# The Positive Relationship between Institutions and the Economic Development – Evidence from a Panel Data Set of OECD Countries

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## Introduction

Institutions are one of the biggest impact factors on a country's economic development[2] (Matthews 1986, 903). Neoclassic theory suggests that the differences in economic power between countries can be explained by differences in capital endowment, for example. But as reality shows, some differences remain after controlling for these factors (Hall and Jones 1999, 83). One of these remaining factors are institutions. The positive impact of well-designed institutions on economic development – recognizable in a positive correlation – is nowadays mostly considered to be common sense in economics (Harms 2010, 109). But the term "institutions" can be interpreted very broadly, which means there is no commonly accepted definition of it (Erlei, Leschke and Sauerland 2007, 22). In view of this fact, the studies conducted to date that try to assess the correlation between institutions and economic development vary in many ways. According to North (1990), informal types of institutions play a key role in this regard. Moreover, the transformation process in Eastern Europe has shown that the adaption of well-designed formal institutions in one country can only take place in another if there is a fit with existing informal institutions (Mummert 1995; Grusevaja 2005). Effective interaction between formal and informal institutions is therefore a necessary precondition for strong economic development. In existing empirical studies on this topic the focus is mainly on formal institutions due to problems with measuring informal institutions (Knowles and Weatherston 2006, 1; Bratton 2007, 97). This paper's goal is twofold: a dataset is compiled that can measure the interaction of formal and informal institutions and it is used to assess the relationship between this interaction and economic development. This dataset is a panel data set, meaning that the correlation between institutions and economic development that is normally evaluated with cross-sectional-data can be viewed over a longer period of time. The next chapter summarizes correlation studies to date, while the following chapter examines the data that are used and the subsequent chapter presents the empirical model. The results are presented and discussed in the last chapter.

## Literature review

One of the first studies to assess the correlation between institutions and economic development is Scully (1988). He establishes a relationship between the growth rates of 115 market economies and measurements of political, civil and economic aspects of freedom over the period from 1960 to 1980. The data measuring economic growth are taken from Summers and Heston (1984) and those for measuring institutions are from Gastil (1982). As a result, he finds that those countries with greater democratic freedom have growth rates that are three times higher than those of countries with less freedom (Scully 1988, 661). Kormendi and Meguire (1985) conducted an explorative study that postulates a relationship between several theoretically derived impact factors and economic development. One of these factors is once again the civil form of freedom. They also use data from Gastil (1979) and come to the conclusion that civil freedom has a negative and slightly statistically significant impact on economic development (Kormendi and Meguire 1985, 156). Barro (1991), by contrast, uses political instability as a variable for measuring the institutional environment. He uses data from Banks (1979) that contain the numbers of revolutions and coups per year and the number of politically-motivated assassinations per million of inhabitants. He finds a negative relationship between political instability and economic development (Barro 1991, 437).

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[2] Defined as Gross Domestic Product (GDP) per capita in this paper.

Another one of the early studies – before the differentiation between formal and informal institutions by North (1990) is generally taken into account – was made by Levine and Renelt (1992). They conducted their study because they had the impression that the results up to that point regarding the impact factors on economic development had not been robust (Levine and Renelt 1992, 942). In their view, this was due to the fact that most of the authors had only considered very few impact factors in their respective studies. The study by Levine and Renelt addresses this problem by conducting sensitivity analyses with a large set of potentially relevant impact factors. Among others, they use data going back to Banks (1979). In the end, they find very few robust impact factors on economic development (Levine and Renelt 1992, 959). All of the last three studies mentioned here use objective measures of institutions. From this point onwards, the studies tend to use increasingly subjectively measured variables of institutions. Two famous examples in this respect are Mauro (1995) and Knack and Keefer (1995), which are widely considered to be the most important studies evaluating the correlation between institutions and economic development (Grogan and Moers 2001, 326). Mauro (1995) uses the amount of corruption in a country as an approximation for institutions. His data are obtained from a Business International survey (Mauro 1995, 683) featuring subjective assessments of experts from the Business International network. With the help of regression analyses, he finds statistically significant negative relationships between corruption and investments and between corruption and economic growth (Mauro 1995, 683). Knack and Keefer (1995) deal with the role of property rights in economic growth. They propose that the objective data used by Kormendi and Meguire (1985) and by Barro (1991) are not able to appropriately depict the protection of property rights (Knack and Keefer 1995, 223). Instead, they use subjective data from International Country Risk Guide and Business Environment Risk Intelligence, as such data are available on a disaggregated level and can therefore be used more specifically in the context of property rights. Compared to previous studies, they find that institutions have a greater impact on investments and economic growth (Knack and Keefer 1995, 207). Some years later, Aron (2000) provides an overview and a summary of the studies in this area. Additionally, she conducts her own calculations of the correlation, but uses data from Easterly and Levine (1997) and Mauro (1995). Accordingly, her result falls into line with previous findings, as she finds a positive and statistically significant correlation between well-designed institutions and economic development (Aron 2000, 118). As most studies resulted in a positive correlation, subsequent work mainly focused on special aspects like the importance of institutions to economic development in the transformation process, e.g. Brunetti, Kisunko and Weder (1997a;b), Grogan and Moers (2001) and Havrylyshyn and Van Rooden (2003). But the main focus of the empirical studies after that point was assessing the causality of the relationship, which is a question that still needs to be addressed (Albouy 2012).

