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Measuring the Government Effectiveness Using
Worldwide Governance Indicators

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Prohlašuji, že jsem bakalářskou práci vypracoval samostatně a použil pouze uvedené zdroje.

Souhlasím s tím, aby tato práce byla zpřístupněna veřejnosti pro účely výzkumu a studia.

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Poděkování

Rád bych poděkoval za věcnou kritiku a postřehy vedoucímu této bakalářské práce
PhDr. Martinu Gregorovi PhD.

Abstrakt

Práce se zabývá problematikou měření kvality institucí pomocí indikátorů Světové banky nazvaných Worldwide Governance Indicators. Na základě zjištění, že lepší institucionální prostředí vede k vyššímu výkonu ekonomiky, se dostáváme k potřebě tuto situaci kvantifikovat a porovnávat. Práce dále zachycuje výhody a nevýhody použitých indikátorů a poskytuje informace o úskalí jejich tvorby. V druhé části práce se zaměřuji na samotné výsledky měření pro nově přistupující země Evropské unie a pomocí dat, která jsou k dispozici, konstruuji vlastní empirický model, který nám pomůže porozumět dalším souvislostem v tématice institucionální kvality nově transformovaných států.

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Abstract

This work focuses on the issues related to the measurement of the quality of institutions using the indicators of the World Bank called Worldwide Governance Indicators. By assuming that better institutional environment leads to higher economic growth, we get to the point where it is necessary to measure the performance of an economy and then compare it to other economies. We are looking at the advantages and disadvantages of these indicators and also at their construction. The second part of this work is more practical. We use the WGI to measure the governance in the countries recently joining the European Union – the EU-12 and compare the results with the level of governance in the rest of the EU. We also construct our own model measuring the state of economic environment and judge the obtained scores against the previous results. These findings should help us understand different aspects of institutional quality of the new members of the EU.

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Charakteristika tématu, současný stav poznání, případné zvláštní metody zpracování tématu:

Již nějakou dobu panuje všeobecný konsenzus o vlivu kvalitního institucionálního prostředí na růst hospodářství. Nicméně až v posledních 10-15 letech se začali ekonomové zajímat také o jeho kvantifikaci. V této práci se podívám na přehled této snahy. Zejména pak budu analyzovat nejdůležitější indikátory tvořené Světovou bankou, jejich konstrukci a přínosy.

Struktura BP:

Abstrakt

Práce se zabývá problematikou měření kvality institucí pomocí indikátorů Světové banky nazvaných Worldwide Governance Indicators. Na základě zjištění, že lepší institucionální prostředí vede k vyššímu výkonu ekonomiky, se dostáváme k potřebě tuto situaci kvantifikovat a porovnávat. Práce dále zachycuje výhody a nevýhody použitých indikátorů a poskytuje informace o úskalí jejich tvorby. V druhé části práce se zaměřuji na samotné výsledky měření pro nově přístupující země Evropské unie a pomocí dat, která jsou k dispozici, konstruuji vlastní empirický model, který nám pomůže porozumět dalším souvislostem v tématice institucionální kvality nově transformovaných států.

Osnova

- 1) Úvod do problematiky, vymezení tématu
- 2) Instituce
 - 2.1) Obecná charakteristika
 - 2.2) Vliv institucí na ekonomický růst a rozvoj
- 3) Měření institucionální kvality
 - 3.1) Smysl měření institucionálního prostředí
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 - 5.1) Zdroje dat
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- 6) Závěr – Budoucnost a další perspektiva měření

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Introduction

The importance of high quality institutions is being stressed more and more by the majority of economists (Hall, Jones (1999); Acemoglu et al. (2001, 2002); Easterly, Levine (2003); Dollar and Kraay (2003); and Rodrik et al. (2004). There is little or no doubt that public sector institutions like small government, an uncorrupt bureaucracy, a legal system that protects everyone's rights and contracts, and a functioning regulation and taxation help to foster the economic growth. If we take a quick look at history it is easy to observe that governments that had adopted well-crafted institutions experienced not only higher economic growth (North, 1981; DeLong, Shleifer, 1993) but also more successful transition to capitalism (Weingast, 1995; Johnson et al. 1997).

There are obviously many more factors in play that affect the output of a certain economy, not only the institutions. The economic system is being influenced every single moment by political, legal and also social determinants. There are many aspects in each one of those categories and it is very difficult to verify the extent to which they influence the economy. In recent years some economists tried to select the most important ones and even measure their influence (La Porta, Lopez-de-Silanes, Shleifer, Vishny, 1999). The results presented by these studies are very important and help us analyze how these factors affect the growth. On the other hand, it is extremely difficult to gather enough relevant data to present significant results for a wide range of countries. This is one of the reasons why an increasing number of studies concentrate on narrowing the determinants of governance and thus achieving higher level of significance.

In this thesis I have decided to analyze more closely the Worldwide Governance Indicators¹ (WGI) that try to measure the quality of governance. These indicators try to set a standard in quantifying the quality of government and consequently give us a chance to compare a wide range of countries. We are going to depict their creation, describe the

¹ The official webpage: <http://info.worldbank.org/governance/wgi/index.asp>

concept and the underlying ideas and show why it is so important to have instruments that can help us measure the quality of governance. Moreover, I decided to focus on their overall advantages and disadvantages and discuss whether it makes sense to use them for cross-country comparisons. In addition, I will use the WGI to measure the quality of governance in the twelve countries recently joining the European Union – the EU-12. I will compare the obtained results with the standard level of governance in the rest of the European Union and try to identify the key areas for improvement.

In the very last chapter of this work I will try to implement an original model of the quality of the economic environment by using objective evidence collected exclusively from the EU-12 countries. Lastly, I will compare the results gathered from both models, find possible similarities and decide which model would better fulfill the requirements for measuring economic governance.

Chapter 1

Institutions and Governance

Let us first start by describing the institutions as such and then stressing their importance. Before we show why institutions matter so much and why the idea of adopting suitable institutions interests so many people we should state the definition of the word.

1.1. Defining the Terms

There are many explanations that we may use but for our needs the most suitable one could be the following:

“Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction.”

This interesting view of economic institutions was given by North (1981) who stressed the importance of constraints that are built by institutions and that stand in a way of maximizing the wealth or utility of the principals. Additionally, institutions serve us by providing the rules of the game and thus reducing uncertainty. The idea of constraint is important to the point that North divides them into two groups – good and bad. North argues that the only good institutions are those that have been made in a democratic process like electoral rules or constitutions. In contrary, the institutions adopted by a single individual (e.g. dictator) could never fulfill this definition. Next important aspect is that the institutions have to be quite durable since temporary constraints can be altered by those who dislike them.

We should emphasize that in this study we consider, above all, the economic institutions and the institutional quality which is thought to be a combined measure of

several interdependent factors, like socio-economic, political, geographic and other societal factors. These determinants certainly influence the behavior of every individual in the economy thus having a strategic role in defining the outcomes of this particular economy. We, as well as the majority of researchers in this field, are interested in both formal and informal institutions, no matter whether they are created by men or they evolved naturally.

As we said before, the quality of institutions is certainly not the only thing that serves as an incentive to our behavior but we believe that its role is fundamental in a progress of a nation and it is the key to understanding its importance. When high-quality institutions are established and people know that their actions will shape their future, they have motivation to work harder and to take risk they otherwise would not accept. This particular aspect may be a little bit more complicated but for our purposes we, in accordance with many scholars, will assume that risk-taking is a beneficial feature. We do so mainly because by establishing good institutions we force people to invest their effort into education and into their personal development. As we know, people and their performance is one of the key factors that influence the progress of a nation. If we take this fact into account it becomes easy to conclude that institutions define the prosperity of a nation.

Classical economists like Smith and political thinkers like Montesquieu were one of the first who stressed the role of economic institutions. And they as well identified them as one of the keys to prosperousness. It was Smith (1776) who accentuated the role of property rights enforcement and the equality before law. Many economists after him followed his steps and also added new examples of important institutions. For instance, the idea that the expansion of markets is probably the driving force in long-run development was presented by Hicks (1969). The only problem with the early theories was that the economist at these times considered institutions to be exogenous. In contrary, we use the assumption that markets are formed by our actions – they are endogenous.

1.2. The Importance of Institutions

We could try to construct some theories that describe why institutions matter so much but it is easier and also more convincing to look at empirical research that has been done in this field. We already mentioned North who was one of the first economists

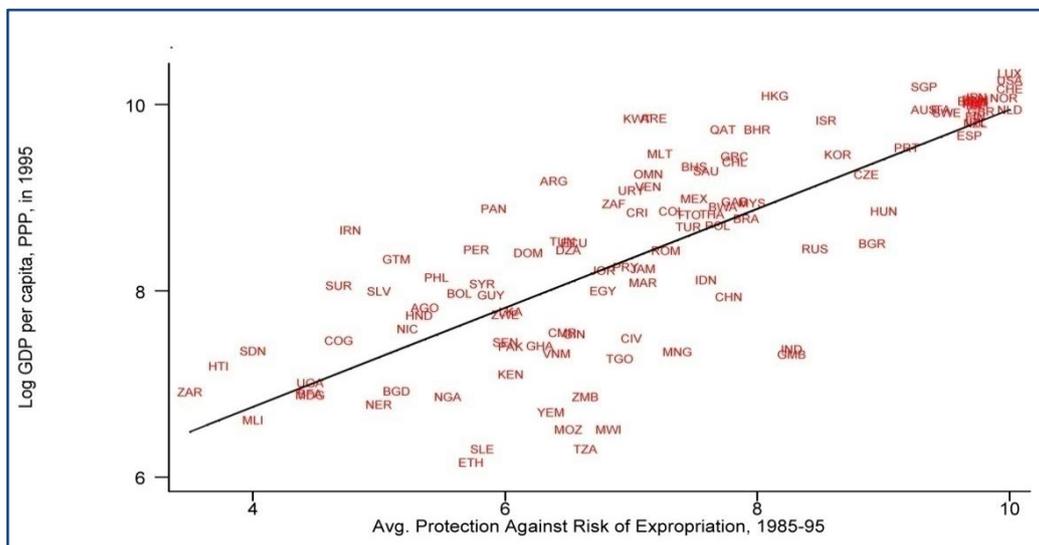
focusing his research almost entirely on institutions and their influence on economic growth and development.

He was followed by Hall and Jones (1999) who tried to find empirical evidence for the ideas presented in North (1981). They analyzed a relation between labor productivity and institutional environment and they found out that there is a strong correlation between those two variables, which means that countries with higher quality of institutions experience higher productivity of labor. Obviously the question if better institutional environment causes the productivity is much more difficult to answer. The authors think that this really is the case and that there is enough exogenous variation in institutions to be able to identify a link from the quality of institutions to productivity. Although their attempt to obtain valid empirical evidence to support this observation was unsuccessful, they at least gave us a hint where to center our attention. Later, DeLong and Shleifer (1993) came with more empirical proofs of North's ideas. They investigated the urbanization in Europe over the last millennium and found out that cities in states with more limited governments grew faster.

In the last fifteen years the researchers have been studying more intensely the direct effect of good institutions on economic growth. This was started by the works written by Knack and Keefer (1995) and by Mauro (1995). Later on, two very important studies by Acemoglu, Johnson and Robinson (2001, 2005) show that different economic institutions cause differences in incomes per-capita. They came to this conclusion by investigating the colonial history of European countries and finding out that colonizers treated every colony in a different way. In brief, Acemoglu, Johnson and Robinson (2001) described a difference between countries where Europeans imported their institutions and made settlements and between those that were purely exploited and used only as resource providers. This approach made a huge difference in the development of those states. Unlike the exploited countries, the states where the institutions had been imported were doing very well even after the process of decolonization.

The validity of this idea can be further supported by using the following graph from their second study.

Figure 1.1: Average protection against expropriation 1985-95 and log GDP per capita



Source: Acemoglu, Johnson and Robinson (2005), page 93

Figure 1.1 shows us the relationship between the log of GDP per capita and the protection against expropriation. The protection against expropriation is considered to be a measure of property rights. The result is averaged over the period 1985 to 1995. It is important to realize that these data and the results do not serve us as a measure of economics institutions but as its authors state: “(...) the findings are robust to using other available measures of economic institutions” (p. 17). The graph evidently shows that countries where property rights are well protected have higher average incomes.

