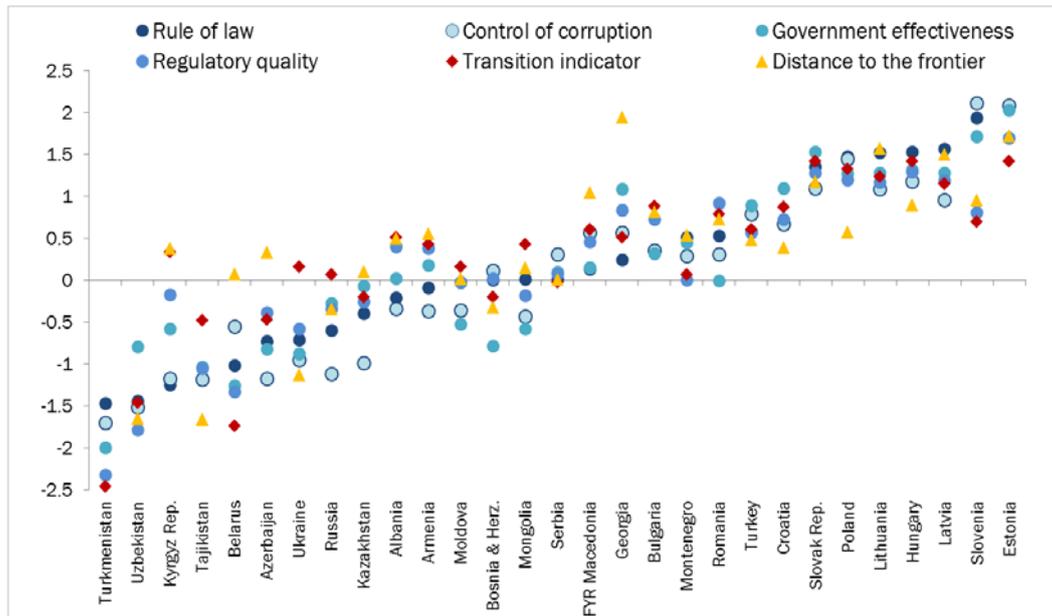
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<sup>1</sup> See <http://info.worldbank.org/governance/wgi/index.aspx#faq>

<sup>2</sup> The “distance to the frontier” measures the distance to the best performing country in the IFC Doing Business database.

performing countries in terms of institutional quality are all in the Former Soviet Union, while the countries with the best developed economic institutions ones in Eastern Europe.

Figure 2.1 Correlations between Measures of Economic Institutions in Transition Economies



Source: World Bank (4 World Governance Indicators); EBRD (Transition Indicator); IFC (Distance to the Frontier of the Doing Business Indicator)

## 3 Determinants of Economic Institutions

In this section we discuss the existing literature (theoretical and empirical) on the main determinants of economic institutions that we explore in this paper: (1) cultural/religious history; (2) membership of empires; (3) years under socialism; (4) natural resources; (5) prospect of EU membership; and (6) political institutions / democracy.

### 3.1 Cultural/religious history

There are many studies that have argued that the roots of institutions stretch back centuries and might have to do with culture or religion. In his famous 1993 article in *Foreign Affairs* called “The Clash of Civilizations?”, Samuel Huntington (1993) predicted that the cultural/religious division of Europe would re-emerge once the ideological division between capitalism and socialism disappeared:

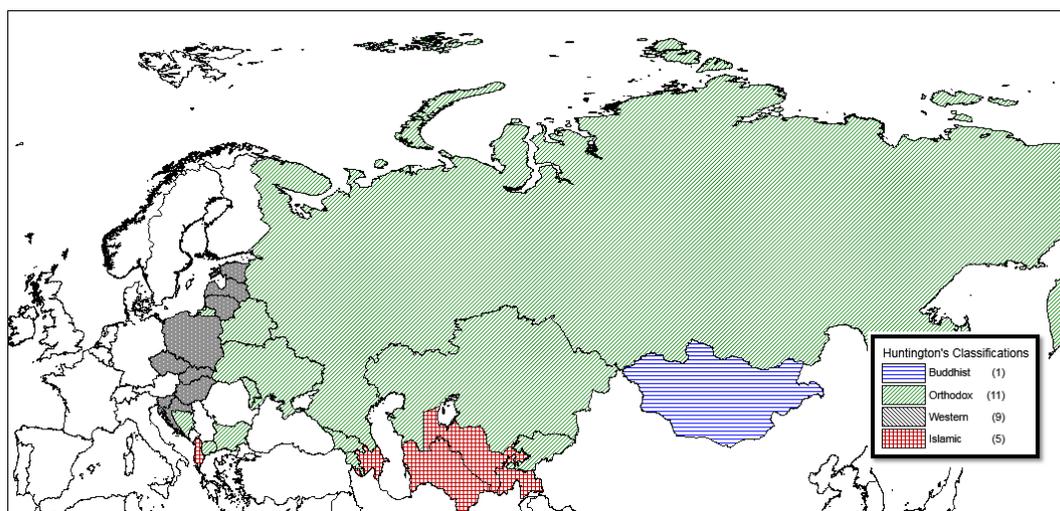
“The fault lines between civilizations are replacing the political and ideological boundaries of the Cold War as the flash points for crisis and bloodshed. The Cold War began when the Iron Curtain divided Europe politically and ideologically. The Cold War ended with the end of the Iron Curtain. As the ideological division of Europe has disappeared, the cultural division of Europe between Western Christianity, on the one hand, and Orthodox Christianity and Islam, on the other, has reemerged. The most significant dividing line in Europe, as William Wallace has suggested, may well be the eastern boundary of Western Christianity in the year 1500.”

Figure 3.1 illustrates this dividing line and also points out which countries are considered “western”, “Islamic”, “orthodox” and “Buddhist” according to Huntington (1993). As this figure shows, most of Eastern and Western Europe is classified as having a “Western” civilization, while most of the countries of the Former Soviet Union have Orthodox roots. However, there are also various former soviet republics with Islamic roots (Azerbaijan, Tajikistan, Turkmenistan, Uzbekistan).