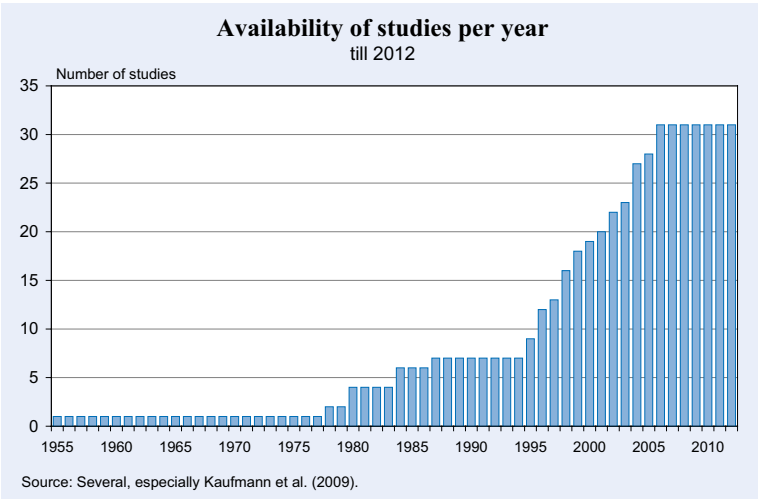
## Data

When setting up a panel data set, the selection of both the time frame and the individuals under consideration have to be explained and described.

### *Selection of the time frame*

Williamson and Kerekes (2011) stated that prior to their study, analyses based on cross-sectional data prevailed due to data availability problems. However, Dawson (1998, 604) considered the emerging of international surveys as a new tool for assessing the relationship between institutions and countries' economic development. Figure 1 illustrates both statements: it shows

**Figure 1**




Source: Several, especially Kaufmann et al. (2009).

the accumulated studies available in every year and includes the surveys featured in this paper.[3]

The Figure reveals that ten and more surveys have only been available on an annual basis since 1996. However, since this Figure is currently rising, it may now be possible to conduct a panel data study based on reasonable data. Accordingly, the panel data set of this paper starts in 1996.

### *Selection of countries*

The selection of individuals i.e. the countries in this paper follows a two-step approach. First, a global set of countries was created to depict the shapes of institutions worldwide. For a detailed description of this step, see Wicher (2014). Second, for the purposes of this paper, the set of countries was reduced to the 28 OECD countries that were available in the global data set.[4] This was done because the content of the statistical analysis in this paper is, of course, limited due to data availability. The variables used here are described below, but the set of variables is obviously not sufficient to describe all of the institution designs that exist worldwide. By reducing the set to OECD countries, a harmonization of the set takes place and at least some of the shapes of institutions that are not depicted in the variables tend to be similar in these countries and do not vary between them, limiting the influence of these differences in the analysis. The harmonization of the institutions in OECD countries is, for example, mentioned by Sachs and Warner (1995, 1).

### *Variables in the data set*

This paragraph describes the variables for the following empirical analysis. As mentioned above, the term "institution" is multifaceted, so it is impossible to summarize the shapes of institutions in one variable. But for the purposes of maintaining clarity, it is possible to build categories of institutions, as we do in this paper. A common approach also adopted in this paper is the division of institutions into political, judicial, economic and societal institutions (Jütting 2003, 14; Acemoglu and Johnson 2005, 950; North 1991, 97). Figure 2 depicts the categories and variables used here.

