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ECONOMIES OF SCALE AND INSTITUTIONAL QUALITY AS CATALYSTS FOR TRADE OPENNESS.

ECONOMÍAS DE ESCALA Y CALIDAD INSTITUCIONAL COMO CATALIZADORES DE LA APERTURA COMERCIAL.

ABSTRACT

The purpose of this paper is to verify the existence of non-cyclical factors to explain the degree of trade openness. To this end, structural and institutional quality variables have been considered to determine their impact on trade openness. We have worked with a sample of 182 economies, over a period of 23 years. The results of the Generalized Method of Moments estimation show that the most important factor is the size of the country, inversely related. Less significant are the weight of the service sector in advanced countries, and the size of the public sector and institutional quality in middle and low income countries.

Keywords: openness, country size, trade, institutional quality

JEL Code: F15, F41, F60

RESUMEN

El objeto del presente trabajo es comprobar la existencia de factores no coyunturales para explicar el grado de apertura exterior. Para ello se han considerado variables estructurales y de calidad institucional para determinar su impacto sobre la apertura comercial. Se ha trabajado con una muestra de 182 economías, en un periodo de 23 años. Los resultados de una estimación con Método Generalizado de Momentos muestran que el factor más importante es el tamaño del país, en relación inversa. Con menor significación aparecen el peso del sector servicios, en los países avanzados, y el tamaño del sector público y la calidad institucional, en los de renta media y baja.

Palabras clave: apertura exterior, tamaño de país, comercio, calidad institucional

Códigos JEL: F15, F41, F60

1. INTRODUCTION

The fact that the degree of openness of different countries varies widely is well known; the reasons that explain this fact are less known, although several hypotheses have been put forward in the specialized literature. On the one hand, there are cyclical reasons that explain short-term variations, such as a country's cyclical problems or generalized shocks that reduce trade, as evidenced by the 2008 financial crisis or the COVID19 pandemic. On the other hand, economic policy, whether protectionist or liberalizing, has traditionally conditioned the degree of openness, although at the beginning of the second globalization, at the end of the twentieth century, economic policy seemed to lose some of its significance. This was due to the broad liberalization process implemented by most countries, either unilaterally or through integration processes, following the recommendations of international organizations or signing new-generation trade agreements. Since the financial crisis, a certain degree of protectionism, still of low intensity, has resurfaced in some parts of the world, and looks set to intensify in the wake of the pandemic crisis and the war in Ukraine.

The commonly accepted hypothesis is that a small economy will generally be more open than a larger one. The reason lies in the need that development seems to impose to deepen specialization in order to compete and take advantage of economies of scale, which do not exist in a small market but are evident in larger ones, as pointed out by Robinson (1960) and Kuznets (1967). From the 1970s onwards, the new theories of international trade insisted on the importance of market size to ensure economic growth and long-term progress.[1]

The relationship between trade and development has long been a major research topic in economics. As regards the degree of openness, the traditional view throughout the nineteenth century was that a greater degree of openness was typical of an advanced economy, while introversion was synonymous with backwardness. A more open economy facilitated growth and, at the same time, guaranteed greater consumer welfare. This was the doctrinal foundation of what is known today as the first globalization.

From the mid-twentieth century onwards, it began to be appreciated that the development process itself and politics, both economic and general, introduce complexity into the processes of openness and that the previous linear view was not accurate. Kuznets (1967) and later Maddison (1991) found that from the beginning of the nineteenth century until the First World War, the degree of openness tended to grow in European countries, although at uneven rates, while it declined in the middle decades of the twentieth century and only began to increase again afterwards until it reached what is now called the second globalization. Economic policy and political relations are said to have mainly been responsible for the changes in the trend.
For Kindleberger (1968), on the other hand, there was a long-term relationship between the degree of development and openness, which led to a "law of

[1] Krugman (1979). Alesina, Spolaore and Wacziarg (2000) showed an inverse relationship between the size of nations, according to demographic criteria, and economic integration.

decreasing foreign trade" in advanced economies, something that had already been anticipated by Werner Sombart. In the early stages of development, economies become integrated because trade in agricultural and industrial products outpaces income. In mature societies, on the other hand, spending on non-importable goods, such as residential capital, increases, and also on services, whose foreign trade is reduced, so that income grows above trade and the coefficient of openness decreases.

