

A Cross-Country Analysis of Public Sector Interventions' Efficiency

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Abstract

In this study, our aim is to measure public sector efficiency and to evaluate the efficiency of public sector economic interventions. We use the rule of law & bureaucratic quality, allocation, economic stability, economic growth and income distribution as outputs; public expenditure and regulation as inputs. In the study, we compute public sector efficiency scores by using a non-parametric, relative efficiency measurement technique, Data Envelopment Analysis (DEA), for 51 counties between 1995 and 2000. The study finds that overall public sector efficiency increases from 1995 to 2000 and there is a positive relationship between the efficiency of public sector and the level of economic development. Furthermore, we also find that a negative relationship between public sector intervention and the efficiency scores. Finally, it is found that the regulation tool is wasted in comparison with the expenditure tool.

Keywords: *public sector interventions, efficiency, Data Envelopment Analysis (DEA)*

JEL Classification: C14, H50, O11

Introduction

Historically, evaluations related to the public sector economic interventions may vary. After the “Great Depression”, the public sector economic interventions were considered necessary for the solution of the problems experienced in the markets; while after the 1980’s, many governments are attempting to move away from “state” or public production to “market” alternatives. There is much academic debate over the attraction of private market organization and the recent

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antipathy to public sector intervention. While some economists such as Friedman (1962) attributed the cause of economic instabilities and problems encountered to the government's untimely and unnecessary economic interventions, some economists like Galbraith (1958) believe that the solution of economic problems encountered is based on a more active role in economy for the state.¹

Debate on the role of the state in economy and what will be the probable economic results of this role still continues. With regard to public expenditures and tax revenues, the role of the state have been directed towards the impacts of the resources that the state has drawn from the economy and used up on economic growth (for example, Marshden, 1983; Ram, 1983; Landau, 1983, 1986; Wolf, 1988; Grier & Tullock, 1989; Engen Skinner, 1992; Fisher, 1993; Barro, 1997). On the other hand, some studies emphasize the relatively less visible regulatory and guiding aspect of public sector economic interventions (for example, North, 1997; Knack & Keefer, 1995; Barro, 1996, 1997; Edwards, 1992; Harrison, 1996; Ballassa, 1985; Alesina et al., 1996; Rauch, 1995; Mauro, 1995; Shleifer & Vishny, 1993; Delong & Shleifer, 1993; Gwartney et al., 1996). In these studies, which generally focus on the institutional aspect of the public sector, it is stated that economic performance of countries are highly affected by variables, such as property rights, rule of law, trade openness, the appropriateness of the environment for investment, tax policies, economic and political stability, bureaucratic quality, and level of corruption.

The only fact that can be expressed with respect to the public sector economic interventions is that it is neither a completely negative nor a positive phenomenon. A perspective supporting this statement was stated in the 1997 Development Report of the World Bank. According to this report, rather than public sector size, it is the efficiency and effectiveness that are more important. The institutional capacity of each country depending on its level of development is different from each other. Consequently, the active role assumed by the public sector of a country may not create a problem if the public sector's institutional capacity in this country is high. However, if the public sector of a country having low institutional capacity tries to assume an active role, this might cause the waste of resources and serious economic problems. This point of view draws attention primarily to the effectiveness and efficiency of the results in the role and activities of public sector.

¹ In fact the roots of the discussions on this issue goes back to very old times and discussions on this issue have continued since the time of Adam Smith up till the present. For example, while Michale Boskin (1999) and Martin Feldstein (1991) have defined a more limited role for the public sector, Joseph Stiglitz (2003) has defined a more active and interventionist role for the public sector.

The main purpose of our study is to analyze the efficiency of the public sector economic interventions. Like other organizations, the state has got objectives to be reached and intervention tools – sources – which can be used to realize these objectives. In this study, rule of law and bureaucratic quality, allocation of public goods, economic stability, economic growth and reasonable income distribution are used as public sector's objectives. As the intervention tools that it may use to reach these objectives, public expenditures and regulations will be taken into consideration.² In addition to this primary purpose, this study aims to make an evaluation of the interventions of the public sector with respect to economic development and regional differences. In the empirical part of the study, the aim is to carry out a comparative statistical analysis with 51 countries for the years 1995 and 2000 by using the Data Envelopment Analysis (DEA). By means of such an approach it is also aimed to observe the changes in results over a two-year period.

With this study, our contributions are as follows; the study provides to take in to account the regulation tool in considering public sector activities and their results. It is provided that the efficiency of public sector interventions by using an input-output approach. In this context, we also expect to observe in the changes of efficiency scores related to the level of development, regional effects and changes in time.

In the first part of the study, theoretical background and literature review are presented. In the second part, subsequent to brief information on the methodology, the inputs-outputs, the basic data and sample will be introduced. Finally, the findings will be summarized and the evaluation of the empirical results will take place.

1. The Objectives and Tools of the Public Sector Economic Interventions

Although what should be the proper roles the public sector in economy have underwent significant changes in time (Tanzi, 1997), it can be said that there is a general consensus on the necessity and importance of public sector activities in some fields. Of these fields, the most important one is no doubt the establishment of the legal structure or rule of law. This activity, which necessitates relatively very little expense,³ is related to areas such as the enforcement of property

² The results obtained with this approach can also be interpreted for the technical efficiency of public sector.

³ According to a measurement based on the year 1992 for USA, the ratio of the expenses made to operate the law system to the total public expenditures is less than 5% (Stiglitz, 2000).

rights, contract enforcement, the protection of workers and consumers, and has a very important function in ensuring the market system functions. Apart from the establishment of legal structure, Musgrave defines as the public sector's functions, allocation, stability and income distribution (Musgrave & Musgrave, 1989, pp. 6 – 14). A fourth element can be added to this classification of Musgrave by considering the economic growth inherent in the definition of economic stability separately.⁴ Accordingly, as in the study of Afonso et al. (2005), these fields of activity can be taken as the basic reference points in the evaluation of the public sector activities.

Pareto optimality used for the evaluation of an organization's economic efficiency produces the policy propositions that justify the public sector interventions in inefficient markets. For this reason, it is possible to define the aim of the public sector economic interventions as improving the efficiency consequences of market economy and maximizing the social welfare. These interventions can be made in many different ways and by utilizing various intervention tools. Barr (1993, pp. 78 – 80) classified these tools as regulation, finance, production and income transfer. The regulation tool represents the public sector's legal and administrative guiding role in economy. While the other three necessitate the use of tax and expenditure sources in accordance with the public sector's priorities and objectives. For this reason, it is possible to group these three intervention tools under the general title of the expenditure interventions, and to sort the intervention tools into two parts: "expenditure type interventions" and "regulation type interventions".⁵

Historically, role of the state and its effects have generally been defined by taxation and expenditure indicators. However, this approach entails problems as regards a sufficient comprehension of all the dimensions of the public sector. This problem derives from taking into consideration orthodox tools consisted of expenditures/taxes as a representative of the interventions of public sector and neglecting the non-orthodox tools (Tanzi, 1995). However, this kind of an approach causes the negligence of the regulation aspect that is an important dimension of public sector interventions. Thus, it has been realized that in recent decades, especially in developing countries, the public sector has had much more important impacts on economic variables by means of its regulatory policies (Tanzi, 1997).

⁴ Briefly, economic stability is the provision of full employment and price stability. An economy with insufficient recruitment should grow economically in order to eliminate this instability. Hence, economic growth can be regarded as a prerequisite to ensure economic stability, and it can be said that economic growth should be regarded as a separate target.

⁵ Tanzi (1995) entitles this notion as "quasi-fiscal activities and regulations".

Subsequent to these explanations, an international evaluation of the relative efficiency of the public sector can be carried out by taking into consideration the input-output indicators. Regardless of the type of the state – social welfare or minimal state – such an approach would give information about the efficiency of the state organizations and interventions. With this study, our aim is to determine the efficient and inefficient countries and to calculate the inefficiencies and waste in the use of economic resources and regulations.

