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RESEARCH ARTICLE / ARAŞTIRMA MAKALESİ

# Calibrating the Economic Impact of a Deficit in the İnstitutional Quality of Government: The Case of Spain

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**Abstract**
The quality of government institutions and the absence of corruption are key factors of economic development. How could we quantify, for any given country, the overall monetary cost of poor-quality institutions? This paper compares the institutional quality in Spain with those of the rest of the world and assesses the economic cost of the deficit of institutional quality in the country. Although Spain is among the top 20% of countries worldwide in terms of the quality of governance institutions, the value of the Spanish governance indicators is below what corresponds to Spain's economic development level. The authors calibrate the effect that a correction of the deficit of institutional quality would have on Spanish income under different parameter scenarios and always finds a high positive potential impact. The method we introduce to conduct these calibrations can serve as a useful blueprint for the analysis of other countries.

**Keywords**
Corruption, Quality of institutions, Economic development, Governance, Spain

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## Introduction

The cost of corruption is often thought of only in terms of stolen or misappropriated money. However, the economic costs of corruption go far beyond the amount of public funds deviated, as it weakens key elements of the functioning and dynamism of an economy. As we discuss in detail below, the control of corruption and the quality of government institutions are central to countries' economic development (Acemoglu, Johnson, and Robinson 2005b; de Waal & Ebben 2011). Yet, how can we assess the overall economic cost of corruption and institutional quality deficiencies in a particular country, in this more comprehensive perspective?

This paper proposes a simple approach to measure a country's deficit of institutional quality and assess the consequences of this deficit on the country's GDP per capita, using Spain as a case study. Spain is a particularly interesting case as this country is among the top 20% countries with the highest level of institutional quality according to the yearly editions of the Worldwide Governance Indicators, WGI (Kaufmann, Kraay and Mastruzzi, 2010) and, nevertheless, corruption has become a major concern of Spanish public opinion in the last years (Jiménez 2016). In order to carry out this measurement, the paper compares, first, the perceived institutional quality and corruption levels in Spain with those of the rest of the world, and, in particular, with the main European economies; and second, it estimates the cost of the possible deficit of institutional quality in terms of economic development. This estimation is carried out using the scientific literature's assessments of the deep determinants of productivity and economic growth, which include institutional quality as one of the key determinants. The approach we introduce to assess the economic cost of corruption and poor institutional quality could serve as a useful blueprint for the analysis of other countries.

This article is structured in four sections. Section 1 discusses the economic consequences of corruption and poor-quality government institutions and the mechanisms through which these circumstances reduce countries' wellbeing and economic growth. Section 2 explains the Worldwide Governance Indicators (WGI) that we use in our empirical analysis and compares Spain's position with various international references. Section 3 first reviews critically the main econometric estimates obtained by the scientific literature regarding the impact of institutional quality on country productivity and per capita income. Second, on the basis of these estimates, the authors conduct in this section a series of calibrations of the positive economic impact that would follow from correcting the estimated Spanish deficit in institutional quality. The final section summarizes and concludes showing that Spain's income level would experience a significant boost in the long term if the country's quality of institutions and governance was brought to the level that corresponds to the country's level of economic development.

## Institutions, Wellbeing, and Economic Development

Achieving an advanced level of economic development requires combining market mechanisms with efficient state intervention. Public institutions play an essential economic role in the economy by establishing the rules of interaction between economic agents and by providing security for transactions. Moreover, they supply essential public goods and regulation that promote social cohesion and compensate for market failures.

The first detailed, modern analysis of the mechanisms that link economic performance with the institutional framework, and the first applications of this analysis to the historical experience of different countries, are the works of Douglass North and his collaborators (North and Thomas 1973, North 1981 and 1990). Douglass North (1990) defined institutions as the formal and informal rules of the game that structure social interaction. After North, the group of researchers that has perhaps had the greatest influence on the analysis of the economic role of institutions is that of Daron Acemoglu, Simon Johnson, and James A. Robinson (2001, 2005a, and 2005b, among other works[1]).

The debate about the effects of the quality of government institutions on economic development has had a substantial impact on theories that seek to explain why levels of prosperity are so different between countries. The models of economic growth of the 1950s and 1960s emphasized the accumulation of productive factors (physical and human capital). These models and subsequent models that placed a greater emphasis on technological advancement were developed without explicit reference to the institutional environment. As stated by North and Thomas (1973), traditional models of growth lacked a more basic explanation that could account for why the levels of physical and human capital or innovation that accompany growth differ from country to country. For these authors, and for many later economists specializing in economic growth and development, the differences in the institutions that establish the economic rules of the game and determine the quality of governance in each country are a fundamental variable that explains differences in investment in physical and human capital and innovation. Additionally, as a country develops economically, a higher level of excellence is required in each of the facets of governance. The more advanced an economy is, the greater the volume of funds invested, and the more sophisticated and riskier the business projects on which the drivers of growth depend. Similarly, there is also a greater number of businesses and professionals participating in the production of each good and service that can be located in different regions and continents. The fluid interaction between individuals and businesses in the context of the extraordinary complexity and fragmentation of the productive processes that characterize a modern economy requires a legal and institutional framework that is increasingly sophisticated and effective, with strict compliance with contracts, an agile and predictable legal system, and an advanced and stable regulatory system.

**Different Facets of Institutional Quality**

Beyond the general legal security that an economy needs to function, institutional quality has several additional facets that are interesting to review. These facets are related to the indicators used in section 2 of this article and to the calculations developed in section 3: democracy and freedoms, the absence of violence and political instability, the effectiveness of administration and quality of regulation, and control of corruption.

Thus, a second facet of the institutional quality of a country is democratic soundness and respect for citizens' rights and freedoms. The dynamism of a modern economy is based, on the one hand, on entrepreneurship, innovation, and competition between infinite businesses whose revenues do not rely on contacts with power but rather on producing well and at a good

1 But see also Eichengreen (1994) for an explanation on how the institutional framework played a decisive role in the sustained economic growth of Europe during the decades of the 1950s and 1960s.

price; on the other hand, it is also based on the honesty and efficiency of a public sector that provides quality services and complements private initiative with adequate levels of public investment and regulation. The flourishing of these public and private factors is incompatible with regimes in which minority groups enjoy privileged access to power and business, where those that govern do not have to be accountable to citizens, and where corruption or shortcomings by politicians cannot be criticized publicly or punished electorally.