The full list of Huntington’s classification for transition countries is as follows:

- **“Western”**: Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia
- **“Islamic”**: Albania, Azerbaijan, Tajikistan, Turkmenistan, Uzbekistan
- **“Orthodox”**: Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, Kyrgyzstan, Macedonia, Moldova, Romania, Russia, Serbia, Ukraine
- **“Buddhist”**: Mongolia

Figure 3.1 Huntington's Civilization Index



Source: Huntington (1993); Authors' calculations.

Kuran (2004) proposes several reasons why the Islamic world was not able to develop growth-inducing institutions at the same time that Western Europe was developing corporations, property rights, and limitations on state power. Similarly, North and Gwin (2010) explain how the medieval Roman Catholic Church created a body of canon law that laid a foundation in the West for modern rule of law. North et al (2013) also find that the state of religion in 1900 is a better measure of a country's current religious/cultural heritage than the state of religion in 2000, and is correlated with "corruption" and "rule of law as measured the the Worldwide Governance Indicators.

## 3.2 Membership of empires

A number of recent studies have found that colonial powers and empires have a long-lasting impact on societies that come under their rule (see, for instance, Becker et al. (2011), Grosjean (2011a, 2011b), Grosfeld and Zhuravskaya (2013) for evidence on the legacy of different empires in Europe).

The membership of empires is related to the dividing line between Western and non-Western culture suggested by Huntington (1993):

"In the Balkans this line, of course, coincides with the historic boundary between the Hapsburg and Ottoman empires. The peoples to the north and west of this line are Protestant or Catholic; **they shared the common experiences of European history-feudalism, the Renaissance, the Reformation, the Enlightenment, the French Revolution, the Industrial Revolution;** they are generally economically better off than the peoples to the east; and they may now look forward to increasing involvement in a common European economy and to the consolidation of democratic political systems. The peoples to the east and south of this line are Orthodox or Muslim; they historically belonged to the Ottoman or Tsarist empires and were only lightly touched by the shaping events in the rest of Europe; they are generally less advanced economically; **they seem much less likely to develop stable democratic political systems.** The Velvet Curtain

of culture has replaced the Iron Curtain of ideology as the most significant dividing line in Europe.”

### 3.3 Years under socialism

In terms of more recent history, Beck & Laeven (2006) argue and find that the number of years under socialism has played an obvious role in explaining the difference in the quality of economic institutions.

Among transition countries there are essentially 2 groups in this regard: one which joined the Soviet Union around 1917 and one which adopted socialist governments around the time of the Second World War. The Baltic states (Estonia, Latvia, and Lithuania) are the only ones that joined the Soviet Union relatively late, after the second world war.

### 3.4 Natural resources

There is a long literature on the subject of the “natural resource curse”, one explanation for which is that resource wealth tends to give rise to a fight over existing resources, which in turn leads to lower growth (Sachs and Warner 1995, 2001). Many subsequent papers have argued that the main channel through which this occurs is through the negative impact that natural resources have on institutional quality, which in turn negatively affects growth.

The theory is that the large rents that can be obtained from natural resources create incentives for governments and private agents to engage in rent-seeking behavior and corruption (e.g., Mauro 1995; Leite and Weidmann 1999). Such incentives arise when the expected net payoffs from engaging in unproductive activities to appropriate the existing wealth (e.g., through corruption) exceed the net payoffs from engaging in productive activities to create wealth. Hausmann and Rigobon (2003) argue that the presence of common-pool problems or uncertainty related to property rights over the resource income leads to inefficient fights over existing resources.

Sala-i-Martin and Subramanian (2003) find empirical evidence for this “institutional impact of natural resources.” In particular, they find that some natural resources (in particular, oil and minerals) exert a robust negative and nonlinear impact on growth *via* their deleterious impact on institutional quality. In a similar study, Isham and others (2005) find that countries that export fuels, minerals, plantation crops, and coffee or cocoa do worse across an array of governance indicators, even when controlling for other potential determinants of governance. There are also a number of empirical studies that find that natural resource dependence is positively related with corruption (e.g., Gylfason, 2004).<sup>3</sup>

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<sup>3</sup> In addition, Gylfason (2004) finds that natural resource dependence is negatively correlated with trade, foreign investment, domestic investment, equality, political liberty, education, and financial depth.

### 3.5 Prospect of EU membership

While natural resource abundance constitutes a negative incentive to reform, the prospect of EU membership has clearly constituted a positive incentive to reform for many Eastern European countries.

EBRD (2013) finds that the influence of EU membership on economic institutions is positive and statistically significant in all of their regressions involving the transition region sample, which is similar to ours. However, EU membership is captured here by a variable that takes the value 1 as of two years before EU accession, as pre-accession reforms usually peak at this time (the following section investigates this effect in the context of case studies.) Note that the effect occurs over and above the influence of democracy, economic openness and per capita income, all of which are correlated with (and, to some extent, induced by) EU membership. Hence, the regressions indicate that, given two equally open, democratic and wealthy countries, where one is in the European Union and the other is not, the EU member would be expected to have better economic institutions.

To measure the prospect of EU membership we obviously cannot use actual data on EU membership. This is because of inherent endogeneity: the incentive to reform depends on the prospect of EU membership, but the prospect of EU membership depends explicitly on the progress made with reform.

A clearly exogenous measure or “instrument” is the distance to Brussels. This variable is clearly exogenous in that it is not influenced by the progress with economic reform, while it does affect the chances of EU membership. This is expected to be the case at least on a global scale: countries that are so far away from Brussels that they are not technically part of Europe, are very unlikely to qualify for EU membership. While countries that are very close to Brussels are likely to be the strongest candidates for EU membership, everything else taken as equal.

### 3.6 Political Institutions / Democracy

Plekhanov et al (2013) argue that one of the most important determinants of the quality of economic institutions is the quality of political institutions. The theory is that political competition and the checks and balances imposed in a well-functioning democracy restrict the ability of governments to engage in rent seeking while accountability of government to taxpayers leads to more business-friendly rules and regulations (see, for instance, Olson (2000), North (1990) and North and Weingast, 1989). Democratic regimes are also more likely to have an independent judiciary and strong and independent regulatory bodies.

The link between the quality of economic and political institutions is further reinforced as better economic institutions tend to support economic development, and economic development over time may lead to demand for better political institution. In fact, disentangling the direction of causality (from democratisation to better institutions and vice versa) is a difficult task, not least because common factors such as history and geography may affect both.