It is possible to encounter partly similar studies carried out using DEA in the literature. However, these studies have different characteristics in terms of the variables, countries and the time period used in the analysis. Some of these studies examine the analysis of countries' macroeconomic performances (MEP). OECD (1987), in analyzing the countries MEP, emphasizes the use of four indicators: GDP growth rate, unemployment rate, inflation rate, and surplus or deficits on the current account of the balance of payments. These indicators are referred to as "magic diamond" in the literature. In studies measuring MEP, it is observed that the aim is generally to use these indicators to establish the "synthetic indicators" of macro economic performance. One of these studies is a study carried out by Lovell, Pastor and Turner (1995) on the measurement of MEP of 19 countries. In this study, the countries are evaluated in terms of macro economic indicators taking into consideration the indicators of GNP, inflation rate, unemployment rate and foreign trade balance. As a result, they produced the Global Efficiency Measure (GEM). Later on carbon and nitrogen emissions are added to the performance indicators to seek the answer to what extent economic policies support their environment. The most significant finding of the study is that the relative efficiencies of 14 European countries in the sample group are affected negatively when environmental performance criteria are added. Other studies on the measurement of countries' MEP are as follows: Färe et al. (1994) produced the Malmquist Productivity Index of 17 OECD countries between 1979 – 1988, Lovell (1995) evaluates the performance of 10 Asian countries between the years 1970 – 1988, and Lovell & Pastor (1995) measure the performance of 16 Ibero-American countries. Additionally, when evaluating macro economic performance, Melyn & Moesen (1991), Moesen & Cherchye (1998), and Cherchye (2001) used these four indicators but they implemented by imposing different weights to these indicators.

In Afonso et al. (2005), which is a relatively different study from the studies in literature, the Public Sector Performance (PSP) and the Public Sector Efficiency (PSE) are calculated by using seven aggregated indicators. The first four of the seven indicators used in the study are the "opportunity indicators" comprised of the administration, education, health and public infrastructure quality.

The remaining three indicators reflect the public sector's Musgravian tasks comprised of allocation, stability and distribution. In the study where the PSE is measured, these performance indicators are taken as outputs and the total public expenditures as inputs, and the public sector efficiency is measured by means of the Free Disposable Hull (FDH) method, which is a non-parametric production frontier approach. In the study significant differences are found in countries' efficiency scores, and it is concluded that significant potential improvements can be done in most countries. In the study of Afonso et al. (2005), it is also stated that there can be a close relationship between public expenditures and tax revenues, regulation policies. So, in this study they ignored tax and regulation policies and used public expenditure as an input. Actually, considering our previous explanations, in a study on the measurement of the efficiency of the public sector, taking into consideration only public expenditures and ignoring regulation policies will prevent us from seeing the complete picture. Thus, in support of this view, Tanzi (1995) emphasizes the fact that regulation policies and tax expenditures are the replacement of public expenditures and there is a negative relationship between them. For this reason, in studies based on measuring the total efficiency of the public sector, it can be said that adopting an approach that takes into consideration tax and regulation policies as well would be more appropriate. That these dimensions of the public sector interventions are taken into consideration in this study is ensured by using the freedom indices (The Index of Economic Freedom and The Economic Freedom of the World)⁶ as representatives of the public sector tax and regulation policies.

2. The Measurement of the Public Sector Economic Interventions' Efficiency

2.1. Methodology

Parametric and non-parametric methods are used in the relevant literature in efficiency measurement studies. Multi-regression analysis is a parametric analysis that can be used in comparing the efficiency of decision-making units (DMUs). However, there are some insufficiencies in the use of the multi-regression approach in studies measuring efficiency (Banker et al., 1988; Bowlin, et al., 1985; Ganley & Cubbin, 1992). Firstly, in multi-regression analyses based

⁶ These indices represent the level of economic freedom in accordance with the level of the public sector's economic intervention. More detailed information on these indices can be reached <<http://www.freetheworld.com>> and <<http://www.heritage.org/index/>>. When the indicators in the indices are examined, it can be seen that these indices represent the regulation role of the state at a level of 90 – 95% including the tax regulations as well.

on a single output, the outputs need to be expressed with a common unit and it is compulsory to use only one output. However, this leads to a weakness, especially when outputs cannot be expressed with a common unit that is the one of the most basic features of public sector activities. Secondly, the reference set used in the evaluation of efficiency is defined with average values and in conjunction with this; the units that lie far from the efficiency frontier can turn out to be more efficient. This outcome shows an inconsistency between the objectives of input minimization or output maximization and economic theory. Finally, regression analysis defines the function of production parametrically. For this reason, the possibility that production units might have used objective combinations is excluded. In other words, it is assumed that there are standard units with respect to the function of production or objective function.

Both the characteristics of public sector and the technical properties that the issue of public sector efficiency measurement forces us to use of non-parametric measurement techniques. The activities carried out in the public sector and the aims sought are various, and in most cases these cannot be expressed in common terms. Because the inputs and outputs used in the public sector are not issues related to the market, it is not possible to convert them into monetary values expressing a common value. Moreover, when public sector policies are considered, it is possible to form alternative goals based on very different priorities.⁷ Data Envelopment Analysis (DEA) is one of the non-parametric techniques that can be used in relative efficiency measurement and is a technique that is in harmony with the economic theory of production. It can be used in studies that include different DMUs and numerous inputs and outputs. Furthermore, there is no obligation that these inputs-outputs should bear common terms (Ganley & Cubbin, 1992, pp. 151 – 152).

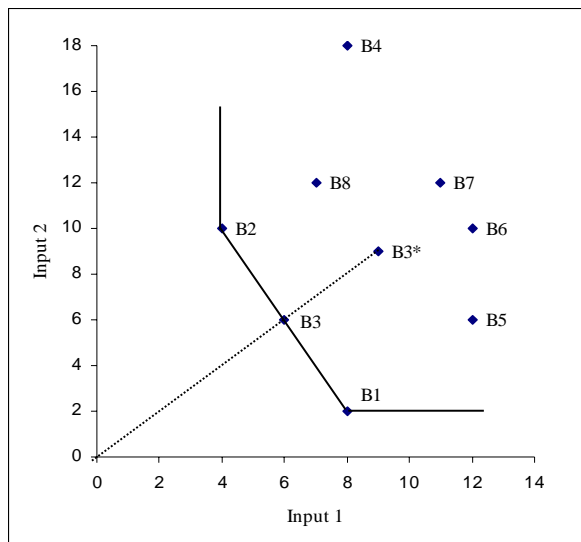
The concept of efficiency frontier has an important place in the DEA approach. Based on the comparison of DMUs, efficiency frontier is defined as a partial, linear, convex set, which is formed by the relatively efficient DMUs and where there is no DMUs lying on the left and at the bottom of this frontier (Farrell, 1957, p. 257). The rationale of DEA can be shown in the following way with a graph prepared according to two inputs and one output.

In Graph 1, the composition of the inputs in which every production unit is used to produce a single output is shown on a two-dimensional input space.⁸ According to this graph, the B_2 uses the second input and the B_1 uses the first input the least.

⁷ For more details on the structure of the supplies and demands of the public sector activities refer to the studies of Wolf (1988) and Ganley & Cubbin (1992).

⁸ It is possible to define the efficiency frontier within output-output space. In this case, the efficiency frontier would change direction of 180 degrees and assume a sectional and concave shape.

Graph 1
A Two-Dimensional Efficiency Frontier Curve



These points on the graph forms two extreme minimum input sets, and they are technically more efficient compared to B_3 , B_4 , B_5 , B_6 , B_7 and B_8 . Consequently, their efficiency increases in the event that they come close to the frontier defined as the efficiency frontier, and if they turn out to be within the efficiency frontier, they are regarded as efficient. For example, the point which represents efficient production to be realized by using the same production process that B_3 production unit uses is represented with B_3^* . However, in this case it is assumed that the production choices are represented by every point on the B_1B_2 line are possible. When examined closely, it can be seen that efficiency frontier surrounds current observations like an envelope (Farrell, 1957, pp. 256 – 258). Thus, it is also due to this characteristic that it is called data envelopment analysis. The most important feature of DEA is that it measures the relative efficiency between DMUs. Thus, the efficiency of the DMUs within one group is defined according to the most efficient DMU in that group.