A third facet of institutional quality and governance includes aspects related to violence and political stability. In a context of wars, violence, and instability, is difficult for individuals in a society to develop themselves personally and professionally and for businesses to engage in long-term planning and investment. Such instability is a crucial limiting factor in the development of many areas of the planet.

Fourth, institutional excellence requires a professional and efficient public administration that provides quality services and a regulatory system that favours the competitive virtues of the market, alleviating the innumerable circumstances under which the free market is a poor organizer of economic activity. Two potential market failures that motivate important state regulation are *asymmetric information* and lack of competition (Stiglitz and Rosengard 2015). These problems are potentially present in sectors as important as finance, energy, or communications.

The problem of asymmetric information is particularly important in financial operations. This problem is at the origin of the supervisory and regulatory activity of institutions, such as the central banks and stock market commissions of each country. Given that financial operations are essential for the activity of all businesses and the economic lives of all families, the supervisory and regulatory quality of central banks and stock market commissions is essential for the proper functioning of an economy. A notable example of this necessity is the global financial crisis of 2008, which was in part due to the errors and omissions by these institutions (Acharya et al. 2011).

Similarly, the absence of competition can deprive the market of many of its virtues, and this situation requires accurate regulations and technically capable and politically independent bodies to execute them (Viscusi et al. 2000, OECD 2002). The advantages of larger size in many economic activities and natural quasi-monopolies, such as energy and telecommunication service provision networks, frequently lead to uncompetitive markets. An economy cannot achieve elevated dynamism and international competitiveness if, for example, energy is artificially high due to industry collusion or if the digital society is poorly regulated and does not incentivize innovation and the adoption of new technologies. High productivity and long-term sustainability of economic growth are difficult to achieve without adequate competition rules and without regulatory bodies with a high level of professionalism that are independent from political power and interest groups.

Finally, corruption is another facet of institutional quality that can negatively affect all areas of governance and thus the functioning of the economic system. Corruption ruptures the rule of law, brings power to incompetent and unethical leaders, undermines the proper functioning of public administration, reduces investment and public services by diverting or wasting resources, leads to policies and regulations that favour spurious interests to the detriment of society as a whole, and distorts the allocation of productive factors, reducing national productivity.

### Some Empirical Results

Since the mid-1990s, the scientific literature in economics and political science has included an intense effort to compare and quantify the impact of low institutional quality and corruption on multiple aspects of economic activity and wellbeing. The works differ in the variables and concrete relations studied and in their methodological approaches. For the objectives of this article, we are specifically interested in studies that quantify the impact of institutional quality on productivity and the income levels of countries and that rigorously identify not simply correlations between variables but rather *causal impacts*. In section 3, we clarify the difference between correlations and causal impacts and review a group of noted studies that meet the most rigorous methodological standards in this regard. Specifically, we review the works by Hall and Jones (1999), Acemoglu, Johnson, and Robinson (2001), Kaufmann and Kraay (2002), Rodrik, Subramanian, and Trebbi (2004), Alcalá and Ciccone (2004), and Acemoglu, Gallego, and Robinson (2014). These studies provide the basis for our subsequent own calculation of the economic cost of the deficit in institutional quality and corruption in Spain.

However, beyond these works, there are other studies that have demonstrated the mechanisms through which institutional weakness and corruption have a negative impact on the economy and wellbeing of countries. It must be pointed out that many of these works focus exclusively on the impact of corruption and not that of institutional quality as a whole and that, while there is complete unanimity regarding the negative impact of poor institutional quality on the productivity of countries, in the case of the specific impact of corruption, there are works that point out nuances of interest. The origin of these nuances lies in the so-called '*grease the wheels'* hypothesis developed in the 1970s, according to which corruption could be beneficial for economic growth where the poor functioning of government institutions distorts markets. In such circumstances, corruption would serve to grease the wheels of these institutions that function poorly, unblocking democracy and improving efficiency, investment, and, over time, growth.

The grease-the-wheels hypothesis was first formulated by academics such as Leff (1964), Huntington (1968), and Leys (1965). However, as a general view of the impact of corruption on the economy, this opinion is no longer defended in the academic world. The way to resolve problems created by a rigid, over-centralized, and honest bureaucracy is not by making it dishonest, but rather flexible and efficient; however, there are cases of extraordinarily stagnant countries in which corruption may cause some resources to function. But the empirical studies by Mauro (1995), Knack and Keefer (1995), Abed and Davoodi (2000), Mo (2001), and Méon and Sakkat (2005), among others, find that corruption has a negative average impact on economic growth.

## Institutional quality and perceived corruption

### Indicators and Interpretations

This section provides a comparative analysis of institutional quality indicators for Spain. The analysis is based on the WGI, which have their origin in a World Bank project and were created by Daniel Kaufmann and Aart Kraay. The WGI provide aggregate governance indicators on more than 200 countries based on a long list of specific indicators obtained from 31 public, non-governmental, and private organizations. The original

indicators capture multiple aspects of the quality of governance in countries based on the perceptions reflected in surveys of persons, institutions, and businesses, as well as in reports by analysts and experts from the public and private sectors. The WGI synthesize indicators from multiple institutions in six aggregate indicators. These six indicators are directly related to the different facets of institutional quality discussed in the previous section of this article and correspond specifically to the following six concepts:[2]

- Voice and Accountability (VA): captures perceptions on the functioning of democracy, the way citizens participate politically and how civil liberties are warranted.
- Political Stability and Absence of Violence (PS): measures perceptions of the likelihood that the government will be destabilized by unconstitutional or violent means.
- Government Effectiveness (GE): captures perceptions of the quality, efficacy and capacity of public and civil services and the degree of its independence from political pressures.
- Regulatory Quality (RQ): captures perceptions of the ability of the government to formulate and implement sound policies and regulations.
- Rule of Law (RL): captures perceptions of the extent to which agents have confidence in and abide by the rules of society and, in particular, the quality of contract enforcement, the security on property rights, the efficacy and impartiality of the police, and the independence and capacity of the courts.
- Control of Corruption (CC): captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

In this article, we use five of these six indicators as combined indicators of institutional quality. The excluded indicator is political stability and absence of violence, because it is markedly affected by international terrorist threats whose differential effects across countries often have a limited connection to national institutions and governance. Although the indicators we use point towards very particular aspects of institutional quality, there is a very high correlation between all of them. Specifically, using the main sample of 157 countries described below, the correlation coefficients between the remaining five indicators vary from a minimum of 0.72 for the correlation between VA and GE to a maximum of 0.98 for the correlation between RL and CC.