Although this law has not been confirmed empirically, the idea that it is services that are a condition for openness has become a recurring theme in the literature on the degree of openness.[2] Lindbeck (1973), for example, considered that industry was becoming increasingly internationalized, although the trend was counteracted by agricultural protectionism and, above all, by the growth of services, a less internationalized sector, but one of growing importance due to the high income elasticity of its demand and the increase in prices unrelated to productivity. Not even the strong growth of foreign trade in services, which has been visible for years, has been able to prevent the sector from remaining less internationalized than industry. Thus, in advanced and highly tertiarized economies, services can interfere with openness, so the relationship between size and openness must be controlled by the weight of services.

One part of the service sector that deserves special attention is the public sector. Traditionally, it has been considered that a large public sector would have a negative impact on the degree of internationalization, since its performance is focused on the domestic economy. Rodrik's (1998) hypothesis argues that open economies are more exposed to import shocks and, in order to mitigate such risks, maintain a high level of public spending, so that the relationship would be the inverse: the greater the openness, the higher the spending. The results of the empirical estimations, however, are not conclusive and among the proposed explanations, the one that establishes that a higher institutional quality in an economy could be an alternative to public spending to offset these risks seems particularly interesting. Higher institutional quality could make public spending more efficient and reduce the need to increase its relative size.[3]

In short, it will be necessary to control the relationship between size and openness by the weight of the public sector and also by the quality of each economy's institutions, as well as by the weight of services. In addition, some structural economic policy measure, such as a country being a member of a particular trade agreement, may influence its degree of openness, so this will also need to be considered. Finally, the degree of development may also influence the degree of openness, either by itself or in combination with its other characteristics. These are the elements on which the proposed models are built, as explained below. The next section explains the variables considered, the data through which they are represented and their sources. The models are then presented and the results are explained. The paper ends with some brief conclusions.

[2] Grassman (1980).

[3] Iversen and Cusak (2000) argued the existence of an inverse relationship between openness and public spending for a sample of countries. Benarroch and Pandey (2008) also found no evidence of a Rodrik effect. Jetter and Parmeter (2014) found a positive relationship between public sector size and openness, in line with Rodrik.

2. VARIABLES AND DATA

In the following study, the variable to be explained is the degree of openness of the economy (O), normally measured as the percentage of the sum of exports and imports of goods and services in relation to GDP (Table 1). This is the traditional formulation of the coefficient of external openness, which combines great informative power with economy of calculation. GDP, exports and imports are taken in current dollars.

The explanatory variables proposed in the base model are three structural variables: the size of the country (SIZE), the weight of services in the national economy (SER) and that of the public sector (PUB). The size of the country has been calculated as the percentage that each country's GDP represents of the world total. The service sector (SER) and public sector (PUB) variables have been measured as the percentage that each of the two sectors represents of the GDP of the corresponding country.

Next, two other models are estimated to incorporate a new explanatory variable in each of them and to test in both cases their interactions with the basic model. First, institutional quality, which could have some substitution relationship with public spending, as noted above, and which is measured by means of the most generic indicator (Rule of Law) of those proposed in the World Economic Indicators (WEI). Second, whether or not each country belongs to a trade agreement, as an expression of its willingness to practice a trade policy that is open to foreign trade.[4]

Finally, four models have been estimated in which the relative level of development of the countries is incorporated through GDP per capita measured in PPP dollars and considering each country's position year by year. In the first two models, the inverse of GDP per capita is related to the percentage represented by services and the level of public spending, respectively, to capture the differential effect in lower income countries. In the next two models, the set is divided into two groups, those with above-average income and those with below-average income, and estimations are made for both groups considering the four variables that were significant for the set as a whole (size, services, public sector and institutional quality).