It is fair to say that not only Acemoglu et al. argue that institutions of restricted government cause the economic growth but there is a strong consensus supported by other works from authors like Dollar and Kraay (2003), Easterly and Levine (2003) or Rodrik et al. (2004). We assume that by showing the relationship between good institutions and higher growth we showed one of the important aspects of adopting high quality institutions. We also have to stress the fact that knowledge of institutional environment that produces more significant outcomes helps in numerous ways. For instance, political advisors can make better suggestions of new laws that should be implemented. New reforms can be recommended so that the political problems can be solved more easily. In general, it provides a solid base for efficient organization of government actions. And

although in reality the processes of implementing new institutions are much more complicated since there is a large variation of interests, it still makes a good sense to study the different aspect of institutional quality.

At this point we could examine many features of institutions and also the process of their acquisition as it was done for example by Persson and Tabellini (2004). Many economists in these days are interested in resolving these issues and gaining even more data to prove our assumptions. We, however, wish to address the problem of measurement of institutional quality.

1.3. Measuring Institutions

Whereas the general agreement that institutions matter and are the fundamental cause of growth has been developing even before the first work that was written by Douglas North at the beginning of the 80s, the empirical studies in this field started about 10 years ago. One of the most important determinants of these analyses was the availability of more and better cross-country and within-country evidence. We are not going to cover all existing indicators but we will try to show the reader some possible approaches. At present, there is no indicator that could help us expose all aspects of governance simply because some characteristics are inherently unobservable. Furthermore, when dealing with the results of governance we have to be careful and bear in mind that there is always some measurement error and thus we should calculate with some margin of error. Nevertheless, since these margins are limited, the comparisons reveal much useful information.

This information has been recently sought especially by aid donors, international investors or development analysts. Their intent is to find supporting evidence reliable enough to help them make the best decision possible. In response to that, the supply of quantitative indices has grown significantly.

Let us start this chapter by summarizing some of the significant research that has been done in the area of the institutions measurement. As we said, there are literally hundreds of individual and aggregated indicators and it is very difficult to orientate in this “jungle” but we will try to cover the most important ones to give a reader an example before we move to the center of our attention – the Worldwide Governance Indicators.

1.3.1. Corruption Perception Index

The best publicly known indicator is the Corruption Perception Index (CPI) issued every year since 1995 by Transparency International (TI)². It is not only used by all kinds of media but also by investors, analysts, scholars and aid donors. This indicator can be viewed as an aggregated survey, gathering outcomes of surveys based on perception of businessmen and experts. It is thus clear that it should provide us with a prevailing view of the corruption in certain country. In 2008, the index covered as much as 180 countries, ranking them from the best to the worst. Regarding the underlying sources, the index was based on 13 surveys and polls from 11 institutions. The Transparency International publishes annually the obtained scores, the number of surveys and also the confidence intervals, which show the estimated degree of measurement precision. The authors have demonstrated that the level of certainty is very important by excluding countries lacking enough reliable data.

When we use the CPI it is important to keep in mind that the causes of the changes in ranking of the countries are not solely due to the changes in the levels of corruption but because of the amended sources. This is true for most indicators presented in this work. Every year the TI team has to leave out some data and adds new ones. Therefore, it would be unwise to make year-to-year comparisons.

1.3.2. Freedom in the World

The next important institution constructing governance indicators is the Freedom House (FH). The index calculated annually since 1972 is called the Freedom in the World³. The aim of its authors is to rate civil and political liberties in 192 countries of the world on a scale from 1 to 7 where 1 is the highest possible value. The countries are consequently separated into groups indicating country's status. These statuses are: "free" (countries scoring less than 3), "partly free" (3 to 5), and "not free" (above 5).

The estimations are made using perception data from in-house experts formulated using the United Nations' Universal Declaration of Human Rights adopted in 1948. The part measuring political rights includes ten questions divided into three categories: a) political pluralism and participation, b) the functioning government, and c) the electoral

² For more information see the page http://www.transparency.org/policy_research/surveys_indices/cpi.

³ More information can be found at <http://www.freedomhouse.org/template.cfm?page=5>.

process. The checklist on civil liberties contains fifteen questions in four categories: a) personal autonomy and individual rights, b) the rule of law, the freedom of expression and c) belief, and people's rights to associate and organize.

Freedom House publishes both the country's status and ratings but does not release the scores on particular questions or groups of questions included in the list. As in previous case, the users should not compare the data over time due to the changes in methodology and different experts determining the scores. The authors do not provide any kind of errors of measurement although they are not insignificant.

1.3.3. International Country Risk Guide

One of the fundamental indices is the International Country Risk Guide (ICRG) rating system created in 1980 and since then used by many economists like Hall and Jones (1999) or Acemoglu et al. (2001) in their studies. Unlike the previous indicators, this one is calculated using both the subjective and the objective data. Since the beginning, the goal of the authors has been to measure economic, financial and political risks in various countries and compare them. This indicator is mainly used by international investors analyzing the possible risks of their business projects. In this case, we are able to compare 140 countries over time given the construction of the ICRG.

As we mentioned, the major part of the underlying data is objective. More precisely, the financial and economic risk evaluations rely only on objective calculations. Some of the indicators are the country's foreign debt service, its foreign debt to its GDP or current account balance to its exports, its level of growth, inflation and GDP per capita or the budget balance. In contrary, the political risk assessments are constructed using only subjective evidence. Some of this evidence can be corruption, political violence, socio-economics conditions, bureaucratic quality or democratic accountability. These are measured by experts' subjective analysis.

Although the ICRG's indicator puts the same weight to the subjective and objective sources, the users are always advised to adapt the data and adjust the ratings according to their needs. The ICRG index is available commercially every month together with their underlying data for commercial clients. Researchers pay much less for access to dataset including annual data on all the components excluding the most recent year. Even though

the measurement error is non-negligible as in case of all governance indicators, the ICRG does not include margins of these errors.

1.3.4. Veto-player Indices

Some of the very well-known and very often used indices were developed by Arend Lijphart (1984, 1999). He focused on different forms of distribution of power and elaborated two indices, the executives-party index and federal-unitary index. Even though these indices are not exactly institutional indicators, they are used commonly in numerous works examining the effects of institutions. Especially analyses by Schmidt (1997) or Scruggs (1999) are very useful for understanding their practical use. By using those tools we can measure both the diffusion of power within governmental institutions and also the diffusion by institutional separation (i.e. division of power among federal and state institutions)

Later on in the nineties, many economists followed Lijphart's work. Other very important index was formulated by Huber, Ragin and Stephens (1993). The index is used for the measurement of constitutional structure. Among others we also recognize the index of institutional pluralism by Colomer (1996), the index of institutional constraints of central state government by Schmidt (1996) and finally the minimal governmental index with A and B parts by Fuchs. The important fact that has to be mentioned is that all the above stated indices are alternatives or variations of Lijphart's work and they are all constructed using the theory of veto player developed by Immergut (1992) and amended by Tsebelis (1995). As a consequence, many economists refer to these indices as to veto-player indices.

There is one obvious setback we have to be aware of when we work with this group of measures and it is the lack of theoretical foundations. When we examine the studies that used these indices, we may observe that the adopted institutional determinants are chosen quite randomly, based only on empirical observations. As Roller (2003) argues, the two indices by Lijphart are a result of a factor analysis of ten institutional characteristics. As we said, there are two dimensions, the executive-parties and federal-unitary, defined by those characteristics, the first one by the composition of cabinets, party systems, interest groups, electoral system and executive-legislative relations. The other one by judicial review, constitutions, centralized versus decentralized government and central banks. What Roller

criticizes most is the way that these characteristics are selected because there is no theoretical validation for this process. From this we can see that it is dubious whether they measure what they are supposed to and we cannot be sure about the level of detail that they provide us.

1.3.5. The World Bank

Two of the most important sets of indicators are provided by the World Bank. The first one of them, which is also the center of our attention, the World Governance Index, is published since 1996 by Daniel Kaufmann and his team at the World Bank Institute. We will get back to this one in the next chapter. The other is called Country Policy and Institutions Assessments (CPIAs). The Bank's own people or country teams calculate these indicators every year since 1977 in order to evaluate the quality of borrowing countries' policy and institutional framework for fostering the reduction of poverty, sustainable growth and efficient use of economic assistance. These indices should help to guide the allocation of loans and grants by the Bank's International Development Association⁴ (IDA) to the countries in need. Until 2006 the results were not published⁵ and only assessed governments were informed of the numerical ratings.

The criteria utilized by its authors have undergone a significant development over the last two decades. Nowadays the CPIAs include sixteen criteria divided into four clusters: Structural Policies, Economic Management, Public Sector Management and Institutions, and finally Policies for Social Inclusion and Equity. Every assessed country obtains a score on a scale from 1 to 6 for each of the criteria. It is important to emphasize that every cluster has the same weight, meaning that not all the criteria are equally weighted. We should also point out that the third cluster, the Public Sector Management and Institutions, is the main input to the "governance factor" which is vital in the process of the allocation of Bank funds. In their effort to achieve higher consistency the World Bank's teams were recently given detailed definitions of all six levels of ratings and the Bank always ensures that there are twelve countries undertaken first that serve later as a benchmark.

We present all the indicators summarized in the following table:

⁴ For more information about IDA consult its pages at <http://go.worldbank.org/QAFU9RGOY1>.

⁵ More information about the disclosure of the CPIA is available at <http://go.worldbank.org/74EDY81YU0>.

Table 1.1: Country Policy and Institutions Assessments Criteria

Cluster	Criteria
Structural Policies	Trade policies
	Financial-sector policies
	Business regulatory environment
Economic Management	Fiscal policy
	Macroeconomic management
	Debt policy
Public Sector Management and Institutions	Property rights and rules-based governance
	Quality of budgetary and financial management
	Quality of public administration
	Efficiency of revenue mobilization
	Transparency-accountability-corruption in the public sector
Policies for Social Inclusion and Equity	Policies and institutions for environmental sustainability
	Social protection and labor
	Gender equality
	Equity of public resource use
	Building human resources

Source: <http://go.worldbank.org/74EDY81YU0>, own editing

Chapter 2

World Governance Indicators

2.1. World Bank Institute

In 1996, the team led by Kaufmann, Kraay and Zoido-Lobaton from the World Bank Institute came with very complex indicators⁶ in their study called *Governance matters*⁷. This first study was then followed by series of papers: Kaufmann, Kraay and Zoido-Lobaton (1999b, 2001), and Kaufmann, Kraay and Mastruzzi (2004, 2005, and 2006). These indicators were a natural conclusion of a process that started earlier in the 80s and soon became the most widely quoted and used in connection with the quality of governance. Together with the CPI by Transparency International, they have taken an important part in putting governance on the agenda in developing countries.

Many economists were interested in the problem of how institutions influence the governance and kept coming up with new conceptions. Authors of the study *Governance matters* summarized these findings and chose more than 300 measures from 35 different data sources provided by 32 organizations. The sources are derived mainly from CPI by Transparency International, but they also include the above mentioned ICRG, Freedom House and the CPIAs. Based on these measures they constructed six main indicators applicable for more than 200 countries. Each of those aggregated indicators measures one of the major groups of institutions. These six indicators ought to give us a complete image of the institutional quality in a certain country and also support even more the general idea that good governance means better outcomes for the society as a whole.

⁶ Sometimes also called Kaufmann Indicators or KKZ Indicators.

⁷ More information to be found at <http://info.worldbank.org/governance/wgi/index.asp>.

Provided the above mentioned facts, the WGI were a natural response to the lack of robustness in cross-country comparisons. There were also other motivations for their construction. Firstly, the authors tried to cope with the issue of interpretation of the differences and their statistical significance. Additionally, one of the main intentions was to find a new method letting us summarize and compare many individual indicators emerging in various researches. Finally, the last important concern was to find a way to compare indicators based on cross-country surveys with indicators using only local surveys. For all these reasons the WGI team has constructed six aggregated indicators: Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, Voice and Accountability, and Control of Corruption. We shall discuss their use and other related details later.

To be more precise, the six indicators are divided into three groups that are: (1) the selection of new government, how it is controlled and changed, (2) the ability of a government to create new policies and the administration of such policies, and finally (3) the respect of citizens and the state of institutions that govern economic and social interactions among them. It is important to mention again the meaning of the word governance. We should not only understand it as a summary of institutions but also from the cultural point of view. This means that we are also interested in the process of the change of governments and even in a general understanding of institutions.

2.2. Data Sources

The data that are used to construct the indicators come from several sources and reflect subjective observations normally in these two forms: a) cross-country surveys of residents conducted by international agencies and NGOs and b) polls of experts that should give us a commercial rating of the country carried out by international risk-rating organizations. Thus only subjective data are used to calculate the WGI. As we can see, the authors did not intend to present wide scale of data concerning differences among countries in social and political institutions.

