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# “Glocalization” and decentralization. The role of local governments in the new international context\*

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*Globalization, technological changes and the information revolution are phenomena that affect the ways in which different levels of government allocate their public resources and expenditures. This paper examines one aspect of the problem: the decentralization of the subnational public sector and its relation to economic integration. The study focuses on Argentina and Brazil with a panel data for each country separately, for the period 1985-2005. The results show no relationship between the vertical structure of the subnational public sector and economic openness. There may be two explanations for this: factors working in opposite directions compensate their effects; or interferences from higher levels of government prevent modifications. The control variables have the signs suggested by the theory of fiscal federalism.*

JEL Classification: F15, H77

Keywords: globalization, information revolution, glocalization, local governments.

*La globalización, los avances tecnológicos y la revolución informática son fenómenos que afectan la distribución de las funciones y los recursos públicos entre los niveles de gobierno. En este trabajo se investiga un aspecto de esta problemática: la descentralización del sector público subnacional y su relación con la apertura económica. El estudio se realiza para la Argentina y Brasil con un panel de datos, para cada país por separado, para el período 1985-2005. Los resultados muestran ausencia de relación entre la estructura vertical del sector público subnacional y la apertura económica. Es posible encontrar dos explicaciones para este*

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*fenómeno: por un lado, factores que influyen en direcciones opuestas que compensan sus efectos; o interferencias desde los niveles centrales de gobierno que impiden los cambios. Las variables de control tienen signos compatibles con la teoría del federalismo fiscal.*

In the new international context that has characterized economies in the last decades, globalization, technological changes and the information revolution are phenomena that are affecting the way in which different levels of government allocate their public resources and expenditures, both within a country and among countries. The expected impacts are summarized in Bell's quotation (1987): "the nation-state is becoming too small for the big problems of life, and too big for the small problems of life". This change was called "glocalization"<sup>1</sup> (Courchene, 1993), which involves an increased role for global governments (and institutions) and local governments, and a secondary role for national and provincial levels of governments. In the new "glocalization" context an important question is how the vertical structure of the public sector has been modified since there have been tendencies against and for decentralization (Garrett and Rodden, 2003; Stegarescu, 2009; Ermini and Santolini, 2010, 2011).

This paper examines one aspect of the problem: the decentralization of the subnational public sector and its relation to economic integration. The study is performed for Argentina and Brazil, the quantitatively most important countries in MERCOSUR,<sup>2</sup> with a panel data for each country separately, for the period 1985-2005. Our main question is if the (local) municipal participation has increased or decreased within the subnational public sector (municipalities plus provinces/states) due to economic openness. The determinants of decentralization identified in the theories of fiscal federalism are used as control variables.

The paper is organized as follows. In Section II, the main arguments for and against fiscal decentralization within a country, which result from

<sup>1</sup> According to Sharma (2008), the expression "glocalization" had its origin in studies of Japanese economists and it is referred to the adaptation of agricultural techniques to local conditions. The sociologist Robertson (1992) used the term to refer to the universalization of the particular and the particularization of the universal; that is, the "conjunction of universality and singularity" (Sebrelli, 2012, pp. 406-407).

<sup>2</sup> The Common Market of the Southern Cone (MERCOSUR) was created in 1991 by Argentina, Brazil, Paraguay and Uruguay.

normative and positive theories of fiscal federalism, are presented. Most theoretical and empirical studies are developed for closed economies and for decentralization measured by the relationship between subnational and total expenditures and revenues. The novelty in this work lies in considering the subnational dimension of fiscal decentralization in open economies. In Section III, empirical analysis -data, model, variables and estimates- is addressed. Section IV shows the conclusions.

The results show no relationship between the vertical structure of the subnational public sector and economic openness, which may be only valid for the short term. As phenomena linked to modernity are, as they seem, irreversible, their forces will join to the other variables leading to greater participation of local governments. The challenge is to modernize and strengthen them for this new scenario. Two obstacles appear in the way: on the one hand, the resistance of provincial governments to lose fiscal powers in favor of lower levels of government; on the other hand, the interference of the national government in the life of the local governments. These obstacles are present both in Argentina and Brazil.