Figure 1 provides a first approach to the close positive relationship that exists between the governance indicators and the level of productivity of countries (the latter variable is measured in logarithms because its evolution is subject to cumulative growth). As throughout the whole article, the WGI used correspond to the year 2017 and have been re-scaled to vary between 0 and 10 in order to make these scores more intuitive.[3] Meanwhile,

2 Details on the methodology used to assign and aggregate the indicators in the WGI can be found in Kaufmann, Kraay, and Mastruzzi (2010) and on the website of the WGI project (World Bank 2021). The construction and significance of these indicators are subject to a lively and interesting debate. A discussion of critiques and replications can be found in Kaufmann, Kraay, and Mastruzzi (2007).

3 By construction, according to a statistical distribution of normal type (0.1), each of the six original indicators

the data on productivity correspond to the ratio between the gross domestic product (GDP) in purchasing power parity (PPP) and employed population. The source used throughout the work for the latter data is the World Bank's World Development Indicators for the year 2017 (World Bank 2018). In all of the comparisons, countries with a population of half a million inhabitants are excluded from the sample because the determinants of productivity in these small countries generally have little to do with the determinants for most countries, such as Spain.[4] Consequently, their inclusion could reduce the relevance of the sample used as reference. The combination of the data on production, employment, and population following these criteria yields a joint sample of 157 countries.

Based on the sample of 157 countries, the correlation between the combined indicator on institutional quality and productivity is 0.68. The correlations vary somewhat depending on the governance indicator used, ranging from a minimum value of 0.44, which is obtained for voice and accountability, to a maximum of 0.76, which is obtained for government effectiveness. In the case of control of corruption, the correlation is 0.63.

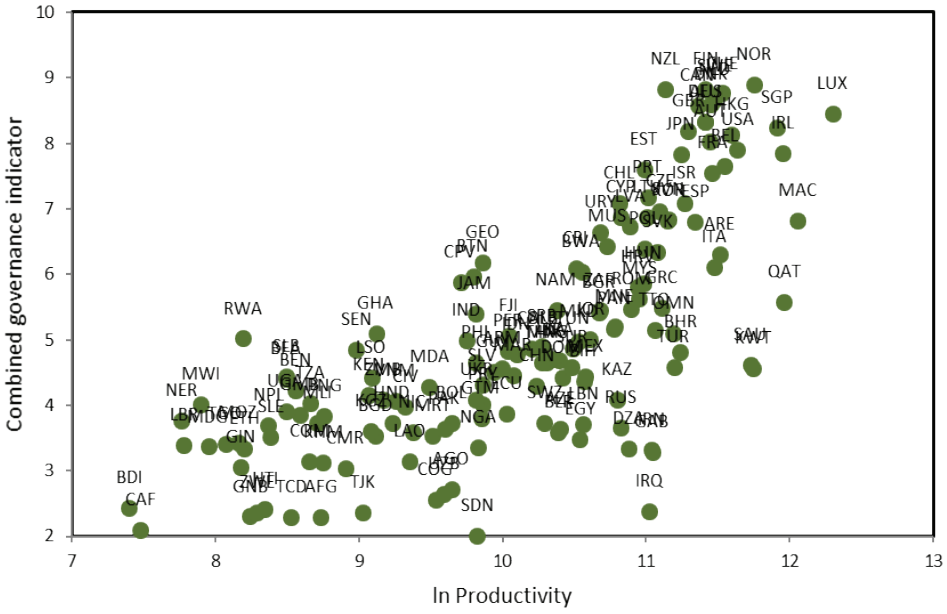



***Figure 1.*** Correlation between the combined indicator of the institutional quality of countries and (the logarithm of) their productivity (2017)

**Source:** World Bank (2018, 2021) and the authors.

from the WGI has a zero mean (for the initial set of more than 200 countries), standard deviation of 1, and an approximate interval of variation of between -2.5 and +2.5. In this article, and following re-scaling, the indicators have approximately a mean of 5 and standard deviation of 2.

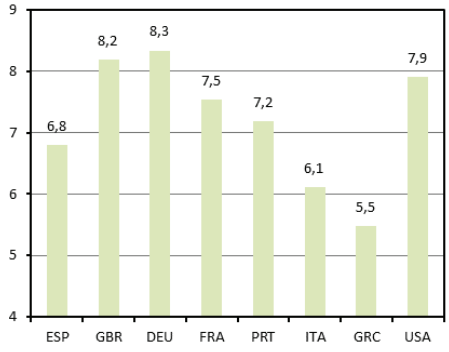
4 A good number of these economies whose population is less than half a million inhabitants are small island states such as Dominica, the Cayman Islands, the Seychelles, or the Marshall Islands, whose income levels depend almost exclusively on the opportunities for tourism offered by their geographies or their operation as tax havens.

Aside from the strong positive correlations that are the underlying fact demonstrated by these variables, two other circumstances are interesting to note. First, the main exceptions to the general trend are produced in large oil and gas exporters such as Saudi Arabia, Kuwait, Qatar, Iraq, Libya, Equatorial Guinea, and Turkmenistan. This feature reveals that the exceptional circumstance that characterizes these countries, an abundance of energy resources, allows them to achieve relatively high-income levels despite low-quality governance. Second, Figure 1 suggests that the positive relationship becomes more consistent with an average level of development, it being somewhat weaker for lower levels of development. Thus, although institutional quality is always important, it appears to be especially so for advanced economies such as Spain. This situation suggests that, when a country is not in the big leagues, it is sufficient to achieve good levels for a small number of competitive factors to maintain or improve its position; however, when a country aspires to compete with the world's most advanced economies and enjoy their income levels, it is necessary to achieve excellence in the majority of factors and, particularly, institutions. This idea is emphasized by Kehoe and Ruhl (2010) in their comparative analysis of growth in China and Mexico.