The degree of efficiency in DEA is measured with the radial distance to the efficiency frontier.⁹ Thus, the efficiency degree for B_1 and B_2 is equals to 1. The efficiency degree for B_3 , on the other hand, is expressed with the OB_3^*/OB_3 ratio and has a value between 0 and 1.¹⁰

⁹ Radial distance can be defined as the geometrical distance of a point from origin.

¹⁰ This logic is modeled with the fractional program method by Charnes, Cooper and Rhodes (1978, 1979 and 1981) and is called the CCR model.

In the standard use of DEA, which we use as well, there are no restrictions except for being positive on factor weights. In this way, it provides an opportunity to choose the weights that would ensure the highest efficiency score for a DMU. Thus, DMUs can be efficient by imposing low weight to relatively weak factors and high weight to relatively successful factors. Levitt & Joyce (1987) and Roll et al. (1991) state that this situation constitutes one of the most important problems for DEA. However, with respect to the purpose of our study, this characteristic is not so much of a problem but gives an opportunity for DMUs to be differentiated according to the weights. There are numerous studies carried out by using DEA.¹¹ Some of these studies are on the efficiency measurement of schools and prisons of local administrations (Ganley & Cubbin, 1992), tax departments (Moesen & Persoon, 1995), the macro economic performances of countries (Lovel, Pastor & Turner, 1995; Melyne & Moesen, 1991; Cherchye, 2001; Färe, Grosskopf, Norris & Zhang, 1994; Lovell, 1995; Lovell & Pastor, 1995; Moesen & Cherchye, 1996).

2.2. Performance Indicators and Intervention Tools of the Public Sector

The basic variables used in the study are summarized as the performance indicators (outputs) and intervention tools (inputs) of the public sector in Figure 1. The definitions and sources of the data on these variables are in Appendix 1.

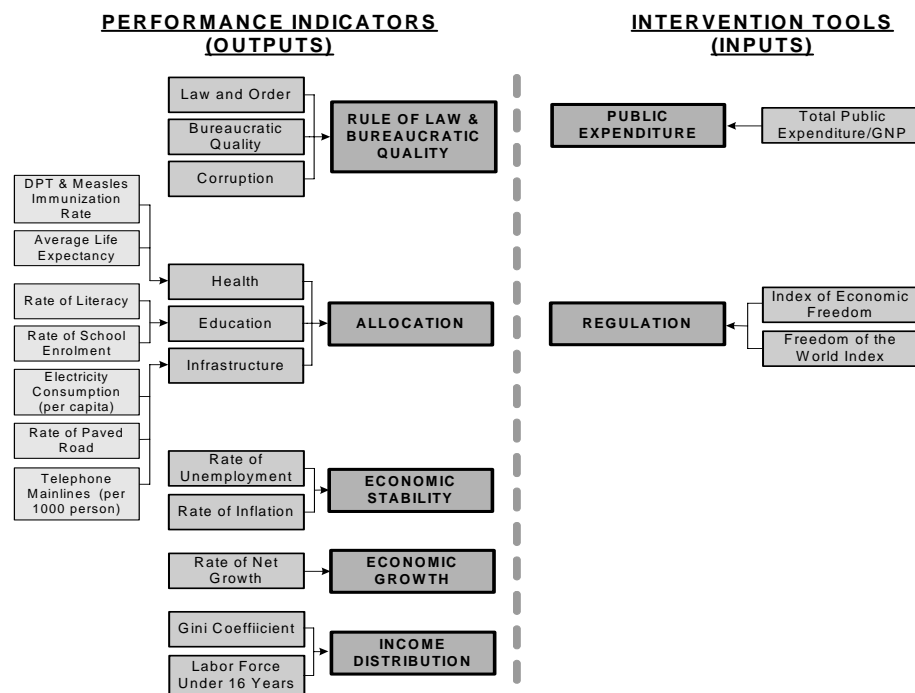
As an indicator of the quality of the public bureaucracy and the success of the public sector in establishing and administering of a legal structure, an equal weight composition of “law and order”, “bureaucratic quality” and “corruption” data produced by International Country Risk Guide (ICRG) was used. Of these variables, the law and order indicator shows the power and objectivity of laws and whether or not laws are conformed to in a prevalent way. Bureaucratic quality represents the power of bureaucracy and the quality of its services. Finally, corruption represents the settlement of degeneration and waste of resources in bureaucracy and politics. This variable is the compliment of the law and order variable and the bureaucratic quality, it can even be considered as its prerequisite.

Regarding the allocation of public goods, infrastructure, education and health, which are the most fundamental service areas, are taken into consideration, and the result indicators of these three “sub service” areas are used. Consequently, a two-phase approach is used in establishing the allocation indicator. In the first phase, with the intermediary of result indicators, which are the representatives of service areas, index values of every service area have been produced. In the

¹¹ For more details on this issue, the study of Tavares (2002) in which 3202 studies carried out with DEA approach are scanned can be made use of.

second phase, a performance result of the main area is generated as an equal-weight average of these sub service areas. For example, regarding health services, the result indicators regarding DPT (diphtheria, pertussis, tetanus)-measles immunization rates and average life expectancy are normalized, and they compose the allocation results of health services in equal weight.¹² Similarly, regarding education and infrastructure services, the result indicators shown in the figure are normalized and calculated in equal weight. In the second phase, the values obtained for the three service areas compose equally weighted the performance results of the allocation function of the public sector. In the calculation of the allocation function, the World Development Indicators (WDI) and the Human Development Report data were used based on the years 1995 and 2000.

Figure 1
Performance Indicators and the Intervention Tools of the Public Sector



¹² It can be asserted that the average life expectancy is determined, in addition to health services, by natural and geographical features, and that for this reason it is wrong to relate it to public policies. However, it is also obvious that life expectancy can be extended with the assistance of protective and curative health services. Consequently, even though it cannot be completely attributed to the public policies, it can be said that a logic parallel to the approach in the Human Development Reports can be utilized.

In the calculation of the economic stability results, the “misery index” approach (McCracken et al., 1977), which was developed by Okun and expressed with the inflation and unemployment rates, is used. It represents the discomfort felt by the individuals within the society concerning the economic instability. However, as can be instantly noticed, in this way it expresses the negative not the positive result and, for this reason, the reverse of the instability figure that was normalized and obtained in equal weight is used. The unemployment and inflation data of countries were taken from WDI and were calculated by taking into consideration the five-year averages formed between the years 1991 – 1995 and 1996 – 2000 in order to decrease the impact of the cyclical or exceptional observations.

The net growth figures have been used as indicators of economic growth or the dynamic performance of economy. For data of countries’ growth performances, the WDI has been made use of. Again to decrease the impact of the cyclical and exceptional observations, calculations have been made as the averages of the years 1991 – 1995 and 1996 – 2000.

As the last of the performance indicators and the representative of the income distribution, the GINI coefficient and the labor rate for children under 16 years of age have been used. The most problematic part of the data is related to the income distribution function. Because it is not possible to find countries’ regular and complete income distribution data. For this reason, for the years in subject (1995 and 2000) the closest GINI coefficients have been used. In fact for some countries the same GINI coefficient figure had to be used for the two years taken into consideration. For this reason, there has been a need for another additional indicator that could reflect upon the results the growth that appeared in terms of the income distribution between the periods and the participation rate for children under 16 years of age to the labor has been calculated. Even though the rate for children under 16 years of age has structural and cultural dimensions, it is thought that it could be taken as the representative of poverty. The two data have been taken from WDI, normalized and included in the calculations with equal weight. Furthermore, because they have a negative character, their reverses have been considered in the calculations.