Democratic institutions are measured by a Polity IV index, compiled annually by the Center for Systemic Peace. The index ranges from -10 (corresponding to a completely autocratic regime, such as hereditary monarchy) to 10 (corresponding to a well-functioning democracy), with countries with Polity scores below -5 labelled as “autocracies”.

Advantages of using this index are as follows:

- Widely used data series in political science research
- Annual scores on the level of democracy for all independent states with population > 500,000
- Assessment of democracy is based on:
  - competitiveness and openness of elections
  - nature of political participation in general
  - extent of checks on executive authority
- For each year and country, a "Polity Score" is determined which ranges from -10 to +10, with -10 to -6 corresponding to autocracies, -5 to 5 corresponding to anocracies, and 6 to 10 to democracies.

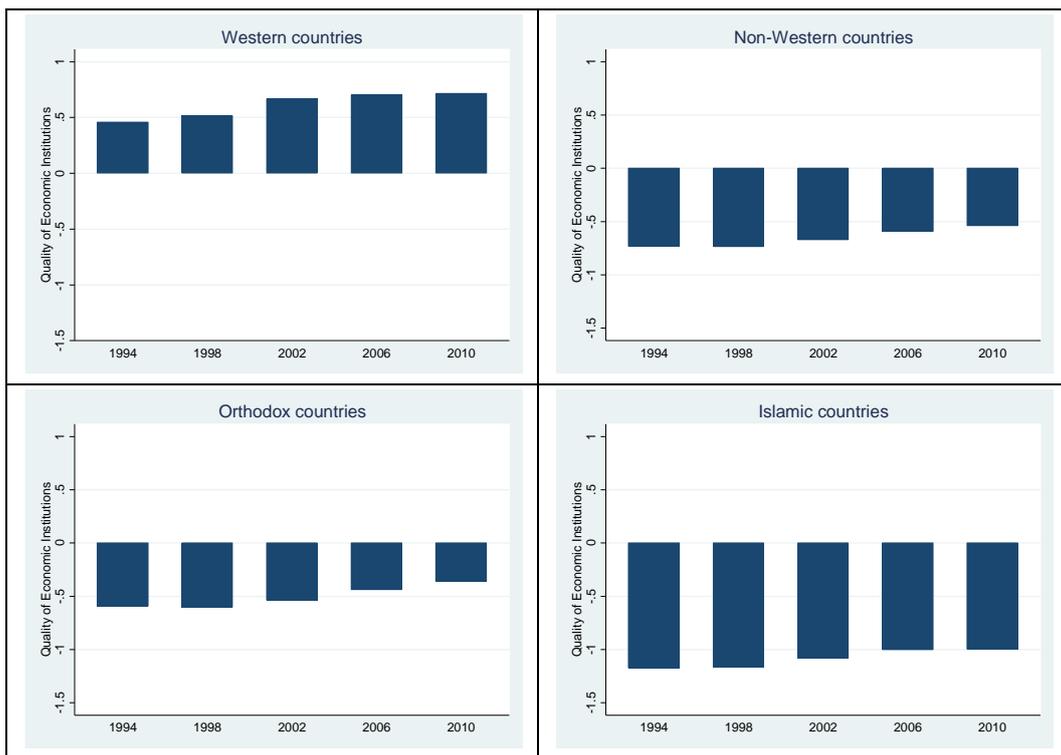
## 4 Empirical analysis

This section analyzes the variables in our dataset. Section 4.1 describes the individual relationships between the determinants and the quality of economic institutions. Section 4.2 performs a econometric analysis in order to discriminate between different explanations of institutional divergence.

### 4.1 Simple statistics

This section provides simple statistics relating the determinants with the quality of economic institutions. Our dataset cover 27 transition countries over the period 1994 through 2013. For the bar charts, we track the development of the variables using four-year intervals. For the scatter plots, we consider the distribution in the last available period, i.e. 2013. The vertical axis in all of the plots is the average of the four WGI indicators (Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption).

Figure 4.1 Quality of Economic Institutions for Transition Countries with Different Cultural/Religious Origins



Source: World Bank World Governance Indicators; Huntington (1993); SEO Amsterdam Economics

Figure 4.1 shows that countries classified as “Western” have significantly better quality of economic institutions than countries classified as “non-Western”. Non-Western countries can be further divided into Orthodox and Islamic countries, of which the latter have the lowest scores.

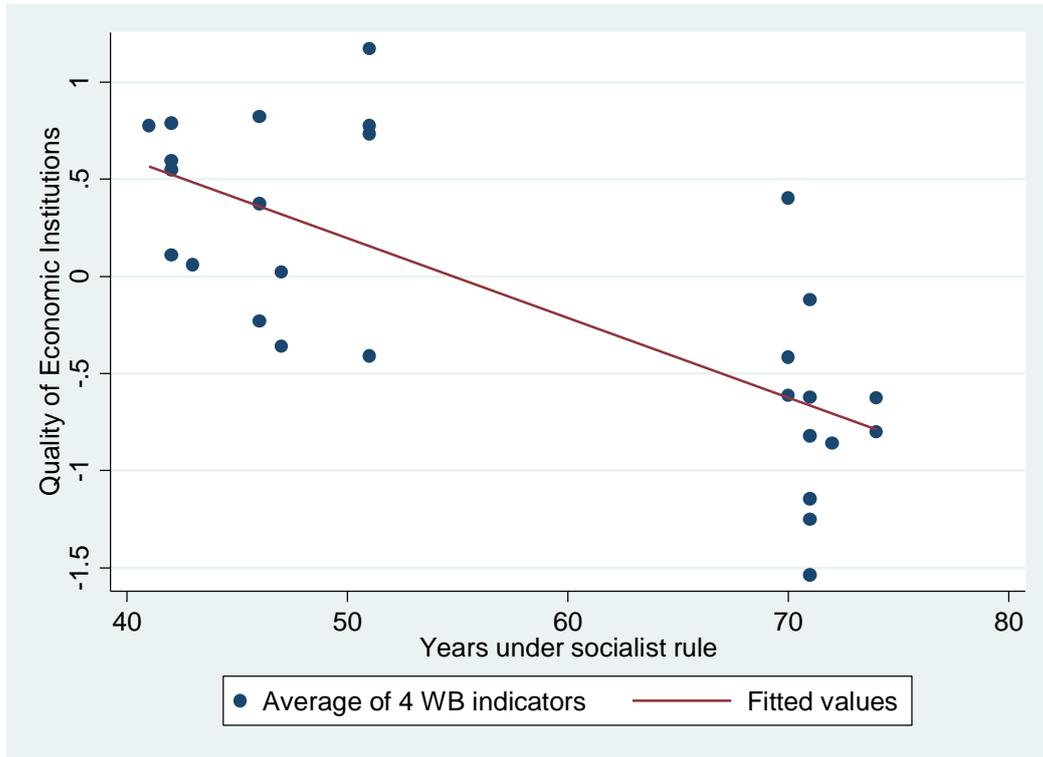
Figure 4.1 Quality of Economic Institutions for Transition Countries with Different Cultural/Religious Origins



Source: World Bank World Governance Indicators; Becker et al (2011); Grosjean (2011a); EBRD (2013); SEO Amsterdam Economics.