What makes the greatest difference is the fact that data introduced by Kaufmann and his colleagues are measuring the image of the quality of governance that have the interested groups of people such as country residents, investors and businessmen. At this point we have to ask one of the most important questions. What use does it have to use

subjective data to conclude objective evidence about the quality of institutions? The answer is quite simple: firstly, it is very difficult and sometimes even impossible to collect substantial data in areas like corruption. Furthermore, it has been proven in other scientific work that information collected by individuals can explain many processes that take place in an economy. Last argument is the most obvious of all, people need not only the sound institutions but they also have to trust them and the people who implement them.

It is obvious that to be able to cover as much as 212 countries like Worldwide Governance Indicators do, the data have to be combined from many different sources. We can observe all the sources of underlying data in Table 2 in Appendix. As we can see, there are two major groups of information in the table divided according to the procedures and techniques they use to calculate the quality of governance; and also according to the importance that any local indicator does have when we compare it to the whole world. When it comes to the techniques that are employed we can distinguish between cross-country surveys and polls of experts. Surveys are using a large number of respondents who are asked questions relating their perception of governance. The people selected are typically from business environment but it is normal to ask also broad range of normal citizens.

In reference to the polls of experts the results come in a form that has been agreed by several country, sector and regional experts. Normally the process starts when country-based analysts create a primary assessment, which uses available sources and their personal experience with the country. Outcomes of their work are consequently checked by other experts who verify the correctness of the data and more importantly make sure that the data have standard form so that they are easily comparable with other countries. It is needless to say that the methods stated above come with some setbacks but also have many advantages. Let us discuss the overall benefit later on.

Next crucial thing is the section of countries that the indicators relate to. Some sources may cover a considerable sample of countries (HFWSJ, DRI or EIU) while others are much more limited (PERS, CEER or FNHT). There are also sources that focus on highly developed countries and others that deal with important developing countries. The problem with those separate sources of data is the difficulty that comes up when we try to compare them. There is, for instance, one source that covers countries with very low income per capita and as we already know from the first chapter the correlation between

governance and per capita income is strongly positive. When this is true we face problems when comparing this source to others that are taken from countries with completely different income per capita. It is also tricky to compare broad range of countries with only small sample (e.g. transition economies). We will discuss the methodology that is used to avoid any obstacles later on but users are advised to keep this information in mind when working with different sources of indicators.

In order to prevent some difficulties the authors constructed a simple index that calculates discrepancy between the distribution of every single country in the world and the related distribution of countries across income and local classifications. Then, for each source of the data, one half of the sum of absolute values of the deviations between the share of countries in each of the 45 categories (nine regions times five income categories) is reported. This measure ranges from zero to one by its construction. The lower values represent more representative indicators and vice versa. Some indicators related to considerable number of countries are much more representative with the value around 0.25. These are called representative indicators while the rest is referred to as non-representative.

2.3. Constructing Governance Indicators

After describing where the data used to construct the indicators come from we shall move to the process of the construction itself. We will first explain how the sources are divided into three main groups, each of them containing two indicators, and then we will move to the method of aggregation. It is important to notice that the authors do not consider the classification to be final and it is normal that some analyses require slightly different division. We will come back to this issue in the last chapter where we will try to use given data for the subset of countries and we will try to obtain more specific results. The aggregate indicators mentioned here utilize data from 1996 to 2006 which mean that we are able to compare the countries among themselves and we can also make comparisons over time. The comparisons over time are, however, slightly more questionable and we have to be careful when making such comparison. Let us come back to this issue later.

2.3.1. Six Indicators of Governance

We mentioned above that there are three main sets of governance. The first one of them, the process of government selection and replacement, is described by first two of Kaufmann indicators. The very first one is called “Political Stability” which is a combination of some statistics that measures subjective view of the possibility that the governing elite will be overthrown by violent or unconstitutional means. The democratic process of election and ability to select government is without a doubt an essential part of well functioning society.

Another governance indicator is known as “Voice and Accountability”. This index is quite similar to the previous one and gives us a good image of how people participate in the elections, whether they are able to freely express their will and opinion. It basically measures the civil liberties and also the independence of the media and press. The autonomy of the press is important when it comes to monitoring the government actions and informing the general public.

Indicators named “Rule of Law” and “Control of Corruption” belong to a larger group of indices capturing the respect of citizens for their government and for the institutions created by the government. The first one captures whether the rules established in the society help the people to enforce the contracts, predict the judiciary and also to be economically and socially interactive. The following cluster is used mainly to measure the corruption and its incidence and it is quite different from the others due to its clear definition. By corruption we understand the abuse of public power by both the corrupter and the corrupted for private gain. There are several aspects of corruption that we have to keep in mind when dealing with this issue. For instance, we distinguish many different forms of corruption from big political affairs to small bribes for public officers. Some of the may even be publicly accepted so we should be careful when it comes to cross-country comparisons. In any way the corruption is one of the symbols of governance failure and serves very well as one of its measures.

The last two groups move to the implementation of new policies. The first cluster called “Regulatory Quality” deals with the policies per se. General public and experts express their perception of market-related actions. The indicators measure excessive regulation in business and foreign trade area, as well as other policies that affect the market in a harmful way. “Government Effectiveness” is the last group of indicators measuring the

overall view of the quality of public service provision, the independence from political force and government's commitment to policies. Authors of this index accentuate the role of "inputs" that are needed to for the government to create and realize sensible policies.

2.3.2. Methods of Aggregation

This subchapter should answer one of the most important questions concerning the Worldwide Government Indicators. Why do we create only six aggregate indicators instead of using more precise indices? The individual specialized sources normally cover only a limited set of countries or regions which makes it difficult to make cross-country comparisons. When we construct only a few comprehensive indicators we are able to compare any pair of countries we wish. Additionally, by its construction, we can calculate quantitative measures of precision of governance estimates for every single country. All these aspects are vital when we want to test cross-country differences in the quality of institutional environment.

We will be discussing the exact method of estimating the indicators in the next chapter and it is even more closely depicted in Kaufmann, Kraay and Zoido-Lobaton (1999) but the fundamental principle is rather uncomplicated. The authors utilize an unobserved components model (UCM), which contains components that express the observed data in each group as a linear function of the unobserved common component of governance. In addition, the model contains a disturbance term that comprises possible variation of the sample and/or the errors of perception. When we apply this model we can easily estimate all six clusters for every country together with the corresponding precision intervals. To be more specific, we can express the estimate of governance for a country created by unobserved components by the mean of the distribution of unobserved governance dependent on the observed data for that country. We are able to simplify this conditional mean by applying weighted average of well-rescaled results of each of the sources of the indicator. As in most econometric models we define the confidence of the estimate by its standard deviation. Specifically in this model the standard deviation decreases with increasing number of indicators in which certain country occurs. On the other hand, the standard deviation rises in the variance of the error term of the indicators. The authors chose the measuring units in order to obtain estimates of governance with zero mean, a standard deviation equal to one, and ranging from -2.5 to 2.5. The distribution of

the observations is considered normal with a mean of zero. Finally, the higher value of the indicator relates to better results.

As in every model we should not forget about the assumptions that are fundamental to obtain valid results. In particular, in our model the three most important ones are the following: 1) the unobserved components of the model and observed indicators have linear relationship; 2) the correlation of errors of calculation of individual indicators is zero across indicators, and finally 3) the unobserved governance are normally distributed across countries. We ought to mention also the consequences of relaxing the assumptions. In the case of the first assumption the authors proposed an easy method of aggregation of the ordinal information. This method does not require linearity and it is also quite simple but the precision is not very high, mainly because it rejects the cardinal information included in the data. The second assumption is practically much more difficult to relax primarily due to the fact that if we omit this assumption we are unable to decide whether the final scores are correlated as a result of correlation of perception errors or if it is a whole notion of measuring governance. We can safely say that the probable correlation across sources will cause the measures of precision to have downward bias. Hence, the reported standard errors should be interpreted as a lower border of the accuracy of aggregate indicators. The last assumption of normal distribution means that the estimated results will be grouped around the mean of the distribution. There is one possible difficulty accompanying this supposition noted by its authors. The normality makes it more complicated to differentiate between countries. After looking more closely at the results and their robustness by using some alternative measures it safe to say that the findings are not significantly influenced by the type of the distribution.

We can alternatively explain conditional mean and standard deviation in a more instinctive way provided that the distribution of governance is normal in all countries. This is one of the hypotheses of the UCM. For instance, we can construct the confidence interval of a real value of governance by using the estimated value and the corresponding standard deviation. Another important feature of the model is that the data is independent across countries. This gives us the possibility to evaluate governance in various countries stating which one is better. When we look at actual standard deviations we notice that they are relatively large. The problem with high standard deviations is that the real values of

governance are not very precise⁸. Consequently, when we have two countries whose confidence intervals are situated at the opposite ends of the scale in such way that they do not cross each other we can be sufficiently assured which country is better. If it be to the contrary, we should be more careful when we interpret the results. We will address this problem later in the chapter about advantages and disadvantages of the indicators.

2.4. *The Model*

This part should shed more light on the construction of the model itself. Let us remind that we use such model where the observed data are a linear function of unobserved governance and a random disturbance term. The model and its construction are quite well-known so we will try to present only the most important parts and pay more attention to its extension. We will end this chapter by describing the process of estimation of the parameters and more importantly how is the model used to approximate all three clusters of governance across countries.

For the purpose of construction of the model we use underlying data sources gathered from multiple indicators and surveys of governance. With this data we try to estimate three main aspects of quality of governance – government effectiveness, rule of law and graft. Let $g(j)$ represent an unobserved index of one these aspects in any given country, for instance, corruption. The collected data on corruption is composed of a cluster of $k = 1, \dots, K$ indicators. Each of these indicators gives us a numerical score of some part of corruption in each of the $j = 1, \dots, J(k)$ countries that this indicator includes. We suppose that it is possible to express the observed rating of country j on indicator k (i.e. $y(j, k)$), as a linear function of unobserved governance $g(j)$ and error term $\varepsilon(j, k)$ in a following form:

$$y(j, k) = \alpha(k) + \beta(k) \cdot (g(j) + \varepsilon(j, k)) \quad (2.1)$$

Where $\alpha(k)$ and $\beta(k)$ are unspecified parameters mapping unobserved governance $g(j)$ into the observed data $y(j, k)$. As we mentioned before we suppose that $g(j)$ is a random variable with mean zero and variance one. Our main goal is to gather the information about $g(j)$ for every country j . For this purpose we will be using the distribution of unobserved governance conditional on the observed data $y(j, k)$, $k = 1, \dots, K(j)$ for country j . In this

⁸ See Figure 3 in Appendix for detailed graphs of 90% confidence intervals.

case the mean of this conditional distribution serves us as a sufficient estimate of the state of governance in country j , and analogically the variance measures how precise this indicator is. We should again stress the importance of zero mean and unit variance when we want to identify both parameters.

Some readers may find it confusing why the UCM uses the unobserved governance $g(j)$ as a random variable rather than a set parameter to be estimated. The reasons are very practical. If we imagine that the variance of the error term is different over the sample then it is impossible to think of $g(j)$ as of fixed parameters because individual effects are not identified in a fixed effects model with heteroskedastic disturbances. The whole issue becomes obvious when we consider a case where $\alpha(k) = 0$ and $\beta(k) = 1$ for all indicators. Then it would be possible to make the likelihood function of the collected data randomly large only by estimating $g(j)$ as the observed score, for example $g(j) = y(j, K)$, and setting $\sigma(K) = 0^9$. Furthermore, from (2.1) it should be apparent that simple methods of aggregation like simple average of rescaled indicators will not produce reasonable estimates of governance, given that the parameters $\alpha(k)$ and $\beta(k)$ vary across indicators. Moreover, various countries appear in different groups of indicators. In addition, it is impossible to get rid of the dependence of the collected data by standardizing (i. e. by subtracting the sample mean and dividing by sample standard deviation). The reason for this is that in the case of non-representativeness, the sample mean displays both $\alpha(k)$ and $g(j)$.

Another very important variable of the model is the error term $\varepsilon(j, k)$ that reflects sources of uncertainty between observed indicators and the true governance. First of all, the category measurement by certain indicator k can never be flawless. The problems stem from either the sampling variation or possibly from errors in perception in polls of experts. In addition, the relationship between the notion measured by indicator k and the equivalent aspect of governance may be flawed. This means that people from different countries may have different idea about corruption so even if some factors of corruption are measured perfectly the indicator itself gives us rather dubious image of the real situation. As we said before the error term of the model by its construction has the mean equal to zero or $E[\varepsilon(j, k)] = 0$. The variance remains unchanged across countries within certain indicator and changes across indicators $E[\varepsilon(j, k)^2] = \sigma(k)^2$. Moreover, the variance of the

⁹ See Kiefer (1980) for more detailed discussion of this point.

disturbance term is independent across countries and indicators and we can imagine it as an evaluation of indicator's ability to interpret $g(j)$. It is important to notice that the independency of disturbances is relatively restrictive but on the other hand if we relax it, we would not be able to determine whether some two indicators are correlated due to some common element of governance, or whether it is simply a sign of correlated disturbances.