The main selection criterion of the data set in this paper is, of course, availability in the surveys that this paper is based upon. The usage of the variables in the existing literature also plays a key role: first, there can be a "positive" justification for the selection of a variable. One can explain why a variable is able to depict a certain aspect of the interaction between formal and informal institutions and postulate that this interaction has probably already been tracked in the past by other authors. Second, there can be a "negative" justification for certain variables that are not considered appropriate for the purposes of this paper, although the data are available and the variable has previously been used to describe certain aspects of institutions and their interactions. This leads to a clearer description of the data set. As it is impossible to describe all of the underlying variables in detail here, the composition of the "political stability" variable – the second variable in the "political institutions" category in Figure 2 – is given as an example below. Please note that the allocation is not always selective, which means that certain aspects could also be assigned to different variables. This holds true for all four categories.

**Figure 2**

**Categories and variables**

| | |
|---|---|
| **Cat. 1:** | **Political institutions** |
| Var. 1-1: | Political corruption and transparency |
| Var. 1-2: | Political stability |
| Var. 1-3: | Satisfaction with the political system |
| **Cat. 2:** | **Judicial institutions** |
| Var. 2-1: | Crime |
| Var. 2-2: | Judicial corruption |
| Var. 2-3: | Independence of justice |
| Var. 2-4: | Trust in judicial system |
| **Cat. 3:** | **Economic institutions** |
| Var. 3-1: | Economic corruption |
| Var. 3-2: | Opinion on tax system |
| Var. 3-3: | Competitive environment |
| **Cat. 4:** | **Societal institutions** |
| Var. 4-1: | Poltical participation |
| Var. 4-2: | Human Rights |
| Var. 4-3: | Civil society |

Source: The authors (2015).

### *Example: political stability*

The use of political stability as a variable to describe aspects of institutions has already been mentioned before. Barro (1991) used the numbers of revolutions and political coups as an approximation. More recently, Dauner, Park and Voigt (2012, 12) stated that variables measuring civil turmoil may be used to capture certain aspects of informal institutions. Survey questions regarding the political stability of a country are used here to assess the interaction of formal and informal institutions. A high amount of political stability is an indicator of good interaction, as the written rules (formal institutions) and those considered to be good (informal institutions) seem to be aligned. On the other hand, a high degree of political instability may be a sign of a mismatch between

[3] See Appendix 1 for the complete list.
[4] See Appendix 2 for the list of these countries.

**Table 1**

**Political stability**

| Nr. | Content / Question | Scale | Source |
|---|---|---|---|
| 1 | Frequency of politically motivated assassinations | 0 – 2 | Cingranelli Richards Human Rights Database |
| 2 | Frequency of (politically motivated) kidnapping | 0 – 2 | Cingranelli Richards Human Rights Database |
| 3 | Frequency of torture | 0 – 2 | Cingranelli Richards Human Rights Database |
| 4 | Amount of political terror | 1 – 5 | Cingranelli Richards Political Terror Scale |
| 5 | Assessment of Security Risk | 1 – 5 | iJET Country Security Risk Rating |
| 6 | Violent underground activities | 1 – 4 | Institutional Profiles Database |
| 7 | Violent social conflicts | 1 – 4 | Institutional Profiles Database |
| 8 | High risk of political instability | 0 –10 | Institute for Management Development World Competitiveness Yearbook |

Source: The authors (2015).

formal and informal institutions. Table 1 shows the respective questions, scales and sources.

As mentioned above, there are some questions in the underlying surveys that are comparable with regards to content, but cannot be considered as appropriate for the purposes of this paper. They include, for example, questions investigating the amount of political terrorism. Such questions can, of course, be interpreted as a measurement of satisfaction with formal rules, but may lead to a strong bias. Political terrorism may possibly emanate from a small group of people and their dissatisfaction cannot be equated with the dissatisfaction of the other, larger group of the country's inhabitants. Additionally, there is no clear definition of the term terrorism, building another potential bias. Political instability might also be based on the influence of another country. There are several surveys with questions leading in this direction. They are not appropriate for the purposes of this paper, as the instability is not generated by the inhabitants of the country in question.