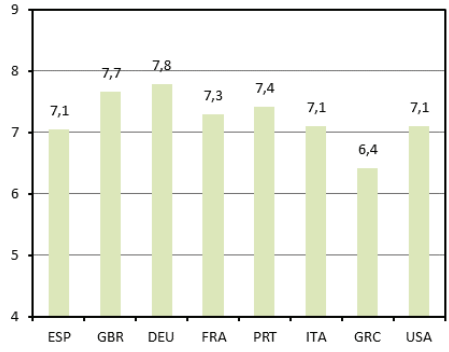
**Comparative Analysis of the Spanish Case**

Figure 2 shows the value of the governance indicators for Spain in comparison with three West European countries (Germany, UK, and France), three Mediterranean European countries (Italy, Portugal, and Greece) and the US. As the main point of reference for comparison with Spain, we use the simple average of the indicators of Germany, UK, and France. These European countries are similar to Spain in size and demographic dynamics and constitute models of advanced economies and institutional functioning. Additionally, from an economic point of view, the difference in productivity of those employed in these countries and Spain (in PPP) is low, approximately 1%, even though their per capita GDP (also in PPP) is 25% higher than that of Spain.

a) Combined governance indicator




b) Voice and accountability



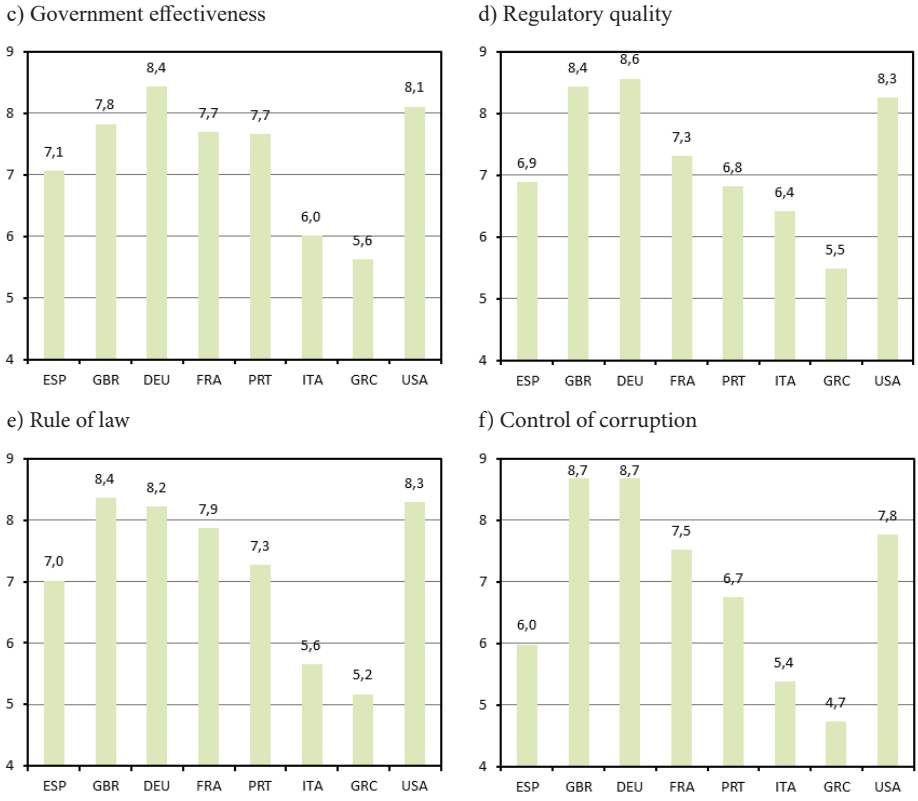



***Figure 2.*** Institutional quality indicators. International comparison (2017)
**Note:** The overall distribution of indicators has a mean of 5 and standard deviation of 2
**Source:** World Bank (2021).

The combined institutional quality indicator generates a value of 6.8 for Spain versus 8.0 for the average of the three West European countries that appear in Figure 2, 6.3 for the three Mediterranean countries, and 7.9 for the United States. Therefore, the framework and quality of government institutions in Spain appear to be inferior compared to the West European countries that constitute our primary reference point, although superior compared to other Mediterranean countries.[5]

Although the different variables are strongly correlated, the differences between Spain and the countries of reference are not equal on all aspects of governance. With regard to the three West European countries, Spain presents its best performance in the categories of voice and accountability and government effectiveness. As previously explained, these two indicators include aspects related, on the one hand, to democratic control of government and citizen rights and freedoms, and on the other, the capacity of the government and administration to implement policies and provide quality public services.

5 The standard errors of these indicators are approximately 0.36 points, which implies a low probability that the ranking of countries reflected by these values could change.

Meanwhile, the aspects for which Spain shows the greatest weakness are those of regulatory quality, rule of law, and, above all, control of corruption. The differences between the values for Spain for these three indicators and the average values for the three West European countries are negative and statistically significant (1.2, 1.1, and 2.3 points, respectively).

The possible economic impact of the quality of governance in Spain can also be assessed by comparing its position regarding the global distribution of institutional quality with its position regarding the distribution of levels of productivity. This comparison provides an approximation to the role institutional factors play in promoting or hindering national competitiveness. The informal theoretical framework of the following analysis is as follows. The productivity and international competitiveness of a country depend on a very varied set of factors, such as its human, physical, and business capital; openness to trade; natural resources; and geographic location. As mentioned in section 1, the institutional and regulatory framework constitutes a key element within this set of factors. If all of these factors were to move together, a country with per capita income that is, for example, in the 75$^{th}$ percentile for global distribution of productivity would also have an educational level that is in the 75$^{th}$ percentile of distribution corresponding to this variable; that is, on average, its population would be more educated than 75% of countries in the world and less educated than the remaining 25% of countries. The same would be true of a country's physical capital per capita, openness to trade, business capital, etc., which would also be located in that same 75$^{th}$ percentile.

Naturally, the factors that determine a country's productivity do not move in unison, and thus, each country bases its competitive advantages on specific factors in which it occupies a relatively prominent position (being located in a higher percentile of global distribution for this factor compared to its position the distribution of productivities), while having relatively unfavourable positions in other factors. The former factors constitute the strengths of the economy in question, while the latter ones constitute its relative weaknesses. Thus, for example, while the countries of the Organization of Petroleum Exporting Countries (OPEC) have a high per capita income despite poor institutional quality thanks to the strength of their oil resources, other countries that are relatively poor in natural resources such as Finland or Denmark can achieve a high level of productivity thanks to very high institutional quality.