To collect all the pieces of our model we still have to look at the estimated parameters $\alpha(k)$ and $\beta(k)$. In spite of the fact that the indicators are rescaled into same units and measured on one range, the parameters still vary across indicators. There are three main causes – first, a certain indicator may be inclined in the sense that it underestimates a specific factor of governance when it is really high. Such situation would mean that the value of $\alpha(k)$ is low and vice versa. The next cause is the range of scores that the indicators employ. Some of them do not use the full range while the others do. This would lead to overvaluation (undervaluation) of this indicator. Finally, the last problem could appear when we use an indicator, which measures a set of countries with one factor of governance (e.g. corruption) on a very high level. This could easily happen in a case when one indicator measures only developed countries. If the score is relative so that the worst country gets zero and the best gets one, then the relatively small differences among countries would be artificially amplified resulting in relatively elevated value of parameter $\beta(k)$.

2.4.1. The Distribution of Governance

In this part we will try to show how are the findings about governance in each country j summed up in our model. The main restriction is again the data that were collected in selected countries. Now when we know that $g(j)$ and $\varepsilon(j, k)$ are equally normally distributed our job becomes much simpler. The conditional distribution $g(j)$ has then the following mean and variance:

$$E[g(j)|y(j)] = i' \cdot \frac{(y(j) - \alpha)}{(u' + \Sigma) \cdot B} \quad (2.2)$$

$$V[g(j)|y(j)] = 1 - \frac{i' \cdot \iota}{(u' + \Sigma)} \quad (2.3)$$

Where $y(j)$ is a $K(j) \times 1$ vector that stacks the $K(j)$ data points for country j , B and Σ are $K(j) \times K(j)$ diagonal matrices with the related $\beta(k)$ s and $\sigma(k)^2$ s on the diagonal, ι is a

$K(j) \times 1$ vector of ones, and α is the $K(j) \times 1$ vector of $\alpha(k)$ s. By the term (2.2) we understand the estimated figure of specific factor of governance in country j . The interval from the $(\frac{\delta}{2})^{th}$ percentile to the $(1 - \frac{\delta}{2})^{th}$ percentile of the conditional distribution of $g(j)$ will be called a δ -percent interval of confidence around the estimate. Finally, the square root of expression (2.3) will stand for the standard error of the estimate.

We have already explained most of the expressions in a very understandable and natural way. Now we will try to do the same with rest of them. Take for example the parameters $\alpha(k)$, $\beta(k)$ and $\sigma(k)^2$. If we know their value, it is very simple to rescale that value by deducting $\alpha(k)$ and dividing the expression by $\beta(k)$. To be more specific, let the following expression:

$$\tilde{y} = \frac{y(j,k) - \alpha(k)}{\beta(k)} \quad (2.4)$$

Represents the new value of $y(j, k)$. In such case, the conditional mean in expression (2.2) is a weighted average of these standardized scores for country j on every $K(j)$ indicator where it appears. The weights are then equal to inverse of the variance of the term of error on every indicator. The new conditional mean and the new variance are therefore:

$$E[g(j)|y(j)] = \frac{\sum_{k=1}^{K(j)} \sigma_{\varepsilon}(k)^{-2} \cdot \tilde{y}(j, k)}{1 + \sum_{k=1}^{K(j)} \sigma_{\varepsilon}(k)^{-2}} \quad (2.5)$$

$$V[g(j)|y(j)] = \frac{1}{(1 + \sum_{k=1}^{K(j)} \sigma_{\varepsilon}(k)^{-2})} \quad (2.6)$$

The conditional variance is increasing in the variance of the error term in each of these indicators, and decreasing in the number of indicators available for the country.

2.4.2. Identifying the Parameters

In previous chapter when we described some aspects of the model we already used the estimated parameters. The process of estimation is not overly complicated. We will once again suppose that $g(j)$ and $\varepsilon(j, k)$ are normally distributed. With this in mind, the next step is to write a likelihood function of the collected data and maximize it with regard to $\alpha(k)$, $\beta(k)$ and $\sigma(k)^2$. This way we will obtain estimates of the required parameters. This method can only be used with representative indicators. To prove this point we take

into account the maximum likelihood estimate of $\alpha(k)$, which is the mean value of indicator k over a sample of countries. Consequently, the sample mean of scores on this indicator has the expected value $\alpha(k) + \beta(k) \cdot \bar{g}(k)$, where $\bar{g}(k)$ stands for the average level of governance in the set of countries covered by indicator k . Now the difference between representative and non-representative indicators is that the non-representative indicator's average is distinct from the world's average and thus the estimate provided by the sample mean is not consistent.

Yet even if this situation the authors propose an elegant solution of how the parameters can be estimated. In a case when $g(j)$ are observable, it is possible to calculate $\alpha(k)$, $\beta(k)$ and $\sigma(K)$ for any indicator. This can be done by using the regression of the observed scores of $y(j, k)$ on $g(j)$. In opposite case, when the parameters are not observable we are forced to transform the original mean into conditional by using only the data from the representative indicators, where $g^*(j)$ represents the mean from the representative data only. It is safe to say that this restricted mean is equal to observed governance plus its deviation from the mean $u(j)$ this means that $g^*(j) = g(j) + u(j)$. Given that the deviation $u(j)$ is independent of $g(j)$, we will be able to use OLS estimates of $\beta(k)$ from a regression of $y(j, k)$ on $g^*(j)$. This regression will unfortunately produce estimators with downward bias since the $g^*(j)$ is not measured precisely. This bias can be expressed as:

$$\beta(k) \cdot \left(1 - \frac{V[u(j)]}{V[g^*(j)]} \right) \quad (2.7)$$

Where the variance of $u(j)$ is the variance of the conditional mean known from expression (2.3). Thanks to the fact that the variance of $g^*(j)$ is observable we can adjust the regression coefficients and get consistent estimates of the parameters of the non-representative indicators.

In conclusion, by showing the mechanism of the model we are trying to get the user to understand it more easily and show him the possible obstacles. The researchers and the policymakers should be aware of the above stated results. We already mentioned the problem with the precision of measurement. When using the WGI one should bear in mind that the estimate are not 100% accurate and thus the comparisons and the country rankings must be set up carefully. Therefore it is better to compare groups of countries instead of

comparing countries directly, especially when we deal with countries with less underlying data.

2.5. Strengths and Weaknesses

We already mentioned some of the possible issues we may have when constructing and managing the WG indicators but there are also many advantages. In this chapter we will be discussing the most important weak and strong points and evaluating possible risks for the user. We shall start by looking at the issues that we have already mentioned earlier when talking about the data sources and then we will move to other critiques.

As we discussed the data used to construct the indicators come from two different sources: polls of experts and surveys. Both of them have some setbacks and advantages. One of the most important benefits of using experts' opinion is that their design was made specifically for cross-country comparability that is also ensured by their standardized form. Nevertheless, their disadvantages are also quite clear. Only few experts rate every country and they have to know the country's background very well, which is not always the case. Furthermore, the rating agencies may sometimes be influenced by the major political opinion in the country. Regardless of these issues the ratings are very useful and they proved to be very similar to those given by surveys and more importantly the agencies sell their opinion to the private clientele. This shows that they come with very important and valuable information about governance.

The surveys, on the other hand, indicate the opinions of many people who are very tightly connected with the countries they are evaluating. But there are also some very important drawbacks. The first one is the cultural background and the differences in perceptions of some situations. It is not a secret that in some middle-eastern countries little bribes are normally accepted and used every day. This means that answers to some equal questions lose their comparability if they are not adjusted, for instance, by making culturally-blind surveys. Such surveys are also very expensive and as we are normally able to conduct them in only one country they cover much smaller area than polls of experts.

Some economists like Arndt and Oman (2006) or Knack (2006) have also criticized some aspects of the use of indicators. Very common objection made by these authors is that setting a zero mean and unit standard deviation means that any kind of information

about trends in global averages is impossible to obtain. In reaction to this issue more evidence was provided regarding the trends and the results showed only a little support for any significant tendencies. Thus it seems that it is safe to interpret the relative changes in governance. In Kaufmann, Kraay and Mastruzzi (2004, 2005 and 2006) was pointed out that if world averages remain unchanged, then it is useful to rescale the indicators to have equal mean in every period. If this happens, then there are no discrepancies between changes in countries' relative positions and their absolute variations.

Next important critique mentions again the problem of comparisons of countries or over time using WGI due to the fact that the sources used for the calculations may be different. What if we wish to compare two countries that do not appear in one data source? One of the advantages of the indicators is that the methodology of aggregation relies on putting every data source into common units. This is exactly why we can afford to compare countries from different sources. It is true that some data sources measure different aspect of governance. The problem of corruption can be viewed from many different angles but the role of the aggregation is to find the common elements, take them out and then compare them. Although we lose a little bit of detail we are still able to judge governance in one country against another. This kind of generalization can sometimes be confusing because even if the indicator is high in two countries it might be so for very diverse reasons. However, the fact is that also dissimilar types of corruption show very strong correlation. In reality there are not many countries in the world that would have high level of only one sort of corruption and vice versa.

Some people also argue that some underlying sources are not impartial, especially when we deal with businessmen. We have to realize that many surveys and ratings are carried out using businesspeople's opinions whose opinion tends to be biased towards less regulation. Then again the indicators are constructed by opinions given not only by business elites. For example in 2005 WGI used three cross-country surveys, six groups of governmental ratings and as much as eleven sets of data by non-governmental organizations. As a matter of fact, the results from business environment and the rest of the society show high levels of correlation so the above stated idea of businessmen being biased does not seem to have much impact on WGI.

One of the last objections to the methodology is that some underlying sources make correlated disturbances and thus too much importance is given to those indicators. When

answering this critique we have to turn back to the construction of the model itself. The authors use unobserved components model. This model uses weighted average of data sources to make the estimates. The weights are important because the data that come in are usually imperfect and do not provide us with the most relevant information. More specifically, in a case that the disturbances of individual sources show high level of correlation, then the sources of data that produce uncorrelated ratings end up being less useful. In the aggregate WGI it is put less weight on these uncorrelated sources. Yet if the correlation among underlying data is because of their correlated disturbance, this logic does not apply anymore and they should be getting less weight. This issue has been raised again by Arndt, Oman and Knack along with the point that the errors of the data supplied by rating agencies tend to be rather correlated. Admittedly this matter is very complicated also due to the problems with isolating correlated disturbances causing the observed correlation between underlying data. And it is also true that some weights could be misplaced and given to wrong sources. This point is discussed more accurately in Kaufmann, Kraay and Mastruzzi (2006). The question that stems from this debate is whether the WGI are constructed using the best weighting scheme. In Kaufmann, Kraay and Mastruzzi (2007) the authors tried to find out how various weighting schemes may affect the final results. The first step was to calculate the indicators not using any weights at all. The findings were clear, the correlations between the original and the non-weighted indicators were very close to one in most cases. This means that none of the sources differ from the rest of them in their estimation of governance. Other applied weighting methods behaved in a similar way with the correlation being very high. Generally speaking, the indicators do not differ substantially when we use various weights for this reason we consider the underlying data sources to be independent assessments of governance.

On the whole, we do not want to make the impression that the WGI are flawless and there are no better ways of analyzing the institutional quality worldwide but it certainly makes sense to use them since they let us compare wide range of countries and come to useful conclusions as you will be able to see later on. Then again we have to keep in mind that the comparisons may sometimes be imprecise and we should consider the confidence intervals. We shall not forget that in this case the precision is still on adequate level and more importantly the aggregate WGI give us better overall picture of governance than any of its elements. All these aspects and advantages contributed to their eminent popularity

and their wide use in many reports and other types of works concentrated mainly on the quality of governance.

2.6. *From the Past to the Present*

Many things concerning methodology, aggregation, data sources and even interpretation changed since the first edition of *Governance Matters* was issued in 1999. In this chapter we will be analyzing the most important trends in the evolution of the WGI, the current situation and even possible objectives that should be explored in the future.

The most evident tendency in the ten-year history of the indicators is the increasing number of included countries. As many as 212 countries are currently covered. This number may be smaller depending on the governance component. This means that we are able to compare the governance in most countries of the world. That was achieved mainly by employing more sources of underlying data. Only 16 different sources were used in 1999. Since then the number increased sharply and nowadays the aggregate statistics consist of some 35 sources. The good sign of this increase is also the median number of sources per country. In 1996 the median ranged from three to six but now there are eight to 13 sources available per country. This evolution is the reason that the number of countries covered by only one source decreased significantly, from an average of 15% to only 7% in 2007. For the evolution of the indicators see again Table 2 in Appendix.