For the estimations, the harmonized World Development Indicators (WDI) and World Government Indicators (WGI) databases were used. Estimations were made for a total of 182 countries and territories, for the period from 1996 to 2019, the maximum available range covered by both databases. The list of countries and territories used can be found in Annex 1 and the division by year between those above and below the average in terms of GDP per capita in Annex 2.

After performing the seven estimations indicated above, a robustness test was carried out to control the results with other variables not considered, but which

[4] Following Lloyd and MacLaren (2002), who pointed out that the degree of openness is conditioned by structural factors, such as resource endowments, technology, consumer preferences or the size of the country itself. They therefore proposed an index that takes trade policies into account.

could be relevant (Table 2). First, we followed the suggestion of Squalli and Wilson (2011) to replace the traditional coefficient of foreign openness with another, proposed by them, which took into account both the domestic weight of foreign trade in the country and the volume of trade of each country in the world total. The omission of the second aspect penalized the larger economies with less openness and ignored their relevance in the dynamics of international trade.[5] The proposed indicator would be defined as follows:

$$adjustedO = \frac{(X+M)_i}{(\frac{1}{n})\sum_{j=1}^{n}(X+M)_j}\frac{(X+M)_i}{GDP_i}$$

Where *adjustedO* is the external openness of a country according to this indicator, X the exports of each country i from j=1 to n, M the imports and GDP the gross domestic product of each country i considered. With the new variable to be explained, three models have been estimated, a general one with the variables that were significant in the previous estimation (except for size, which is already included in the new index), and two more with the relationship between services, on the one hand, and public spending, on the other, with the inverse of GDP per capita.

Second, two explanatory variables were replaced by other alternatives, which sought to represent the same phenomenon, in order to verify whether the relationship was maintained or the significance improved. On the one hand, membership in a trade agreement was replaced by presence in the European Union or NAFTA, the two most relevant for the entire period. On the other hand, the Rule of Law index was successively replaced by the other three indicators of the World Government Indicators (WGI), those of Control of Corruption (IQ2), Regulatory Quality (IQ3) and Voice and Accountability (IQ4).

3. MODELS AND ESTIMATIONS

The degree of openness (logO) is initially explained by a double logarithmic function of economic size (logSIZE), the percentage of services in GDP (logSER) and the percentage of public expenditure in GDP (logPUB). The institutional quality variable (logIQ) is then added to test its interrelation with the others. Equation (1) represents the core model.

$$logO_{it} = \beta_0 + \beta_1 logSIZE_{it} + \beta_2 logSER_{it} + \beta_3 logPUB_{it} + \beta_4 logIQ_{it} + \varepsilon_{it} \quad (1)$$

The core model and all the others have been estimated using the Generalized Method of Moments in Differences in two stages (GMM-DIFF) proposed by Arellano and Bond (1991), having detected some initial signs of endogeneity among the variables. The GMM method is not only designed for dynamic models but also for models in which the explanatory variables are not strictly exogenous, as is the case here. When endogeneity is present, the estimators obtained are

[5] Tang (2003) and Fuji (2019) also argued that the traditional index introduced a bias in favor of smaller economies.

not unbiased, and the difference in estimated value is attributed to fixed effects. The solution offered for this by Arellano and Bond (1991) is to eliminate the fixed effects with the model in differences and use as instruments the differences of the lags of the explanatory variables. In this case, lag structures containing 2 and 3 lags of the endogenous variables have been estimated as lag structures, in order to keep the number of instruments as small as possible and, at the same time, to allow the Hansen test to confirm its validity. The model provides unbiased estimators and presents no autocorrelation problems. Therefore, it may be concluded that the endogeneity among the variables has been adequately addressed.

TABLE 1 OVER HERE

The results are consistent and conclusive. The three variables of the basic model (column 1) are highly significant and maintain the expected sign. First, the smaller the size, the greater the openness; second, the smaller the proportion of services, the greater the openness; and third, in the case of the public sector, Rodrik's hypothesis is supported, since greater openness implies greater size of the public sector. Institutional quality is also significant, when added, without the other variables losing significance (column 2). The same is not true for the variable reflecting the existence of a country's trade agreements, which turns out not to be significant, so its analysis is abandoned here (column 3).

