

Institutions and economic growth in Portugal: a quantitative exploration*

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Abstract. This paper presents a broad diagnostic of the level of institutional development in Portugal in the legal, corporate governance and financial systems. A comparative assessment suggests that Portuguese institutions are less developed than their European Union and East Asian counterparts, more developed than Greek institutions and on a level similar to that of Spanish institutions. We use data for a wide cross-section of countries since 1960 and correlate indicators of institutional development with the long-term average growth rate, identifying issues where reform is likely to significantly affect economic growth. We construct three new indices that measure the potential of institutional reform – the impact of reform on growth, the required reform effort and the efficiency of reform index – by taking into consideration the institutional “distance” between Portugal and the European Union. These indices measure, respectively, which reforms have the most payoff in terms of growth, which are “less costly” to undertake and which deliver the most growth per required effort. Our results strongly suggest that in a large number of issues, institutional reform may translate into substantially higher rates of economic growth. Of the ten most promising reforms, six are in the legal area, irrespective of which of the indices is considered. Whereas legal reform is promising at the aggregate and the microeconomic levels, in the financial sector aggregate indicators offer the wider scope for productive reform, while in the corporate governance area it is indices at the micro level that hold the most promise. These results support the view that a comprehensive reform effort is likely to deliver higher rates of growth in Portugal, allowing faster real convergence with the rest of the European Union.

Keywords: Economic growth – Portugal – Legal system – Corporate governance – Financial system

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1 Introduction

“We cannot see, feel, touch, or even measure institutions; they are constructs of the human mind.”

Douglass North (1990)

In the last couple of decades the importance of institutions for economic growth has received increasing attention by academics and policy-makers. Today, the cliché “institutions matter” is likely to be among the set of priors held by economists. In this paper we focus on three different areas of institutional development: the legal system, the governance of the firm and financial markets. The internal organization of firms, the access to financial resources and the legal framework within which firms and individuals operate all affect the growth rate of an economy. Our analysis examines a broad cross section of countries and wide array of institutional data to derive policy implications for institutional reform in Portugal. We characterize Portuguese institutional development in the legal, financial and firm governance areas and compare Portugal to Spain, Greece, its European Union partners and East Asian competitors. The assessment of relative institutional development in Portugal is then crossed with estimates of the impact of each institution on economic growth to compute the benefits of bringing Portuguese institutions up to par with those in the European Union. We calculate three new indices of the benefits of reform, the impact of reform on growth, the reform effort required to raise the quality of Portuguese institutions and the efficiency of reform, that is, the impact on growth per effort required. Finally, we identify the areas where institutional reforms are likely to have a substantial impact on Portuguese growth with relatively low effort.

2 What are institutions and what are they for?

Douglass North defines institutions as “the humanly devised constraints that (. . .) structure incentives in human exchange, whether political, social or economic” (North (1990, p. 3)). The idea of institutions as constraints that facilitate exchange is important. Coase (1960) had shown that, in a zero transaction cost world with costless bargaining and contracting, competitive markets would arrive at the solution that maximized aggregate income. In such a world institutions are redundant. However, when interactions are for the most part one-shot events, information is incomplete or asymmetric, or transactions occur over an extended period of time and involve many players, exchange and cooperation become more difficult.¹ In other words, transaction costs arise from problems of search and information, bargaining and contracting, or policing and enforcing of contracts. In this context, institutions do matter.

¹ See, for instance, North (1990, p. 12).

What do institutions do? What roles do they perform that affect exchange and growth? A short list of the functions that institutions perform is likely to include the following:

1. Creating and enforcing rules – When individualistic behavior does not lead to the most efficient joint outcomes institutions can facilitate more efficient outcomes by restricting the set of choices available to individuals. Examples include situations characterized by multiple equilibria, public goods, externalities or prisoner's dilemma type of incentives. Creating rules, determining if they are violated and making it costly to do so is an important role that institutions perform.

2. Aggregating information and preferences – The provision or consumption of goods and services with complex characteristics – including public goods and externalities – makes it hard for market mechanisms to deliver efficient outcomes. Private and social benefits may be poorly aligned and individuals may lack incentives to reveal their true preferences. In these cases institutions can be set up with the objective of aggregating information and delivering a choice. A national parliament or the general assembly of a firm are institutions that perform such a role.

3. Sharing risks and reducing uncertainty – Institutions can be valuable as risk-sharing mechanisms. Overall, institutions provide a structure to everyday transactions that reduces uncertainty and allows groups and individuals to enlarge the set of fruitful exchanges available. More specifically, some institutions are set in order to share risks between members of a group. Examples include social security and unemployment insurance systems.

4. Optimizing resource utilization – Institutions pool individual capabilities and resources to increase social output in ways that are beyond the possibilities of individuals acting alone.

5. Redistributing resources – Institutions may be created to change the distribution of resources away from the market outcome. In this role institutions reflect society's beliefs as to the merits of certain groups – e.g. retired people – or conditions – e.g. unemployed.

Institutions have both formal and informal features. In their formal incarnation, institutions are a set of explicit, detailed, coded rules applied within defined limits. On the other extreme, informal institutions are no more than an evolving set of social conventions and behavior that is widely followed in a given society.

It is important to distinguish organizations from institutions. While organizations have a clearly defined purpose that explicitly forwards the interests of their members, institutions have a broader scope as general facilitators. While a corporation is an organization, corporate law is an institution whose existence furthers the interests of corporations, governments and individuals.

3 Institutions and economic growth: firms, financial markets and the law

Why should institutions matter for economic growth? A first illustration may be provided by growth accounting, which views output as the result of the combination of inputs – say land, labor and capital. The cost involved in combining

these inputs in the most efficient way can be labeled transaction cost and added to the direct costs of the inputs. Institutions can affect growth as far as they affect transaction costs and thus the production possibilities frontier.²

A second possibility is to view institutions as encouraging specialization. North (1990) has highlighted how “non-specialization is a form of insurance when the costs and uncertainties of transactions are high. The greater the specialization and the number and variability of attributes, the more weight has to be put on reliable institutions (. . .)”. The importance of institutions becomes evident if one recalls how Adam Smith identified specialization of production as the key mechanism in economic development. By broadening the set of possible exchanges, institutions increase the effective size of the market and encourage specialization.

Several recent studies analyse the effect of institutions, *latu sensu*, on economic growth.³ Here we restrict ourselves to the role of three institutional areas: the legal system, the organization of firms and the financial system. The relationship between the law, the judiciary and economic growth has been the subject of political economy from early on. Adam Smith (1755, p. 322) highlighted that “a tolerable administration of justice,” in conjunction with peace and low taxes, could bring a state “to the highest degree of opulence.”⁴ In his studies on society and economics, Max Weber also examined the relation between the law, the judiciary and economic development. There are two broad reasons why the judicial system may affect economic performance. First, it enforces property rights, in particular keeps the government in check, curbing the temptation to abuse its own power. Second, the judiciary facilitates exchanges between private parties.⁵

In the neoclassical view of the firm, managers choose quantities of inputs and technologies so that the value of output is maximized. If the market is perfectly competitive and information freely available, management lacks any meaningful role. Coase (1937) first pointed that in a setting with no transaction costs there would be no reason for the existence of firms. All transactions would be undertaken in the market. However, even if “(. . .) production could be carried out in a completely decentralized way by means of contracts between individuals, the fact that it costs something to enter into these transactions means that firms will emerge (. . .) whenever their costs [are] less than the costs of carrying out the transactions

² See North (1990, p.28). Wallis and North (1986) measure the importance of transaction costs by summing the value of banking, insurance and commerce activities as well as the income of lawyers, accountants, managers, etc. They found that about 45 percent of total U.S. output was devoted to these activities, up from 25 percent a century earlier. In a certain sense, the rise in the importance of services reflects the efforts to reduce transaction costs.

³ For examples see Aron (2000), Rodrik (2000) and Tavares and Wacziarg (2001). Cabrac and Pinheiro (2002) provide a first analysis of the relation between characteristics of the legal system and firm performance in Portugal.

⁴ In the tradition of Adam Smith, North (1981) highlights the emergence of a system of enforceable property rights as the important institutional prerequisite for economic growth.