## THEORY AND EMPIRICAL EVIDENCE

### THEORY

The main question of this paper is if the (local) municipal participation has increased or decreased within the subnational public sector (municipalities plus provinces/states) due to the new integration processes that have been affecting economies during the last years. Trade agreements proliferation and trade easiness, financial integration and the revolution in production technologies, communications and services, among other aspects, are part of a scenario of a globalized world in which it is interesting to investigate how decentralization, both of revenues and expenditures, responds. To carry out this work, there are certain difficulties not only in defining conceptually but also in quantifying a variable that reflects all the aspects that integration involves. As a proxy, we use one dimension of economic openness: the relationship between level of exports and gross domestic product (GDP). The arguments for and against fiscal decentralization, both in a closed and in an open economy, are considered below.

In a closed economy, there are arguments for and against fiscal decentralization that come from the normative and positive theories of fiscal federalism. In the normative theory, the degree of decentralization results from the trade-off between benefits –the better adaptation of the offer of

the local public goods to the demand in each locality (preference matching)- and costs –due to the loss of economies of scale and the presence of interjurisdictional externalities. In the positive theory, the trade-off results from the benefits of greater control of politicians and bureaucrats by the citizenry (accountability) and the costs due to perverse incentives for fiscal responsibility that intergovernmental transfers can generate. Most theoretical and empirical studies are developed for closed economies, and the degree of decentralization -measured by the relationship between subnational and total expenditures and revenue- is the variable to be explained. In few of these papers, the degree of decentralization within the subnational sector (municipal in relation to subnational expenditures and revenues) is studied (Wallis and Oates, 1988).

In the new international context there are new factors which can also explain fiscal decentralization. From an initial closed economy scenario, the international context generates movements in both directions, strengthening or weakening decentralization. On the one hand, due to the improvement in transport and communications, free trade enables to obtain goods at lower prices without the need of great extension, which weakens the argument of economies of scale in favor of centralization. Additionally, if there are differences in the preferences of the jurisdictions, the centralized government, in the new context, will have greater availability of information, which may also lead to reduce the heterogeneity of preferences and the advantages of decentralization. Moreover, information dissemination generates higher pressure for decision making at the local level since it increases the power of decision of the citizens against central governments.

On the other hand, the common market (openness) generates incentives for subnational governments to invest their revenues efficiently, which enables their jurisdictions to improve their competitive position (Quian and Weingast, 1997; Weingast, 1995, 2009). Globalization generates greater productive specialization of regions, non-coordinated business cycles among regions, and winner and loser jurisdictions and persons, which will demand national compensatory policies –insurance role (Rodrik, 1998).

Two obstacles arise for local government decentralization: on the one hand, the resistance of provincial governments to lose fiscal powers in favor of lower levels of government; on the other hand, direct interference from the national government on local governments. Some literature (de Figueiredo and Weingast, 2005; Oates, 2005) considers that within society and

the public sector there are forces that may weaken the structure and functioning of the federal system: 1) the intrusion of upper level of governments, which reduce the power of decentralized governments and can lead to the destruction of the federal system; 2) the opportunistic behavior of lower levels of government which seek to obtain benefits for their jurisdictions from transferring costs to the rest of the country. The stability and governance of the federal system is a delicate balance between these two forces.

Specifically for Brazil and Argentina, it is possible to find concrete examples of the facts previously mentioned. In Brazil the Constitution of 1988 recognizes three level of government –the Union, the States and the Municipalities. In contrast with other federal countries, the relationship between the three levels of government is between principals. The Constitution considers Municipalities as members of the Federation with broad autonomy. This autonomy is reflected at the state level by a lower vertical imbalance, but when full account of national regulations is introduced, it is clear that autonomy in decision making by subnational governments is considerably reduced. Something similar happens at the municipal level. Gomes (2012) documents that due to national regulations the index of autonomy of the states reduces from 77.1 percent to 48.6 percent, and the one corresponding to subnational governments (states plus municipalities) from 61.7 percent to 33 percent (year 2004). In Argentina, at least in the Constitution, the relationship between the nation and the provinces is between principals, but it looks distorted in practice by the interference of the central government. This intrusion is possible by the important vertical imbalance due to revenue centralization and expenditure decentralization. Provinces have weak and distortionary tax bases and poor access to credit. Moreover, the relationship between the provinces and their municipalities is of principal-agent type, that is, the political power of the provinces is strong in comparison with the one of the municipalities.<sup>3</sup> Provinces regulate the functions and resources of the municipal governments and dictate the regulations of transfers. In Argentina there is great national interference in subnational finances. Not only the total revenue is highly centralized (almost three quarters at the head of the national government), but also national regulations reduce the total amount and the power of decision making by subnational governments in relation to the destination of the transfers. The intricate