As Figure 4.2 shows, transition countries that belonged to Prussian or Habsburg empires have significantly better economic institutions than countries that belonged to Russian or Ottoman empires. Within the transition country sample, countries belonging to the Russian empire have the worst economic institutions. In recent years, countries from the former Ottoman empire have improved their institutions the most.

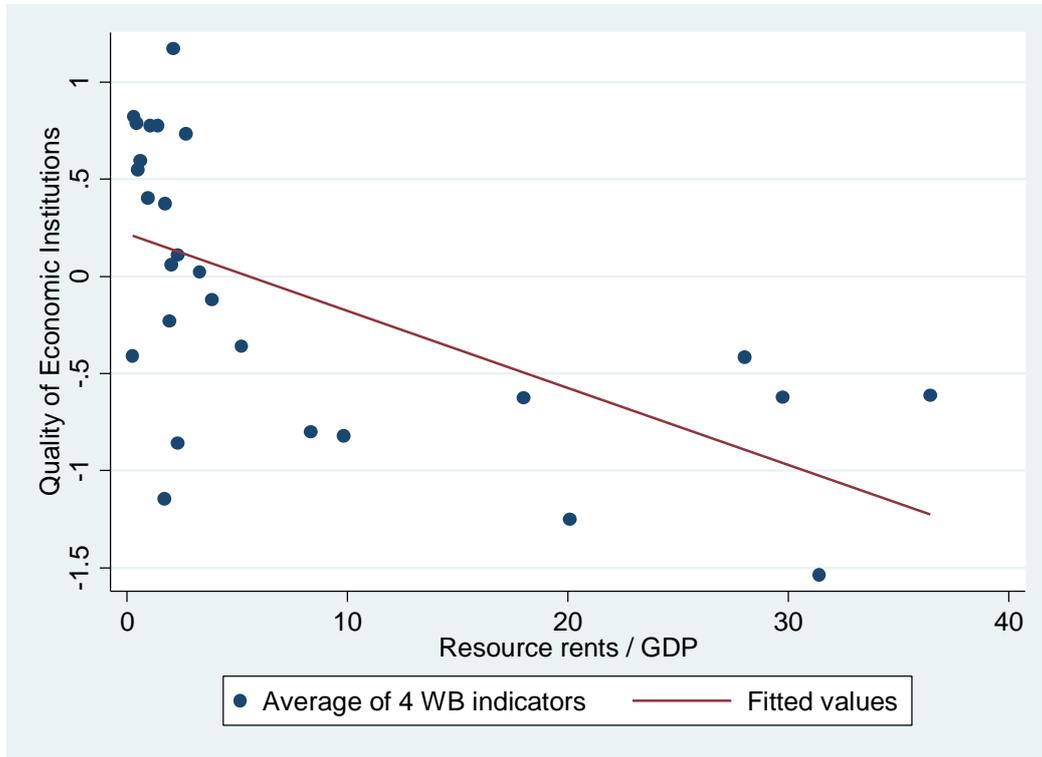
Figure 4.3 Quality of economic institutions is negatively correlated with years under socialist rule



Source: World Bank World Governance Indicators; SEO Amsterdam Economics

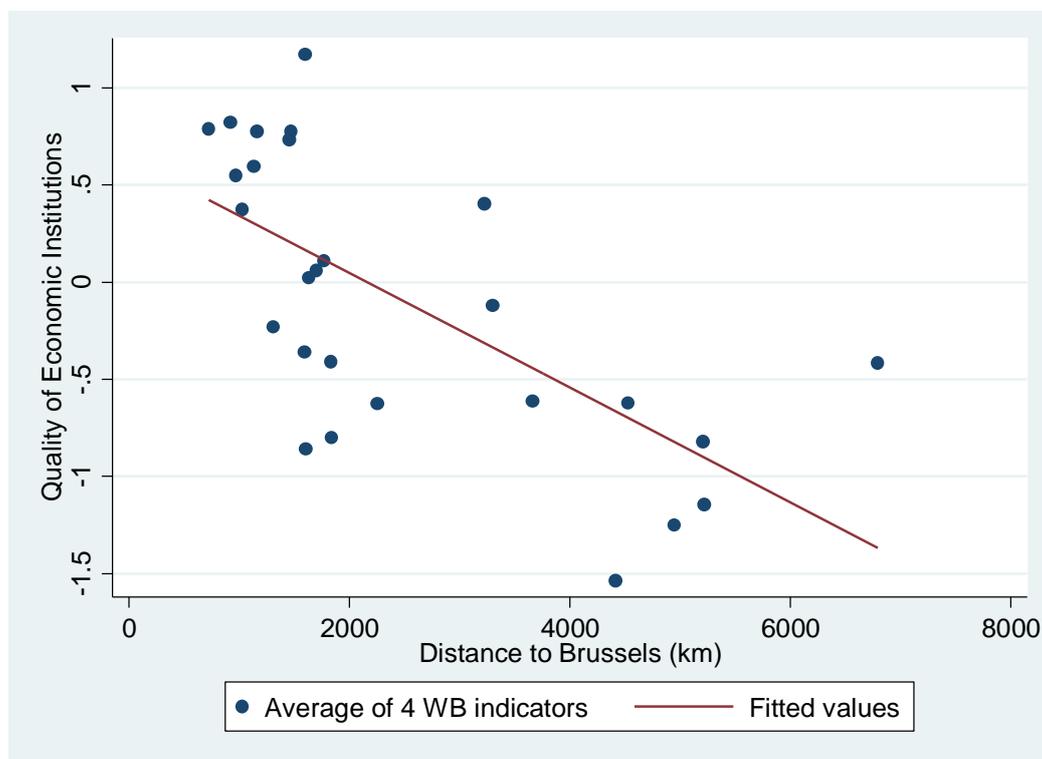
As Figure 4.3 shows, there is a clear negative correlation between the quality of economic institutions and the length of time under socialism. The group of countries that adopted socialism later have a significantly higher quality of economic institutions today.