The first of the variable taken as intervention tools is the ratio of public expenditures to GNP. In the comparison of countries on this variable, it can be said that there are serious problems arising from the differences in generating the public expenditure data. However, we cannot say that we have more reliable alternative tools that can be used. Data concerning the ratio of countries’ total public expenditures to their GNP have been taken from WDI and calculated as the average of the years 1991 – 1995 for 1995, and 1996 – 2000 for 2000. Due to

missing data for some countries like Japan, Central and Eastern European countries, these countries were excluded from the sample.¹³

The indicator of regulations taken as the other intervention tool is the freedom indices which have been produced in recent years and have started to be used in economic studies. These indices have been prepared according to numerous criteria indicating the public sector's level of efficiency in economy. Thus, they can be regarded as good indicators of the level of the public sector economic interventions. Moreover, the dominant character of the criteria in these indices is that it represents the public sector's economic regulations. In these indices, the weight of the ratio of public expenditures to GNP, which are regarded indicators of the economic resources that the government uses, is approximately 5%. Consequently, it will not be wrong to say that they can be taken as indicator of the regulations other than the expenditures. In the calculation of the regulation degree of the countries, two freedom indices have been used. These are the Economic Freedom of the World prepared by the Fraiser Institute, and the Index of Economic Freedom prepared by the Heritage Foundation. The index values of countries are normalized and calculated with equal weight for 1995 and 2000.

2.3. Sample

The countries included in the study have been determined based on data limitations. If the data of a country obtained as performance outputs and indicators of intervention tools were missing, this country was not included in the application. This type of an approach can be supported from two aspects. The first of all, we wanted to include as many observations as possible. The secondly, we aimed to have samples with various features regarding especially intervention patterns and to observe different points of the range regarding public sector interventions. 51 countries have been included in the study. 24 of them are high-income (HI) countries, 14 of them are upper middle-income (UMI) countries, 11 of them are lower-middle income (LMI) countries, and 2 of them are low-income (LI) countries. In addition, of these countries, 20 are from Europe-Middle Asia (EMA), 13 from Latin America-Caribbean (LA), 8 from East Asia-Pacific (EAP), 4 from the Middle East-North Africa (MENA), and 2 from each region of North America (NA), South Asia (SAS) and South Africa (SAF).¹⁴

¹³ It is possible to find the data of such developed countries as Japan in other sources. However, using a complementary data set was refrained from because of the concern that they are incomparable.

¹⁴ For classifying the countries, we used the methodology of the World Bank. Accordingly; Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Korea. Rep.,

2.4. Results

a) Efficiency Scores and the Changes in Time

The public sector efficiency scores of countries for the years 1995 and 2000 as an outcome of the study are presented in Table 1. Efficiency scores are presented in percentage units and for this reason efficient DMUs have a score of 100.

Table 1 shows the countries that have been found to be efficient for the years 1995 and 2000, their efficiency scores, their ranking within 51 countries, and the frequency of their being shown as reference. Accordingly, in 1995 the public sector of 17 countries and in 2000 the public sectors of 20 countries have been found to be efficient. The countries that are efficient have an efficiency score of 100. The number of times the efficient samples are shown as reference by the inefficient countries is important because it shows whether that country has gained that efficiency score due to the extreme features of the public sector preferences and political alternatives or because of the generally accepted features. Hence, it can be said that the efficient countries that are frequently reference for the inefficient countries are more meaningful with respect to the evaluation. Furthermore, the evaluation of the weights given to the inputs and outputs is important. These weights imply strength or weakness of public sector's policy fields. Thus, the outputs and inputs, to which weight is not given, can be taken into consideration as relatively weak components while determining policies. The input and output weights of DMUs are presented in Appendix 2.

Observing to what extent the efficiency scores of the public sector of countries the years 1995 and 2000 showed improvement is also important in terms of the time dimension. Graph 2 was prepared using countries' public sector efficiency scores belonging to the years 1995 and 2000. The observations that lie on the top left part of the graph indicate the countries whose efficiency results improved from 1995 to 2000, and those on the bottom right indicate the countries whose efficiency scores declined.

Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States are HI countries, Argentina, Botswana, Chile, Costa Rica, Dominican Republic, Hungary, Malaysia, Mexico, Panama, Poland, South Africa, Turkey, Uruguay, Venezuela. RB are UMI countries, Algeria, Brazil, Colombia, Egypt. Arab Rep., Indonesia, Morocco, Paraguay, Peru, Philippines, Sri Lanka, Thailand are LMI countries and Nicaragua, Pakistan are LI countries. The distribution of countries according to region is that: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, Hungary, Poland, Turkey are EME Countries, Nicaragua, Brazil, Colombia, Paraguay, Peru, Argentina, Chile, Costa Rica, Dominican Republic, Mexico, Panama, Uruguay, Venezuela. RB are LA countries, Australia, Korea. Rep., New Zealand, Singapore, Indonesia, Philippines, Thailand, Malaysia are EAP countries, Israel, Algeria, Egypt. Arab Rep., Morocco are MENA Countries, Botswana, South Africa are SAF Countries, Pakistan, Sri Lanka are SAS countries, and finally Canada, United States are NA countries.

Table 1
The Public Sector Efficiency Score Estimates (1995&2000)

Countries/Country Groups	Symbols of Countries	Ranks		Efficiency Scores (%)		Frequency of Reference	
		1995	2000	1995	2000	1995	2000
Algeria	ALG	37	36	84.3	89.1		
Argentina	RA	1	1	100.0	100.0	6	
Australia	AUS	21	23	97.8	97.6		
Austria	A	24	22	96.3	98.4		
Belgium	B	18	21	99.7	99.8		
Botswana	RB	46	50	73.8	72.0		
Brazil	BR	50	41	68.0	87.0		
Canada	CND	1	1	100.0	100.0	10	3
Chile	RCH	25	32	95.7	91.3		
Colombia	CO	1	49	100.0	73.2	1	
Costa Rica	CR	40	31	81.1	91.5		
Denmark	DK	1	1	100.0	100.0	10	8
Dominican Republic	DOM	41	1	80.0	100.0		
Egypt. Arab Rep.	ET	48	38	69.3	88.1		
Finland	FIN	1	1	100.0	100.0		5
France	F	26	34	95.6	90.5		
Germany	D	19	24	99.7	95.5		
Greece	GR	33	37	89.2	88.9		
Hungary	H	27	1	95.3	100.0		2
Indonesia	RI	28	28	93.9	92.9		
Ireland	IRL	29	1	93.9	100.0		5
Israel	IL	22	35	97.2	89.2		
Italy	I	32	42	89.7	85.2		
Korea. Rep.	ROK	1	1	100.0	100.0	14	12
Luxembourg	L	1	1	100.0	100.0	13	16
Malaysia	MAL	1	1	100.0	100.0	1	4
Mexico	MEX	35	1	88.1	100.0		1
Morocco	MO	49	44	68.7	81.8		
Netherlands	NL	1	1	100.0	100.0	1	
New Zealand	NZ	1	1	100.0	100.0		
Nicaragua	NIC	51	43	57.2	82.3		
Norway	N	1	1	100.0	100.0	14	9
Pakistan	PAK	39	30	81.7	91.6		
Panama	PA	44	45	74.8	80.2		
Paraguay	PY	1	27	100.0	93.7	1	
Peru	PE	43	33	76.8	90.9		
Philippines	RP	42	40	78.2	87.6		
Poland	PL	23	25	96.9	94.8		
Portugal	P	34	26	89.0	94.1		
Singapore	SGP	1	1	100.0	100.0	19	13
South Africa	SA	30	47	92.7	74.1		
Spain	ESP	31	29	92.0	92.4		
Sri Lanka	SL	36	39	86.5	88.1		
Sweden	S	1	1	100.0	100.0	2	6
Switzerland	CH	1	1	100.0	100.0	1	2
Thailand	T	1	1	100.0	100.0	3	7
Turkey	TR	47	51	70.8	63.1		
United Kingdom	GB	20	1	98.4	100.0		1
United States	USA	1	1	100.0	100.0	2	2
Uruguay	U	38	46	82.9	79.8		
Venezuela. RB	V	45	48	74.4	74.1		
Low Income Countries	LI			64.5	87.0		
Lower Middle Income Coun.	LMI			84.2	88.4		