<sup>3</sup> An example is the failure of several of the provinces in fulfilling the mandate of the 1994 Constitution granting autonomy to the municipal level of government.

mechanism for the distribution of the national revenue between the Nation and the Provinces, and among provinces is a clear example (Berteau, 2012). The intrusion of the central government, which has concentrated on provincial governments for a long time, is now extended to municipal governments. One proof is the growing share of direct transferences to municipalities,<sup>4</sup> designed apparently to improve the local decision process and to strengthen decentralization but actually, it is a mean of political control of the municipalities.<sup>5</sup> The net result of various forces -economic, political and social- which operate in opposite directions is an empirical issue that is discussed in the next section.

The previous arguments are similar for resources, but there is an additional tension between centralization and decentralization. On one hand, the second generation theories of fiscal federalism recommend to decentralize revenues *pari passu* with expenditures to maintain fiscal discipline in the subnational sector. On the other hand, recent progress in communications and transports, which made possible high mobility of financial flows, goods and people, provide a stage for tax competition between countries within an economic union and between regions within a country, resulting in the need of coordination and harmonization. The problems of coordination and harmonization become more complex when the vertical structure of public sector is taken into account. If all the countries/regions have their revenue tax system centralized, the difficulty of harmonization will be lower.<sup>6</sup>

#### EMPIRICAL EVIDENCE

This section presents a brief review of empirical studies on the issue. The relationship between fiscal decentralization and economic integration has been subject of recent empirical studies with all the research referred

<sup>4</sup> Direct transfers from the national government to the municipalities in Argentina have increased suddenly in the recent times.

<sup>5</sup> Another recent example in Argentina is that due to the increase in agricultural prices, the price of rural land, which is taxed by the province and municipalities, also increases. The national government imposed taxes on the exports and captured the largest fraction of the increase on land rent, limiting the possibility of raising revenues of the municipalities. Provinces had a behavior similar to the nation. Municipalities, with less constitutional and political power, could not take advantage of the increasing value of this tax base.

<sup>6</sup> There is vast literature about fiscal coordination and harmonization in a common market, such as González-Páramo (1999), Sorensen (2004) and Rezende (2006).

to decentralization measured by the relationship between subnational expenditures (revenues) and total expenditures (revenues).

Garrett and Rodden (2003) estimate a panel data model for a heterogeneous set of 47 industrialized and developed countries for the period 1978-1997. They find a negative relationship between economic integration -measured by the degree of trade and/or financial openness of countries- and fiscal decentralization. As a measure of fiscal decentralization, they use the relationship between subnational public expenditure and total public expenditure, excluding tax-related measures. Stegarescu (2009) distinguishes -particularly in the case of the European Union- between economic integration (trade and financial openness) and political integration.<sup>7</sup> He uses a panel data model of twenty three countries of the OECD -relatively homogeneous in terms of being industrialized and democratic countries- for the period 1965-2001. The results show a positive and significant relationship (5 percent) between economic integration (trade and financial openness) and fiscal decentralization on the expenditure side. When they use a measure of decentralization on the tax side,<sup>8</sup> both integration measures have positive signs as previously, but only trade openness is significant (10 percent). Political integration measures have no significant effects on fiscal decentralization. Ermini and Santolini (2010) find, for a sample of sixteen OECD countries in the period 1978-1997, a positive and significant relationship between fiscal decentralization (both for expenditures and revenues) and the KOF globalization index proposed by Dreher (2006). Ermini and Santolini (2011) decompose the effects of the index taking into account the different dimensions that it