Another, maybe even more important feature, is the measurement precision of the WGI, achieved thanks to more sources and adjusted methodology. We can see this immediately by looking at the standard errors of the governance indicators depicted in the Table 1 in Appendix. The average of the standard error in the first issue of the WGI was about 0.3. This number declined substantially (to about 0.2) which is again due to the increased number of sources. Note that the Political Stability cluster shows slightly increased standard error over time, possibly revealing less available sources. We stated before that one of the advantages of the aggregate indicators was their precision which in this case is higher than the precision of any single indicator mainly because they comprise as much information as possible avoiding measurement errors or possibly errors in perception. We can prove this point by looking at median standard error of the individual data sources that is about 0.6. This means that the standard error of the WGI is approximately one half of any individual indicator.

2.7. New Trends

This chapter is aimed to inform the reader about most recent trends in the area of measuring governance especially using global averages. We already discussed the advantages and setbacks of using aggregate indicators. From this discussion we may conclude that the level of aggregation and the methodology should be chosen with respect to the objective we pursue. We will be seeing some objectives and showing most appropriate uses of indicators. In this process there are several signs or better said principles we should be evaluating before we choose the most suitable procedure. On the other hand, there are also some obstacles when choosing the most convenient indicator.

The first problematic area is the type of the indicator or more specifically the underlying sources used for its construction. We see quite often that there is a sharp distinction between objective and subjective data and some economists tend to underestimate the meaning of subjective evidence. Besides, some people do not like the idea of creating an indicator based on both types of evidence. This difference is sometimes overrated since almost all data are based on someone's judgment or opinion. In some cases even the authors make mistakes in terminology and call their indicators objective as in case of new African Governance indicator while using demonstrably subjective Corruption Perceptions Index by Transparency International. We should be always analyzing the underlying data and asking ourselves whether the indices satisfy our needs.

So should we choose an individual source or aggregated indicator? The shortest answer to that is that it depends. It depends mainly on the purpose of our research. We cannot use the same indicator for cross-country comparisons and studies examining effects of governance at a national level. We concentrated mainly on the area of aggregated indicators but the tools for detailed in-country analysis have become much more variable and innovative. For instance, the World Bank issues Governance and Anticorruption index¹⁰ (GAC) or Investment Climate Assessments¹¹ tool (ICAs), both highly specialized individual indicators.

The availability of a great amount of high quality data has led to creation of many governance indicators in the last decade. The important factor for the users is their wide

¹⁰ For more information consult the following web page: <http://www.worldbank.org/wbi/governance/>.

¹¹ More information can be found at: <http://alturl.com/hnws>.

availability. This fact has triggered a wave of reactions and feedbacks which is very useful for the authors and some of them made significant adjustments in reaction to these feedbacks. The risk of self-interest or manipulation has been lowered by the entrance of supposedly independent non-governmental organizations and many works were published in peer-reviewed journals which should improve their transparency. Then again, the current situation on this field is not as optimistic as it may seem since some of the important indicators still remain closed to public examination. Fortunately, there is a clear improvement and now more and more indicators are being disclosed as for example the World Bank's CPIA index for developing countries.

The interpretation of the results is one of the trickiest areas of governance measurement given that no indicator is 100% accurate. The recognition of the margins of error and their proper use is one of the principal points when working with governance indicators. The WGI are a good example of acknowledging the error of measurement and its authors openly advise the users to take this fact into account before they start comparing countries worldwide. Apparently, more and more indicators include margins of errors and more and more authors suggest using it. The much demanded transparency influences the current research and now we are able to examine closely many processes concerning governance worldwide. It is likely that in upcoming years the progress in the area of precision and coverage of some less developed regions will continue.

Chapter 3

Economic Environment Model

In contrary to the previous part where we studied rather political aspects of governance, we will now focus on the economic side. Although we are aware of many advantages that the WGI have, we would like to propose a model to calculate the compound index of economic environment (QE EI) that could help us understand the quality of economic governance in certain country. We have to say that we are not trying to replace standard political indicators like political stability, corruption, regulatory quality or accountability. We believe that both ways of measuring the governance are very useful but in order to increase the effectiveness of our research it would be better to study the governance from different points of view. This is also the main purpose of our model based on the latent/unobservable factor.

3.1. Data Sources

With regards to our statements made at the beginning of this chapter we have selected the underlying data so as to indicate mainly outcome and the economic openness of a particular country. For our needs we have selected eleven objective variables, which are: Total debt service (% of GDP), Total debt service (% of exports of goods and services), Government expenditure (% of GDP), Overall budget balance (% of GDP), Current account balance (% of GDP), Inflation in consumer prices (annual %), Gross international reserves in months of imports, Gross international reserves (% of GDP). We also used Trade (% of GDP), Gross foreign direct investment (% of GDP), and Real interest rate (%). We were able to get the required data for the period 1998 – 2006. We

have picked both, input and output variables to reflect comprehensively the economic environment in selected countries.

In order to reflect the economic environment in a particular country we considered the government's activities related to its expenditure policy concerning public works. This is expressed by the indicator Government expenditure (Govexp) and measured in proportion to GDP. We believe that the ability of government to spend public money in this area is strongly connected to the processes of generating revenue and to all incidental policies and incentives. Some of the countries from our sample were hit by various supply side restraints and it became more difficult to mobilize necessary resources. Hence, we suppose that the countries that can gather more funding for public spending would obtain better place in our ranking.

The next group of indicators is meant to describe the accessibility of the government's resources. In this group we included the following variables: Total debt service as proportion of GDP (Debtgdp) and as of exports of goods and services (Debtser), Gross international reserves relative to GDP (Intres) and in months of imports (Gromres). The reason why we have chosen these variables is that with the increasing volume of the foreign reserves increases the strength of a country. In addition, these reserves, if adequate, provide countries with more stable currency and boost the capital stock, which may be later used for economic investments. In contrast, overly augmented debt complicates efficient governance and lowers general wealth. For this reason the QEEI declines when a country has elevated levels of Total debt service.

After the debt related indicators we have a group of variables describing the stability of fiscal policy and also the state of external sector. In the first case the variable is Government's debt (Govdebt) and the other one is called Current account balance (Curracc), both in proportion to country's GDP. The selected variables should illustrate the macroeconomic stability dependent on the mix of the fiscal policy and the external sector policy. Obviously the higher quality of economic environment index comes with lower deficit in disciplined countries.

The penultimate group of indicators deals with the international trade. The indicators called Trade (Tragdp) and Foreign direct investment (Fdigdp) are both measured at the rate of the GDP. They should give us more information about country's openness. We are interested in this aspect because we assume that more open countries and countries

that attract more foreign investors achieve better results concerning their economic governance. Moreover, we add two classical indicators. The Real interest rate (Rinrat) and the Inflation rate (Inflat) should give us more details about the country's investment and financial environment or generally about the health of given economy. Presumably, the increased values of these variables are a negative sign for local and international investors who would barely take a risk of investing in such countries. The economy itself would be subsequently negatively influenced. All the underlying data were found in the World Bank's World Development Indicators¹² database.

3.2. The Model

We will now move to the description of our model that we would like to use as an alternative to unobserved components model used by Kaufmann et al. for estimating the WGI. For our purpose we will be using a variation of quality of economic environment index, which has recently become quite popular thanks to the work of Nagar and Basu (2002). The model itself is a version of a latent variable model where the index is linearly dependent on a set of observable indicators. We also add an error term that is supposed to capture any kind of inaccuracy. Thus the model has the following form:

$$QEEI = \alpha + \beta_1 X_1 + \beta_2 X_2 \dots + \beta_k X_k + \varepsilon \quad (3.1)$$

Where the vector X_K is a group of indicators reflecting the quality of economic environment. The total variation of the QEEI is thus explained by two orthogonal parts, the set of indicators, and the disturbance term. By the construction of the model, the mean of probability distribution of the error term is zero, and the variance of the error term is relatively small in comparison with the total variance of the variable QEEI. We suppose that the total variation of QEEI is described mostly by the variation in the indicators used to its calculation.

In our study, we suggest to replace the selected group of indicators by the same number of their basic elements¹³ (BE). The basic elements still completely explain the variation in indicators. To calculate the BEs we start by converting the indicator into its normalized form:

¹² For more information consult the page: <http://go.worldbank.org/SI5SSGAVZ0>.

¹³ For details about the theory and their construction consult Anderson (1984).

$$X_k = \frac{X_k - \bar{X}_k}{S_{X_k}} \quad (3.2)$$

Where S_{X_k} is the standard deviation of the observations across the included countries, and \bar{X}_k is the arithmetic mean, for $k = 1, 2, \dots, n$. Then for λ we solve the determinantal equation:

$$|R - \lambda I| = 0 \quad (3.3)$$

Where R is a $K \times K$ matrix. By solving this equation we get a K -th degree polynomial equation in λ and thus K roots. We call these roots eigenvalues of R . If we rearrange λ from the highest to the lowest values of magnitude, in such way that:

$$\lambda_1 > \lambda_2 > \dots > \lambda_k \quad (3.4)$$

Correspond to each value of λ . Afterward we solve the matrix equation:

$$(R - \lambda I)\alpha = 0 \quad (3.5)$$

For $K \times 1$ eigenvectors α , conditional on $\alpha' \alpha = 1$. Then we can write the characteristic vectors as:

$$\alpha_1 = \begin{pmatrix} \alpha_{11} \\ \vdots \\ \alpha_{1k} \end{pmatrix}, \dots, \alpha_k = \begin{pmatrix} \alpha_{k1} \\ \vdots \\ \alpha_{kk} \end{pmatrix} \quad (3.6)$$

Corresponding to $\lambda_1, \lambda_2, \dots, \lambda_k$, respectively. Consequently, we find the basic elements as

$$\left. \begin{aligned} BE_1 &= \alpha_{11}X_1 + \dots + \alpha_{k1}X_k \\ BE_2 &= \alpha_{12}X_1 + \dots + \alpha_{k2}X_k \\ &\vdots \\ BE_k &= \alpha_{1k}X_1 + \dots + \alpha_{kk}X_k \end{aligned} \right\} \quad (3.7)$$

By using components of consecutive eigenvectors related to eigenvalues $\lambda_1, \lambda_2, \dots, \lambda_k$ we calculate all the BEs. Finally, we get to estimate the QEEI as weighted average of the BEs, so:

$$QEEI = \frac{BE_1\lambda_1 + BE_2\lambda_2 + \dots + BE_k\lambda_k}{\lambda_1 + \lambda_2 + \dots + \lambda_k} \quad (3.8)$$

Where the weights are the eigenvalues of the correlation matrix R .

To increase the validity of our indicators we assign the highest weights to the first BEs due to its proportion of total variation in all indicator variables. This means the second BE that represents the second highest proportion gets the second largest weight until we have all the BEs attached with corresponding weights.

We can additionally get the normalized values of the QEEI by applying the following formula:

$$\widehat{QEEI}^k = \frac{QEEI^k - \min\{QEEI^k\}}{\max\{QEEI^k\} - \min\{QEEI^k\}} \quad (3.9)$$

For $k = 1, 2, \dots, n$. The index ranges from one to zero. Number 1 represents the best performing country and 0 the worst country from our sample.

The dimension of the measurement of QEEI is positive; meaning that with higher value of the indicator comes better economic governance. The reader has probably noted that the increasing value of some of the utilized variables, as for example current account deficit, budget deficit or inflation, would have negative impact in QEEI and thus rank the countries lower than they deserve. Nevertheless, the values were corrected adequately while solving the equation for every indicator, and we were consequently able to obtain values for all BEs. Finally, to get the QEEI we would simply multiply these figures with the standardized indicators.

Chapter 4

Comparing Governance

In this chapter we will present the results of the comparisons based on both the indicators, the WGI and the QEEI. We have selected 12 countries recently joining the European Union. The chosen countries are Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia. We have picked the countries for clear reasons. One of them was to see whether their entrance into the European Union had any significant impact on their governance measured by our indices. Although we are aware of the fact that their entrance is still quite fresh, we assume that the changes generally take place before the actual entrance and thus it should be possible to evaluate some differences related to this process.

Some of them also share common history and we were interested if they still have some common aspects in the area of governance. Most of them come from former eastern bloc and have undergone a long and complicated process of transition to democracy. Their path was full of obstacles and not all of those countries were able to implement all important institutions and policies. Many scholars have analyzed this process and tried to find a suitable mix of measures that should be adopted by countries in similar situations.