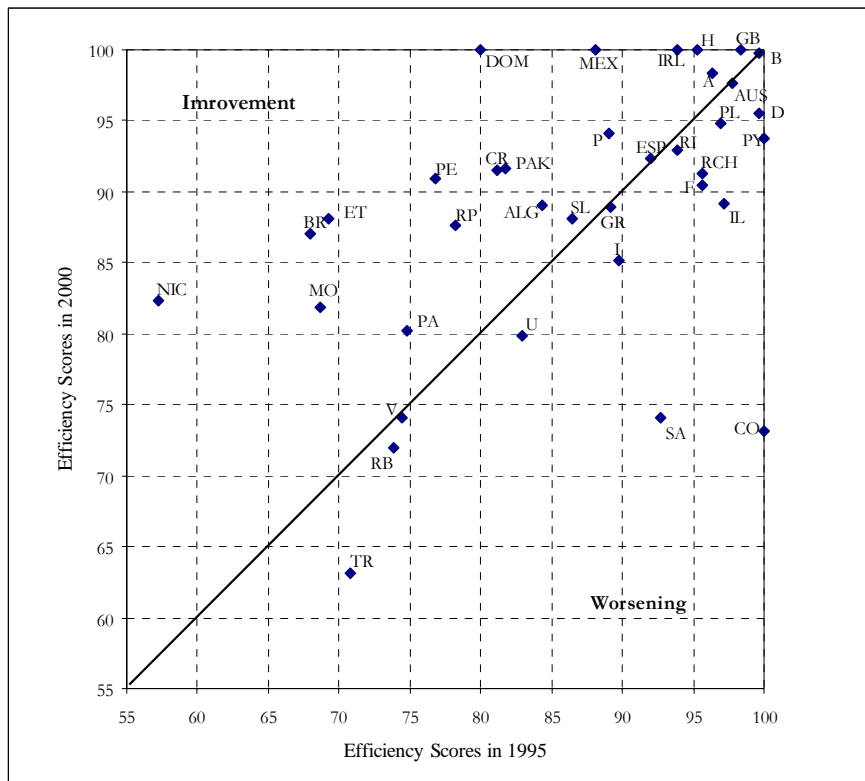
Upper Middle Income Coun.	UMI			86.2	87.2		
High Income Countries	HI			97.4	97.2		
M.East &North Africa Coun.	MENA			79.9	87.1		
South Africa Countries	SAF			83.3	73.1		
Latin America Countries	LA			83.0	88.0		
South Asia Countries	SAS			84.2	89.9		
Europe&Middle Asia Coun.	EMA			95.6	95.1		
East Asia&Pasific Coun.	EAP			96.2	97.3		
North America Countries	NA			100.0	100.0		
<i>Group Average</i>	<i>AV</i>			<i>90.4</i>	<i>92.1</i>		

Source: Authors' estimates.

For example, while the public sector efficiency of Philippines improved, the position of South Africa worsened. The observations on the diagonal line in Graph 2 expresses the countries whose situation has not changed. In the preparation of the Graph 2, the observations in which the efficiency score was the highest (100) in each of the two years were not take place on the graph.

Graph 2

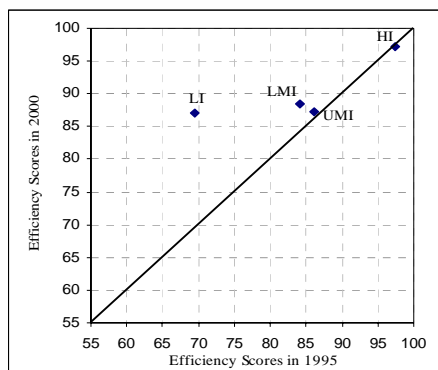
The Variation in the Efficiency Results of the Countries' Public Sector (1995&2000)



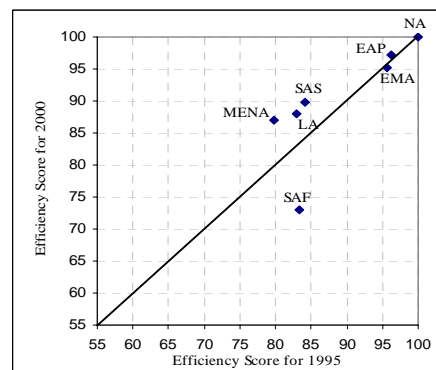
In general, from 1995 to 2000 not only did the number of efficient countries increase, but also the average efficiency score and the number of the countries whose efficiency scores improved turned out to be relatively higher. This result indicates a global improvement over time in the efficiency of the interventions of the public sector. This situation can be attributed to the reorganization or the downsizing of the state and the new paradigm of the public administration¹⁵ in the recent decades for a more rational and efficient public sector.

No doubt, it can be said that the efficiency results of public sector are affected by countries' level of development and regional location. Graph 3 depicts the relationship between the countries' level of development and efficiency scores according to the classification made by the World Bank. As it can be seen, there is a positive relationship between the countries' level of development and the public sector's efficiency results. This is an indication of the fact that level of development is one of the determinants of the efficiency of the use of resources and regulation tools used by the public sector. On the other hand, although it is observed that the efficiency results for all groups of country have improved in time, the highest improvement is realized in the group of countries with LI. However, it may be said that there are only two countries representing the group of LI, and thus, the power of representation of the result, when compared with other income groups, is lower.

Graph 3
The Variation in the Efficiency Results
According to Development (1995&2000)



Graph 4
The Variation in the Efficiency Results
According to Regional Location
(1995&2000)



¹⁵ The new public administration approach means to increase effectiveness and efficiency by making such contemporary administration techniques as total quality management, performance management, strategic management, technological management, good governance dominant in the public sector.

In Graph 4, the efficiency scores of countries according to their regional location are analyzed. Accordingly, in an evaluation to be made on regions, the NA region turns out to be completely efficient with respect to both time periods. Similarly, the public sector efficiency scores of the countries in EAP and EMA regions turn out to be high and exhibit improvement over time. While the only region whose public sector efficiency decreases is SAF region, the region in which the highest improvement is experienced is the region of MENA.

The analysis of to what extent the inputs and outputs utilized determines efficiency scores will also provide us significant results. For this purpose, it is necessary to analyze the correlation between efficiency scores and inputs and outputs.

Table 2

The Correlations between Efficiency Scores and the Inputs and Outputs

		Rule of Law and Bureaucratic Quality	Allocation	Economic Stability	Economic Growth	Income Distribution	Public Expenditure/GNP	Regulation
Efficiency Score	1995	0,62	0,71	0,64	0,07	0,61	0,17	-0,71
	2000	0,62	0,53	0,74	0,15	0,48	0,04	-0,52

Source: Authors' calculation.

When Table 2 is examined with respect to outputs, it is observed that four outputs have very close values to each other, except for economic growth. This means that the outputs are effective almost at the same level at the point of determining the efficiency scores. However, it is not possible to make a similar evaluation with respect to economic growth output. This situation arises from the fact that there are huge differences among the countries with respect to their economic growth results. While few countries have very good growth performance, the rest of the majority is quite bad. Thus, this finding is also confirmed in the following paragraphs with respect to the potential improvements. From the aspect of inputs, however, the case is slightly different. It has been found that there is a negative relation between regulation inputs and efficiency scores but a strong relation compared to the public expenditure input. This shows that it is the regulation input that is determinant in efficiency scores with respect to inputs. In fact, this result shows that the view that regards intervention as a tool without making any discrimination among public interventions may entail mistakes.