<sup>7</sup> The measures of political integration used are:

- a) a dummy variable which represents whether the country belongs or not to the European Union;
- b) a variable of interaction between this dummy variable and the participation of the expenditure of the European Union in relation to the total expenditure of the member states, which -unlike the previous one- captures the degree of progress in the political integration; and
- c) a variable that measures the different degrees of integration among countries (belonging to a free trade area, a custom union, an economic and monetary union, among others).

<sup>8</sup> The measure of revenue decentralization takes into account the revenue on which subnational governments have significant control (autonomous tax revenue) in relation to the total income of the public sector.



reflects: economic, political, and social integration.<sup>9</sup> They conclude that the main determinant of fiscal decentralization (both for expenditures and revenues) is social integration, and that the results found in Ermini and Santolini (2010) on the positive and significant correlation between fiscal decentralization and the global index KOF are mainly due to the increasing social interdependence between countries (that is, an increasing flow of social information, personal contacts and cultural proximity between countries). It is interesting to mention that the KOF economic index is not significant in most of the estimates.

Although this paper focuses on the subnational dimension of decentralization, estimates about the aggregate relationship between expenditure and revenue decentralization and trade openness are also carried out (Table A3 from Appendix).<sup>10</sup> The results show that the relationship is negative for expenditure decentralization in Argentina and not statistically significant when own revenues are considered. For Brazil, it is not significant both for revenues and expenditures. Because this is an estimate at an aggregate level, it is possible to approximate the relationship between decentralization and globalization through the KOF index (Table A4 from Appendix); the relationship is only positive and significant for the decentralization of expenditure and revenues in Brazil. As a novelty, the regional dimension of the aggregate measure has been studied (Porto, Porto and Tortarolo, 2014). In this case, the relationship at the level of each state/province is estimated using a dependent variable related to decentralization, which is called contribution of each

<sup>9</sup> The KOF index summarizes twenty three variables that relate different dimensions of economic, political and social integration. The index of economic integration is built with information about flows of trade and investment; and economic constraints such as barriers to imports, taxes on international trade and the capital account of the balance of payments. The index associated with the political dimension includes the presence of embassies in a country, participation in international treaties and international organizations, among OTHER VARIABLES. The social index is built with information of international tourism, information flows (using the internet, telephone) and cultural proximity. The KOF index can be found on <http://globalization.kof.ethz.ch/>.

<sup>10</sup> The aggregate measures of decentralization at the national level are the expenditures of subnational governments (states and municipalities) in relation to total expenditures:  $Dec_t^E = (E_s + E_m)_t / (E_s + E_m + E_r)_t$ , where  $E_m$  is the municipal expenditure by state,  $E_s$  is the subnational expenditure and  $E_r$  is the national expenditure. Similarly, the indicator for own resources is built. The economic openness indicator is measured by the ratio  $(X+M) / GDP$ .

state/province to the expenditure (revenue) decentralization. Contribution is negative and significant both for expenditures and revenues in Brazil, and negative or not significant in Argentina. The negative sign means that states which are more opened (measured by the relationship between exports and GDP), have a lower level of decentralization.<sup>11</sup>

Another branch of the literature refers to the relationship between the size of the public sector and trade openness. Among others, Alesina, Baqir and Easterly (2000) and Rodrik (1998) find a positive and significant relationship between the size of the government and the degree of exposure to international trade. This could be explained considering that public spending has an insurance role against adverse external shocks. Although they do not work with the division of expenditures among levels of government, most of the expenditures that have an insurance role are in the field of national governments. In all of the above mentioned cases, estimates include fiscal and non-fiscal aggregate variables, at country level.

## EMPIRICAL ANALYSIS FOR ARGENTINA AND BRAZIL

### DATA

This section presents an overview of the fiscal and foreign trade variables, of interest to this paper, at an aggregate level, for Argentina and Brazil, for the year 2005 (Table 1).