***Data preparation***

After the exemplified presentation of the variables in the data set, the data preparation for the following empirical analysis is described. This is necessary because not all survey results are based on the same scale, as Table 1 indicates. This problem holds true for all the other categories and variables of Figure 2. Moreover, not all surveys cover all of the countries that will be looked at in this paper. Please note that the following adjustments of the data are made to the global data set described above. Applying the adjustments only to the set of the OECD countries would result in overemphasis on the variation within these countries, which is exaggerated if you look at institutions from a global perspective. Due to the differences in the underlying scales, a standardization on a relative scale is conducted. This step allows a later aggregation and average calculation over several questions. The countries with the most extreme results within a question get assigned the values 0 and 100, while the remaining countries receive values relative in distance to these extreme values (Enste and Hardege 2006, 54). If a high scale value implies good interactions between formal and informal institutions, the standardization equation can be written as follows:

$$R_i = \frac{V_i - \min(V_i)}{\max(V_i) - \min(V_i)} * 100$$

$V_i$ denotes the absolute value of the question in the respective country and $R_i$ is the assigned relative value. On the other hand, if a low value on a scale implies good interaction and informal institutions, the standardization equation is as follows:

$$R_i = \frac{\max(V_i) - V_i}{\max(V_i) - \min(V_i)} * 100$$

Subsequently, it is possible to calculate the average overall questions for a specific country relating to a certain variable. This average calculation minimizes the problems created by missing values. It is also possible to calculate single values for each country over all variables in a certain category, but as the analysis in this paper takes place on a disaggregated level, this is not necessary. Categories are only defined to provide a clearer overview here.

***Test: separation of variables***

It was mentioned above that the distinction between the different variables of institutions is not always definite due to overlapping contents. However, this could lower the accuracy of the empirical analysis conducted later in this paper. The distinctiveness of the data set is therefore tested in this paragraph. The procedure relies on Grogan and Moers (2001). They constructed four variables measuring institutions from four different sources and assessed their distinctiveness by calculating the correlation coefficient. The result is 0.73, so they conclude that it is difficult to differentiate between the variables (Grogan and Moers 2001, 331). Additionally, Woodruff (2006, 10) finds a correlation of 0.77 for different indices measuring corruption. Table 2 shows the results for the correlation calculations of the variables on a disaggregated level in this paper. The data cover the year 2012.

The Table shows that there are several cases where the correlation coefficients are lower than those of Grogan and Moers (2001) and Woodruff (2006), illustrating the advantage of looking at the variables, and not the categories in this paper. Taking into account that there are also some high coefficients, the distinctiveness of the variables in this paper can be described as sufficient.

**Table 2**

**Correlation coefficients**

| | Pol. Cor. | Pol. Stab. | Satisf. | Crime | Jud. Cor. | Ind. Jus. | Trust | Eco. Cor. | Tax | Com. Env. | Pol. Par. | Hum. Rig. | Civ. Soc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pol. Cor. | 1 | 0.80 | 0.55 | 0.79 | 0.54 | 0.77 | 0.83 | 0.79 | 0.74 | 0.73 | 0.64 | 0.62 | 0.66 |
| Pol. Stab. | . | 1 | 0.44 | 0.75 | 0.37 | 0.66 | 0.66 | 0.63 | 0.62 | 0.53 | 0.55 | 0.57 | 0.58 |
| Satisf. | . | . | 1 | 0.46 | 0.54 | 0.65 | 0.41 | 0.71 | 0.33 | 0.54 | 0.73 | 0.75 | 0.79 |
| Crime | . | . | . | 1 | 0.45 | 0.64 | 0.79 | 0.65 | 0.63 | 0.58 | 0.46 | 0.47 | 0.52 |
| Jud. Cor. | . | . | . | . | 1 | 0.59 | 0.51 | 0.68 | 0.35 | 0.53 | 0.57 | 0.55 | 0.60 |
| Ind. Jus. | . | . | . | . | . | 1 | 0.67 | 0.78 | 0.58 | 0.58 | 0.72 | 0.77 | 0.79 |
| Trust | . | . | . | . | . | . | 1 | 0.67 | 0.67 | 0.59 | 0.38 | 0.42 | 0.46 |
| Eco. Cor. | . | . | . | . | . | . | . | 1 | 0.56 | 0.77 | 0.75 | 0.76 | 0.79 |
| Tax | . | . | . | . | . | . | . | . | 1 | 0.66 | 0.32 | 0.39 | 0.40 |
| Com. Env. | . | . | . | . | . | . | . | . | . | 1 | 0.53 | 0.51 | 0.59 |
| Pol. Par. | . | . | . | . | . | . | . | . | . | . | 1 | 0.91 | 0.90 |
| Hum. Rig. | . | . | . | . | . | . | . | . | . | . | . | 1 | 0.96 |
| Civ. Soc. | . | . | . | . | . | . | . | . | . | . | . | . | 1 |

Source: The authors (2015).