One of the important information to be derived from the results is the potential improvement scores. DMUs can use them while guiding policies. This evaluation may be made either generally or on the basis of the DMUs. In this study only a general evaluation will take place.¹⁶ In this way, which inputs and outputs are relatively important and more prone to potential improvements can be determined. As can be seen in Table 3, generally, the regulation tool was more wasted and is

open to a larger potential improvement in two years. This finding supports the consequences of Tanzi (1995). On the other hand, considering the outputs, it can be stated that while the area necessitating improvement in 1995 was economic growth, the areas requiring improvement for 2000 were income distribution, growth, allocation, rule of law, bureaucratic quality and economic stability respectively.

Table 3
The Improvement Rates for Inputs and Outputs

		Rule of Law and Bureaucratic Quality	Allocation	Economic Stability	Economic Growth	Income Distribution	Public Expenditure/GNP	Regulation
Efficiency Score	1995	0,35	0,35	0,37	97,0	1,46	-0,07	-0,41
	2000	10,65	12,41	5,99	25,4	35,04	-0,83	-10,70

Source: Authors' calculation.

b) The Analysis of the Structure of Public Sector Interventions

Analyzing the effects of the level and combination of interventions on the performance of the public sector constitutes the main aim of the study. Within this framework, the analysis of the results acquired will be informative with respect to the degree and content of public interventions and will be guiding to the public sector interventions. So that, the countries have first been classified according to public expenditures and regulations with four different groups. In the course of this taxonomy, considering the two variables, the countries above the average values were considered as interventionist states, the countries that were below the average values were considered as non-interventionist states. For example, for the year 1995, in order to determine the interventionist countries from the aspect of expenditure, the average of the public expenditures/GNP figures of the whole sample was calculated (30.54%), and the countries that had public expenditures above this were regarded as interventionist from the aspect of expenditure. Similarly, interventionist countries with respect to regulation were also determined. Subsequently, samples that were interventionist or non-interventionist from the aspect of both public expenditure and regulation were categorized into four separate groups.¹⁷ This approach can be summarized with the public interventions matrix in Figure 2.¹⁸

¹⁶ The potential improvement rates of inefficient countries are presented in Appendix 3.

¹⁷ According to the quality of the public sector, it can be said describing countries as being interventionist or having a big government is quite difficult and open to criticism. As an alternative to the method we followed, for example, it is possible to assume that the countries with a public expenditure/GNP rate of above 40 percent have a big-interventionist state (Afanso et al., 2005) or

Figure 2
Public Sector Intervention Matrix¹⁹

		Side of Expenditure	
		<i>Interventionist</i>	<i>Non-interventionist</i>
Side of Regulation	<i>Interventionist</i>	I	REG
	<i>Non-interventionist</i>	EXP	NI

After this grouping, the level and combination of intervention and the performance results of the public sector are generally found to be as shown in Table 4.

Several conclusions can be derived from Table 4. First of all, there is a negative relationship between the level of public sector interventions and the efficiency of public sector. This observation is confirmed to a great extent for both the year 1995 and the year 2000. As it can be seen in Graph 5 below, while the countries which are NI and EXP appear on the top right as a result of the efficient use of intervention tools. The countries that are REG and I appear on the left and at the bottom.²⁰

Table 4
The Relationship Between the Structure of Public Intervention and the Efficiency of the Public Sector (1995&2000)

Alternatives of Public Sector Intervention Structure	Number of Sample	Efficiency Score (%)		Potential Improvement in Expenditures (%)		Potential Improvement in Regulations (%)	
		1995	2000	1995	2000	1995	2000
Non-Interventionist in terms of Expenditure and Regulation (NI)	12	97.35	93.72	1.0	0	15.0	16.75
Interventionist in terms of Expenditure (EXP)	16	97.14	95.68	5.7	4.9	10.6	10.8
Interventionist in terms of Regulation (REG)	12	82.88	92.96	4.6	0	57.0	33.9
Interventionist in terms of Expenditure and Regulation (I)	11	80.67	81.14	13.8	0	62.6	64.1

Source: Authors' calculation.

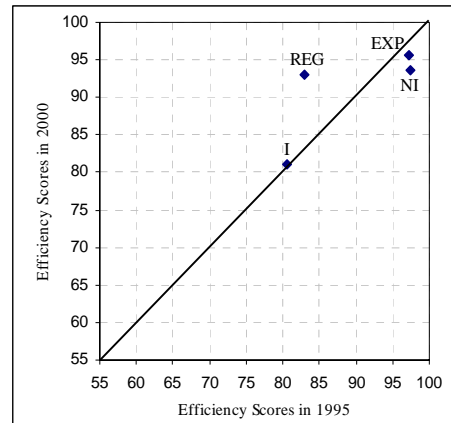
those with a rate above 50 percent have big-interventionist state (Tanzi, 1997). However, this kind of an approach can also be said to be arbitrary.

¹⁸ The calculations concerning the classification mentioned are presented in Appendix 4.

¹⁹ This matrix is generated by the authors.

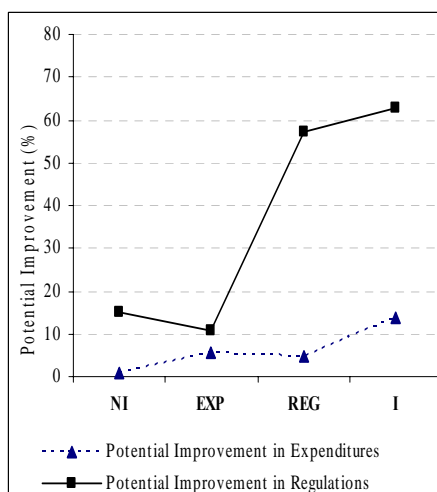
²⁰ Although it is not possible to say that there is a causality between public sector efficiency and government intervention from the results, it can be said that the efficient countries are more liberal than the other countries in terms of the interventionism. Hence one may interpret this result as a causal effect from the interventionism to public sector efficiency.

Graph 5

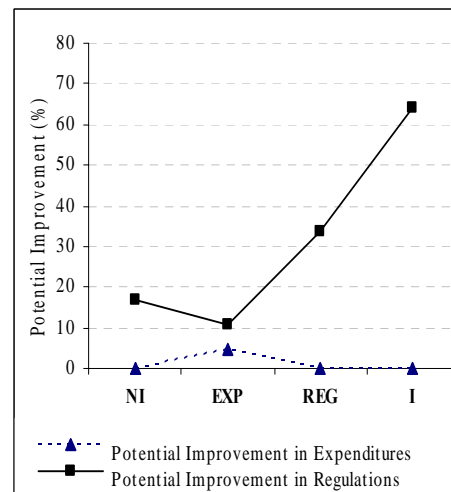
The Level of Public Sector Interventions and the Efficiency of Public Sector

Another way of analyzing the efficiency in the use of intervention tools is to find out to what extent these tools are wasted or how flexibly they are used. From this aspect, looking at the potential improvement degrees in the use of intervention tools at the end of the application would be guiding. In Graph 6a and Graph 6b, potential improvement percentages of four different interventionist country groups are shown for the years 1995 and 2000.

Graph 6a
Potential Improvements in Public Expenses and Regulations (1995)



Graph 6b
Potential Improvements in Public Expenses and Regulations (2000)



According to this, for both the year 1995 and the year 2000, while the country group that needs to make the highest potential improvement is I, REG follows it. This result is in conformity with the result reported in the study of Afonso et al. (2005) that there is significant waste in the public expenditures and for this reason there are broad improvements areas. Moreover, it can be concluded in our study that of the public intervention tools, the regulation tool is relatively wasted more, and thus needs more improvement and to be more carefully handled. This result implies that the regulation tools that the public sector has used prevalently and sometimes in a way to create policy illusion should be used more carefully, and that by means of the improvements ensured here, it would be possible for the market economy to run more efficiently at a lower transaction costs.