Population, area, density, income inequality (Gini coefficient) and poverty are higher in Brazil. Argentina shows a greater degree of urbanization and trade openness. The GDP per capita depends on the unit of measure: on the basis of purchasing power parity (PPP), the GDP per capita is greater in Argentina; however, in current US dollars in each country, they are similar. In Brazil, public expenditures, in terms of GDP, amount to 34.3 percent versus 27.3 percent in Argentina. In Brazil, expenditures are more centralized

<sup>11</sup> Expenditure decentralization in state  $i$ , in year  $t$ , is  $Dec_{it}^E = (E_s + E_m)_{it} / (E_s + E_m + E_r)_{it}$ .

If the national public good is Samuelsonian, that is, if all jurisdictions benefit with the same amount of the good ( $E_{ri}=E_r$ ), when comparing two jurisdictions, if  $(E_s + E_m)_i > (E_s + E_m)_j$ , fiscal decentralization is higher in  $i$  compared with  $j$ . Contribution to decentralization is used as a dependent variable assuming a uniform distribution of national expenditure in all jurisdictions  $Cont_{it}^E = (E_s + E_m)_{it} / (E_s + E_m + E_r)_t$ . Contribution is higher as decentralization is higher. This definition, which is a transformation of  $Dec_{it}^E$ , is used because the sum of contributions is equal to total decentralization.

(56.7 percent) than in Argentina (51.3 percent).<sup>12</sup> The reverse is true for public revenues: 76.4 percent in the national government in Argentina, and 69.6 percent in Brazil. Both countries show a public sector with vertical imbalance: the subnational government (state or provinces and municipalities) finances 77 percent of its expenditures with own revenues in Brazil, and 46.2 percent in Argentina. At the municipal level, the percentages are 43 percent and 52 percent, respectively. From the point of view of the insertion in international trade, trade openness -measured by exports plus imports in terms of GDP- is 27 percent in Brazil and 44 percent in Argentina. Using the KOF index, both countries present similar values for the aggregate (60 percent) with differences on the economic and social KOF, not on the political one.

**Table 1. Descriptive Statistics - Brazil and Argentina - Year 2005**

Variables	Brazil	Argentina
Population (in mill.) (1)	190.7	40.1
Area (in mill. km2) (1)	8.5	3.7
Population Density (hab/km2) (1)	22.4	10.7
Degree of Urbanization (%) (1)	81.2	89.4
Gini Index (2)	0.569	0.488
Incidence of Poverty (%) (3)	22.9	15.4
Trade Openness (X + M)/GDP (%) (4)	26.6	44.2
Openness (X / GDP) (%) (4)	15.1	25.1
Openness (M / GDP) (%) (4)	11.5	19.2
KOF Index (%) (5)	60.3	61.6
<i>Economic KOF</i>	57.0	51.5
<i>Social KOF</i>	41.8	50.0
<i>Political KOF</i>	92.1	93.0
GDP pc, PPP (constant 2005 U\$S) (6)	8509	10833
GDP pc (current U\$S) (6)	4743	4736
<b>Public Expenditures (% of GDP)</b>	<b>34.3</b>	<b>27.3</b>
<i>Nation (Union)</i>	19.5	14.0
<i>Provinces (States)</i>	10.1	10.6
<i>Municipalities</i>	4.6	2.7

<sup>12</sup> The intermediate or subnational levels consist of provinces and municipalities. States and provinces will be used indistinctly.