⁵ The argument that in contracts “he that performeth first has no assurance the other will perform after because the bonds of words are too weak to bridle men’s ambitions, avarice, anger, and other passions without the fear of some coercive power” was first made in the 17th century, as quoted in Messick (1999).

through the market.” (Coase (1988, p. 7).⁶ The relative costs of internal and market transactions determine what the firms will buy and sell in the market and what they will produce in-house. It also limits the size of the firm, since costs increase as more and more internal transactions have to be organized. In sum, firms arise and grow up to the point where it is less costly to take transactions out of the market place and bring them into a controlled environment, for reasons of monitoring, enforcing, etc.⁷ A series of different and complex contracts can be substituted for one simple contract stipulating that the employee works for a certain remuneration, under the directions of a manager and within certain limits.⁸

Capital is a key factor of production and its ready availability to firms and enterprising individuals depends on the workings of the financial system. Gerschenkron (1962) highlighted the relationship between finance and development in contrasting the experiences of Britain and other European countries.⁹ The Schumpeterian view of the process of development as one of “creative destruction” implies economies where the amassing of resources for new ventures as well as the prompt liquidation of unsustainable firms work hand in hand.¹⁰ What functions do financial systems perform? They encourage savings and direct their allocation to the best productive uses. The financial sector can increase saving rates as well as liquidity, in a process known as financial deepening. Financial intermediaries such as banks and securities markets pool resources that would not otherwise be available for firms that want to reach a larger and more efficient scale of operation. These intermediaries also channel funds to projects with a longer horizon by providing liquidity services. A second role is that of acquiring information and evaluating projects, a process too costly to be undertaken at the individual level, at which financial intermediaries benefit from economies of scale and expertise. A third role is to overcome the idiosyncratic risk involved in single-project investment, even when the amount of financial resources available to the investor is small. Risk is priced, diversified and transacted so that projects with high return and high-risk can also be financed. Finally, financial intermediaries monitor firm managers, overcoming another source of high cost of information acquisition.

⁶ The firm is, in such a view, an environment within which the price mechanism takes the back seat, even if its internal transactions need to remain reasonably linked to market prices through what the firm buys and sells. The entrepreneur becomes the substitute of the price system in the management of firm resources.

⁷ There are other views of the firm. One sees it as a unit that transforms uncertainty: the employee trades his autonomy for a fixed or stable income while the employer directs all resources, obtains an income which is uncertain and becomes the residual claimant. This is the view of Knight (1933). The system under which “the confident and venturesome assume the risk and insure the doubtful and timid by guaranteeing to the latter a specified income (. . .)”. A third view is that firms are the result of the need to organize an ever-increasing specialization and division of labor. But the main issue, as Coase (1988) has pointed out, is one of relative costs, that is, whether and when is firm organization more efficient than the price system.

⁸ More generally, a firm may imply control over another person’s property/capital as well as labor.

⁹ Whereas Great Britain relied on a market-based system, Germany, the latecomer, relied on a bank-based system.

¹⁰ See Schumpeter (1934).

An important issue is the comparative advantage of banks versus stock markets. At low levels of financial development, the type of financial system affects the type of external finance. In countries where the legal system predicts a developed securities market, there are more firms growing at rates that require long-term sustained external finance. Securities markets may be better suited for long-term financing, whereas the banking sector is closely related to the availability of short-term financing. The type of system has implications for which firms and which projects obtain financing.¹¹

4 Institutions and growth: a quantitative exploration

The most widely recognized framework to analyze economic growth is the neoclassical growth model, first developed in Solow (1956). Neoclassical growth theory attempts to explain a country's rate of economic growth as a function of several factors, most notably the current level of capital per worker: since the marginal product of an additional unit of capital decreases with the level of capital per worker, all else equal a higher level of capital per capita implies slower growth. As countries accumulate more capital (relative to labor) the marginal product of the extra capital decreases and growth tapers off.¹² Countries that differ in a fundamental way such as the production function or the savings rate also differ as to the point at which growth tapers off, i.e. the steady-state level of income per capita. But as the "distance" of a country to its own steady-state decreases, so does its rate of economic growth. This is the so-called convergence effect. The initial level of income per capita can thus be used as a proxy to empirically assess the convergence effect. A summary examination of the influence of an economic or social variable on economic growth thus needs to control for each country's initial level of income per capita.

In contrast with neoclassical theory of growth, the theory of endogenous growth highlights the importance of technological progress and the different rates at which countries may grow in steady-state, shifting the focus to the root causes of technological progress.¹³ The preeminent candidate to explain technological progress is the scale of the market: larger scale makes innovation more profitable and accelerates the rate of technological progress. For the purposes of the current paper it may make sense to interpret institutions as one of the factors that alters the effective scale of the market. If the legal system delivers clearer and more efficient laws, as financial markets grow deeper and more sophisticated and the firm governance framework fosters the efficient use of capital and labor, the number of transactions and the effective scale of the market increase.

In this paper, we choose to conduct our empirical exercise in the context of the neoclassical growth theory, for two reasons. First, this is the simpler and more frequently used context for empirical studies, allowing a clearer evaluation of our results against the benchmark of previous results in the literature. Second, there is

¹¹ As argued in Demirgüç-Kunt and Maksimovic (1996).

¹² Barro and Sala-i-Martin (1995) provide an extensive survey of the basic model and extensions.

¹³ Aghion and Howitt (1998) review the literature on endogenous growth.

a gaping lack of empirical support for the role of scale in economic growth so that the empirical relevance of endogenous growth theory is not yet clear.

We use data on institutions to investigate which institutions matter and how much they matter for economic growth. Since institutions tend to change slowly and we care for long-term growth, we use average yearly growth in the 1960–1995 period as our dependent variable to be explained.¹⁴ As right hand-side variables we use the level of country GDP per capita in 1960 in all specifications, taking into consideration the convergence effect. We then use each institutional indicator in succession as right-hand side variable.

The purpose of our empirical study is to explore possible correlations between institutional indicators and long-term growth. We do not attempt to find a causal relation between the variables, instead we bring to the fore possible candidates for further investigation. The empirical study is thus broad and exhaustive, covering a wide array of indicators, rather than investigating the exact link between one institutional characteristic and growth. Our aim is not to determine causality. Given the broad scope of the current study as well as the variety of institutions under scrutiny, we leave the test of specific causality relationships to future studies. Instead our aim is to suggest patterns of correlation between indices of institutional development and average long-term growth.

Our empirical specification is thus:

$$\text{Growth GDP 1960–1995} \equiv \beta_0 + \beta_1 \cdot \text{GDP 1960} + \beta_2 \cdot \text{Institution}$$

Several of the institutional measures used in this paper were available only for later sub-periods, sometimes only for the 1990–1995 period. For reasons of lack of data availability and because institutions tend to change slowly over time, we use the indicators for the 1990's as proxies for a country's level of institutional development in the whole 1960–1990 period. We can interpret our results as assessing the long-term relationship between institutions (which evolve slowly over time) and economic growth, which is volatile in the short-run but more precisely measured in the long-run, over the span of several decades. Our exercise identifies the institutions that affect growth significantly, in statistical or in economic terms. The results are grouped by area – legal, corporate governance and financial. We present the results for Ordinary Least Squares estimates but correct standard errors for heteroskedastic-consistency.

The breadth and scope of the paper also determined our choice not to present robustness results and not adding additional control variables in addition to the initial income per capita level. The small sample sizes – due to limited availability of data on institutions – and the difficulty in measuring some of the institutional indices support our choice of a simple empirical specification that captures broad patterns of correlation rather than causation. In fact, for the samples involved, the convergence effect is the most significant single factor that robustly affects economic growth.

We will interpret statistical significance of the coefficient on the institutional index as suggestive of association between institutional development and economic

¹⁴ Other definitions of the dependent variable were used and the qualitative results do not change appreciably.

growth. If, in a given policy area – legal, corporate governance or financial systems – we find that regression coefficients tend to come out as statistically and economically significant, we will conclude that reform in this area is likely to deliver important growth benefits.

Tables 1 through 3 present results for the legal system, from aggregate performance of the legal system to specific characteristics of tenant eviction and bounced check collection procedures. Table 1 shows that all aggregate legal performance indicators are associated with growth in the predicted way. Since higher levels denote better institutions the positive regression coefficients suggest that improving legal institutions is associated with higher growth. All the indicators with the exception of judicial efficiency have statistically significant coefficients, and even the former is almost significant. Better rule of law, lower corruption, lower risk of expropriation and of contract repudiation, and better citizen access to justice all foster growth. Respect for contractual agreements – low expropriation and repudiation risks – seem to have the strongest impact on growth, followed by a predictable legal framework characterized by a strong rule of law and low corruption.