The estimated models in columns 4 and 5 attempt to capture the interactions of services and the public sector with the inverse of GDP per capita, to see the differential effect in lower per capita income countries. Services are shown to be negatively related to openness in this case, although there are nonlinearities and the interaction indicates a significant reduction in this effect as the GDP per capita of the countries decreases. The public sector has the expected sign, but reflects a greater weight in the countries with lower per capita income.

Columns 6 and 7 show the estimated models for the four core variables (size, services, public sector and institutional quality) when differentiating between countries with below-average per capita income (column 6) and those with above-average per capita income (column 7). For lower income countries all variables have the expected sign and are significant, with the exception of services, although the significance of the public sector doubles the average effect of the more general model (column 2). In countries with above-average income, the results indicate that size and the proportion of services are significant and have the expected sign: the larger the size, the less openness and with a high proportion of services, openness also decreases; in contrast, the public sector works in the opposite direction to Rodrik's hypothesis and institutional quality does not appear to be significant.

The seven models estimated for the robustness test have also been estimated using the Generalized Method of Moments in Differences in two stages (GMM-DIFF) proposed by Arellano and Bond (1991) and all the fits are correct (Table 2). The results confirm the estimations previously made, with some nuances.

The three models in which the traditional coefficient is replaced as the variable to be explained by the one proposed by Squalli and Wilson (columns 1, 2 and 3) have the expected signs and maintain significance; it even increases for institutional quality (column 2). In the interaction of services and the inverse of GDP per capita, the negative effect of services on openness is substantially reduced as GDP per capita decreases, and in the interaction with the public sector (column 3) the weight of the public sector has a more positive influence on openness as GDP per capita decreases.

In the four models in which some explanatory variable is modified, but the traditional coefficient and the three variables of the base model (size, services and public sector) are maintained, the results are also maintained with nuances. EU or NAFTA membership remains insignificant, as in the case with trade agreements in general (column 4). The three alternatives of institutional quality are significant with the expected sign and the sign and significance of the other variables are maintained, with small changes in the coefficients.

TABLE 2 OVER HERE

4. CONCLUSIONS

In summary, the results of our study (182 countries and territories and a period of 23 years) confirm the initial hypothesis that size is a relevant variable in explaining the degree of external openness for all types of economies, in the sense that the larger the size, the lower the openness coefficient. The service sector, public sector and the degree of development and institutional quality, are also relevant, but are less conclusive and require clarifications. The services sector has the expected sign in all the estimated models, showing that the greater the weight of services, the less openness, but in lower income countries it is not significant. Rodrik's compensation hypothesis works in the sample as a whole and in middle and low income countries, but it is completely nullified with the opposite sign in high-income countries. Institutional quality is significant, with the expected sign, in the whole sample and in lower income countries. The robustness tests confirm the general conclusions.

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ANNEX 1. SAMPLE COUNTRIES AND TERRITORIES

Albania, Algeria, Angola, Antigua and Barbuda, Netherlands Antilles, Algeria, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Belarus, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina-Faso, Burundi, Bhutan, Cape Verde, Cambodia, Cameroon, Canada, Qatar, Central Africa, Chad, Czech Republic, Chile, China, Colombia, Cyprus, Comoros, Congo, Democratic Republic of Congo, Côte d'Ivoire, Costa Rica, Croatia, Cuba, Denmark, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Finland, Fiji, France, Gabon, Gambia, Georgia, Ghana, Grenada, Greece, Greenland, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, Iraq, Ireland, Philippines, Slovakia, Slovenia, Spain, United Arab Emirates, United States, Uruguay, Uruguay, Venezuela, Uruguay, Venezuela, Uruguay, Venezuela, Venezuela, Venezuela (Bolivarian Republic of), Venezuela (Bolivarian Republic of), Venezuela (Bolivarian Republic of), Venezuela (Republic of), Venezuela (Republic of), Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Kiribati, Kosovo, Kuwait, Laos, Latvia, Lebanon, Lesotho, Liberia, Lesotho, Lithuania, Luxembourg, Macau, North Macedonia, Madagascar, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mauritania, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Palestine and Gaza, Panama, Paraguay, Peru, Poland, Portugal, Puerto Rico, United Kingdom, Romania, Russia, Rwanda, St. Kitts and Nevis, St. Vincent and the Grenadines, St. Lucia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Sri Lanka, South Africa, Sudan, South Sudan, Sweden, Switzerland, Suriname, Thailand, Tanzania, Tajikistan, Timor, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkmenistan, Turkey, Ukraine, Uganda, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Zambia, Zimbabwe.