Conclusion

In this study, the efficiency of the public sector interventions is measured according to the public sector tasks (objectives) and intervention tools. From another point of view, this attempt can be considered as a measurement of relative efficiency of the public sectors of various countries. The results obtained in this study can be listed as follows:

Of the 51 countries included in the study, 17 countries for the year 1995 and 20 countries for the year 2000 appear to be efficient. Thus, improvement seems to be needed in the rest of the countries with respect to the resources that their public sectors use and the results they produce. Of the two periods deal with, in the year 2000 it was found that both the average efficient scores of the group had improved and the number of countries appearing as efficient had increased, and the number of the countries whose situation had improved was higher than the number of those whose situation got worse. This condition can be attributed to the reconstruction of the state in general, and the success of the developments of new public administration techniques and applications.

It has been found that regulations have a negative effect on the efficiency scores of the public sector and are more powerful compared to public expenses. This finding should be interpreted as regulation policies and results should be prepared and followed very carefully.

A direct relationship has been found between the efficiency scores of the public sector and the level of development. Not only do the underdeveloped and developing countries have organizational and structural problems concerning their private sector, but they also have serious insufficiencies in their public sector. In other words, there are insufficiencies concerning the capability of their public sector organizations and in fulfilling the role it assumes efficiently.

While North America, Asia-Pacific and European countries appear to be more efficient compared to countries in other regions, the public sector efficiency of South African countries not only appears to be lower but also seems to get worse throughout time, unlike other regions.

As the intervention level of countries gets higher, the efficiency of public sector or the efficiency in the use of intervention tools decreases. This condition leads to the idea that the expenditure and regulation tools in public sectors in the countries appeared as inefficient are wasted by excessive usage. There appears to be a need for a higher potential improvement in especially the use of regulation tool. When this finding is combined with the result that efficiency scores in underdeveloped countries turn out to be lower, the appropriateness and qualitative aspects of the regulation policies, especially those of underdeveloped and developing countries, become more important.

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Appendix 1

Data Descriptions and Sources

OUTPUTS/INPUTS	PROXIES OF OUTPUT/OUTCOMES		PREPARATION OF DATA	DATA PERIOD	DATA SOURCES
RULE OF LAW AND QUALITY OF BUREAUCRACY	Law And Order		Included with 1/3 weight	1991 – 1995, 1996 – 2000	The PRS Group (www.prsgroup.com/ICRG.aspx)
	Bureaucratic Quality		Included with 1/3 weight	1991 – 1995, 1996 – 2000	The PRS Group (www.prsgroup.com/ICRG.aspx)
	Corruption		Included with 1/3 weight	1991 – 1995, 1996 – 2000	The PRS Group (www.prsgroup.com/ICRG.aspx)
ALLOCATION	HEALTH	Immunization of DPT (percentage of children under 12 months), and Measles	Normalized and included with 1 / 2 weight	1995, 2000	World Development Indicators 2004 CD ROM
		Life Expectancy At Birth, Total (Year)	Normalized and included with 1 / 2 weight	1995, 2000	World Development Indicators 2004 CD ROM
	EDUCATION	Illiteracy Rate	Normalized and included with 1 / 2 weight	1995, 2000	Human Development Report 1998, 2002
		School Enrollment	Normalized and included with 1 / 2 weight	1995, 2000	Human Development Report 1998, 2002
	INFRASTRUCTURE	Electric Power Consumption (kwh per capita)	Normalized and included with 1 / 3 weight	1995, 2000	World Development Indicators 2004 CD ROM
		Paved Roads (percentage of total roads)	Normalized and included with 1 / 3 weight	1995, 2000	World Development Indicators 2004 CD ROM
Telephone Mainlines (per 1000 people)		Normalized and included with 1 / 3 weight	1995, 2000	World Development Indicators 2004 CD ROM	
ECONOMIC STABILITY	UNEMPLOYMENT	Unemployment, Total (percentage of total labor force)	Normalized and included with 1 / 2 weight	1991 – 1995, 1996 – 2000	World Development Indicators 2004 CD ROM
	INFLATION	Consumer Price Index (1995 = 100)	Normalized and included with 1 / 2 weight	1991 – 1995, 1996 – 2000	World Development Indicators 2004 CD ROM
ECONOMIC GROWTH	Gross Domestic Product Growth (annual %)		Normalized	1991 – 1995, 1996 – 2000	World Development Indicators 2004 CD ROM
INCOME DISTRIBUTION	GINI Index		Normalized and included with 1 / 2 weight	1995, 2000	World Development Indicators 2004 CD ROM
	Labor Force, Children 10-14 (percentage of age group)		Normalized and included with 1 / 2 weight	1995, 2000	World Development Indicators 2004 CD ROM
PUBLIC EXPENDITURE	Expenditure, Total (percentage of GDP)		Primary Data	1991 – 1995, 1996 – 2000	World Development Indicators 2004 CD ROM
REGULATIONS	Index of Economic Freedom		Normalized and included with 1 / 2 weight	1995, 2000	Fraser Institute (www.fraserinstitute.ca/)
	Economic Freedom of the World Index		Normalized and included with 1 / 2 weight	1995, 2000	Heritage Foundation (www.heritage.org/)

Appendix 2

The Weights of Inputs and Outputs Given by Countries (%)

Countries	Rule of Law & Bureaucratic Quality		Allocation		Economic Stability		Economic Growth		Income Distribution		Government Expenditure/GNP		Regulation	
	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000
Algeria								3	100	97	100	100		
Argentina		100					100				100	100		
Australia	88					8	12	3		89	100	55		45
Austria					100	42				58	66		34	100
Belgium					7				93	100	71		29	100
Botswana	73					72	27	28			48	57	52	43
Brazil	84					99	16	1			100	100		
Canada	92	100									100	69		31
Chile		5				95	100				100	100		
Colombia			100			100					100	97		3
Costa Rica	80					98	20	2			100	100		
Denmark			68	2					32	98		71	100	29
Dominican Republic	100							100			100	100		
Egypt. Arab Rep.					100	99					44	100	56	
Finland	67	20	29					10	4	70		100	100	
France	82		17	35			1			65		69	100	31
Germany	24				6	14				70	86	100	100	
Greece	14		12					4		74	96	100	100	
Hungary									100	100	61	67	39	33
Indonesia					9	100	73			18		100	100	
Ireland	77						23	100			72	84	28	16
Israel			51			15	28	7	21	78	53	64	47	36
Italy						30			100	70	63	72	37	28
Korea. Rep.								11	100	89	100	100		
Luxembourg					100	100					71	81	29	19
Malaysia						99	100	1			55	100	45	
Mexico			12		78	100			10		100	100		
Morocco					22			5	78	95	100	100		

Netherlands	34	91	66			5		4				82	100	18
New Zealand	35	68	64							32			100	100
Nicaragua	87					76	13	24			100	100		
Norway			100			78				22	65	100	35	
Pakistan					100	99			1		36	100	64	
Panama			32	9	62	91	6				48	100	52	
Paraguay					100	100					100	100		
Peru						100	52		48		30	100	70	
Philippines					100	100					35	100	65	
Poland							2	11	98	88	100	100		
Portugal			35		65	100					59	68	41	32
Singapore						98	100	2			21	100	79	
South Africa					100	97				3	46	100	54	
Spain			8					5	92	95	100	100		
Sri Lanka						3	18	12	82	85	44	100	56	
Sweden	61	25	38	75							62	74	38	26
Switzerland	7	54			93	12				34	100	19		81
Thailand						100	100				100	100		
Turkey	84			81			16	19			100	100		
United Kingdom	3		77	84					20	16			100	100
United States	3		79	85					18	15			100	100
Uruguay			92	26		74	8				100	100		
Venezuela. RB									100	100	100	100		

Source: Authors' estimates.