<b>Public Revenues (% of GDP)</b>	<b>37.2</b>	<b>29.7</b>
<i>Nation (Union)</i>	25.9	22.7
<i>Provinces (States)</i>	9.3	5.5
<i>Municipalities</i>	2.0	1.4
<b>Public Expenditures pc (U\$S)</b>	<b>1781.4</b>	<b>1377.1</b>
<i>Nation (Union)</i>	1012.5	706.1
<i>Provinces (States)</i>	527.1	533.4
<i>Municipalities</i>	241.8	137.6
<b>Public Revenues pc (U\$S)</b>	<b>1936.3</b>	<b>1498.4</b>
<i>Nation (Union)</i>	1344.5	1149.1
<i>Provinces (States)</i>	485.5	279.2
<i>Municipalities</i>	106.3	70.2
<b>Fiscal Correspondence % (Revenues/Expenditures)</b>	<b>108.7</b>	<b>108.8</b>
<i>Nation (Union)</i>	132.8	162.7
<i>Provinces (States)</i>	92.1	52.3
<i>Municipalities</i>	44.0	51.0
<b>Fiscal Decentralization %</b>		
<i>Subnational / Total – Expenditures</i>	43.2	48.7
<i>Subnational / Total – Revenues</i>	30.6	23.3
<i>Municipal / Subnational - Expenditures</i>	31.4	20.5
<i>Municipal / Subnational - Revenues</i>	18.0	33.6

Source: (1) Brazil: IBGE, Population Census 2010. Argentina: INDEC (National Institute of Statistics and Census), National Census of Population and Housing 2010. National Geographic Institute (IGN). (2) Brazil: Institute of Applied Economic Research (IPEA); Argentina: SEDLAC (CEDLAS and the World Bank). (3) SEDLAC. Poverty Line USD-2.50-a-day. (4) World Development Indicators (WDI), World Bank national accounts data. (5) Dreher (2006). (6) WDI, World Bank national accounts data. *Source Revenues and Expenditure: Brazil:* Nation: IBGE and Ministry of Finance-National Treasury Secretariat - IPEA and Finbra database The disaggregated data of expenditures and revenues from the FINBRA corpus do not match the consolidated data available from the Treasury. The tax correspondence coefficient is bigger when FINBRA data are used. As in this study data are disaggregated at the level of municipalities, the indicator –at a national level- is the sum of the contributions that each state makes to decentralization (Table 2). *Argentina:* Ministry of Economy and Production, Secretariat of Finance, National Budget Office (ONP) (1961-2004 period). Own estimates based on ONP (2005-2008 period).

**Table 2. Descriptive Statistics - States of Brazil - Year 2005**

States	Population	Area	Population Den-	Degree of Urba-	Trade	Openness (in%)	Gini Index	Incidence of	Relative GDP	Fiscal Decentralization		Fiscal Corresponden-			
	(in mill.)	(mill km <sup>2</sup> )	sity	nization (in %)	(in %)	(in %)	(3)	Poverty	pc	(subnat / total)	(municipal / subnat)	(Revenues / Expenditure)	ce (in %)		
	(1)	(1)	(1)	(1)	(2)	(2)	(3)	(3)	(4)	Expend	Reve- nue	Reve- nue	States		
	(1)	(1)	(1)	(1)	(2)	(2)	(3)	(3)	(4)	nue	Expend	nue	Subnat		
	(1)	(1)	(1)	(1)	(2)	(2)	(3)	(3)	(4)	nue	Expend	nue	Subnat		
Acre	0.7	0.16	4.5	66.4	0.7	0.583	47.4	65	0.25	0.06	16.0	6.5	27.9	10.3	25.1
Alagoas	3.1	0.03	112.3	68.0	10.1	0.566	60.5	41	0.55	0.17	30.9	10.5	42.5	11.2	32.8
Amapá	0.5	0.14	3.3	89.0	4.3	0.525	37.9	74	0.20	0.03	13.7	9.9	18.2	12.6	17.5
Amazonas	2.8	1.56	1.8	74.9	15.7	0.511	40.0	96	0.80	0.49	27.7	8.7	85.2	21.2	67.5
Bahía	14.0	0.56	24.8	67.1	16.0	0.554	51.4	56	2.38	1.32	30.6	8.7	79.3	17.1	60.2
Ceará	8.4	0.15	56.7	71.5	5.6	0.578	52.2	45	1.32	0.69	31.6	14.5	70.8	26.1	56.7
Espírito Santo	3.5	0.05	76.2	79.5	28.8	0.558	19.5	124	1.01	0.89	26.5	9.0	117.8	32.2	95.1
Goiás	6.0	0.34	17.7	87.9	8.8	0.557	20.5	82	1.27	0.79	30.3	14.2	84.0	32.0	68.3
Maranhao	6.6	0.33	19.8	59.5	14.4	0.521	60.0	36	0.73	0.22	39.6	10.4	49.4	8.8	33.3
Mato Grosso	3.0	0.90	3.4	79.4	27.0	0.523	21.0	121	0.84	0.53	29.3	8.9	88.2	20.7	68.5
Mato Grosso do Sul	2.4	0.36	6.9	84.1	12.9	0.533	20.6	85	0.67	0.43	31.2	14.1	86.6	31.2	69.3
Minas Gerais	19.6	0.59	33.4	82.0	17.1	0.527	19.8	87	4.20	2.98	34.5	14.7	100.5	32.7	77.1
Pará	6.2	1.25	5.0	66.5	29.9	0.514	44.7	51	1.01	0.43	35.6	12.0	63.6	15.7	46.6