Tables 2 and 3 present the relationship between the procedural characteristics of check collection and tenant eviction and economic growth. The most noticeable regularity is the significance of virtually all procedural characteristics of check collection, the exception being defendant protection and the written versus oral legal bias of the law. In contrast, for the case of tenant eviction only the statutory regulation of evidence and the dispute resolution indices matter for economic growth. These results suggest that our exercise is not spurious as check collection – a procedure closely associated with the efficiency of economic transactions – is most directly correlated with long-term growth. All the specific indices grow in the direction of less efficiency and efficacy so that the negative sign suggests that lower efficiency of legal procedures leads to lower average growth over time. Overall, legal indices are strongly related to economic growth at the aggregate and the disaggregated levels, suggesting legal institutions are key to long-term economic development.

As to corporate governance indices, the results are presented in Tables 4 and 5. Table 4 relates to indicators of the power relations between firm stakeholders and Table 5 to the opening and closing of firms. Indicators in Table 4 are generally not statistically significant as determinants of long-term growth: only the percentage of share ownership required to call a general meeting, the average size of the three largest shareholders and the quality of accounting standards seem to matter. Nevertheless, the coefficients associated with these indicators suggest that they do matter in a way that is compatible with the most common prior: higher minimum shares to call a general meeting, more concentrated ownership and worse accounting standards, all suggestive of less transparency and small investor participation, tend to be associated with lower growth.

Table 5, in contrast, shows all indicators of barriers to opening a firm associated with lower growth. A larger set of required procedures, higher time, dollar or total cost all display negative and significant coefficients. As an example, the addition of one more procedure as a necessary requirement to open a firm is associated with a 0.10 percent decrease in average yearly growth. In other words, the apparently

Table 1. Performance of the legal system. Dependent variable: growth of real per capita GDP 1960–1995

	Rule of law	Corruption	Risk of expropriation	Contract repudiation	Judicial efficiency index	Citizen's access to justice
	(1)	(2)	(3)	(4)	(5)	(6)
Initial income	-0.0006** (-6.40)	-0.0004** (-3.97)	-0.0006** (-8.47)	-0.0005*** (-7.97)	-0.0001** (-6.49)	-0.0002** (-2.60)
Institutional indicator	0.58** (6.52)	0.48** (3.55)	1.03** (9.40)	0.89** (9.10)	0.16 (1.49)	0.21** (3.14)
Number of observations	48	48	48	48	53	70
R2	0.56	0.34	0.72	0.72	0.21	0.13

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedasticity-consistent standard errors. ** and * denote significance at the 5 % or at the 10 % level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

Table 2. Procedures for check collection. Dependent variable: growth of real per capita GDP 1960–1995

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Index defendant protection	Index mandatory time limits	Log of duration	Index professionals- laymen	Index written-oral	Index legal justification	Index statutory regulation of evidence	Index control of superior review	Dispute resolution index
Initial income	-0.0001** (-4.35)	-0.0001** (-5.35)	-0.0001** (-4.44)	-0.0001** (-5.37)	-0.0001** (-4.91)	-0.0001** (-5.07)	-0.0001** (-6.17)	-0.0001** (-4.22)	-0.0001** (-5.54)
Institutional indicator	-1.07 (-0.98)	-1.41** (-2.57)	-0.38* (-1.73)	-1.29** (-2.13)	-1.15** (-1.18)	-0.93** (-1.70)	-2.12** 0 (-2.44)	-1.04* (-1.79)	-0.27** (-2.02)
Number of observations	80	80	80	80	80	80	80	80	80
R2	0.08	0.12	0.09	0.12	0.08	0.10	0.11	0.09	0.11

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedastically-consistent standard errors. ** and * denote significance at the 5% at the 10% level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

Table 3. Procedures for tenant eviction. Dependent variable: growth of real per capita GDP 1960–1995

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Index defendant protection	Index mandatory time limits	Log of duration	Index professionals- laymen	Index written-oral	Index legal justification	Index statutory regulation of evidence	Index control of superior review	Dispute resolution index
Initial income	-0.0001** (-3.57)	-0.0001** (-4.76)	-0.0001** (-4.08)	-0.0001** (-4.71)	-0.0001** (-4.60)	-0.0001** (-4.76)	-0.0001** (-6.21)	-0.0001** (-4.22)	-0.0001** (-5.28)
Institutional indicator	-1.15 (-1.22)	-1.02* (-1.66)	0.18 (0.77)	-0.32 (-0.63)	0.24 (0.24)	-0.10 (-0.16)	-2.11** (-2.45)	-0.62 (-1.15)	-0.23* (-1.83)
Number of observations	80	80	80	80	80	80	80	80	80
R2	0.08	0.09	0.07	0.07	0.06	0.06	0.11	0.07	0.08

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedastically-consistent standard errors. ** and * denote significance at the 5 % or at the 10 % level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

Table 4. Firm governance indicators. Dependent variable: growth of real per capita GDP 1960–1995

	One share one vote	Percentage general meeting	Anti director rights	Creditor rights	Mean 3 largest shareholders	Accounting standards	Market capitalization 10 largest
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial Income	-0.0001* (-1.93)	-0.0002** (-2.82)	-0.0002** (-2.49)	-0.0001** (-2.03)	-0.0003** (-3.41)	-0.0003** (-3.31)	-0.0002** (-2.25)
Institutional Indicator	0.57 (0.94)	-6.18** (-2.29)	0.10 (0.68)	0.17 (1.12)	-4.57** (-2.82)	0.05** (2.84)	-0.02 (-0.08)
Number of observations	48	47	48	47	44	40	46
R2	0.11	0.18	0.09	0.11	0.27	0.31	0.10

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedastically-consistent standard errors. ** and * denote significance at the 5 % or at the 10 % level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

Table 5. Opening and closing a firm. Dependent variable: growth of real per capita GDP 1960–1995

	Number of procedures	Time	Cost	Cost and time	Percentage Bankruptcies
	(1)	(2)	(3)	(4)	(5)
Initial Income	−0.0001 (−1.15)	−0.0001 (−1.21)	0.0000 (−0.26)	−0.0001 (−1.36)	−0.0002* (−1.78)
Institutional indicator	−0.10** (−1.97)	−0.02** (−2.04)	−0.01** (−6.13)	−0.61** (−1.95)	0.66** (0.06)
Number of observations	68	68	68	67	33
R2	0.06	0.07	0.03	0.09	0.12

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedastically-consistent standard errors. ** and * denote significance at the 5 % or at the 10 % level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

small difference between Portugal and the European Union average of three required procedures is likely to imply an economically important impact on growth. On the other hand, the number of bankruptcies is totally unrelated with long-term growth in this sample. It seems that it is the ease with which a firm is opened that most determines the quality of the existing pool of firms and the rate of economic growth.

Tables 6 through 8 analyze the relation between financial indicators and growth. Specifically, we examine the role of financial market depth and bank versus stock market bias, indicators of bank regulation and of firm financial health. We find that all indicators related with the depth of the financial system associate positively with long-term growth. In contrast, only one of the indicators related to the structure of the financial system – bank-based versus stock market based – is significantly related to economic growth. This is in line with previous results in the literature, showing that it is the development of the financial system rather than its structure that matters for economic development. Other indicators of the general performance of the financial system relate significantly with country growth and the sign of the estimated coefficient is also as expected: higher net interest margins are negatively correlated to growth while more private credit, higher value traded in the stock market and more non-bank credit all correlate positively.

Table 7 shows that the nature of bank supervision and regulation do not seem to be important determinants of an economy's growth after the convergence effect is taken into account. The percentage of banks rated internationally and the existence of an explicit deposit insurance scheme are the only indicators that are significantly associated with growth. In contrast, bank concentration, government ownership, the intensity and independence of supervision and the nature of funding for the deposit insurance scheme are not closely associated with long-term growth.