Figure 4.4 Quality of economic institutions is negatively correlated with natural resources



We measure the Distance to Brussels as the “great circle distance” from Brussels to the capital city of each country. The great circle distance is the distance between two points measured along the surface of the Earth, and is often used in economic literature as the operationalization of physical distance. The source of the distance data is the Geobytes City Distance calculator.

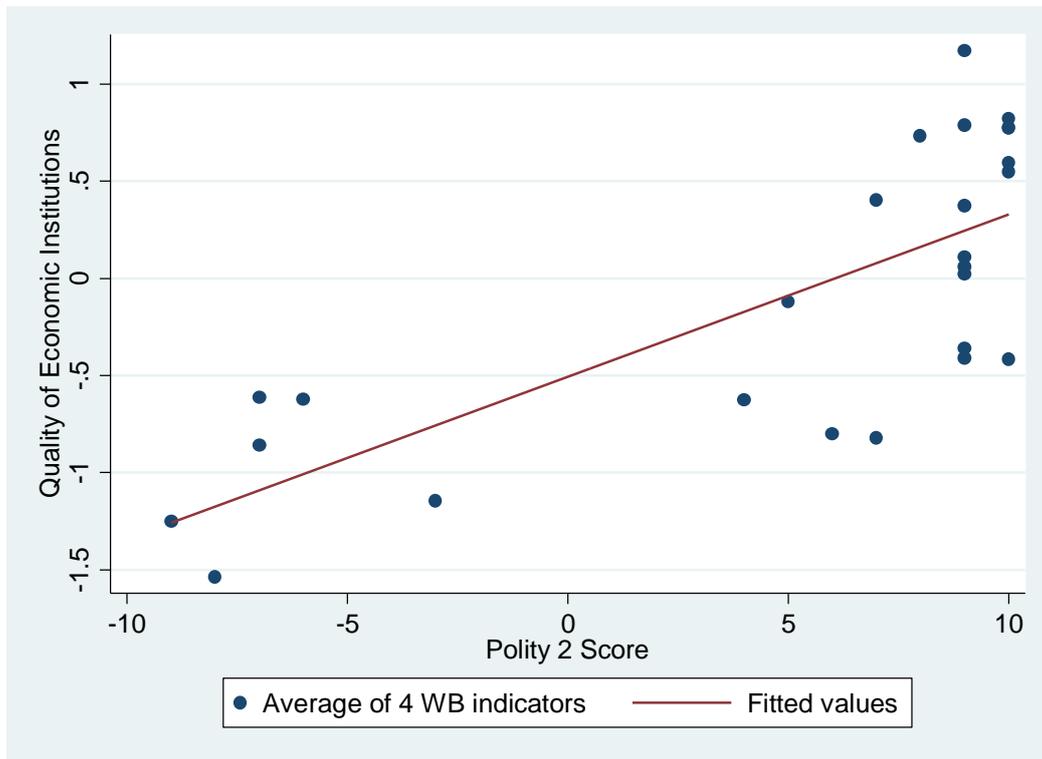
**Figure 4.5** Quality of economic institutions is negatively correlated with distance to Brussels



Source: World Bank World Governance Indicators; SEO Amsterdam Economics

Figure 4.5 plots the quality of economic institutions with the distance to Brussels. The quality of economic institutions is negatively correlated with this distance.

Figure 4.6 Quality of economic institutions is positively correlated with democratic institutions



Source: World Bank World Governance Indicators; SEO Amsterdam Economics

Finally, the quality of economic institutions and that of democratic institutions are strongly positively correlated, see Figure 4.6. The relationship does not appear to be linear, or even monotonic. For a worldwide sample, Plekhanov et al. (2013) find that this relationship has a U-shaped curve, but this is not the case in the transition sample.

Table 4.1 summarizes the correlations in the bar charts and scatterplots quantitatively, based on the estimated slope of simple univariate OLS regressions.

Table 4.1 The individual relations of the six determinants with WGI4 are strong

Dependent variable:	Quality of Economic Institutions (WGI4)	
	Estimate	(Standard error)
Non-Western (Huntington)	-1.24***	(0.18)
Russian empire	-0.52*	(0.28)
Years under socialist rule	-0.041***	(0.007)
Natural resources (% GDP)	-0.040***	(0.011)
Distance to Brussels (1000 km)	-0.30***	(0.07)
Democracy (Polity2)	0.083***	(0.015)
Number of observations	27	

Estimated slope based on simple OLS cross-country regressions for the most recent year in the sample, i.e. 2013. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*.

Source: Authors' calculations

The estimates in Table give a first idea of how much of the variation in institutional quality can be explained by the six determinants of economic institutions discussed above. The dependent variable WGI4 is an index with values theoretically ranging from -2.5 to 2.5, and within our dataset ranges from about -1.5 to 1.2. This gives a total variation of about 2.7 index points between the minimum and the maximum level of institutional quality in our dataset.

Within the range for institutional quality of 2.7 points, the univariate analysis provides the following information about the size for each of the correlations:

- “Non-Western” countries have on average a WGI4 of 1.24 lower than “Western countries (definition based on Huntington)
- Countries that were part of the Russian empire have a lower WGI4 by -0.52.
- Every additional year that a country spent under socialist rule is associated with a lower quality loss of 0.041 point
- Having an additional 1 percent of GDP in terms of natural resource rents is also associated with a loss of -0.041 point.
- Having a capital 1000 kilometers further from Brussels gives on average a 0.30 lower score.
- A one point Polity2 score higher gives a 0.083 point lower WGI4 score.

In summary, one could say that the individual relations are reasonably large in size. Also all of them, except for countries from the former Russian empire, are strongly significant (at the 1 percent level).