Parafba	3.8	0.06	66.9	71.1	3.3	0.581	51.1	40	0.66	0.24	32.8	6.2	55.5	7.5	39.8
Paraná	10.4	0.20	52.4	81.4	19.3	0.539	21.6	107	2.24	1.66	34.3	20.8	97.0	48.7	80.4
Pernambuco	8.8	0.10	89.6	76.5	3.8	0.587	55.4	51	1.56	0.86	29.6	13.0	73.8	26.4	59.8
Piauí	3.1	0.25	12.4	62.9	1.3	0.591	57.1	32	0.48	0.14	32.5	12.3	40.6	11.8	31.2
Rio de Janeiro	16.0	0.04	365.3	96.0	8.1	0.557	21.5	139	4.82	3.76	31.9	21.9	97.3	58.3	84.8
Rio Grande do Norte	3.2	0.05	60.0	73.3	5.6	0.598	47.6	52	0.66	0.28	31.8	11.8	58.9	16.9	45.6
Rio Grande do Sul	10.7	0.27	39.8	81.6	17.7	0.520	20.6	115	2.74	2.04	30.3	18.2	94.8	48.3	80.7
Rondonia	1.6	0.24	6.6	64.1	3.8	0.568	37.6	76	0.39	0.18	25.6	5.2	65.2	10.3	51.2
Roraima	0.3	0.22	1.4	76.1	0.7	0.545	48.5	80	0.17	0.02	19.1	9.4	17.9	7.9	16.0
Santa Catarina	6.2	0.10	65.3	78.7	16.0	0.461	10.5	129	1.51	1.10	36.4	19.2	101.2	41.9	79.6
Sao Paulo	41.3	0.25	166.2	93.4	12.8	0.532	17.8	159	11.83	10.97	31.0	22.2	113.6	72.1	100.7
Sergipe	2.1	0.02	94.4	71.4	1.2	0.554	46.9	61	0.49	0.19	28.0	9.8	54.0	15.0	43.1
Tocantins	1.2	0.28	4.2	74.3	4.3	0.535	43.1	64	0.40	0.10	23.7	5.3	34.2	6.2	27.6
<b>Total Brazil *</b>	<b>190.7</b>	<b>8.50</b>	<b>22.4</b>	<b>81.2</b>	<b>13.4</b>	<b>0.569</b>	<b>30.8</b>	<b>100</b>	<b>43.2</b>	<b>30.6</b>	<b>31.4</b>	<b>18.0</b>	<b>92.1</b>	<b>44.0</b>	<b>77.0</b>

Source: (1) IBGE, Population Census 2010. (2) Foreign Trade Secretariat (SECEX), Department of Development and Planning of Foreign Trade (DEPLA). (3) IPEA and Base Finbra. (4) calculated by the relationship between the value of each state against the national average, multiplied by 100. Source revenues and expenditures: Ministry of Finance, National Treasury Secretariat. Base FINBRA and IPEA. \* Totals include Federal District. Subnational corresponds to provinces and municipalities. More descriptive statistics on decentralization within the subnational level and trade openness between 1985 and 2005 can be found in Table A1 of the Appendix.