Table 6. Financial system indicators. Dependent variable: growth of real per capita GDP 1960–1995

	Finance- activity	Finance- size	Finance- aggregate	Finance- dummy	Structure- activity	Structure- size	Structure- aggregate	Structure- dummy	Net interest margin	Private credit	Total value traded	Non-bank credit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Initial income	-0.0003** (-3.39)	-0.0002** (-2.68)	-0.0003** (-3.13)	-0.0002** (-2.89)	-0.0002** (-2.14)	-0.0001 (-1.11)	-0.0001 (-1.50)	-0.0001 (-1.26)	-0.0001** (-1.93)	-0.0002** (-3.35)	-0.0002** (-2.35)	-0.003** (-2.63)
Institutional indicator	0.36** (4.24)	1.11** (2.91)	0.95** (3.68)	1.71** (3.95)	0.35** (2.47)	0.02 (0.06)	0.31 (1.15)	0.35 (0.68)	-33.03** (-2.72)	2.57** (3.36)	3.17* (1.75)	4.96** (2.74)
Number of observations	41	41	41	41	41	41	41	41	54	60	50	42
R2	0.43	0.36	0.42	0.39	0.20	0.04	0.09	0.05	0.18	0.22	0.16	0.19

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedastically-consistent standard errors. ** and * denote significance at the 5 % or at the 10 % level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

Table 7. Bank regulation. Dependent variable: growth of real per capita GDP 1960–1995

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	5 Bank concentration ratio	Percentage government owned	Percentage foreign owned	Percentage of top 10 rated internationally	Bank supervisors per institution	Onsite examination per bank last 5 years	Supervisors employed by bank industry	Explicit deposit insurance
Initial income	-0.0004 (-0.58)	-0.0001** (-5.32)	-0.0001** (-5.06)	-0.0001** (-6.79)	-0.0001** (-4.18)	-0.0001** (-5.55)	-0.0001** (-4.12)	-0.00004** (-2.01)
Institutional indicator	-0.01 (-1.01)	-0.01 (-1.23)	-0.005 (-0.25)	0.02** (4.20)	0.10 (1.30)	-0.02 (-0.39)	-0.09 (-0.30)	0.87 (2.75)
Number of observations	65	65	59	59	63	61	70	121
R2	0.02	0.09	0.08	0.33	0.10	0.08	0.07	0.06

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedastically-consistent standard errors. ** and * denote significance at the 5 % or at the 10 % level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

Table 8. Firm finance indicators. Dependent variable: growth of real per capita GDP 1960–1995

	(1)	(2)	(3)	(4)	(5)
	Operating income variability	Total debt to market value of equity	Long term debt to market value of equity	Short term debt to market value of equity	Net working capital to total assets
Initial income	-0.0002** (-4.07)	-0.0002** (-2.92)	-0.0003** (-3.87)	-0.0002** (-2.54)	-0.0002** (-3.31)
Institutional indicator	-0.85 (-1.43)	1.2402** (3.20)	3.21 (1.41)	1.6702** (3.56)	0.45 (0.13)
Number of observations	43	44	44	44	44
R2	0.26	0.29	0.23	0.30	0.19

Note: The description of each variable and its source are explained in the Data Appendix. t-statistics are presented in the even rows using heteroskedastically-consistent standard errors. ** and * denote significance at the 5 % or at the 10 % level, respectively. The first row of the Table designates the institutional indicator used as independent variable.

As to disaggregated financial indicators at the level of the firm, we find that total debt and short-term debt as a share of equity correlate positively with economic growth. None of the other factors correlate significantly, even if higher income variability and the availability of long-term debt come close and the coefficients associated display the expected signs. The gist in terms of finance is that financial sophistication and depth matter while financial structure – stock markets versus banks - and firm level indicators do not.

A summary of our empirical results runs as follows: institutions matter for growth and their likely impact is quantitatively important. As far as the legal system is concerned, both the general performance indicators and very specific procedural characteristics are important. Aggregate indicators of corporate governance are not strongly related to growth but faster and cheaper procedures to open a business firm do. Finally, as far as the financial system is concerned it is key that there is wide access to capital but whether that is achieved through the banking system or the stock market is not as relevant. Most of the disaggregated financial indicators are not important, the exception being the availability of total and of short-term debt.

5 Strategies for institutional reform in Portugal

We now turn to the identification of specific issues that institutional reform in Portugal may address. The objective is to evaluate the benefits of reform for each issue making use of the empirical results in the previous section and taking into account the stage of institutional development in Portugal relative to other European Union countries. The methodology we adopt is simple and, we hope, suggestive. For each institutional indicator – whether in the legal, firm governance or financial markets areas – we construct three summary indicators, specifically the Impact on Growth, the Required Reform Effort and the Efficiency of the Reform Effort indices. The Impact on Growth index is computed as the regression coefficient on the specific institutional indicator i times the actual difference between the level of that institutional index in Portugal and in the EU. Thus:

Impact on Growth i =

[Institution i , EU Average – Institution i , Portugal] * Regression Coefficient i

This index measures the yearly increase in per capita growth – estimated for the period 1960–1995 – that would result from a specific institutional reform elevating Portugal to the European Union level. Evidently, a higher Impact on Growth index indicates a more promising reform area.¹⁵

A shortcoming of the Impact on Growth index is that it abstracts completely from the “cost of reform”, i.e., it ignores whether bringing Portugal to the EU level is more or less hard for each specific issue considered. Of course that is a very hard issue to assess but we find it useful to compute a second summary index, the Required Reform Effort index. It tries to assess the “cost of reform” by using the

¹⁵ We have computed the level of institutional development so that a higher level for the index denotes better institutions.

relative position of Portugal and the EU average for each institution divided by the Portuguese level. It is based on the values of each institutional index i for Portugal and for the European Union average:¹⁶

$$\text{Required Reform Effort } i = \frac{[\text{Institution } i, \text{ EU Average} - \text{Institution } i, \text{ Portugal}]}{[\text{Institution } i, \text{ Portugal}]}$$

Thus, this index measures the “amount” of institutional change that Portugal needs to undertake to achieve the EU average level, relative to the current Portuguese index. The Required Reform Effort is a measure of the “cost of reform” computed as the percentage change required with a higher value indicating a higher required effort to reform the specific institution.

In contrast with the Impact on Growth index, the Required Reform Effort index totally ignores the impact on growth of the specific reform. Our third and last index is the Efficiency of Reform index. It combines the previous two indices by dividing the Impact on Growth by the Required Reform Effort and thus assessing the increase in yearly growth per unit of required reform effort. It is computed for the same change of Portuguese institutional development towards the EU average level:

$$\text{Efficiency of Reform } i = \frac{\text{Impact on Growth } i}{\text{Required Reform Effort } i}$$

A higher index on Efficiency of Reform denotes a higher percent increase in economic growth per unit of reform effort, simplistically a higher “bang for the buck”. The value of 1 denotes an increase of 1 percent in yearly economic growth for each reform effort of 100 percent.

Tables 9, 10 and 11 present an evaluation of the reform potential for different legal, firm governance and financial reform indicators. The first two columns present the value of the index for Portugal and for the European Union average, the third column the difference between the previous two and the fourth the regression coefficient from Tables 1 through 8 in the previous section. The Impact on Growth, the Required Reform Effort and the Efficiency of Reform indices are presented in the three last columns. The name of the indices for which the regression coefficient is statistically different is noted with an asterisk and the whole row of data noted in bold. As can be easily noted, different reform issues correspond to widely different impacts on yearly growth, different required efforts and, most importantly, very different efficiency of reform.

Figures 1, 2 and 3 present the ten “most promising” issues for reform according to each of the three summary indices: Impact on Growth, Required Reform Effort and Efficiency of Reform. In other words, we present in succession the ten issues for which raising the Portuguese level to European Union standards raises economic

¹⁶ It is defined for the cases where Portuguese institutional development lags behind European levels and computed always so that a higher index represents a higher level of institutional development.