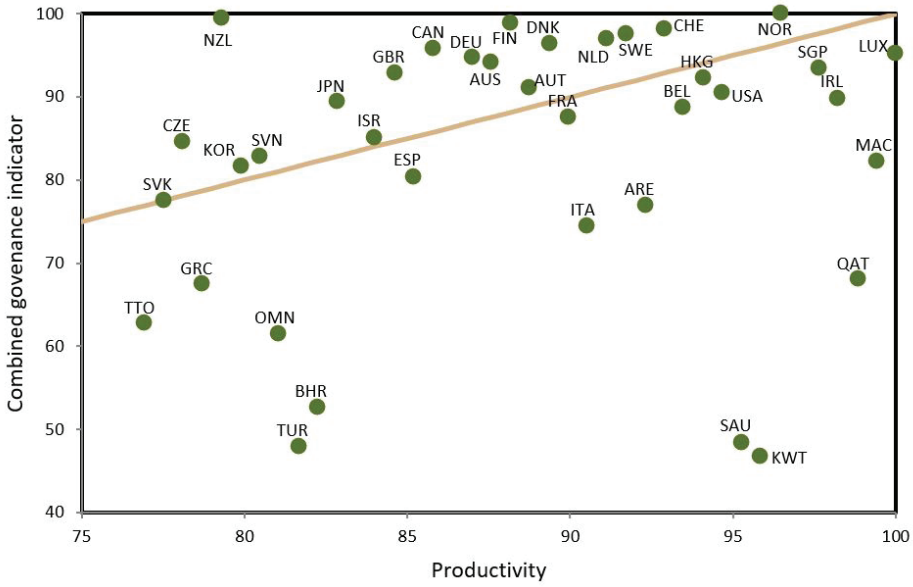
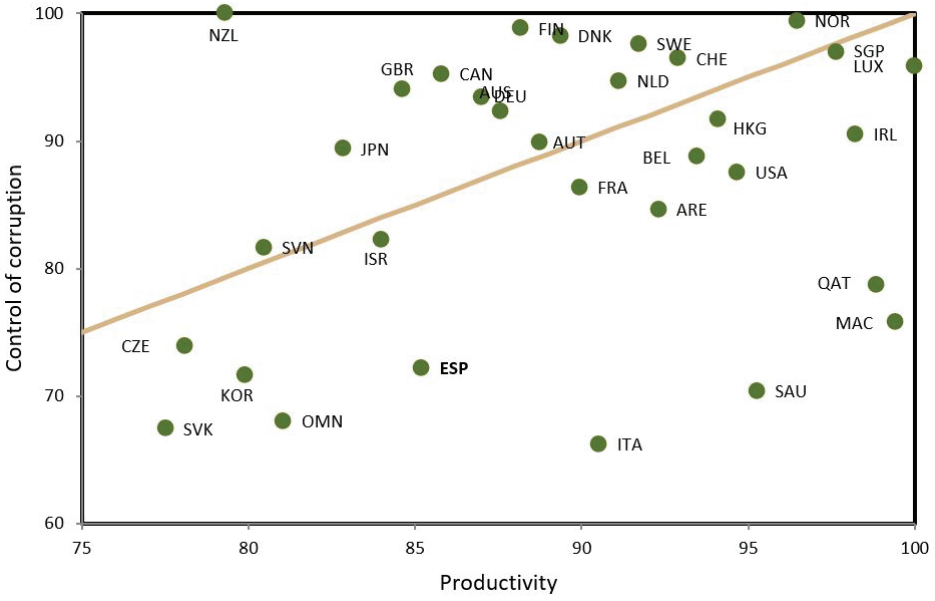



***Figure 3.*** Productivity and combined governance indicator (2017) (percentiles)
**Note:** The line intersects points at which both variables are in the same percentile
**Source:** World Bank (2018, 2021) and the authors.

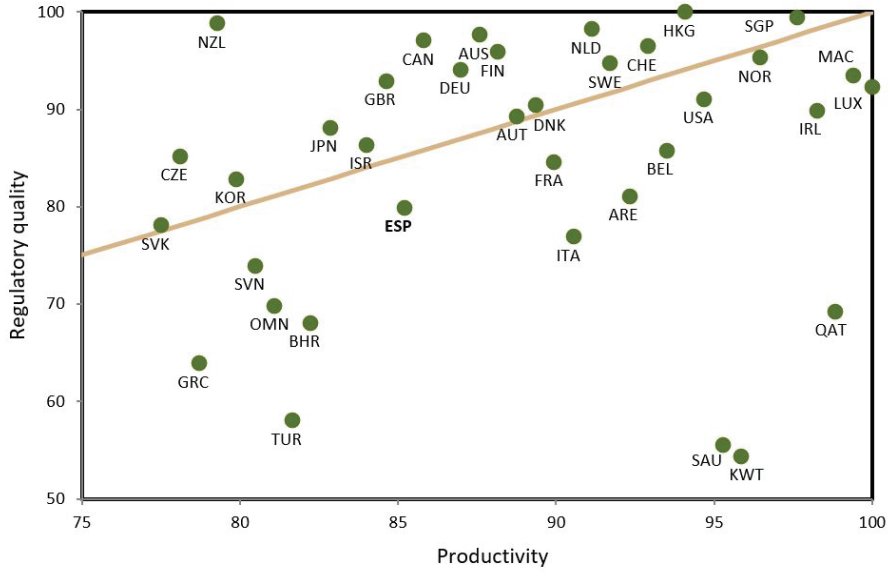
Figures 3 and 4 show the position in terms of productivity and governance quality of the 25% most productive within the set of 157 countries we have been considering, among which Spain is included.[6] Specifically, they show the combined indicators, control of corruption, regulatory quality, and rule of law. Instead of measuring productivity in dollars and governance quality in arbitrary units, countries are distributed along the two axes according to the percentile in which they are located in the corresponding global distribution. The lines intersect the points at which both variables are in the same percentile. Countries located above these lines enjoy institutional and governance quality that is higher than what would be expected based on the level of economic development (as measured by their aggregate productivity).