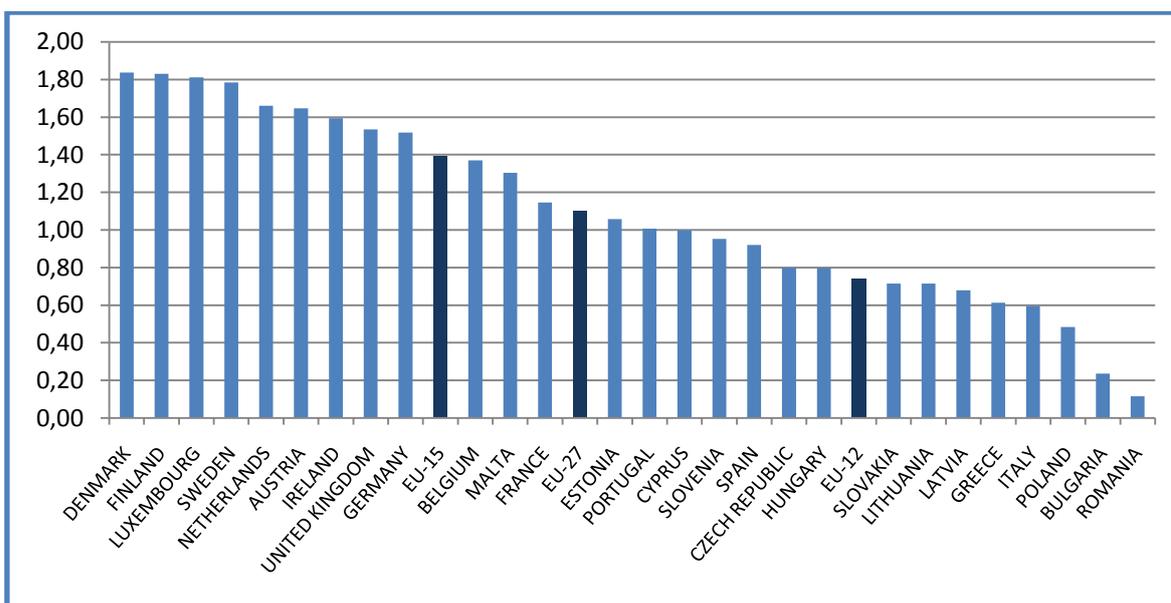
In the following chapter we will be using our own calculations based on the dataset publicly available at the official webpage¹⁴ of the Worldwide Governance Indicators.

¹⁴ <http://info.worldbank.org/governance/wgi/resources.htm>

4.1. Country Comparison Using Worldwide Governance Indicators

We first present the total index of governance in the EU-12 countries compared to the whole European Union and also to the EU-15. This index has been constructed using a simple average of all 6 indicators. For more detail, we also added individual index for every member country of the EU.

Figure 4.1: Total index of governance for EU countries

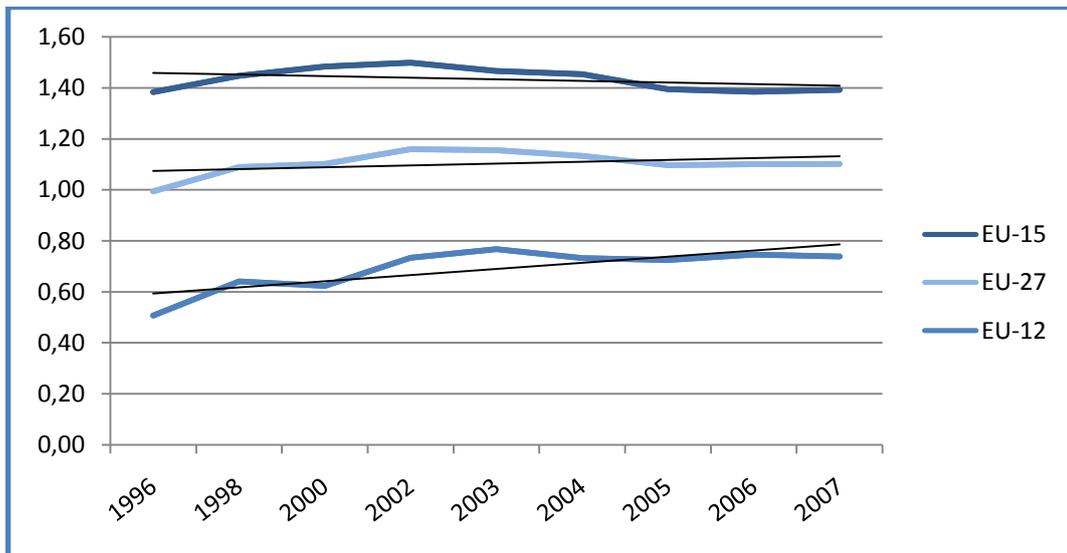


Source: Governance Matters VII, own editing

The important results that we can see from this diagram are that the best performing countries of the EU are Denmark together with Finland. The leading countries were all expected to obtain high score due to their long-lasting history of high-quality governance. In contrary, the position of Italy between Greece and Poland leaving behind only Bulgaria and Romania was less expected. Although we can understand Italy's position better if we take a closer look at its internal policies and problems with corruption. The worst countries are Bulgaria and Romania, which is logical due to their issues concerning governance in the past years. The average value of the EU-12 (0.74) countries is between the values obtained by Hungary and Slovakia. The average of the EU-12 countries is still far from the average of the old European Union countries, which shows us that there is a lot of room for improvement. The best performing countries from the EU-12 is Malta where the level of governance is close to the average level of EU-15 countries.

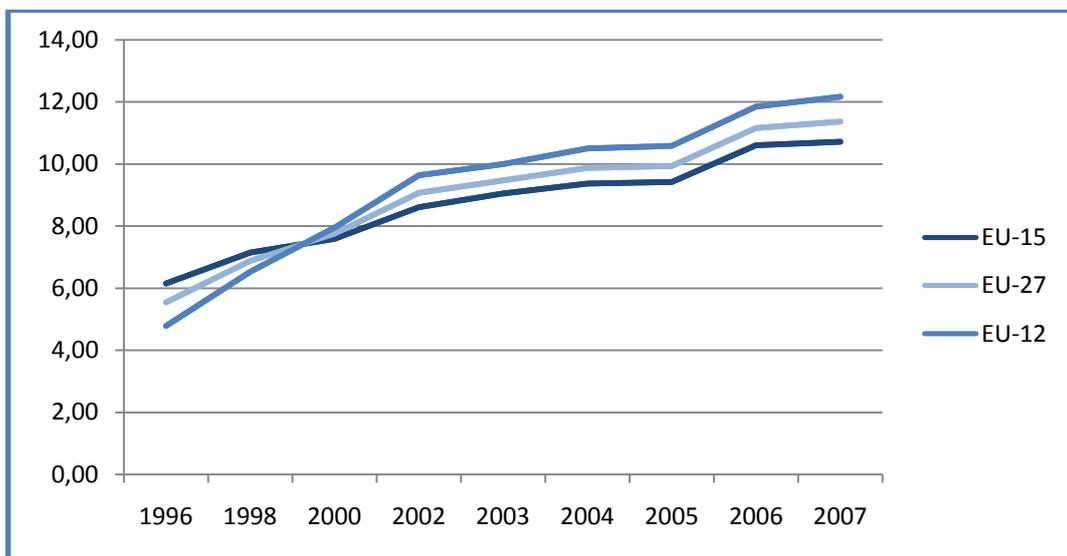
Provided that we have the data back to the 1996, we can also show the evolution of the overall indicator for the EU countries (Figure 4.2) and of the underlying data sources (Figure 4.3), which should help us understand the development of the indicators and their increasing precision. In the first graph we also included the linear trend.

Figure 4.2: The evolution of the total index of governance



Source: Governance Matters VII, own editing

Figure 4.3: The evolution of the number of data sources



Source: Governance Matters VII, own editing

By looking at the graphs, we can see that in case of the overall indices for the whole European Union and the EU-12 the trend has been increasing while for the EU-15 the

tendency has been slightly decreasing. The reason for the overall increase of the EU is that the increase of the quality of governance in the EU-12 was much higher than the decrease of the governance in the EU-15. We may observe that in 2004, during the biggest enlargement in the history of the EU, the overall index fell significantly. This was due to the fact that the quality of governance in the new countries was inferior in comparison with the old nations. The quality of governance in the EU-15 fell between the years 2002 to 2006, practically under the level established in 1996. This means that the countries recently joining the EU erased a big part of the difference between them and the most developed countries.

The Figure 4.3 depicting the evolution of the average number of sources reveals that this number has been increasing every year. The old European countries started with the average number of some 5 sources per country and ended at 12 sources per country, leaving the EU-15 countries behind with less than 11 sources. There is a clear positive correlation between the number of sources and the precision of the indicators. Then again, the number of the sources itself should not be the only indicator of precision since we have to be looking at the nature of the sources and evaluate their value.

Let us now analyze the above mentioned trends in the next table showing the first and last known value of the individual indicators again for the EU-12, EU-15 and EU-27.

Table 4.1: Total indices of governance

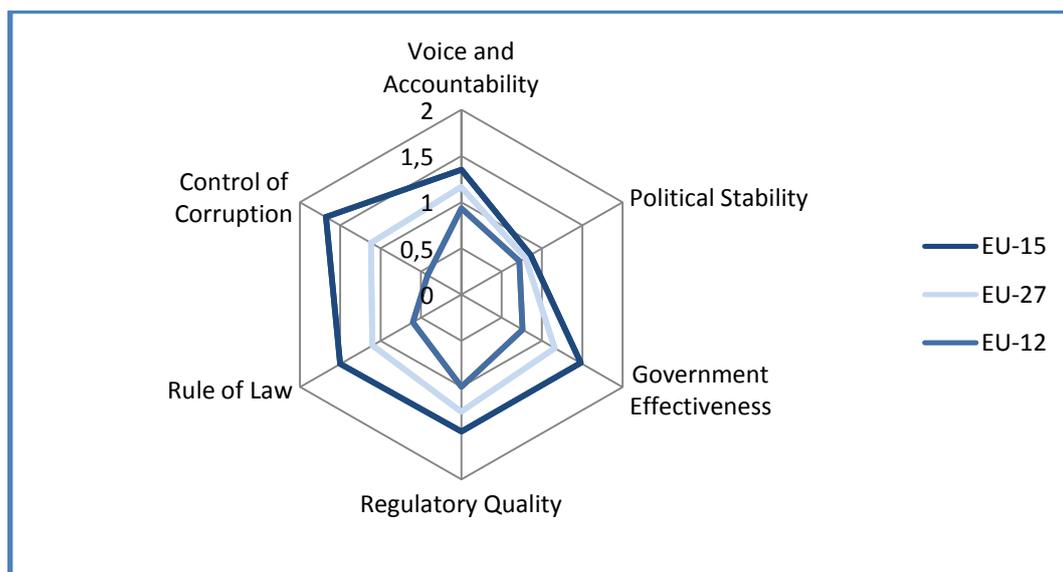
Indicator	Year	EU-15	EU-12	EU-27
Voice and Accountability	1996	1.21	0.79	1.03
	2007	1.35	0.93	1.16
Political Stability	1996	0.95	0.61	0.80
	2007	0.86	0.72	0.80
Government Effectiveness	1996	1.80	0.24	1.10
	2007	1.48	0.76	1.16
Regulatory Quality	1996	1.06	0.69	0.90
	2007	1.48	1.00	1.27
Rule of Law	1996	1.58	0.44	1.07
	2007	1.50	0.60	1.10
Control of Corruption	1996	1.70	0.27	1.06
	2007	1.68	0.42	1.12

Source: Governance Matters VII, own editing

By using the Table 4.1 we can examine more in depth the development in the segments of the EU. The substantial increase in the countries of EU-12 was mainly thanks

to the better ratings of Government Effectiveness that has tripled over the last 11 years. The least improving value was the Voice and Accountability that has risen by only 17%. In case of the EU-15 countries the best indicator was the Regulatory Quality, which has increased by exactly 40%. The Government Effectiveness, on the other hand, has fallen by almost 20%. We will now use another plot to see this from a different perspective.