Table 9. Law and reform. Impact on growth, required reform effort and efficiency of reform

	(1) Index	(2) European Union	(3) (2)–(1) Difference	(4) Coefficient	(5) (4)*(3) Impact on growth	(6) (3)/(1) Required reform effort	(7) (5)/(6) Efficiency of reform
Rule of law**	8.68	8.97	0.29	0.58	0.17	0.03	5.03
Corruption**	7.38	8.65	1.27	0.48	0.61	0.17	3.54
Risk of expropriation**	8.90	9.42	0.52	1.03	0.53	0.06	9.17
Contract repudiation**	8.57	9.06	0.49	0.89	0.43	0.06	7.63
Judicial efficiency index	5.50	8.56	3.06	0.16	0.49	0.56	0.88
Citizen's access to justice**	7.50	7.88	0.38	0.21	0.08	0.05	1.58
Index defendant protection	0.20	0.47	0.27	–1.07	–0.29	1.36	–0.21
Index mandatory time limits**	0.80	0.27	–0.53	–1.41	0.75	0.66	1.13
Log of duration**	5.80	5.30	–0.50	–0.38	0.19	0.09	2.20
Index professionals–laymen**	1.00	0.64	–0.36	–1.29	0.46	0.36	1.29
Index written–oral	0.75	0.78	0.03	–1.15	–0.04	0.04	–0.86
Index legal justification**	1.00	0.69	–0.31	–1.93	0.60	0.31	1.93
Index statutory regulation of evidence**	0.38	0.25	–0.13	–2.12	0.27	0.33	0.81
Index control of superior review**	1.00	0.72	–0.28	–1.04	0.30	0.28	1.04
Dispute resolution index**	5.13	3.89	–1.24	–0.27	0.33	0.24	1.39
Index defendant protection	0.50	0.62	0.12	–1.15	–0.14	0.24	–0.58
Index mandatory time limits	0.80	0.29	–0.51	–1.02	0.52	0.64	0.82
Log of duration	6.04	5.21	–0.83	0.18	–0.15	0.14	–1.09
Index professionals–laymen	0.67	0.57	–0.10	–0.32	0.03	0.15	0.21
Index written–oral	0.75	0.76	0.01	0.24	0.00	0.01	0.18
Index legal justification	1.00	0.67	–0.33	–0.10	0.03	0.33	0.10
Index statutory regu- lation of evidence**	0.50	0.27	–0.23	–2.11	0.48	0.46	1.06
Index control of superior review	0.67	0.62	–0.05	–0.62	0.03	0.07	0.42
Dispute resolution index**	4.58	3.72	–0.87	–0.23	0.20	0.19	1.05

The name of the indices for which the regression coefficient is statistically different is noted with an asterisk and the whole row of data noted in bold. For data sources see the Data Appendix.

Table 10. Corporate governance and reform. Impact on growth, required reform effort and efficiency of reform

	(1) Index Portugal	(2) European Union	(3) (2)–(1) Difference	(4) Coefficient	(5) (4)*(3) Impact on growth	(6) (3)/(1) Required reform effort	(7) (5)/(6) Efficiency of reform
One share one vote	0.00	0.07	0.07	0.57	0.04	1.00	0.04
Percentage general meeting**	0.05	0.10	0.05	–6.18	–0.29	0.93	–0.31
Anti director rights	3.00	2.50	–0.50	0.10	–0.05	0.17	–0.30
Creditor rights	1.00	1.93	0.93	0.17	0.16	0.93	0.17
Mean 3 largest shareholders**	0.52	0.45	–0.07	–4.57	0.32	0.14	2.38
Accounting standards**	36.00	63.62	27.62	0.05	1.38	0.77	1.80
Market capitalization 10 largest**	0.03	0.29	0.26	–0.02	–0.01	8.51	0.00
Number of procedures**	12.00	9.00	–3.00	–0.10	0.30	0.25	1.20
Time**	76.00	36.57	–39.43	–0.02	0.79	0.52	1.52
Cost**	0.18	0.16	–0.02	–0.01	0.00	0.10	0.00
Cost and time**	0.49	0.31	–0.18	–0.61	0.11	0.37	0.30
Percentage bankruptcies	0.00	0.02	0.02	0.66	0.01	1.00	0.01

The name of the indices for which the regression coefficient is statistically different is noted with an asterisk and the whole row of data noted in bold. For data sources see the Data Appendix.

growth the most, the ten issues for which the Required Reform Effort is the lowest and the ten for which the Efficiency of Reform is highest. Note that there are four different reasons why an institutional reform strategy may not be recommended for Portugal in this exercise, as far as the Efficiency of Reform is considered. First, if Portugal is at a level of institutional development in a specific category that is above the average level for the EU – that is, Portugal has better institutions than the EU in this area – we should not consider it an area for potential reform. Second, any institutional indicator that was not associated with economic growth in a statistically significant way in the previous section is not recommended for reform. Third, when there is a statistically significant impact of reform on growth, the impact may be too small to make the reform effort promising. Finally, even when a given institution is significantly related to growth – statistically and economically – if Portugal is very far from the EU average level, this reform area may not be suitable for reform if it requires too much of a “reforming effort”.

Table 11. Finance and reform. Impact on growth, required reform effort and efficiency of reform

	(1) Index Portugal	(2) European Union	(3) (2)–(1) Difference	(4) Coefficient growth	(5) (4)*(3) Impact on effort	(6) (3)/(1) Required reform effort	(7) (5)/(6) Efficiency
Finance-activity**	4.23	5.48	1.25	0.36	0.45	0.29	1.52
Finance-size**	4.31	4.41	0.10	1.11	0.11	0.02	4.78
Finance-aggregate**	0.12	0.43	0.31	0.95	0.30	2.59	0.11
Finance-dummy**	1.00	0.69	-0.31	1.71	-0.53	0.31	-1.71
Structure-activity**	-4.26	-2.65	1.61	0.35	0.56	-0.38	-1.49
Structure-size	-2.66	-1.30	1.36	0.02	0.03	-0.51	-0.05
Structure-aggregate	-1.49	-0.13	1.36	0.31	0.42	-0.91	-0.46
Structure-dummy	0.00	0.46	0.46	0.35	0.16	1.00	0.16
Net interest margin**	0.04	0.03	-0.01	-33.03	0.38	0.29	1.32
Private credit**	0.63	0.71	0.08	2.57	0.20	0.12	1.62
Total value traded**	0.02	0.10	0.08	3.17	0.25	3.96	0.06
Operating income variability	0.87	0.69	-0.85	0.15	0.21	0.74	
Total debt to market value of equity**	0.59	0.39	-0.21	1.24	-0.25	0.35	-0.73
Long term debt to market value of equity	0.22	0.16	-0.06	3.21	-0.19	0.27	-0.71
Short term debt to market value of equity**	0.37	0.23	-0.15	1.67	-0.24	0.39	-0.62
Net working capital to total assets**	0.05	0.17	0.12	0.45	0.05	2.37	0.02
5 bank concentration ratio	81.70	59.19	-22.51	0.45	-10.13	0.28	-36.77
Percentage assets government owned	20.80	10.81	-9.99	-0.01	0.10	0.48	0.21
Percentage foreign owned	11.70	16.29	4.59	-0.01	-0.05	0.39	-0.12
Percentage of top 10 rated internationally**	100.00	66.15	-33.85	-0.01	0.17	0.34	0.50
Bank supervisors per institution	2.40	0.78	-1.62	0.02	-0.03	0.67	-0.05
Onsite examination per bank last 5 years	2.50	2.43	-0.07	0.10	-0.01	0.03	-0.25
Supervisors employed by bank industry	2.00	2.07	0.07	-0.02	0.00	0.04	-0.04
Explicit deposit insurance**	1.00	1.00	0.00	0.87	0.00	0.00	0.00

The name of the indices for which the regression coefficient is statistically different is noted with an asterisk and the whole row of data noted in bold. For data sources see the Data Appendix.