Appendix 3

The Areas of Potential Improvement for Inefficient Countries (%)

Countries	Rule of Law & Bureaucratic Quality		Allocation		Economic Stability		Economic Growth		Income Distribution		Government Expenditure/GNP		Regulation	
	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000
Algeria	119	123	77	76	249	96	146	12	18	12	0	0	-65	-63
Australia	2	3	12	6	5	2	2	2	2	2	0	0	-31	0
Austria	6	6	6	21	3	1	46	108	3	1	-1	-5	-21	0
Belgium	7	26	8	10	0	3	19	10	0	0	-15	-15	-9	0
Botswana	35	53	79	81	127	38	35	38	4038	2605	-17	0	-77	-71
Brazil	46	49	56	26	111	14	46	14	1168	478	0	0	-80	-49
Chile	24	9	9	15	19	9	4	12	19	17	0	0	-63	-34
Colombia	0	67	0	41	0	3	0	455	0	86	0	0	0	0
Costa Rica	23	9	29	18	23	9	23	9	46	16	0	0	-87	-23
Dominican Republic	24	0	25	0	52	0	43	0	182	0	0	0	-31	0
Egypt. Arab Rep.	66	66	71	52	44	13	64	13	44	35	-26	0	-85	-54
France	4	21	4	10	8	14	4	29	9	10	-7	-18	0	-24
Germany	0	7	8	6	0	4	11	66	0	4	0	-21	-17	0
Greece	12	16	12	16	22	16	94	12	12	12	0	0	-39	-29
Hungary	20	0	27	0	43	0	4207	0	4	0	-25	0	-50	0
Indonesia	50	61	59	96	6	7	6	445	6	41	0	0	-67	-60
Ireland	6	0	7	0	39	0	6	0	8	0	-11	0	-17	0
Israel	6	20	2	12	32	12	2	12	2	12	-41	-19	-67	-44
Italy	33	20	19	20	11	17	20	77	11	17	-17	-20	-41	-5
Mexico	32	0	13	0	13	0	154	0	13	0	0	0	-29	0
Morocco	58	32	128	124	45	32	122	22	45	22	0	0	-50	-53
Nicaragua	74	53	103	88	78	21	74	21	239	307	0	0	-75	-82
Pakistan	112	40	351	350	22	9	63	9	84	40	-25	0	-99	-41
Panama	177	86	33	24	33	24	33	26	67	50	-12	0	-86	-77
Paraguay	0	64	0	75	0	6	0	606	0	130	0	0	0	-34
Peru	104	67	36	41	50	9	30	135	30	33	-6	0	-61	-67
Philippines	105	43	46	48	27	14	155	58	43	41	-5	0	-99	-97
Poland	17	25	24	12	84	8	3	5	3	5	0	0	-62	-59

Portugal	21	15	12	13	12	6	56	84	20	17	-3	0	-41	-48
South Africa	12	46	42	60	7	34	262	99	40	34	-43	0	-99	-61
Spain	16	19	8	9	69	33	69	8	8	8	0	0	-23	-20
Sri Lanka	93	38	42	24	46	13	15	13	15	13	-19	0	-34	-46
Turkey	41	82	76	58	114	131	41	58	80	65	0	0	-81	-70
United Kingdom	1	0	1	0	7	0	49	0	1	0	-37	0	0	0
Uruguay	103	84	20	25	83	25	20	73	37	30	0	0	-43	-46
Venezuela. RB	43	42	50	54	91	65	57	581	34	34	0	0	-53	-46

Source: Authors' estimates.

Appendix 4

The Level of Interventions According to Regulations and Government Expenditures

Countries	1995			Countries	2000		
	Regulation	Government Expenditure/GNP	Level of Interventions		Regulation	Government Expenditure/GNP	Level of Interventions
Argentina	50.0	13.8	NI	United States	8.4	20.0	NI
Australia	27.4	25.4	NI	Switzerland	12.3	27.6	NI
Canada	23.6	26.6	NI	Singapore	0	19.2	NI
Chile	35.9	20.8	NI	Peru	47.2	18.5	NI
Korea. Rep.	35.9	16.5	NI	Panama	40.7	23.9	NI
Malaysia	32.1	25.3	NI	Korea. Rep.	41.5	17.4	NI
Panama	42.4	24.6	NI	Costa Rica	44.9	22.2	NI
Paraguay	49.1	13.4	NI	Colombia	48.6	16.7	NI
Singapore	0	17.7	NI	Chile	23.4	21.8	NI
Switzerland	18.9	25.6	NI	Canada	18.3	21.5	NI
Thailand	34.9	15.5	NI	Australia	15.6	24.4	NI
United States	17.0	22.7	NI	Argentina	32.7	16.0	NI
Colombia	61.3	13.4	REG	Venezuela. RB	75.3	19.9	REG
Costa Rica	50.9	21.0	REG	Thailand	51.1	20.5	REG
Dominican Republic	65.1	14.8	REG	Sri Lanka	60.4	25.6	REG
Indonesia	60.4	16.5	REG	Philippines	51.3	19.2	REG
Mexico	58.5	15.0	REG	Paraguay	60.7	17.5	REG
Pakistan	65.1	23.7	REG	Pakistan	81.6	22.6	REG
Peru	65.1	18.1	REG	Mexico	64.8	15.5	REG

Philippines	53.8	18.7	REG	Malaysia	51.2	20.6	REG
Sri Lanka	54.7	27.9	REG	Indonesia	78.2	17.8	REG
Turkey	61.3	22.4	REG	Dominican Rep.	57.8	16.3	REG
Uruguay	59.4	28.5	REG	Brazil	82.9	25.7	REG
Venezuela. RB	75.5	19.3	REG	Uruguay	45.9	30.9	EXP
Austria	32.1	39.9	EXP	United Kingdom	10.9	37.6	EXP
Belgium	31.1	48.7	EXP	Sweden	27.2	40.4	EXP
Denmark	26.4	41.1	EXP	Spain	38.3	33.6	EXP
Finland	32.1	41.3	EXP	Portugal	34.2	39.2	EXP
France	38.7	45.1	EXP	Norway	31.9	35.8	EXP
Germany	32.1	32.7	EXP	New Zealand	9.6	31.4	EXP
Ireland	23.6	38.9	EXP	Netherlands	18.7	46.1	EXP
Italy	45.3	50.1	EXP	Luxembourg	17.5	39.1	EXP
Luxembourg	25.5	39.7	EXP	Italy	33.3	45.4	EXP
Netherlands	20.8	50.2	EXP	Israel	48.5	46.2	EXP
New Zealand	12.3	36.1	EXP	Ireland	12.2	33.8	EXP
Norway	34.9	41.2	EXP	Hungary	41.9	44.2	EXP
Portugal	44.3	41.5	EXP	Greece	48.4	31.5	EXP
Spain	42.5	35.6	EXP	Germany	28.4	49.9	EXP
Sweden	42.5	44.6	EXP	France	40.0	46.3	EXP
United Kingdom	18.9	41.6	EXP	Finland	24.0	35.7	EXP
Algeria	85.8	32.0	I	Denmark	29.6	37.5	EXP
Botswana	60.4	36.0	I	Belgium	28.2	46.2	EXP
Brazil	83.0	31.1	I	Austria	23.1	40.2	EXP
Egypt. Arab Rep.	69.8	35.6	I	Turkey	58.3	33.3	I
Greece	53.8	32.3	I	South Africa	60.2	30.1	I
Hungary	53.8	54.8	I	Poland	62.2	36.9	I
Israel	61.3	44.8	I	Nicaragua	75.0	34.5	I
Morocco	59.4	31.4	I	Morocco	66.1	31.4	I
Nicaragua	82.1	31.4	I	Egypt. Arab Rep.	68.7	31.5	I
Poland	75.5	40.9	I	Botswana	50.7	36.1	I
South Africa	56.6	31.3	I	Algeria	93.9	30.3	I

Notes: 1) The value of regulation is normalized and the samples that exceeding average value (50) has been taken as an interventionist country.

2) NI: Non-interventionist Countries, REG: The Interventionist Countries in terms of Regulation, EXP: The Interventionist Countries in terms of Public Expenditure, I: Interventionist Countries.

Source: The regulation data are prepared from Economic Freedom of the World Index 1995, 2000 and Index of Economic Freedom 1995, 2000; the government expenditure/GNP data are prepared from World Development Indicators 2004 CD ROM by authors.