6 The panels in Figure 4 exclude Equatorial Guinea, Trinidad and Tobago, Gabon, and Iraq so that their very low levels of institutional quality do not impose a scale that hinders the visualization of the graphic.

a) Control of corruption




b) Regulatory quality



c) Rule of law

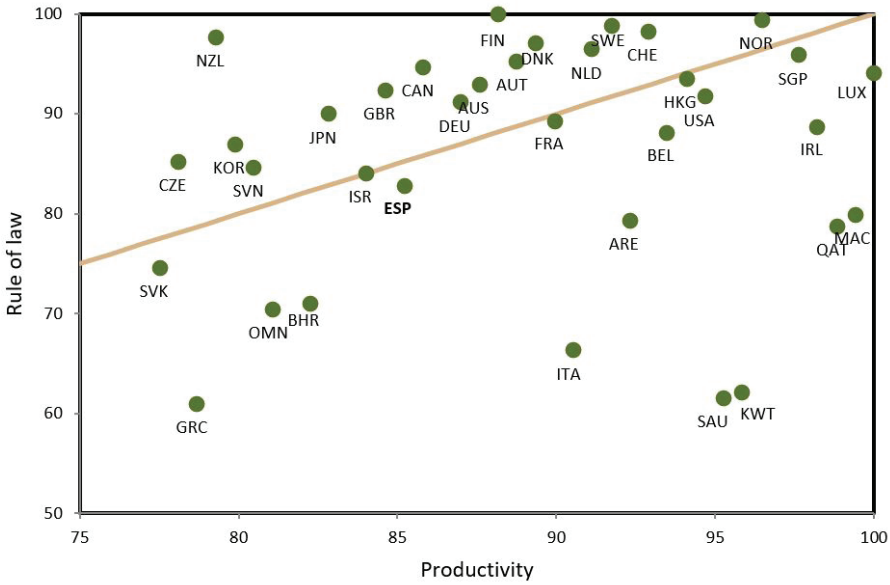



***Figure 4.*** Productivity and governance indicators: control of corruption, regulatory quality, and rule of law (2017) (percentiles)
**Note:** The line intersects points at which both variables are in the same percentile
**Source:** World Bank (2018, 2021) and the authors.

Thus, institutional quality constitutes one of the competitive strengths of these countries. The opposite is true of countries that are below the line, for which institutional quality is one of their competitive weaknesses.

Spain is in the 81st percentile on the combined indicator for institutional quality.[7] Meanwhile, it is in the 85th percentile for per capita GDP distribution in PPP (the measure of productivity used in this article). Consequently, institutional quality appears as one of the weaknesses of the Spanish economy, as it has lower than expected performance based on its productivity.

We can advance the quantitative assessment of the imbalance between the level of economic development in Spain and its institutional quality as follows. Keeping in mind that Spain is in the 81st percentile for the combined indicator on institutional quality, it is helpful to examine what productivity level corresponds to the 81st percentile in the distribution of productivity by country. This percentile corresponds to countries with productivity that is lower than in Spain by approximately 17%. This number means that if the other factors besides institutional quality that affect a country's average productivity (such as human, physical, and business capital) were situated at the same levels relative to those at which institutional quality is found, Spanish productivity would tend to decrease by approximately 17%. Fortunately, the rest of the country's productive factors have been able to advance relatively ahead of what institutional environment's performance.

7 Note that the percentile of the global indicator is not equal to the mean of the percentiles corresponding to each of the five specific indicators.

As we have stated, the indicator that shows the most weakness in Spain is control of corruption. Spain is in the 75th percentile in global distribution for this indicator. The distribution of productivity across the 157 countries considered reveals that the 75th percentile corresponds to a productivity that is 23% lower than that of the Spanish economy. Therefore, if all of the factors that affect productivity, such as human, physical, and public capital and the business structure, were to move in unison and occupy, in the case of the Spanish economy, an international position similar to that occupied by control of corruption (as perceived by the reports and surveys included in WGI), the productivity of the Spanish economy would tend to be 23% lower than it is currently. Consequently, and with the caution imposed by the difficulty of measuring the phenomena with which we are concerned, these comparative data are quite conclusive in pointing to corruption as an important hindrance of the productivity and economic wellbeing of the country. Other factors must make an extra effort to compensate for this negative situation, obtaining a lower return than could be achieved if this component of governance were to attain a level that is more consistent with Spain's economic development.

The other governance indicator in which Spain has the poorest results compared to the West European reference is regulatory quality. Spain is in the 80th percentile, which corresponds to a productivity that is 19% lower than that of the Spanish economy.

## Impact on productivity and per capita income

This section calibrates the aggregate economic impact that could be obtained through improved institutional quality. As indicated in section 1 of this article, a large body of scientific literature exists that, using a macroeconomic approach, attempts to measure the size of this type of impact. Making use of institutional quality indicators for a large number of countries, this literature econometrically estimates the average effect that institution quality has had on income levels, productivity, and economic growth in different countries, taking into account the remaining factors that also have relevant effects on these variables. Once we determine the coefficients that measure this estimated effect, we can then calculate the potential long-term effect that a modification of levels of institutional quality would have on a country's economy. In the first part of this section, we discuss the econometric techniques utilized and the results obtained by the specific scientific literature that have had the greatest academic impact, and in the second section, we use these results together with the information presented in the previous section to carry out the calculation regarding the Spanish economy.

### Estimates in the Scientific Literature

What is the size of the impact of institutional quality on the productivity of a country? Due to the complexity of the phenomenon, there is no exact or uniform answer to this question in the scientific literature. However, if we adhere to studies that use the most reliable methodology, it is possible to find a certain consensus regarding an interval of values.

In section 1, we reviewed a series of works that demonstrate the high correlation that exists between different aspects of institutional quality and a long series of variables that affect the productivity and wellbeing of countries. In light of the positive correlation between institutional quality and productivity, questions arise regarding the possibility

that there may be inverse or mutual causation or that third variables cause institutions and productivity to move simultaneously and in the same direction. The arguments according to which greater institutional quality favours the economic growth of a country were presented in section 1; however, there are also arguments that causation may exist in the opposite direction. Thus, for example, higher income tends to generate greater demand for transparent and efficient institutions among citizens and entrepreneurs, increases the human capital that is needed to construct these institutions, makes it possible to pay the higher costs entailed by higher institutional quality, and reduces political patronage (on this last point, see Bobonis et al. [2016]). Likewise, in times of rapid growth and transformation of a country, institutional rigidities tend to relax at heterogeneous paces to adapt to an environment of greater market freedom. This environment is a suitable breeding ground for corruption, which may explain the positive association between growth and corruption that is found in some cases and gave rise to the so-called Asian paradox (Rock and Bonnett 2004; Ugur and Dasgupta 2011).

For the subsequent calculations to make sense, it is important to use care with these possible interactions, and thus it is necessary to identify the specific causal effect between the institutional quality of countries and their productivity. Fortunately, economic analysis includes an econometric technique that makes it possible to isolate and quantify causal relationships as long as suitable data exists. The technique is known as estimation with instrumental variables, and it has been applied in a number of works to the study of the effects of institutional quality on levels of productivity and income in countries.[8] We must draw on these works to evaluate the possible economic impact of the deficit in institutional quality and control of corruption in Spain, and thus, we will pause briefly below to explain their results.