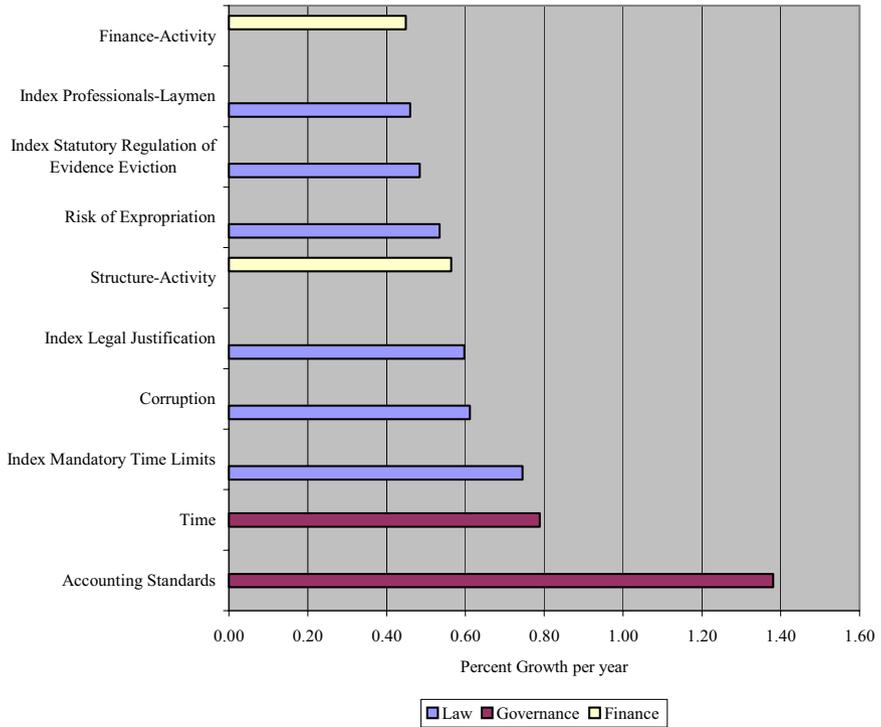


Fig. 1. Growth impact of reform

In Figure 1 we find that the two most growth enhancing reform issues are in the corporate governance area. However, six out of the ten most promising reforms in terms of induced growth increase stem from issues related to the legal system. Again, as far as the required reform effort is concerned, five out of the six reform items requiring the least effort from Portuguese institutions are in the legal area. The indices computing the growth impact and the required reform effort show that two issues each of the finance and corporate governance areas are within the ten most promising reforms. Interestingly, the finance and corporate governance reform items that have the most growth impact and the least required effort are aggregate and disaggregated level measures respectively. In contrast, in the legal area both aggregate and disaggregated institutional indicators are within the ten most promising.

Figure 3 presents the efficiency of the required reform index. The three most efficient reform indices relate to legal issues, namely the risk of expropriation, the risk of contract repudiation and the rule of law indices. All are aggregate measures of the efficiency of the legal system. Three other legal indices are among the ten most efficient reforms to undertake: decreasing the level of corruption to European Union levels is the fifth most efficient; improving the index of legal justification and the logarithm of duration of the check collection procedure are the seventh and eighth most efficient. Increasing the depth of the financial system and decreasing

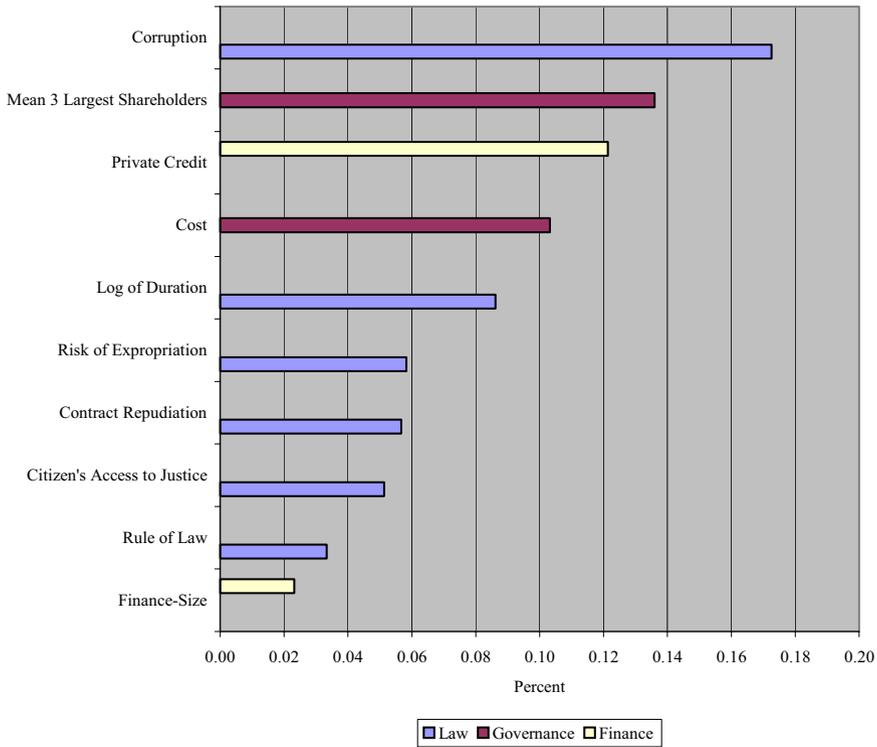


Fig. 2. Required reform effort

the ownership concentration are also efficient reforms. A gauge of the actual impact of reform is revealing: the five most efficient reforms deliver from 0.3 to 0.9 percent extra growth per year for each 10 percent increase in institutional progress towards European Union levels. For a relatively small effort in reform, Portugal can obtain important gains in terms of growth.¹⁷ These results give us reasons to believe that institutional reform is an important instrument to foster Portuguese economic growth.

Looking at the results more finely, one concludes that the legal system is the most promising area for reform, both in its general workings – measured by aggregate indices – or in its specific procedures. Reform in the corporate governance and financial areas is also important but while overall change in the workings of the financial system is most promising, in firm governance it is very specific issues that come out as the most promising.

¹⁷ Of course the simultaneous improvement in several institutional indices is likely to deliver an increase in growth of less than the sum of the impact of each improvement.

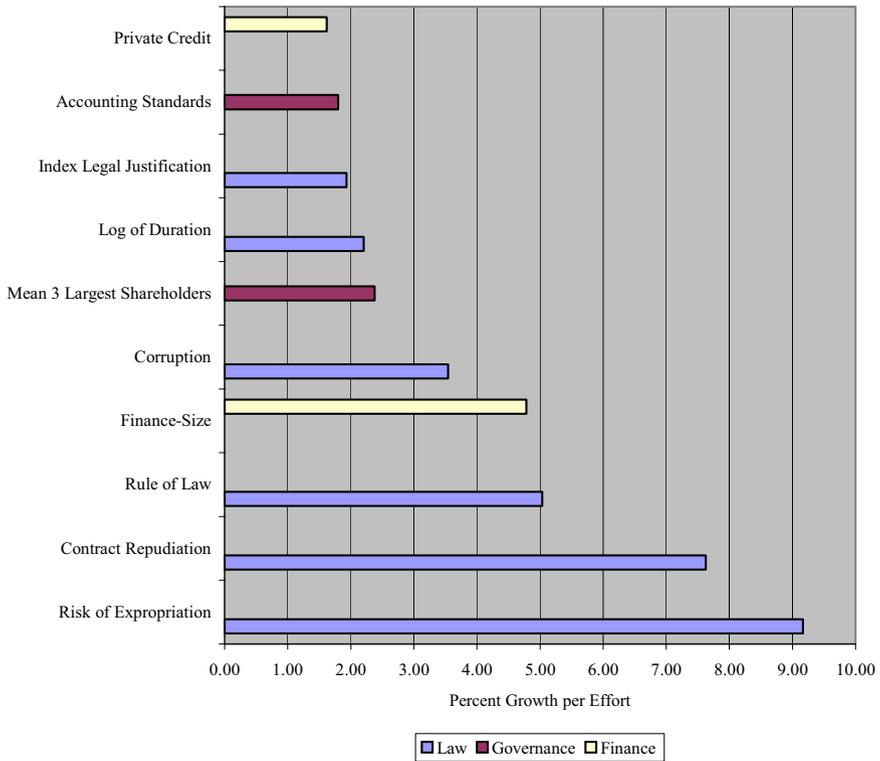


Fig. 3. Efficiency of reform

6 Conclusions

This paper evaluates Portuguese institutional development in light of the experience of Spain, Greece, the European Union and the high-growth East Asian economies. Three areas are scrutinized: the legal, corporate governance and financial systems. We assess the benefits of reforming Portuguese institutions by elevating them to European Union levels along three dimensions: the impact on growth, the required reform effort and the efficiency of the reform effort. Our analysis shows that Portugal is generally below European Union levels of institutional development and even more distant from East Asian levels in all areas – legal, governance or financial. While on some issues Portuguese institutions are more developed than their Spanish counterparts, there are as much instances where the reverse is true. As compared to Greece, Portugal tends to benefit from more developed institutions.