ANNEX 2: COUNTRIES ABOVE-AVERAGE PER CAPITA INCOME

Germany	1997-2019	Ireland	1997-2019
Antigua and Barbuda	2003-2019	Island	1997-2019
Netherlands Antilles	1997-2019	Israel	1997-2019
Saudi Arabia	1997-2019	Italy	1997-2019
Argentina	2008, 2010-19	Japan	1997-2019
Aruba,	1997-2019	Kazakhstan	2007-2019
Australia	1997-2019	Kuwait	2011-2019
Austria	1997-2019	Latvia	2007-2019
Azerbaijan	2013-2014	Lithuania	2007-2019
Bahamas	1997-2019	Luxemburg	1997-2019
Bahrein	2007-2019	Macau	1997-2019
Belgium	1997-2019	North Macedonia	2019
Bermudas	2011-2019	Malaysia	2006-2019
Belarus	2012-2019	Maldives	2016-2019
Botswana	2016-2019	Malta	2000-2019
Brunei	1997-2019	Mauritius	2012-2019
Bulgaria	2014-2019	Mexico	2012-2019
Canada	1997-2019	Montenegro	2016-2019
Qatar,	2012-2019	Norway	1997-2019
Czechia	2001-2019	New Zealand	1997-2019
Chile	2007, 2009-2019	Oman	1999-2019
China	2010-2019	Netherlands	1997-2019
Cyprus	1997-2019	Palau	2015-2018
Korea	1997-2019	Panama	2011-2019
Costa Rica	2015-2019	Poland,	2008-2019
Croatia	2006-2019	Portugal	1999-2019
Cuba,	1997-2018	Puerto Rico	1997-2018
Denmark	1997-2019	United Kingdom	1997-2019
Dominican Republic	2018-2019	Romania	2010-2019
Arab Emirates	2002-2019	Russia	2008-2019
Slovakia	2006-2019	Saint Kitts and Nevis	2004-2013
Slovenia	1999-2019	Serbia	2018-2019
Spain	1997-2019	Seychelles	2006-2019
United States	1997-2019	Singapore	1997-2019
Estonia,	2006-2019	Sweden	1997-2019
Finland	1997-2019	Switzerland	1997-2019
France	1997-2019	Suriname	2017-2019
Greece	1997-2019	Thailand	2017-2019
Greenland	2004-2018	Trinidad and Tobago	2004-2013
Equatorial Guinea	2007-2019	Turkey	2010-2019
Hong Kong	2001-2019	Uruguay	2011-2015
Hungary	2005-2019	Venezuela	2008-09, 2011-14
Iran	2010-2011		