Figure 4.4: Governance Indicators 2007



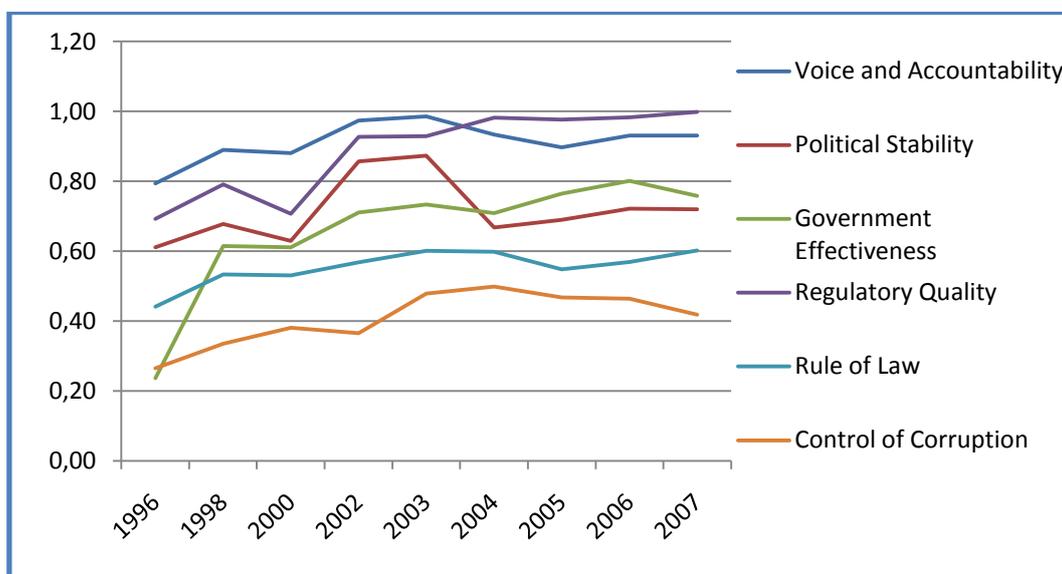
Source: Governance Matters VII, own editing

By looking at the Figure 4.4 above it is simple to tell where are the differences between the new and the old members of the EU. Let us now summarize the areas of governance they cover and the differences between the EU-12 and EU-15. Firstly, the Voice and Accountability together with Political Stability indicators measure the quality of democratic processes in the areas of politics, human rights and media independence. The EU-15 countries are obviously better than the rest but not by much. We can say that the gap between the standard democracies of the western world is not too big and for example the democratic elections take place in every EU-12 country. The next indicator is called Government Effectiveness. With higher values of this index comes well functioning bureaucracy and good public sector services. Here the difference is much bigger than in the first case. This indicates that the government efficiency is a big issue in the EU-12 countries and they still have a lot of space for improvement in the areas of bureaucracy, quality of public service and the structure of public spending.

The quality of regulation is an essence of a well-functioning institutional environment. The countries score higher values of Regulatory Quality indicator if the system encourages free entrepreneurship and lower values when there is an excess of regulatory measures harming the market. The market in EU-12 countries still experience many problems like overcomplicated fiscal system or excessive regulation of the labor and real estate market causing the difference between them and the developed countries. The Rule of Law index is one of the most important determinants of a modern society. This indicator covers mainly the protection of property rights and more generally the respect of citizens for the law. The EU-12 countries have adopted many new laws in accordance with the requirements of the EU, which helped to improve their position but there is still a lot to do in this area. The corruption has been one of the topics that worried most the government officials in the EU-12 countries. The state of the corruption is still alarming and many countries have problems with their credibility in the eyes of the investors.

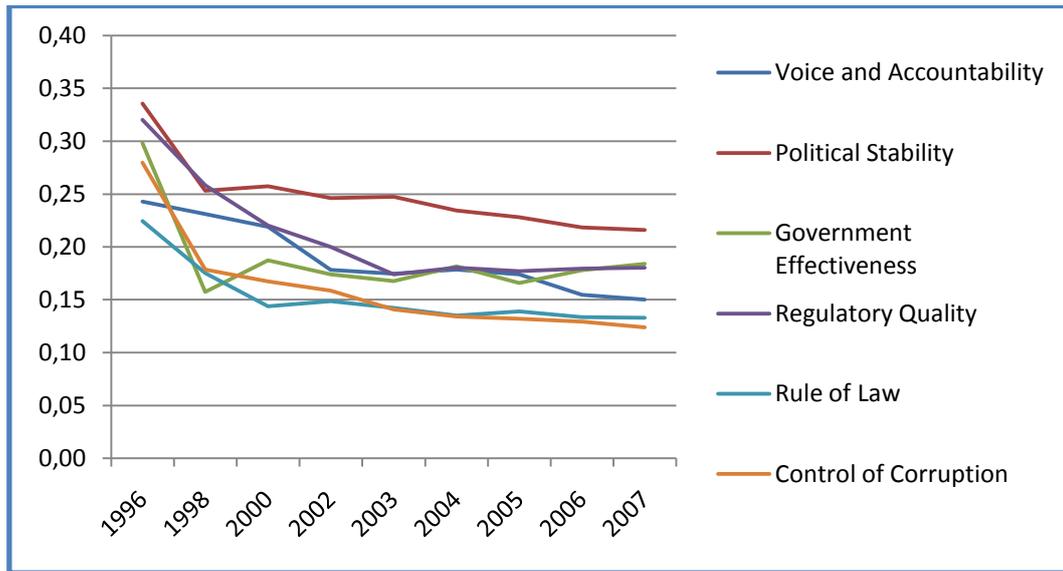
In the following section we will put more emphasis on the individual countries recently joining the European Union. We will try to compare them and answer some questions concerning the development itself. But first let us take a look at the evolution of the six indicators followed by the evolution of their respective standard error:

Figure 4.5: Evolution of the indicators in EU-12 countries



Source: Governance Matters VII, own editing

Figure 4.6: Evolution of the standard error in EU-12 countries



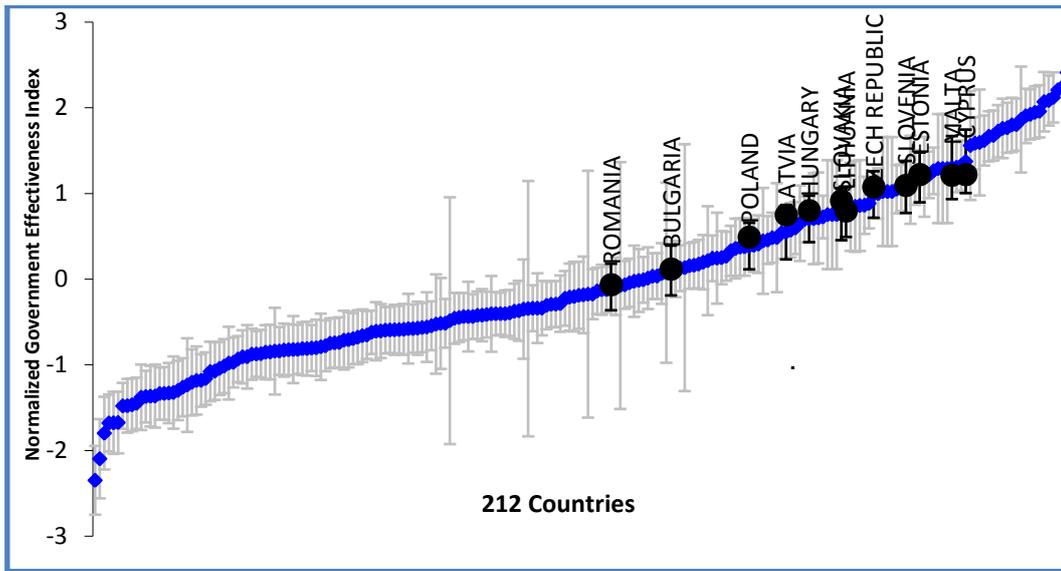
Source: Governance Matters VII, own editing

The Figure 4.5 shows us the evolution of individual indicators. We can clearly see that all of them have grown substantially over the last eleven years. Especially the indicator of Government Effectiveness increased rapidly during the first year mainly thanks to more efficient governments in countries like Bulgaria, Latvia, Lithuania or Malta. We can also observe that some indicators have decreased in the past few years.

By looking at the second diagram we can tell that the value of standard deviation has diminished considerably in the selected period, from the average of 0.25 to only 0.17. As we already know, the standard deviation serves us to construct the confidence intervals. Therefore with decreasing value of the standard deviation the confidence interval gets smaller and we are able to make more effective comparisons among countries. From this we may conclude that the precision of the indicators has incremented considerably.

Let us now take a closer look at the individual countries. From the first graph of this section above it is easy to recognize that the best performing country overall is Malta followed by Estonia and Cyprus. The worst countries in terms of governance are Bulgaria and Romania. But is it safe to say that Malta is better than any country from the sample? The answer is no. We always have to examine the confidence interval and only in the case when two intervals do not overlap we can safely rank the countries. Here, the situation is not that straightforward. We will demonstrate that on the graph below.

Figure 4.7: Indicator of Government Effectiveness 2007



Source: Governance Matters VII, own editing

Figure 4.7 shows us the indicator of Government effectiveness for the year 2007. Blue dots represent estimates of the indicator and the thin vertical lines represent standard errors around these estimates for each country world-wide. Black dots represent the countries from our sample. As we mentioned above, we should not be comparing two countries unless we know more about their standard error. Here, for instance, we can safely say that Cyprus is better in Government Effectiveness than Poland or Bulgaria but we are not sure whether the same statement is valid for Slovenia since their standard error intervals overlap. The diagrams for other indicators can be found in Appendix in Figure 1. By looking at these diagrams we immediately see that the EU-12 countries share more or less similar values of governance which complicates the situation and we are only able to compare countries from the opposite sides of the scale. In general the situation is the same for all the indicators – the group is led by Malta, Estonia or Cyprus with Romania and Bulgaria in the last two places. The rest of the countries are on more or less the same level and it would not make any sense to compare them.

In conclusion, we have shown some of the possible uses of the WGI by comparing the EU-12 countries. Although precise comparison of countries is not recommended, we were still able to show significant differences between the EU-12 and the rest of the EU. We also examined the development of the indicators and their precision in time. Even though it is not desirable to rely heavily on the results of time comparisons, we illustrated

the overall tendencies and demonstrated that the precision of the indicators increased significantly since they were first used.

4.2. Country Comparison Using Economic Environment Model

In this last section we present the results based on our calculations of the QEEL. As in the previous part we calculated the index for 12 countries recently joining the European Union. More specification about the countries is given above. Before we can calculate the QEEL we will present the simple descriptive statistics of all the economic data utilized in our study. Table 4.1 shows all fourteen indicators used for the construction of the QEEL. We give you the results of their mean, standard deviation, coefficient of variation and minimum and maximum values.

Table 4.1: Descriptive statistics

Indicator	Mean	Standard Deviation	Coefficient of Variation	Maximum	Minimum	Comment
Government Expense (% of GDP)	34.75	15.09	43%	48.44	48.44	
Gross International Reserves (months of imports)	3.98	1.49	37%	6.49	1.78	
Gross International Reserves (% of GDP)	6.21	6.92	111%	29.52	0.36	
Central government debt (% of GDP)	43.45	32.13	74%	105.72	6.40	
Current Account Balance (% of GDP)	-5.97	3.83	-64%	3.05	-22.48	
Inflation (CPI) (annual %)	6.57	8.88	135%	59.10	-1.18	
Trade (% of GDP)	120.12	44.59	37%	194.76	53.27	
Gross foreign direct investment (% of GDP)	6.54	4.99	76%	28.07	-10.14	
Real Interest Rate (%)	4.80	3.93	82%	15.27	-7.75	
Total Debt Service (% of export)	21.1	10.3	49%	39.1	9.24	Data N/A for all countries
Total Debt Service (% of GDP)	11.17	6.3	56%	29.4	2.65	Data N/A for all countries

Source: World Development Indicators

In the Table 4.2 we present the correlation matrix of the indicators used for the computation of the QEEL.

Table 4.2: Correlation matrix of the indicators

	Govexp	Debtser	Debtgdp	Govdebt	Curracc	Inflat	Gromres	Intres	Tragdp	Fdigdp
Debtser	-0.217									
Debtgdp	-0.268	0.534								
Govdebt	-0.536	0.109	0.149							
Curracc	-0.233	-0.023	-0.088	0.133						
Inflat	0.037	0.164	-0.170	0.014	0.055					
Gromres	0.270	0.202	0.185	-0.368	-0.245	0.083				
Intres	-0.003	0.038	-0.036	-0.182	-0.016	0.255	-0.064			
Tragdp	0.175	0.082	-0.399	-0.023	0.146	0.377	-0.146	0.465		
Fdigdp	0.055	0.093	-0.124	-0.138	0.268	0.144	0.118	0.286	0.456	
Rinrat	-0.124	-0.253	-0.384	0.012	0.216	-0.030	-0.063	0.195	0.386	0.275

By applying our methodology that has been explained above, we calculate the eigenvalues of R and arrange them in descending order of magnitude. All calculations were made using the statistical program R 2.8.1. The indicators with their corresponding eigenvalues are presented in the following table:

Table 4.3: Indicators and their corresponding eigenvalues

Indicator	Corresponding eigenvalue
Government Expense (% of GDP)	0.182
Total debt service (% of export)	0.288
Total debt service (% of GDP)	0.380
Central government debt (% of GDP)	0.505
Current account balance (% of GDP)	0.651
Inflation (annual %)	0.784
Gross international reserves (in months of imports)	0.898
Gross international reserves (% of GDP)	1.082
Trade	1.729
Gross foreign direct investment (% of GDP)	1.970
Real Interest Rate (%)	2.531

Finally, we calculate the QEEI for the sample of 12 countries. The values of the estimated index are shown in the table below. In this same table we also show the values of normalized QEEI as well as the ranking of every country from the sample. The first country in the ranking has, by our methodology, the best economic governance. As we showed before, the normalized values are in the scale of 0 to 1.