As to institutional reform, we find that the legal area is the most promising for reform since most institutional indicators are strongly associated with growth and require relatively little effort. This is true for very aggregate as well as disaggregated indices of legal development. More than half of the ten institutional indices that have the strongest impact on growth and that require the least reform effort are legal indices. However, indices related to corporate governance and the financial system

also appear among the most effective and least expensive reforms to undertake. Our conclusion is that reform in all three areas is needed and is likely to be beneficial. The high growth impact per reform effort required suggests that institutional reform may be sufficient to bring Portuguese economic growth to substantially higher levels.

Our results are exploratory and need to be taken with some caution for two main reasons. First, it is difficult to compare institutions – particularly their “quality” – across countries. In this matter our evaluation is just as good as the quality of the institutional indicators themselves. Second, we base our estimates of the impact of institutional quality on economic growth in bivariate estimates where only the indicator itself and initial income per capita are right-hand side regressors. For this reason, our results have to be interpreted as suggestive of a correlation between the institutional indicator and economic growth. The main contribution of the paper is thus to suggest broad areas of reform – legal, corporate governance or financial markets – that are more likely to induce higher growth, rather than estimating the precise impact of any specific indicator.

Portugal has recently experienced a slowdown in economic growth that hinders the convergence process vis-à-vis richer countries in the European Union. The fact that institutions change very infrequently and very little strongly suggests that the low level of development of Portuguese institutions severely constrains the growth rate of the economy. A comprehensive and sustained reform effort may be the missing necessary condition for Portuguese growth to resume at higher rates. And decisively reduce the income gap with other European Union countries.

Data Appendix – Sources, variables and descriptions

“Law and finance”

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W. (1998)

Rule of Law – Assessment of the law and order tradition in the country produced by the country-risk rating agency *International Country Risk (ICR)*. Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for less tradition of law and order. The scale was modified from its original range of 0 to 6.

Corruption – ICR’s assessment of corruption in government. Lower scores indicate “that high government officials are likely to demand special payments” and “illegal payments are generally accepted throughout lower levels of government” in the form of “bribes connected with import and export licences, exchange controls, tax assessment, policy protection, or loans.” Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher levels of corruption. The scale was modified from its original range of 0 to 6.

Risk of expropriation – ICR’s assessment of the risk of “outright confiscation” or “forced nationalization”. Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher risks.

Contract repudiation – ICR’s assessment of the “risk of a modification in a contract taking the form of a repudiation, postponement, or scaling down” due to “budget cutbacks, indigenisation pressure, a change in government, or a change in government economic and social priorities.” Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher risks.

Efficiency of the judicial system – Assessment of the “efficiency and integrity of the legal environment as it affects business, particularly foreign firms” produced by the country risk rating agency *International Country Risk (ICR)*. It may be “taken to represent investors’ assessment of conditions in the country in

question.” Average between 1980 and 1983. Scale from 0 to 10, with lower scores representing lower efficiency levels.

One share one vote – Equals one if the Company Law or Commercial Code of the country requires that ordinary shares carry one vote per share, and zero otherwise. Equivalently, this variable equals one when the law prohibits the existence of both multiple-voting and non-voting ordinary shares and does not allow firms to set a maximum number of votes per shareholder irrespective of the number of shares she owns, and zero otherwise.

Proxy by mail – Equals one if the Company Law or Commercial Code allows shareholders to mail their proxy vote to the firm, and zero otherwise.

Shares not blocked before meeting – Equals one if the Company Law or Commercial Code does not allow firms to require that shareholders deposit their shares prior to a General Shareholders Meeting thus preventing them from selling those shares for a number of days, and zero otherwise.

Cumulative voting or proportional representation – Equals one if the Company Law or Commercial Code allows shareholders to cast all of their votes for one candidate standing for election to the board of directors (cumulative voting) or if the Company Law or Commercial Code allows a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board, and zero otherwise.

Oppressed minorities mechanism – Equals one if the Company Law or Commercial Code grants minority shareholders either a judicial venue to challenge the decisions of management or of the assembly or the right to step out of the company by requiring the company to purchase their shares when they object to certain fundamental changes, such as mergers, assets dispositions and changes in the articles of incorporation. The variable equals zero otherwise. Minority shareholders are defined as those shareholders who own 10 percent of share capital or less.

Preemptive rights to new issues – Equals one when the Company Law or Commercial Code grants shareholders the first opportunity to buy new issues of stock and this right can only be waived by a shareholders’ vote, and zero otherwise.

Percentage general meeting – It is the minimum percentage of ownership of share capital that entitles a shareholder to call for an Extraordinary Shareholders’ Meeting. It ranges from one to 33 percent.

Mandatory dividend – Equals the percentage of net income that the Company Law or Commercial Code requires firms to distribute as dividends among ordinary stockholders. It takes a value of zero for countries without such restriction.

Anti director rights – An index aggregating the shareholder rights which we labelled as “anti-director rights.” The index is formed by adding 1 when: (1) the country allows shareholders to mail their proxy vote to the firm; (2) shareholders are not required to deposit their shares prior to the General Shareholders’ Meeting; (3) cumulative voting or proportional representation of minorities in the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders’ Meeting is less than or equal to 10 percent (the sample median); or (6) shareholders have pre-emptive rights that can only be waived by a shareholders’ vote. The index ranges from 0 to 6.

Restrictions when going into reorganization – Equals one if the reorganization procedure imposes restrictions, such as creditors’ consent, to file for reorganization. It equals zero if there are no such restrictions. Bankruptcy and

No automatic stay on secured assets – Equals one if the reorganization procedure does not impose an automatic stay on the assets of the firm upon filing the reorganization petition. Automatic stay prevents secured creditors to gain possession of their security. It equals zero if such restriction does exist in the law.

Secured creditors first – Equals one if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. Equals zero if non-secured creditors, such as the Government and workers, are given absolute priority.

Management does not stay – Equals one when an official appointed by the court, or by the creditors, is responsible for the operation of the business during reorganization. Equivalently, this variable equals one if the debtor does not keep the administration of its property pending the resolution of the reorganization process, and zero otherwise.

Legal reserve – It is the minimum percentage of total share capital mandated by Corporate Law to avoid the dissolution of an existing firm. It takes a value of zero for countries without such restriction.

Creditor rights – An index aggregating different creditor rights. The index is formed by adding 1 when: (1) the country imposes restrictions, such as creditors' consent or minimum dividends to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm; and (4) the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4.

Mean 3 largest shareholders – The average percentage of common shares owned by the three largest shareholders in the ten largest non-financial, privately owned domestic firms in a given country. A firm is considered privately owned if the State is not a known shareholder in it.

Accounting standards – Index created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items. These items fall into 7 categories (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items). A minimum of 3 companies in each country was studied. The companies represent a cross-section of various industry groups where industrial companies numbered 70 percent while financial companies represented the remaining 30 percent.

Market capitalization 10 largest – Capitalization of the ten largest non-financial, privately owned domestic firms in a given country. A firm is considered privately owned if the State is not a known shareholder in it.

“Legal structure and judicial efficiency: the lex mundi project”

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (2001)

Enforceability of contracts – Assessment of the “efficiency and integrity of the legal environment as it affects business, particularly foreign firms” produced by the country risk rating agency International Country Risk (ICR). It may be “taken to represent investors' assessment of conditions in the country in question.” Average between 1980 and 1983. Scale from 0 to 10, with lower scores representing lower efficiency levels.

Citizen's access to justice – Assessment of the extent to which citizens are “equal under the law, do they have access to an independent, non-discriminatory judiciary, and are they respected by the security forces”. Scale from 0 to 10. The higher the rating, the greater the degree of equality under the law.

Index defendant protection – Measures the protection granted by the procedural law to the tenant and his/her family, by reducing the disparity in means and legal representation between landlord and tenant. The index ranges from 0 to 1, where higher values mean a higher level of defendant protection, while 0 means a lower level. For the Eviction case the index is formed by the normalized sum of the following variables : (i) mandatory legal aid by law or by court or administrative order, (ii) attorney fees are fixed or limited by statute, court or administrative regulation, (iii) judge has the independent legal obligation to investigate facts, (iv) tenant's economic situation is considered at judgment, and (v) tenant's economic situation considered at enforcement. For the Check case the index is formed by the normalized sum of the following variables: (i) mandatory legal aid by law or by court or administrative order, (ii) attorney fees are fixed or limited by statute, court or administrative regulation, (iii) judge has the independent legal obligation to investigate facts, (iv) attachment of defendant's property only after judgment, (v) transfer of defendant's property only through public auction, and (vi) mandatory exclusion of defendant's essential survival assets.