Econometric studies of this causal impact differ in terms of the dependent variable (which can be productivity or per capita income), the indicator used to measure institutional quality, the instrumental variables used to capture causal impacts, and the set of additional independent variables included in the estimates to control for other determinants of the dependent variable. Table 1 presents a selection of these works: Acemoglu, Johnson, and Robinson (2001) (AJR), Kaufmann and Kraay (2002) (KK), Rodrik, Subramanian, and Trebbi (2004) (RST), Alcalá and Ciccone (2004) (AC), and Acemoglu, Gallego, and Robinson (2014) (AGR). The works by AJR, RST, and AC are probably those that are most often cited in the specialized literature that capture the causal effect of institutions

8 The instrumental variables method consists of finding variables (instruments) that are not affected by the phenomenon studied (in our case, country productivity) but that do have an impact on this phenomenon and for which that impact is produced exclusively through the independent variable in which we are interested (in our case, institutional quality). If these conditions are met, the variations in the instruments give rise to variations in the variable of interest (institutional quality), which meanwhile impact the dependent variable (productivity). By studying these specific impacts whose direction of causality we know, given that they originate in exogenous variations of the instruments, we can measure the causal influence of the independent variable of interest on the dependent variable. Suppose, for instance, that we want to isolate the effect of smoking on health conditions. As health conditions may be affected by other factors rather than smoking and as smoking can be affected as well by health conditions (as depression or anxiety, for example), to isolate the effect of smoking on health we can use a variable which is related with smoking, but not with health such as the taxes on tobacco. In particular, we can use tobacco taxes as an instrument that predicts some of the changes in tobacco consumption, and use these latter predicted changes to estimate the causal effect of tobacco consumption on health.

through a methodology of instrumental variables.[9] Meanwhile, the estimates by AGR can be considered a revised version of those by AJR, responding to some critiques such as those of Glaeser et al. (2004), while the estimates by KK are notable because they were created by the two directors of the WGI project.[10]

Table 1
*Estimates of the Causal Impact of Governance Quality on the Economy*

| | **Governance indicator** | **Dependent variable** | **Coefficient in the more complete estimate** | **Additional controls** | **Instrumental variables** |
|---|---|---|---|---|---|
| Acemoglu, Johnson, and Robinson (2001) | Protection against risk of appropriation by the state | GDP per capita in PPP (in logarithm) | 0.98 (0.30) | Geography | HM |
| Kaufmann and Kraay (2002) | Rule of law, among others | GDP per capita in PPP (in logarithm) | 0.68 (0.05) | | HM imputed using Eurolan, Englan, DistEq |
| Rodrik, Subramanian, and Trebbi (2004) | Rule of law | GDP per capita in PPP (in logarithm) | 0.6 (0.15) | Openness to international trade, geography | HM, Eurolan, Englan, DistEq |
| Alcalá and Ciccone (2014) | Average of government effectiveness, rule of law, and control of corruption | GDP per employed worker in PPP (in logarithm) | 0.26 (0.07) | Openness to international trade, size of domestic market, geography | Eurolan, DistEq |
| Acemoglu, Gallego, and Robinson (2014) | Rule of law | GDP per capita in PPP (in logarithm) | 0.53 (0.19) | Education and geography | HM, HDD |

**Note:** The coefficients have been readjusted based on the units used for the indicators in this article to facilitate comparison. The figures in parentheses are the standard deviations; HM: historical mortality; Eurolan: percentage of the population whose native language is one of the five main European languages; Englan: percentage of the population whose native language is English; DistEq: distance between the country and the equator; HDD: historical demographic density.

The coefficients that appear in the fourth column of Table 1 have been readjusted according to the units used in this article for the governance indicators so that they are consistent with the data previously provided. Additionally, except for AJR (2002), the distribution of the independent variable is the same for all of the works, as they use the WGI as a source on governance data. Because AJR (2002) is an exception to this situation,

9 The main objective of the work by AC is not to estimate the economic impact of institutional quality but rather that of international openness. However, this work also estimates the causal impact of institutions, having the virtue that it adequately controls for the effects of geography, the scale of the economy, and international openness and that it has a broader sample base of developed countries than AJR and AGR. Note that the omission of the variables mentioned or inadequate instrumentation of international openness can lead to overestimating the impact of institutional quality. The over-estimation to which the omission of the control for external openness can lead is emphasized by Campos, Dimova, and Saleh (2010) in their meta-analysis of a long list of studies of the effects of corruption on growth.

10 The selection of works does not include that of Hall and Jones (1999), although it could be considered the pioneer in the use of instrumental variables to estimate the causal effect of institutions on the productivity of countries. The reason for not including the estimates by Hall and Jones (1999) is that their institutional quality indicator is a combination of governance indicators and the indicator of policies of economic openness to the outside created by Sachs and Warner (1995). For this reason, it is risky to suppose that their estimates specifically identify the impact of institutional quality.

comparisons with this article should be made with caution. All of the works cited offer various estimates corresponding to diverse specifications and samples. The coefficients reported in Table1 correspond to the most complete specifications and samples, ignoring those specifications that include additional controls that are not significant. In most cases, the complementary estimates show higher coefficients, and thus, using the more complete estimates shown in Table1 leads to a conservative calculation of the impacts.

To select one of the estimates as the main reference, we follow the criterion of using revised estimates from the work that has had the greatest academic impact in the economic analysis of the causal effect of institutions on the growth of countries. The work that has had the greatest academic impact in this area is that by AJR, and what could be considered the revised estimates of that work are those appearing in AGR. This choice has the added attractiveness of providing an estimated coefficient (0.53) situated at an intermediate point compared to the rest of the estimates and with a standard confidence interval that includes the estimates by the rest of the authors; specifically, the highest value (0.68) estimated by KK and the lowest value (0.26) estimated by AC fall within the confidence interval of the estimate by AGR.

**Calibrating the Impact of Improving Institutional Quality**

What would be a reasonable goal for a country's institutional quality? Our criterion is that countries should aspire to, at least, reach the average institutional quality of the countries that have a similar productivity level. Hence, we calculate below the increase in per capita income that is to be expected in the long term if governance quality in Spain were to rise to the level that corresponds to its productivity.