**Methodology**

The model used in this paper is the one-way error component regression model. It is applicable to all panel data sets and in certain specifications, it has the advantage of controlling for individual unobserved heterogeneity like the fixed effects model (Baltagi 2008, 6). One can easily think of factors that are unobservable in the context of this paper such as cultural aspects, for example. When the basic specification of the model is applied to the relationship investigated here, the following equation results:

$$(GDP\ per\ capita)_{i,t} = \alpha + I'_{i,t}\beta + C_{i,t}\gamma + \mu_i + v_{i,t}$$

Here, $I'_{i,t}$ denotes the vector of independent variables, i.e. the variables measuring the interaction of formal and informal institutions. $C_{i,t}$ is the vector of control variables, $\mu_i$ controls for the individual unobserved heterogeneity mentioned above and $v_{i,t}$ contains the disturbances with $v_{i,t} \sim N(0, \sigma_v^2)$.

***Control variables***

The selection of appropriate control variables is an important factor in terms of the quality of the estimated model. When trying to estimate the importance of variables for the economic development of a country, there are many potential impact factors and control variables besides institutions (Ciccone and Jarocinski 2010, 222). Most empirical studies tend to only use a handful of variables (Ciccone and Jarocinski 2010, 222). This leads to criticism regarding the method and – as stated above – non-robust results (Levine and Renelt 1992, 959). But in order to be consistent with the old studies, only four control variables are used here. The first control variable in this paper is – in line with Fischer (1993) – the inflation rate. He concludes from the existing literature that a stable macroeconomic environment is a precondition for good economic development and, as he considers inflation to be a sign of instability and general flaws in economic policy, he suspects a negative relationship between the inflation rate and economic development (Fischer 1993, 487). Data published by the OECD are used in this paper (OECD 2013a). The second control variable in this paper is government expenditure. Barro (1991) cites public spending as a potential impact factor on economic development. He argues that it does not have a direct impact on private productivity, but it does have an indirect negative impact on savings via a tax channel (Barro 1991, 430). The analysis in this paper draws on data released by the OECD and the Fraser Institute (OECD 2013b; Fraser Institute 2013). When comparing the results to those of Barro (1991), one has to take into account that the variables in this paper feature expenditure on education and defense. The third control variable is also taken from Barro (1991) and controls for the education of a country's inhabitants. Unlike with the control variables above, Barro (1991, 409) suspects a positive relationship to economic development as higher education leads to higher productivity. This paper draws on the data from the OECD study entitled: "Education at a Glance" (OECD 2013c). The information is split into two variables that control for the attendance rates of primary schools and secondary schools respectively. The fourth and last control variable is the unemployment rate, which can already be found in a study by Frank (1968). A larger number of unemployed inhabitants not only leads to an increase in expenditure on social welfare, but also to lower levels of tax income than potentially possible. He therefore suspects the relationship to be negative (Frank 1968, 250). The data used in this paper are also given by the OECD (2013a).

***Test: fixed effects vs. random effects***

The decision between the choice of a fixed effects and a random effects model is based on a Hausman (1978) test. To this end, the null hypothesis is tested of whether the relationship can be modeled with a random effects model or not. If this hypothesis is rejected, a fixed effects model results in a better model fit. However, the test result is inconclusive ( $\chi^2_{13}$ = 14.3729, p-Value = 0.3481) and the null hypothesis cannot be rejected. No preference for either the random effects model or the fixed effects model can be found as a result. As the fixed effects model has weaker assumptions and can be described as more appropriate for inter-country analyses (Baltagi 2008, 14), it is adopted in this instance.