Index mandatory time limits – The index measures the presence of mandatory time limits in the procedure. The index is calculated as the average of the following variables: (i) term for admission, (ii) term to present evidence, (iii) term to present defence, (iv) term for judgment, (v) term for compliance, (vi) term for notification of judgment. The index ranges from 0 to 1, where higher values mean more mandatory deadlines. Available for two legal cases: tenant eviction and collection of a bounced check.

Administrative procedure – The variable equals one if there is a generally available procedure for eviction or check collection before an administrative officer, which may be used as a substitute to the judicial procedure, and which does not imply any judicial involvement (such as issuance of warrants) or the participation of a housing or debt-collection tribunal. The variable equals zero otherwise.

Index professionals-laymen – The index measures whether the resolution of the case provided would rely mostly in the intervention of professional judges and attorneys, as opposed to the intervention of other types of adjudicators and lay people. The index is formed by the normalized sum of the following variables: (i) general jurisdiction court, (ii) professional vs. non-professional judge, and (iii) legal representation is mandatory. The index ranges from 0 to 1, where higher values mean a higher intervention of professionals. Available for two legal cases: tenant eviction and collection of a bounced check.

Index written-oral – The index measures the written or oral nature of the actions involved in the procedure, from the filing of the complaint, until the actual enforcement. The index is calculated as the number of stages carried out mostly in a written form over the total number of applicable stages, and it ranges from 0 to 1, where higher values mean higher prevalence of written elements. Available for two legal cases: tenant eviction and collection of a bounced check.

Index legal justification – The index measures the level of legal justification required in the process. The index is formed by the normalized sum of the following variables : (i) complaint must be legally justified, (ii) judgment must be legally justified, and (iii) judgment must be on law (not on equity). The index ranges from 0 to 1, where higher values mean a higher use of legal language or justification. Available for two legal cases: tenant eviction and collection of a bounced check.

Index statutory regulation of evidence – The index measures the level of statutory control or intervention of the administration, admissibility, evaluation and recording of evidence. The index is formed by the normalized sum of the following variables : (i) judge can not introduce evidence, (ii) judge can not reject irrelevant evidence, (iii) out-of-court statements are inadmissible, (iv) mandatory pre-qualification of questions, (v) oral interrogation only by judge, (VI) only original documents and certified copies are admissible, (vii) authenticity and weight of evidence defined by law, and (viii) mandatory recording of evidence. The index ranges from 0 to 1, where higher values mean a higher statutory control or intervention. Available for two legal cases: tenant eviction and collection of a bounced check.

Index control of superior review – The index measures the level of control or intervention of the appellate court's review of the first-instance judgment. The index is formed by the normalized sum of the following variables : (i) enforcement of judgment is automatically suspended until resolution of appeal, (ii) comprehensive review in appeal, and (iii) interlocutory appeals are allowed. The index ranges from 0 to 1, where higher values mean a higher control or intervention. Available for two legal cases: tenant eviction and collection of a bounced check.

Dispute resolution index – An independent procedural action is defined as a step of the procedure, mandated by law or court regulation, that demands interaction between the parties or between them and the judge or court officer (e.g., filing a motion, attending a hearing, mailing a letter, or seizing some goods). We also count as an independent procedural action every judicial or administrative writ or resolution (e.g., issuing judgment or entering a writ of execution) which is legally required to advance the proceedings until the enforcement of judgment. Actions are always assumed to be simultaneous if possible, so procedural events that may be fulfilled in the same day and place are only counted as one action. To form the index, we: (1) add the minimum number of independent procedural actions required to complete all the stages of the process (from filing of lawsuit to enforcement of judgment); and (2) normalize this number to fall between zero and one using the minimum and the maximum number of independent procedural actions across the countries in the sample. The index takes a value of zero for the country with the minimum number of independent procedural actions, and a value of one for the country with the maximum number of independent procedural actions. Available for two legal cases: tenant eviction and collection of a bounced check.

Duration – The variable measures the total average duration in calendar days of the procedure under the factual and procedural assumptions provided. It results from the sum of: (i) duration until completion of service of process, (ii) duration of trial, and (iii) duration of enforcement. Available for two legal cases: tenant eviction and collection of a bounced check.

*“The regulation of entry”**Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (2000)*

Number of procedures – The number of different procedures that a start-up has to comply with in order to obtain a legal status, i.e. to start operating as a legal entity.

Time – The time it takes to obtain legal status to operate a firm, in business days. A week has five business days and a month has twenty-two.

Cost – The cost of obtaining legal status to operate a firm as a share of per capita GDP in 1999. It includes all identifiable official expenses (fees, costs of procedures and forms, photocopies, fiscal stamps, legal and notary charges, etc). The company is assumed to have a start-up capital of ten times per capita GDP in 1999.

Cost and time – The cost of obtaining legal status to operate a firm as a share of per capita GDP in 1999. It includes all identifiable official expenses (fees, costs of procedures and forms, photocopies, fiscal stamps, legal and notary charges, etc) as well as the monetised value of the entrepreneur’s time. The time of the entrepreneur is valued as the product of Time and per capita GDP in 1999 expressed in per business day terms. The company is assumed to have a start-up capital of ten times the GDP per capita level in 1999.

*“Bankruptcy around the world: explanations of its relative use”**Klapper, L. (2001)*

Percentage bankruptcies – Total number of bankruptcies as a percentage of total number of firms.

*“New firm formation and industry growth: does having a market- or bank-based system matter?”**Beck, T., Levine, R. (2001)*

Finance-activity – Logarithm of (Total value traded as share of GDP and claims on private sector by financial institutions as share of GDP).

Finance-size – Logarithm of (Market capitalization and claims on private sector by financial institutions as share of GDP)

Finance-aggregate – First principal component of Finance-Activity and Finance-Size.

Finance-dummy – Dummy variable that takes the value 0 if total value traded as share of GDP and claims on private sector by financial intermediaries as share of GDP are less than the respective sample mean, 1 otherwise.

Structure-activity – Logarithm of (Total value traded divided by claims on private sector by commercial banks).

Structure-size – Logarithm of (Market capitalization divided by claims on private sector by commercial bank).

Structure-aggregate – First principal components of Structure-Activity and Structure-Size.

Structure-dummy – Dummy variable that takes the value 1 if Structure-Aggregate is above the median, 0 otherwise.

*“Banking systems around the globe: Do regulation and ownership affect performance and stability?”**Barth, J., Caprio, G., Levine, R. (2001b)*

Net interest margin – average net income divided by total assets over the 1990–1995 period.

Private credit – claims on the private sector by deposit money banks and other financial institutions as a share of GDP. Average value over the 1980–1995 period.

Total value traded – equals the value of domestic equities traded on domestic exchanges divided by GDP. Average over the 1980–1995 period.

Non-bank credit – nonbank financial institution claims on the private nonfinancial sector as a share of GDP. Average value over the 1980–1995 period.

“Corporate risk around the world”

Claessens, S., Djankov, S., Nenova, T. (2001)

Operating income variability – Cash flow risk; operating income variability.

Total debt to market value of equity – Financial leverage, total debt to equity.

Long term debt to market value of equity – Financial leverage; long-term debt to equity.

Short term debt to market value of equity – Financial leverage; short-term debt to equity.

Net working capital to total assets – Short-term financial needs measured as net working capital divided by total assets. Average for 1995–1996.

“The regulation and supervision of banks around the world – A new database”

Barth, J., Caprio, G., Levine, R. (2001a)

Five bank concentration ratio – Share of largest 5 banks in total banking industry.

Percentage assets government owned – Government owned banks.

Percentage foreign owned – Foreign bank ownership.

Percentage of top 10 rated internationally – Percent of 10 biggest banks rated by international rating agencies.

Bank supervisors per institution – Supervisors per bank.

Onsite examination per bank last 5 years – Onsite examination frequency.

Supervisors employed by bank industry – Likelihood supervisor moves into banking.

Explicit deposit insurance – Takes value 1 if there is an explicit deposit insurance scheme.

“The quality of government”

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W. (1999)

Legal origin – Identifies the legal origin of the company law or commercial code of each country. Equal 1 of the origin is English common law, two if the origin is the French commercial code, three if the origin is the German commercial code, four is the origin is Scandinavian civil law, and five if the origin is Socialist civil law.

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