ANNEX 2 (CONT.): COUNTRIES BELOW-AVERAGE PER CAPITA INCOME

Albania	1997-2019	Fiji	1997-2019	Myanmar	2011-2018
Angola	2002-2019	Gabon	1997-2019	Namibia	1997-2019
Antigua and Barbuda	1997-2002	Gambia	1997-2019	Nepal	1997-2019
Algeria	2000-2019	Georgia	1997-2019	Nicaragua	1997-2019
Argentina	1997-2007, 2009	Ghana	1997-2019	Niger	1997-2019
Armenia	2013-2019	Grenada	2004-2013	Nigeria	1997-2019
Azerbaijan	1997-12, 2015-19	Guatemala	1997-2019	Pakistan	1997-2019
Bangladesh	1997-2019	Guinea	1997-2019	Palau	2006-2014
Barbados	1997-2019	Guinea-Bissau	1997-2019	Palestine and Gaza	1997-2019
Belize	1997-2019	Guiana	1997-2013	Panama	1997-2010
Benin	1997-2019	Haiti	2001-2019	Paraguay	1997-2019
Belarus	1997-2011	Honduras	1997-2019	Peru	1997-2019
Bolivia	1997-2019	Hungary	1997-2004	Poland	1997-2007
Bosnia-Herzegovina	2003-2019	India	1997-2019	Portugal	1997-1998
Botswana	1997-2015	Indonesia	1997-2019	Romania	1997-2009
Brazil	1997-2019	Iran	1997-2009	Russia	1997-2007
Bulgaria	1997-2013	Irak	1997-2019	Rwanda	1997-2019
Burkina-Faso	1997-2019	Jamaica	1997-2019	S. Vicent and Granad	2004-2013
Burundi	1997-2019	Jordan	1997-2019	Saint Lucia	2004-2013
Buthan	1997-2019	Kazakhstan	1997-2006	Senegal	1997-2019
Cape Verde	2008-2019	Kenya	2007-2019	Serbia	1997-2017
Cambodia	1997-2019	Kyrgyzstan	1997-2019	Seychelles	1997-2005
Cameroon	1997-2019	Kiribati	2009-2018	Sierra Leone	1997-2019
Central African	2010-2019	Kosovo	2009-2019	Sri Lanka	1997-2019
Chad	1997-2019	Laos	2001-2016	South Africa	1997-2019
Czechia	1997-2000	Lesotho	2004-2019	Sudan	1997-2019
Chile	1997-06, 2008-09	Latvia	1997-2006	South Sudan	2009-2015
China,	1997-2009	Lebanon	1997-2019	Suriname	2007-10, 2016
Colombia	1997-2019	Liberia	2001-2019	Thailand	1997-2016
Comoros	1997-2019	Lithuania	1997-2006	Tanzania	1997-2019
Congo	1997-2019	North Macedonia	1997-2018	Tajikistan	1997-2019
Congo Dem Rep	1997-2019	Madagascar	1997-2019	Timor	2001-2019
Ivory Coast	1997-2019	Malaysia	1997-2005	Togo	1997-2019
Costa Rica	1997-2014	Maldives	2015	Tonga	1997-2012
Croatia	1997-2005	Mali	1997-2019	Tunisia	1997-2019
Dominica	2004-2013	Malta	1997-1999	Turkmenistan	1997-2017
Dominican Republic	1997-2017	Marshall Islands	2005-2018	Turkey	1997-2009
Ecuador	1997-2019	Morocco	1997-2019	Ukraine	1997-2019
Egypt	1997-2019	Mauritius,	1997-2011	Uganda	1997-2019
El Salvador	1997-2019	Mauritania	1997-2019	Uruguay	1997-2010
Slovakia	1997-2005	Mexico	1997-2011	Uzbekistan	1998-2019
Slovenia	1997-1998	Moldova	1997-2019	Vanuatu	2004-2013
Estonia	1997-2005	Mongolia	1997-2019	Venezuela	1997-07, 2010
Ethiopia	2012-2019	Montenegro	2001-2015	Vietnam	1997-2019
Philippines	1997-2019	Mozambique	1997-2019	Zambia	2011-2019