***Tests for heteroscedasticity and serial correlation***

One of the assumptions of the standard one-way error component regression model is that the regression disturbances are homoscedastic with the same variance across time and individuals (Baltagi 2008, 87). According to Baltagi (2008), this may be a restrictive assumption for panels, where the cross-sectional units may be of varying size and may exhibit different variation as a result. Additionally, Barro (1991, 414) suggests that heteroscedasticity can be a problem for inter-country analyses. To check for heteroscedasticity in this paper, a Breusch and Pagan (1979) test is conducted. The null hypothesis is tested that homoscedasticity prevails (Breusch and Pagan 1979, 1288). Here, the null hypothesis has to be rejected ( $\chi^2_{13}$ = 161.66, p-Value = 2.2e^-16), so the regression disturbances tend to be heteroscedastic. A data set faces serial correlation if the characteristics of an individual are correlated with past characteristics of the same individual (Auer 2007, 391). Ignorance of serial correlation when it is present will result in still consistent, but not efficient estimation results and biased standard errors, just like the ignorance of heteroscedasticity when it is present (Baltagi 2008, 92). To check for serial correlation a test designed by Wooldridge (2010) is conducted, as it does not require the regression disturbances to be homoscedastic. The null hypothesis that there is no serial correlation present has to be rejected in this case (Test statistic of a z-distribution = 4.2453, p-Value = 2.183e^-5), so that both heteroscedasticity and serial correlation are present. To take this into account, a robust covariance-matrix of the form

$$\widehat{Cov}\left(\hat{\beta}\right) = (X'X)^{-1}\left(\sum_{i=1}^{N} X_i'\hat{u}_i\,\hat{u}_i'X_i\right)(X'X)^{-1}$$

**Table 3**

**Estimation result**

| Category | Variable | Coefficient | Std. Error | t-Value | Pr (> t) |
|---|---|---|---|---|---|
| Political institutions | Political corruption | -0.32 | 1.05 | -0.31 | 0.76 |
| | Political stability | 0.28 | 1.13 | 0.25 | 0.80 |
| | Satisfaction with the political system | -4.57 | 4.99 | -0.92 | 0.36 |
| Judicial institutions | Crime | 0.26** | 0.13 | 1.97 | 0.05 |
| | Judicial corruption | 0.32** | 0.15 | 2.09 | 0.04 |
| | Independence of justice | -0.34 | 1.12 | -0.30 | 0.76 |
| | Trust in judicial system | -1.95 | 2.05 | -0.95 | 0.34 |
| Economic institutions | Economic corruption | 0.27*** | 0.10 | 2.64 | 0.01 |
| | Opinion on tax system | 0.68 | 1.08 | 0.62 | 0.53 |
| | Competitive environment | -2.61*** | 0.82 | -3.20 | 0.00 |
| Societal institutions | Political participation | -0.20 | 0.73 | -0.28 | 0.78 |
| | Human Rights | -0.57 | 1.60 | -0.36 | 0.72 |
| | Civil society | -2.75 | 1.91 | -1.44 | 0.15 |
| Control variables | Inflation | 2.06 | 2.64 | 0.78 | 0.44 |
| | Government expenditures | 9.87 | 14.15 | 0.70 | 0.49 |
| | Unemployment | 0.03 | 6.36 | 0.00 | 1.00 |
| | Primary school enrollment | 0.40 | 2.78 | 0.14 | 0.89 |
| | Secondary school enrollment | 0.25 | 0.76 | 0.32 | 0.75 |
| Adj. $R^2$ | 0.16 | Countries | 28 | | |
| F-Statistic | 3.75 | Years | 13 | | |
| p-Value | 8.3064e^-7 | | | | |

Source: The authors (2015).

must be used to make the estimation results efficient (Arellano 1987, 432; Croissant and Millo 2008, 31).

## Results and discussion

The estimation results of the specified model given above are depicted in Table 3.

Overall, four of the variables are estimated as statistically significant, including two variables that measure corruption. These are the judicial and economic types of corruption. Due to the operationalization of the variable, the estimated relationship is positive in both cases. They do not measure the amount of corruption, but the assessment of the amount. Generally, a country with a low amount of corruption will get a better assessment. On the other hand, the variable measuring the political type of corruption was not estimated as statistically significant. This might also be due to the operationalization, as this variable captures all those aspects that could not be assigned to one of the three defined types. Therefore, the content of this variable is not as distinctive as that of the other two. The estimated result for this relationship between corruption and the economic development is in line with Mauro (1995). A possible explanation for the positive relationship might be that a higher standard of living reduces the necessity of personal gain through corruption. On the other hand, when there is a low amount of corruption within a society, political and economic procedures will be more efficient and will therefore increase productivity, leading to a better economic development. As the causality is not addressed here, the direction of the relationship will remain open. The second type of variable that was estimated as statistically significant is the one measuring crime. Here, the relationship is also estimated to be positive. The same comment regarding the operationalization of the corruption variables holds true for this variable, as it is the assessment of crime that is measured here. The direction of the relationship can be considered as two-fold. If there is better protection of private property within a society, people do not have to spend that much money on their own and can spend their earnings in more productive ways, which, in turn, boosts economic development. On the other hand, a higher standard of living might again reduce the necessity to conduct criminal activities, just as mentioned above for the corruption variables. Again,