Note that these individual relations do not depend on treating small and large countries equally. Table 4.2 shows the same results for simple weighted least squares, using the logarithm of GDP as weights. When correcting for GDP the individual relations, remain almost unaltered.

**Table 4.2 The relations between the six determinants and WGI4 remain when correcting for GDP**

Dependent variable:	Quality of Economic Institutions (WGI4)	
	Estimate	(Standard error)
Non-Western (Huntington)	-1.25***	(0.17)
Russian empire	-0.55*	(0.27)
Years under socialist rule	-0.042***	(0.007)
Natural resources (% GDP)	-0.041***	(0.010)
Distance to Brussels (1000 km)	-0.31***	(0.07)
Democracy (Polity2)	0.084***	(0.015)
Number of observations	27	

Estimated slope based on simple OLS cross-country regressions for the most recent year in the sample, i.e. 2013, weighted with the logarithm of total GDP. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*.

Source: Authors' calculations

Section 4.2 below discusses the (multivariate) econometric analysis. First, before presenting the results of this analysis, it is important to note the *ex ante* difficulty in discriminating between the determinants. The reason is that the explanatory variables are strongly correlated between each other (see Table ).

**Table 4.3** The six determinants are highly correlated between each other.

Correlation matrix	Non-W	Rus emp	Years soc	Nat res	Brussels	Democ
Non-Western (Huntington)	1.00					
Russian empire	0.26	1.00				
Years under socialist rule	0.66	0.66	1.00			
Natural resources (% GDP)	0.46	0.27	0.61	1.00		
Distance to Brussels (1000 km)	0.61	0.34	0.74	0.68	1.00	
Democracy (Polity2)	-0.49	-0.53	-0.69	-0.65	-0.53	1.00

Calculations on the 27 countries in the dataset for the most recent observed year, i.e. 2013. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*.  
Source: Authors' calculations

The high correlations suggest that multicollinearity may be a problem. In particular, multicollinearity arises when one explanatory variable influences another (e.g. culture/religion is related to imperial history and also with the length of socialist rule) or when another, unobserved variable influences both (e.g. all historical measures may be influenced by a people's inherent 'DNA', e.g. the reliance on a 'strong leader'). Strong multicollinearity may lead to coefficients in the multivariate regression falsely appearing insignificant. We address this question by comparing specifications that include different subsets of the correlated variables.

Apart from the possible multicollinearity, a second challenge of the multivariate analysis is endogeneity. Endogeneity is particularly relevant for the quality of democratic institutions, as democratic institutions and economic institutions affect one another. We indicate below how endogeneity is best addressed in this context.

## 4.2 Econometric model

For our econometric analysis we make use of a two-stage procedure based on Mundlak (1978), as discussed by e.g. Wooldridge (2010: 332). There are two sets of explanatory variables,  $X^{(1)}$  and  $X^{(2)}$ , of which the first set contains time-varying variables, and the second set contains variables that are constant over time, changing only between countries.

The first stage regression reads

$$\Delta y_{it} = a_i + \Delta X_{it-1}^{(1)} b_1 + e_{it},$$

where  $\Delta y_{it}$  and  $\Delta X_{it-1}^{(1)}$  refer to differences from the time average,  $\bar{y}_i = \sum_t y_{it}$  and  $\bar{X}_i^{(1)} = \sum_t X_{it}^{(1)}$ . The parameters  $a_i$  are the country-fixed effects. The result of the first stage regression is formed by the within-period effects  $b_1$  of the time-varying variables.

In the second stage regression, the estimated country-fixed are regressed on the second set of explanatory variables:

$$\hat{a}_i = X_i^{(2)} b_2 + u_i$$

As an extension of the second stage, the time-invariant levels of the first set of explanatory variables can also be added:

$$\hat{a}_i = X_i^{(2)} b_2 + \bar{X}_i^{(1)} c_1 + u_i$$

The main reason to execute the Mundlak procedure is address the endogeneity problem in our dataset. The first stage is to estimate a panel data model in terms of changes, rather than the levels of the time-varying variables. In this case the differences in e.g. democracy could be interpreted as causal variables for changes in institutional quality. In the second stage, the remaining country-level differences in economic institutions are explained by a cross-section analysis, using time-varying variables such as historical or geographical indicators.

Table 4.4 reports the results of the first stage regression. Observations have both a country and a period dimension, explaining the high level of observations. The dependent variable is WGI4. Column (1) contains five time-varying explanatory variables: natural resources, the Polity2 score, income, trade openness and financial openness, which are all lagged one year. Column (2) shows the results when the Polity2 score is excluded as explanatory variable.

**Table 4.4** Natural resources and democracy show no within-year effect on economic institutions

Dependent variable:	Average of four Worldwide Governance Indicators (WGI4)	
	(1)	(2)
Natural resources (% GDP)	4.4x10 <sup>-4</sup> (1.4x10 <sup>-3</sup> )	6.1x10 <sup>-4</sup> (1.4x10 <sup>-3</sup> )
Democracy (Polity2)	0.020 (0.016)	
Income (GDP)	2.5x10 <sup>-5***</sup> (7.7x10 <sup>-6</sup> )	2.7x10 <sup>-5***</sup> (6.9x10 <sup>-6</sup> )
Trade openness	0.146 (0.122)	0.158 (0.122)
Financial openness	-0.043 (0.032)	-0.040 (0.032)
Number of countries	26	27
Number of observations	330	342
R-squared (within)	0.231	0.205
R-squared (total, including f.e.)	0.965	0.963

Coefficient estimates from panel regressions. Regressions include country-fixed effects (not reported). Robust standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are lagged by one year. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*.

Source: Authors' calculations

Somewhat surprisingly, the first stage regression shows no causal effect of natural resources. It is well-known from the literature that the availability of natural resource rents often gives governments high incentives for rent-seeking and low incentives to structural reform. Removing the democracy measure from the equation, as in column (2) does not change this result.

Also Polity2 does not have a significant coefficient in the panel regression. The reason for this result is that changes in democratic institutions have a more delayed effect on economic institutions, i.e. longer than one year. When we include four lags (rather than one) in regression (8), we find that the second lag of Polity 2 is significant at the 5 percent level. All higher order lags of the other explanatory variables are not significant at the 5 percent level.