	Zimbabwe	1997-2018

Table 1. Panel estimations of economic openness (GMM-DIFF)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Dependent variable *log O*							
log SIZE	-0,3482 ***	-0,2692 ***	-0,2043 ***	-0,3659 ***	-0,4100 ***	-0,2207 **	0,3667 ***
	0,000	*0,003*	*0,000*	*0,000*	*0,000*	*0,040*	*0,000*
log SER	-0,2376 ***	-0,2778 ***	-0,2423 ***	-0,3146 ***	-0,2733 ***	-0,0760	-0,1284 ***
	0,000	*0,000*	*0,000*	*0,000*	*0,000*	*0,176*	*0,000*
log PUB	0,2677 ***	0,2932 ***	*0,3966* ***	0,4703 ***	0,3641 ***	0,6543 ***	-0,2700 ***
	0,000	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*
log IQ		0,0293 *	*0,0166* *	0,0374 ***	0,0284 ***	0,0437 ***	-0,0161
		0,065	*0,080*	*0,000*	*0,001*	*0,000*	*0,130*
FTA			*0,0245*				
			0,131				
log SER/GDPpc				0,2868 ***			
				0,000			
log PUB/GDPpc					*0,1542* ***		
					0,000		
time dummies	yes	yes	yes	yes	yes	yes	yes
AR(1)	-0,98	-0,98	-0,98	-0,96	-0,97	-1,02	2,03
	0,328	*0,327*	*0,328*	*0,336*	*0,333*	*0,306*	*0,043*
AR(2)	-0,84	-1,34	-1,43	-1,53	-1,54	-1,70	-1,18
	0,400	*0,179*	*0,153*	*0,125*	*0,124*	*0,089*	*0,239*
Hansen test	66,56	54,65	88,87	121,85	89,12	55,94	59,85
	0,356	*0,237*	*0,283*	*0,052*	*0,251*	*0,201*	*0,589*
F(,)	F(25,182)=61.08	F(20.181)=54.15	F(21,181)=96.19	F(21, 178)=341.07	F(21,178)=131.71	F(20,100)=154.82	F(20,123)=136.00
	0,000	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*
number of instruments	89	69	104	120	103	69	84
number of groups	182	181	181	178	178	100	123
obs	3717	2805	2805	2768	2768	1163	1642

p-values in italics. ***, ** and * denote significance levels at 1%, 5% and 10%, respectively.

Table 2. Robustness checks

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Dependent variable:	*log(adjustedO)*	*log(adjustedO)*	*log(adjustedO)*	*log O*	*log O*	*log O*	*log O*
log SIZE				-0,4603 ***	-0,1140 *	-0,2272 ***	-0,1957 **
				0,000	*0,052*	*0,007*	*0,017*
log SER	-0,1771 ***	-0,4548 ***	-0,2220 ***	-0,1946 ***	-0,3227 ***	-0,3416 ***	-0,3221 ***
	0,000	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*
log PUB	0,9508 ***	0,7534 ***	0,3425 ***	0,3409 ***	0,4386 ***	0,4940 ***	0,4803 ***
	0,000	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*
log IQ	0,1023 ***	0,0564 ***	0,0689 ***	0,0235 **			
	0,000	*0,000*	*0,000*	*0,013*			
UE, NAFTA				*-0,0167*			
				0,172			
log SER/GDPpc		0,9741 ***					
		0,000					
log PUB/GDPpc			0,4710 ***				
			0,000				
IQ2					*0,0879 ****		
					0,000		
IQ3						*0,0487 ****	
						0,000	
IQ4							*0,0430 ****
							0,000
time dummies	yes	yes	yes	yes	yes	yes	yes
AR(1)	-0,95	-0,94	-0,96	-0,96	-0,97	-0,97	-0,98
	0,344	*0,346*	*0,338*	*0,338*	*0,333*	*0,332*	*0,327*
AR(2)	-1,29	-1,31	-1,21	-1,41	-1,48	-1,55	-1,53
	0,196	*0,192*	*0,228*	*0,158*	*0,138*	*0,121*	*0,126*
Hansen test	72,53	164,89	167,32	117,58	56,62	58,38	55,33
	0,272	*0,532*	*0,478*	*0,098*	*0,184*	*0,145*	*0,191*
F(,)	F(19,179)=23.86	F(20,176)=43405.91	F(20,176)=15415.44	F(21,181)=151.20	F(20,181)=58.04	F(20,181)=67124.92	F(20,181)=54.01
	0,000	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*	*0,000*
number of instruments	86	188	188	121	69	69	69
number of groups	179	176	176	181	181	181	181
obs	2767	2730	2730	2805	2795	2799	2797

p-values in italics. ***, ** and * denote significance levels at 1%, 5% and 10%, respectively.

IQ2: Control of Corruption (rank), IQ3: Regulatory Quality (rank), IQ4: Voice and Accountability (rank)