Table 4.4: Values of the QEEI

Country	QEEI	\widehat{QEGI}^k	Rank
Slovenia	0.2146	1.0000	1
Estonia	0.1948	0.9606	2
Hungary	0.1428	0.8574	3
Czech Republic	0.1270	0.8260	4
Slovakia	0.1133	0.7988	5
Lithuania	0.0444	0.6619	6
Malta	0.0172	0.6078	7
Cyprus	-0.0002	0.5733	8
Latvia	-0.0689	0.4367	9
Poland	-0.1026	0.3698	10
Romania	-0.1976	0.1811	11
Bulgaria	-0.2887	0.0000	12

By using the QEEI index we put the Slovenia at the first place, followed by Estonia, Hungary and Czech Republic. In contrary the worst scored Romania and Bulgaria.

4.3. Comparing the Results

In this chapter we will briefly compare the results obtained from both models. The rankings are presented in the following table:

Table 4.5: Comparison of the results

Country	WGI	QEEI
Malta	1	7
Estonia	2	2
Cyprus	3	8
Slovenia	4	1
Czech Republic	5	4
Hungary	6	3
Slovakia	7	5
Lithuania	8	6
Latvia	9	9
Poland	10	10
Bulgaria	11	11
Romania	12	12

We can see immediately that the ranking of the best performing countries is slightly different. Whereas the best country according to the WGI is Malta, in case of the QEEI it is Slovenia. This is due to the differences in underlying data and especially due to the purpose of both models. By using the WGI, we are trying to find out more about the overall governance but when we use the QEEI we get the image of the economic environment and openness or even economic governance. With that in mind, it is logical that economically strong countries like Slovenia score very high. On the other hand, small countries like Malta or Cyprus are known for the restricted government and well-functioning bureaucracies, so their position in the WGI ranking is logical as well. The second part of the ranking is almost the same in both cases. By this we may conclude that countries with poor economic environment also have problem establishing good institutional environment and thus having worse governance.

The most striking result is the position of Hungary in the QEEI model. For an economy with deep structural problems it is unlikely to end up so well in a model examining economic governance. This may be due to the imperfections of the model and the result should be subject to further adjustments of the model. Otherwise the QEEI seems to reflect quite realistically the economic position of selected countries.

4.4. Comparing the Models

After seeing the results of the comparisons we can finally evaluate the models. The World Governance Indicators is without a doubt a more comprehensive measure of governance, closely depicting the six main aspect of governance. Thanks to the history of measurement, we are able to depict some of the trends over time. Its precision, as one of the vital determinants of every model, has been increasing steadily. Owing to this fact we are now able to compare countries more precisely. The authors include 90% confidence intervals and strongly advise to use them when comparing various countries. This also makes the analysis based on the WGI more reliable although not every pair of countries can be compared.

The original QEEI model emphasizes the state of economic environment in a particular country. In spite of not being as precise and reliable as the WGI it could still help us get a different perspective of economic governance in selected country. The results confirm this assumption and in our opinion the findings reflect the economic governance

quite well. Obviously, there are still some inaccuracies which can be told by the position of some countries that we would not have expected (e. g. Hungary at the third place) but we are aware that the model needs further adjustments and the indicators should be assessed and calculated again in upcoming years.

Conclusions

In this work we have taken a closer look at the quantitative analysis of the quality of governance. We have shown that it makes sense to measure economic institutions and governance since there is a strong link between the measure of quality and the measure of performance of a nation. We have tried to give the reader a brief summary of the current research concerning the most important indicators. We paid special attention to the governance indicators calculated annually by the World Bank Institute. We consider these indicators to be one of the most important measures of governance available and thus they are an inspiration for all researchers working in this field.

Consequently, we explained comprehensively the process of the estimation of the Worldwide Governance Indicators to give a reader a chance to evaluate possible risks and setbacks of their use. We discussed some of the most important critiques raised by various researchers. In spite of some limits of the WGI, we believe that the advantages by far outweigh the drawbacks and it is certainly very useful to compare countries or whole regions using the WGI.

Afterward, we used the indicators to make a comparison of the countries recently joining the European Union, the EU-12. Firstly, we compared our sample with the rest of the countries belonging to the EU and we tried to make year-to-year comparisons to determine the trends of the governance over time. At the same time, we examined the evolution of the number of underlying data sources and the precision of the measurement. We came to the following conclusions: a) There is a clear improvement in the quality of governance in the EU-12 countries; b) As the number of sources increases every year, the precision of estimation of the values improves.

Thanks to the increasing level of precision we were also able to compare some countries within our sample. In order to be able to make confident conclusions we had to take into account the margins of error. These margins limit the possibility of comparisons

but we were still able to divide our sample into two groups according to the quality of their governance. The best performing country in our sample was Malta with an average value of the WGI equal to 1.3 followed by Estonia scoring 1.06. On the other side of the spectrum there was Romania scoring only 0.12. We may note that the differences among the EU-12 countries are not statistically significant which makes the effective comparisons even more difficult.

In the third chapter of this study we also constructed a simple latent variable model based on the data related to the economic performance and we ranked the countries by the level of their economic environment. We have to advise the reader to be cautious about making any statements from the results given by our model since there is a lot of space for refining the selected data for the estimation of the QEEI. Additionally, we think that it is necessary to monitor the results periodically in order to be able to appropriately show the progress of the countries.

To conclude, when we accept the challenge of measuring the quality of governance we always have to keep in mind that countries are shaped by various socio-economic, political and cultural determinants. As a result, the models we used in this study can hardly reveal the links between governance and economic performance. Further progress is conditional on satisfactory implementation of various socio-economic, cultural, legal and political variables.

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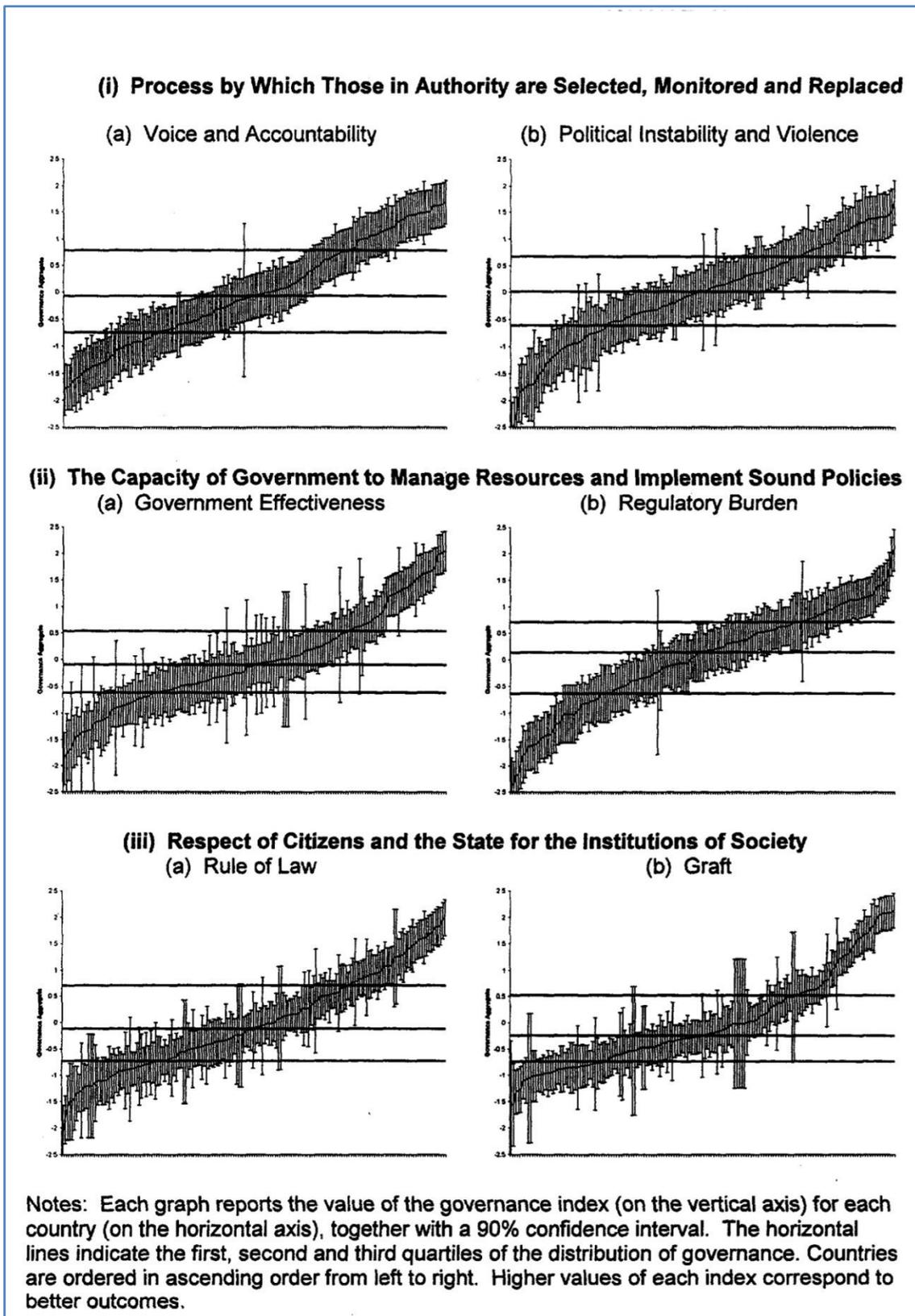
Appendix

Table 1: Summary Statistics on Governance Indicators

	<u>Voice and Accountability</u>	<u>Political Stability/ Absence of Violence</u>	<u>Government Effectiveness</u>	<u>Regulatory Quality</u>	<u>Rule of Law</u>	<u>Control of Corruption</u>	<u>Overall</u>
Number of Countries							
1996	194	180	182	183	171	154	177
1998	199	189	194	194	194	194	194
2000	200	190	196	196	196	196	196
2002	201	190	202	197	197	197	197
2003	201	200	202	197	202	198	200
2004	208	207	208	204	209	205	207
2005	208	208	209	204	209	205	207
2006	209	209	212	206	211	207	209
2007	209	209	212	207	211	208	209
Median Number of Sources Per Country							
1996	4	4	3	4	6	4	4
1998	5	5	4	5	7	5	5
2000	5	5	5	6	8	6	6
2002	7	6	8	8	11	7	8
2003	8	6	8	8	11	8	8
2004	8	7	9	8	12	9	9
2005	9	7	9	8	12	9	9
2006	10	8	10	9	13	11	10
2007	11	8	11	9	13	11	11
Proportion of Countries with Only One Data Source							
1996	15	16	21	11	6	18	15
1998	11	7	10	10	9	10	10
2000	11	8	8	7	7	8	8
2002	10	7	5	7	7	8	7
2003	3	10	5	7	5	7	6
2004	6	6	8	7	9	8	7
2005	6	5	8	7	8	7	7
2006	6	3	9	8	8	8	7
2007	6	3	8	9	8	8	7
Average Standard Error							
1996	0.25	0.37	0.34	0.41	0.30	0.32	0.33
1998	0.27	0.31	0.18	0.30	0.22	0.24	0.25
2000	0.26	0.32	0.22	0.28	0.19	0.22	0.25
2002	0.21	0.30	0.22	0.25	0.19	0.22	0.23
2003	0.20	0.30	0.22	0.21	0.20	0.20	0.22
2004	0.21	0.29	0.23	0.21	0.19	0.20	0.22
2005	0.20	0.28	0.21	0.21	0.19	0.19	0.21
2006	0.18	0.26	0.23	0.21	0.19	0.19	0.21
2007	0.18	0.26	0.23	0.22	0.19	0.19	0.21

Source: Kaufmann et al. (2008), page 32

Figure 1: Aggregate Governance Indicators: 90% Confidence Intervals



Source: Kaufmann et al. (1999a), page 22