The causal effect of changes in GDP per capita on changes in institutions is strongly significant, although the size is small. For the other two control variables, trade openness and financial openness, we find no significant coefficients. This may indicate that these two control variables capture differences between countries, rather than within countries. Such considerations can be inferred from the second stage regression, presented in Table 4.5.

The dependent variable in Table 4.5 is formed by the country-fixed effects found in the first stage. Column (3) presents the results of the cross-section regression with four time-invariant explanatory variables: Non-Western countries based on the definition of Huntington, countries of the former Russian empire, years under socialist rule, and the distance to Brussels. Column (4) adds the time-invariant counterpart of the five other explanatory variables, by taking averages over all years for every country. Column (5) equals (3) with the category Non-Western divided between Orthodox and Islamic countries.

**Table 4.5 History is strongly correlated with country-specific levels of economic institutions**

Dependent variable:	Country-fixed effects estimated in (1)		
	(3)	(4)	(5)
Non-Western (Huntington)	-0.654*** (0.167)	-0.387** (0.156)	
Orthodox (Huntington)			-0.488*** (0.136)
Islamic (Huntington)			-0.776*** (0.170)
Russian empire	0.079 (0.167)	0.140 (0.108)	0.239 (0.149)
Years under socialist rule	-0.016* (0.009)	-0.013* (0.006)	-0.022** (0.009)
Distance to Brussels (1000 km)	0.040 (0.054)	0.016 (0.043)	0.024 (0.052)
Natural resources (% GDP)		-0.002 (0.004)	
Democracy (Polity2)		0.011 (0.010)	
Income (GDP)		4.4X10 <sup>-6</sup> (1.2X10 <sup>-5</sup> )	
Trade openness		0.011 (0.096)	
Financial openness		0.169*** (0.039)	
Number of countries	26	26	26
Number of observations	26	26	26
R-squared	0.728	0.932	0.780

Coefficient estimates from cross-section regressions. Standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are averaged over all years for every country. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*.

Source: Authors' calculations

The main result from the econometric analysis is that history is very strongly correlated with the quality of economic institutions, even after taking account other relations and control variables. Non-Western countries have a WGI4 score which is on average around 0.7 lower than comparable Western transition countries. Additionally, one year longer under socialist rule gives a 0.02 decrease. The coefficients for the Russian empire and the distance to Brussels have an unexpected positive sign, but are insignificant.

Non-Western countries can be further divided into Orthodox and Islamic countries, following the classification of Huntington (1993). Column (5) shows that the effect for each of these subsets is still strongly significant. Islamic countries have an even lower score than Orthodox countries, consistent with Figure 4.1.

Adding per-country averages of Polity2, income, trade openness and financial openness, as is done in column (4), does not alter the conclusion about history. The average levels of these variables cannot be significantly associated with the quality of economic institutions, except for financial openness. The effect of financial openness thus operates through variation between countries, rather than within countries.

Appendix A contains a robustness analysis, where we change the dependent variable to each of the Worldwide Governance Indicators separately. The results are mainly comparable to the ones presented above. Interestingly though, the effect of natural resources is seen to be significant for Regulatory Quality.

## 5 Conclusion

This paper has attempted to explain the large differences in institutional quality among transition countries. It found evidence that these differences can be explained by a number of historical variables, natural resources, and possibly the prospect of EU membership.

Of the historical variables, the cultural/religious origins and the years under socialist rule seemed the most robust. Obviously one issue here is multicollinearity: the fact that all three historical variables are highly correlated with each other and other explanatory variables may lead to unjustified conclusions when looking at one-to-one relations. Indeed, the correlation between the former Russian empire and institutional quality does not hold when other factors are taken into account. However, cultural/religious origins and years under socialism appear to be robust explanatory factors.

We do not find finding that the availability of natural resource rents appears to exert a negative influence on the quality of economic institutions, despite the economic theory and previous empirical studies on this matter. However, if we focus on regulatory quality as an economic institutions, we do find a significant effect of natural resource rents.

We have several suggestions for further research, some of which we plan to carry out in the next version of this paper: The most challenging part of the research will be to identify the effect of the prospect of EU membership on the quality of economic institutions. Merely including the distance to Brussels does not show any importance in the multivariate analysis; this is most likely because this instrument is too weak. More creative ways of measuring upcoming EU membership are required to address this issue.

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## Appendix A Robustness analysis

In this appendix we perform a robustness analysis using each of the Worldwide Governance Indicators separately as the dependent variable, rather than the average of these indicators as in the main text. Tables A.1 and A.2 relate to Government Effectiveness; Tables A.3 and A.4 to Regulatory Quality; Tables A.5 and A.6 to Rule of Law; and Tables A.7 and A.8 to Control of Corruption.

The main results in section 4.2 hold under these different measures of economic institutions. For Regulatory Quality however, it is found that natural resources have a significant effect.

**Table A.1** Natural resources and democracy show no within-year effect on government effectiveness

Dependent variable:	Government Effectiveness	
	(6)	(7)
Natural resources (% GDP)	3.3x10 <sup>-4</sup> (1.5x10 <sup>-3</sup> )	5.2x10 <sup>-4</sup> (1.5x10 <sup>-3</sup> )
Democracy (Polity2)	0.025 (0.014)	
Income (GDP)	2.6x10 <sup>-5***</sup> (8.7x10 <sup>-6</sup> )	2.8x10 <sup>-5***</sup> (8.8x10 <sup>-6</sup> )
Trade openness	0.094 (0.142)	0.111 (0.141)
Financial openness	-0.046 (0.037)	-0.043 (0.036)
Number of countries	26	27
Number of observations	330	342
R-squared (within)	0.176	0.149
R-squared (total, including f.e.)	0.948	0.947

Coefficient estimates from panel regressions. Regressions include country-fixed effects (not reported). Robust standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are lagged by one year. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*.

Source: Authors' calculations

Table A.2 History is strongly correlated with country-specific levels of government effectiveness

Dependent variable:	Country-fixed effects estimated in (6)	
	(8)	(9)
Non-Western (Huntington)	-0.812*** (0.156)	-0.600** (0.178)
Russian empire	-0.005 (0.156)	0.007 (0.123)
Years under socialist rule	-0.006 (0.009)	-0.004 (0.007)
Distance to Brussels (1000 km)	0.023 (0.050)	0.006 (0.049)
Natural resources (% GDP)		-0.002 (0.004)
Democracy (Polity2)		3.8X10 <sup>-5</sup> (0.011)
Income (GDP)		4.2X10 <sup>-6</sup> (1.4X10 <sup>-5</sup> )
Trade openness		-0.052 (0.110)
Financial openness		0.168*** (0.044)
Number of countries	26	26
Number of observations	26	26
R-squared	0.753	0.908

Coefficient estimates from cross-section regressions. Standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are averaged over all years for every country. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*.