The Spanish productivity per employed person is in the 85$^{th}$ percentile of the distribution for the global set. Therefore, we consider as the goal for the Spanish governance indicator the level corresponding to that same 85$^{th}$ percentile in the global distribution of the governance indicator. That is, our calculation estimates what would be the increase in per capita income that Spain would experience in case its institutional quality, as measured by the combined indicator of the WGI for 2017, would rise to reach the same rank that this country occupies in the world distribution of productivity. In Figure 3, this means to raise the position of Spain in the figure up to the yellow line (which is drawn to show the points for which productivity and institutional quality are at an identical level). The WGI governance indicator corresponding to the 85$^{th}$ percentile has a value of 7.06, which is 0.28 points above the indicator's value for Spain[11]. Then, based on the discussion in the previous section, we consider the estimated relationship between productivity and governance quality that was obtained by AGR. This estimation is a semi-elasticity with a value of 0.53[12]. Therefore, the potential impact of changes in governance quality can be calculated as follows: percentage of increase in productivity = [exponent (0.53 * increase in governance quality) – 1] * 100, where the increase in governance quality is equal to

11 As it has already said, we have recalculated the scores for the WGI in a more intuitive scale of 0-10 instead of the original of -2.5 to 2.5.

12 This means that the estimated relationship between a country's productivity (or, similarly, its per capita income) and its governance quality is: ln(productivity) = 0.53 * governance quality. Therefore, we have ln(new productivity) – ln(initial productivity) = ln(new productivity / initial productivity) = 0.53 * increase in governance quality. Hence, (increase new productivity / initial productivity) = exponent (0.53 * increase in governance quality).

0.28. Consequently, we find a potential per capita income increase of 15.3% of improving governance in Spain to the level that corresponds to its position in the global distribution of productivity.[13]

This calculation, which we use as a central reference, can be complemented with those obtained using some of the alternative estimates of the effect of institutional quality on income and productivity presented in Table1. According to this type of exercise, and using the coefficient estimates obtained by AC and RST, it is found that the increase in institution quality up to the indicated references would increase per capita GDP by 7.6% and 21.0%, respectively.[14]

Certainly, both improvements in institutional quality and the effects of this improvement on the economic system would take time. The positive impact that improved institutional quality would have on the GDP would occur indirectly through mechanisms that would increase investment and efficiency in the allocation of resources, and with these, productivity and employment. Greater legal certainty, reduced corruption, elimination of administrative obstacles, improved regulation, greater competition, etc., would incentivize domestic and foreign investment, make entrepreneurship and innovation more profitable, and improve the allocation of public and private resources. The cited long-term increase in GDP by 15,3% could entail, over a 15-year period, an increase in average annual growth of the Spanish economy of approximately one percentage point.

Alcalá and Jiménez (2018) pointed out some lines of reform that could allow to achieve this result for the Spanish case. In particular, they recommended three sets of reforms: (i) strengthening the checks and balances of power, (ii) improving the independence, quality, and transparency of the public administration; and (iii) improving the effectiveness of elections as a selection and oversight mechanism of political elites. Within the first group, among other lines of action, the improvement of the independence and the resources of the judiciary, the strengthening of the parliamentary control of the executive (creating, for example, a parliamentary office for the evaluation of public policies), the safeguard of the impartiality and the capacity of independent authorities (such as the court of audit or information commissioners), and avoiding political interferences of the executive power in mass media, were all pointed out.

Within the group of measures to improve the independence, quality and transparency of public administration, a simplification of all regulations (particularly regulations of economic activities), the reinforcement of the independence of the regulatory and supervisory bodies and the professionalization of high public managers in public organizations, were the reforms suggested by these authors. Finally, in order to improve the effectiveness of elections as a selection and control mechanism of political elites, the ballot structure might be changed so that the voter can both change the order of the candidates presented by the party and cross out the ones he/she dislikes most.

13 This point estimate can be evaluated taking into account that the confidence intervals resulting from the standard deviation associated with the coefficient is 0.53.

14 These point estimates fall within the 90% confidence interval associated with the estimate obtained using the coefficient by AGR.

## Conclusions

The previous scientific literature had made clear that the quality of government institutions and control of corruption are fundamental keys to economic development. The economic costs of corruption go far beyond the amount of public funds misappropriated, as it weakens key elements of an economy's functioning. Corruption and poor institutional quality reduce levels of investment because they reduce the profitability of business projects and increase their uncertainty, diverting human and financial resources towards rent-seeking behaviors instead of dedicating them to productive activities; they also discourage entrepreneurship and innovation, instead orienting efforts towards the search for privileges.

The population should be aware that the transparency and accountability of governments, the independence and agility of the judiciary, or the quality of economic regulation, among other components of institutional quality, are not alien academic concepts but, rather, fundamental instruments to improve the economic and social welfare of the masses in the long run. However, how could we quantify, for any given country, the overall monetary cost of poor institutional quality?

This article compared perceived institutional quality in Spain with that of the rest of the world, measured the country's deficit of institutional quality that results from comparing its position in the world distribution of institutional quality with its position in the world distribution of country productivities, and calibrated the overall economic cost of this deficit of institutional quality (or, equivalently, the economic benefits that would result from overcoming this deficit). The method we introduced to carry out this measurement and calibration can serve as a useful blueprint for the analysis of other countries.

The quality of government institutions in Spain is within the top 20% of countries in the world. However, despite this position of privilege, we found that the quality of government institutions in Spain is below what would correspond to its level of economic development. The calibration of the impact of improved institutional quality on per capita income involves different scenarios and results. All of the calculations carried out by the authors suggest a notable positive impact. The income level of Spaniards would experience a significant boost in the long term with an increase in the country's quality of institutions and governance. Raising institutional quality in Spain to the level that would correspond to this country based on the productivity of its economy yields a potential long-term GDP increase of approximately 16% (7.6% under the most conservative estimates and 21% according to the most optimistic ones). Taking 15 years as a time horizon for this long-term impact, this would mean increasing the average annual economic growth of the Spanish economy by approximately one percentage point. However, it is important to recognize that comparing the institutional quality of countries and quantifying the economic impact of improved institutional quality is a difficult task that is subject to significant margins of error.

The challenge of improving the quality of government institutions is not trivial because it includes highly diverse aspects that go beyond control of corruption and address questions such as the agility of the judicial system, the vigor and independence of oversight bodies, regulatory quality, administrative efficiency, and the transparency of

the public sector. However, beyond the concrete figures and recommendations, the basic message is that, in addition to ethical and political reasons, improvement of the quality of governance must constitute a key piece of the long-term economic development strategy of any country, particularly that of mature economies such as Spain.

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