the causality of the relationship cannot be addressed here. The only statistically significant variable that is surprising in Table 3 is the competitive environment that has been estimated as negatively related to economic development. A better economic situation would therefore go hand in hand with a more negative assessment of the competitive environment. There are two possible explanations for this. First, the economic success could be achieved by companies that get too powerful in the following and the competitive environment could be assessed as negative. Second, it could be possible that the people participating in the underlying surveys of this paper do not all have an explicit economic educational background. Therefore, the term "competition" could be connoted in a more negative way for them than for economists. Once again the causality of the relationship cannot be answered here. It is also quite surprising that none of the control variables has been estimated as statistically significant. As mentioned above, several studies have come to other conclusions, although the results have always been non-robust. Nevertheless, the results of this paper should be treated and considered as preliminary since there is a great demand for further research.

## Demand for further research

Although the paper at hand has shown that there is now a sufficient amount of data available to conduct a panel data analysis, more and better data are needed. This is true for both the length of the time frame and the depth for each of the years. As mentioned above, there are a lot of aspects with regard to institutions that have not been addressed in surveys and cannot therefore be taken into account in this paper. Only such data will make it possible to conduct studies that do not focus on OECD countries, but on other regions in the world that might be more interesting in terms of finding factors improving the economic development.

Additionally, the topics regarding control variables should be addressed. Here again, the problem of data availability prevails. At this point it is not possible to obtain quality data over a certain time frame for many countries other than the OECD without coming up with too many missing values. Further studies, perhaps relying on different or more control variables, should be conducted.

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## Appendix 1

**List of studies**

| Study | Organization |
|---|---|
| Country Policy and Institutional Assessments | African Development Bank |
| Afrobarometer | (3 organizations) |
| Country Policy and Institutional Assessments | Asian Development Bank |
| Business Environment and Enterprise Performance Survey | World Bank, European Bank for Reconstruction and Development |
| Bertelsmann Transformation Index | Bertelsmann Stiftung |
| Global Risk Service | Global Insight |
| Transition Report | European Bank for Reconstruction and Development |
| Economist Intelligence Unit | Economist |
| Freedom in the World | Freedom House |
| Freedom of the Press | Freedom House |
| Nations in Transit | Freedom House |
| Global Corruption Barometer | Transparency International |
| Global Competitiveness Survey | World Economic Forum |
| Global Integrity Index | Global Integrity |
| Gallup World Poll | The Gallup Organization |
| Cingranelli Richards Human Rights Database | University of Binghamton |
| Political Terror Scale | University of North Carolina |
| Rural Sector Performance Assessments | International Fund for Agricultural Development (IFAD) |
| Country Security Risk Ratings | iJET |
| Institutional Profiles Database | French Ministry of the Economy |
| Latinobarometro | Latinobarometro |
| Media Sustainability Index | International Research and Exchanges Board |
| Open Budget Index | International Budget Project |
| Country Policy and Institutional Assessments | World Bank |
| Corruption in Asia Survey | Political and Economic Risk Consultancy |
| International Country Risk Guide | Political Risk Services |
| Press Freedom Index | Reporters without borders |
| Trafficking in People Report | U.S. Department of State |
| Americas Barometer | Vanderbilt University |
| World Competitiveness Yearbook | Institute for Management Development |
| Business Risk and Conditions | Global Insight |

## Appendix 2

**List of countries**

| | | | |
|---|---|---|---|
| Australia | Austria | Belgium | Canada |
| Czech Republic | Denmark | Finland | France |
| Germany | Greece | Hungary | Ireland |
| Italy | Japan | Luxembourg | Netherlands |
| New Zealand | Norway | Poland | Portugal |
| Slovakia | Slovenia | Spain | Sweden |
| Switzerland | Turkey | United Kingdom | United States |