Source: Authors' calculations

**Table A.3** Natural resources have a significant within-year effect on regulatory quality

Dependent variable:	Regulatory Quality	
	(10)	(11)
Natural resources (% GDP)	-0.004*** (0.001)	-0.004*** (0.001)
Democracy (Polity2)	0.029 (0.011)	
Income (GDP)	3.1x10 <sup>-5</sup> *** (9.1x10 <sup>-6</sup> )	3.4x10 <sup>-5</sup> *** (9.5x10 <sup>-6</sup> )
Trade openness	0.142 (0.145)	0.160 (0.146)
Financial openness	-0.011 (0.042)	-0.009 (0.042)
Number of countries	26	27
Number of observations	330	342
R-squared (within)	0.289	0.149
R-squared (total, including f.e.)	0.961	0.947

Coefficient estimates from panel regressions. Regressions include country-fixed effects (not reported). Robust standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are lagged by one year. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*. Source: Authors' calculations

**Table A.4** Years under socialist rule is correlated with country-specific levels of regulatory quality

Dependent variable:	Country-fixed effects estimated in (10)	
	(12)	(13)
Non-Western (Huntington)	-0.396 (0.269)	0.040 (0.178)
Russian empire	0.209 (0.268)	0.342* (0.171)
Years under socialist rule	-0.029* (0.015)	-0.021** (0.007)
Distance to Brussels (1000 km)	0.025 (0.086)	0.006 (0.069)
Natural resources (% GDP)		-0.005 (0.004)
Democracy (Polity2)		0.020 (0.016)
Income (GDP)		-9.2X10 <sup>-6</sup> (1.9X10 <sup>-5</sup> )
Trade openness		0.162 (0.153)
Financial openness		0.247*** (0.061)
Number of countries	26	26
Number of observations	26	26
R-squared	0.530	0.886

Coefficient estimates from cross-section regressions. Standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are averaged over all years for every country. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*. Source: Authors' calculations

Table A.5 Natural resources and democracy show no within-year effect on rule of law

Dependent variable:	Rule of Law	
	(14)	(15)
Natural resources (% GDP)	-0.001 (0.002)	0.001 (0.001)
Democracy (Polity2)	0.002 (0.017)	
Income (GDP)	$3.5 \times 10^{-5***}$ ( $7.6 \times 10^{-6}$ )	$3.6 \times 10^{-5***}$ ( $7.5 \times 10^{-6}$ )
Trade openness	0.179 (0.120)	0.184 (0.115)
Financial openness	-0.062** (0.027)	-0.064** (0.025)
Number of countries	26	27
Number of observations	330	342
R-squared (within)	0.247	0.255
R-squared (total, including f.e.)	0.962	0.961

Coefficient estimates from panel regressions. Regressions include country-fixed effects (not reported). Robust standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are lagged by one year. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*. Source: Authors' calculations

Table A6 History is strongly correlated with country-specific levels of rule of law

Dependent variable:	Country-fixed effects estimated in (15)	
	(16)	(17)
Non-Western (Huntington)	-0.704*** (0.201)	0.511** (0.186)
Russian empire	0.107 (0.201)	0.186* (0.123)
Years under socialist rule	-0.024** (0.011)	-0.015** (0.007)
Distance to Brussels (1000 km)	0.089 (0.065)	0.043 (0.049)
Natural resources (% GDP)		0.004 (0.004)
Democracy (Polity2)		0.036*** (0.011)
Income (GDP)		$-1.6 \times 10^{-5}$ ( $1.4 \times 10^{-5}$ )
Trade openness		0.044 (0.110)
Financial openness		0.167*** (0.043)
Number of countries	26	26
Number of observations	26	26
R-squared	0.697	0.933

Coefficient estimates from cross-section regressions. Standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are averaged over all years for every country. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*. Source: Authors' calculations

Table A.7 Natural resources and democracy show no within-year effect on control of corruption

Dependent variable:	Control of Corruption	
	(18)	(19)
Natural resources (% GDP)	-0.001 (0.002)	0.001 (0.002)
Democracy (Polity2)	0.026 (0.021)	
Income (GDP)	$1.0 \times 10^{-5}$ ( $6.6 \times 10^{-6}$ )	$1.2 \times 10^{-5*}$ ( $6.9 \times 10^{-6}$ )
Trade openness	0.167 (0.129)	0.177 (0.130)
Financial openness	-0.051 (0.031)	-0.044 (0.073)
Number of countries	26	27
Number of observations	330	342
R-squared (within)	0.092	0.051
R-squared (total, including f.e.)	0.931	0.928

Coefficient estimates from panel regressions. Regressions include country-fixed effects (not reported). Robust standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are lagged by one year. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*. Source: Authors' calculations

Table A.8 History is strongly correlated with country-specific levels of control of corruption

Dependent variable:	Country-fixed effects estimated in (18)	
	(20)	(21)
Non-Western (Huntington)	0.703*** (0.153)	0.476* (0.248)
Russian empire	0.007 (0.153)	0.026 (0.172)
Years under socialist rule	-0.007 (0.009)	-0.010 (0.009)
Distance to Brussels (1000 km)	0.020 (0.049)	0.031 (0.069)
Natural resources (% GDP)		-0.004 (0.006)
Democracy (Polity2)		-0.011 (0.016)
Income (GDP)		$-1.2 \times 10^{-5}$ ( $1.9 \times 10^{-5}$ )
Trade openness		-0.108 (0.153)
Financial openness		0.098 (0.061)
Number of countries	26	26
Number of observations	26	26
R-squared	0.720	0.790

Coefficient estimates from cross-section regressions. Standard errors are shown in parentheses. Natural resources, Polity2, income, trade openness and financial openness are averaged over all years for every country. Values significant at the 10 percent level are marked with \*; at the 5 percent level, with \*\*; at the 1 percent level, with \*\*\*. Source: Authors' calculations