**Table 3. Descriptive Statistics - Provinces of Argentina - Year 2005**

Provinces	Population	Area	Population Den-	Degree of Urba-	Trade Openness	Gini Index	Poverty NBI	Relative GDP pc	Fiscal Decentralization		Fiscal Corresponden-				
	(in mill.)	(mill km <sup>2</sup> )	sity (hab/km <sup>2</sup> )	nization (in %)	(in%)	(3)	(3)	(4)	(in %)	(municipal /	ce (in %)	(Revenues /			
	(1)	(1)	(1)	(1)	(2)	(3)	(3)	(4)	Expend	subnational)	Provin	Expenditure)			
									iture	total)	cipe				
									Reve-	Revenue	Revenue	Subnat			
									nue	Expend	Expend	cip			
									nue	nue	nue				
Buenos Aires	15.6	0.31	50.8	96.4	26.9	0.434	13.0	105	15.42	8.33	26.8	23.9	59.4	51.0	57.2
Catamarca	0.4	0.10	3.6	74.1	45.1	0.462	18.4	171	0.82	0.20	16.3	6.3	28.3	9.8	25.3
Chaco	1.1	0.10	10.6	79.7	7.5	0.451	27.6	52	1.57	0.34	15.2	11.5	24.1	17.5	23.1
Chubut	0.5	0.22	2.3	89.5	59.2	0.421	13.4	204	1.47	0.92	18.7	19.0	66.4	68.1	66.7
Córdoba	3.3	0.17	20.0	88.7	32.1	0.433	11.1	113	4.39	1.73	27.1	30.7	39.5	47.2	41.6
Corrientes	1.0	0.09	11.3	79.4	5.0	0.465	24.0	54	1.23	0.26	11.8	14.6	21.5	27.4	22.2
Entre Rios	1.2	0.08	15.7	82.5	23.5	0.432	14.7	75	1.83	0.62	19.3	24.3	33.7	45.2	35.9
Formosa	0.5	0.07	7.4	77.7	3.8	0.459	28.0	45	1.00	0.14	8.1	7.1	15.0	13.0	14.8
Jujuy	0.7	0.05	12.7	85.0	14.6	0.436	26.1	57	0.96	0.20	15.6	13.3	22.9	19.1	22.3
La Pampa	0.3	0.14	2.2	81.3	15.4	0.421	9.2	129	0.83	0.40	21.1	13.6	56.4	33.1	51.5
La Rioja	0.3	0.09	3.7	83.2	22.6	0.418	17.4	64	0.83	0.12	18.5	7.4	17.8	6.3	15.7
Mendoza	1.7	0.15	11.7	79.3	14.5	0.433	13.1	114	2.06	1.07	17.3	9.7	60.0	30.9	55.0

Misiones	1.1	0.03	37.0	70.4	18.2	0.418	23.5	54	1.26	0.35	11.9	13.7	28.5	33.6	29.1	
Neuquen	0.6	0.09	5.9	88.6	19.0	0.454	15.5	240	2.02	1.48	17.5	10.3	83.9	45.6	77.2	
Río Negro	0.6	0.20	3.1	84.4	18.0	0.451	16.1	104	1.14	0.49	13.8	13.6	45.7	44.8	45.5	
Salta	1.2	0.16	7.8	83.4	29.8	0.505	27.5	62	1.35	0.40	15.2	20.9	29.3	43.1	31.4	
San Juan	0.7	0.09	7.6	86.0	19.4	0.438	14.3	58	0.92	0.25	12.5	10.1	29.6	23.3	28.8	
San Luis	0.4	0.08	5.6	87.1	20.8	0.391	13.0	116	0.80	0.21	9.8	11.5	27.3	32.5	27.8	
Santa Cruz	0.3	0.24	1.1	96.1	30.1	0.403	10.1	352	1.37	0.78	15.9	8.2	65.7	31.0	60.2	
Santa Fe	3.2	0.13	24.0	89.2	55.3	0.413	11.9	116	3.98	1.82	27.3	27.6	48.1	48.7	48.2	
Santiago del Estero	0.9	0.14	6.4	66.1	6.7	0.484	26.2	48	1.12	0.22	13.2	10.0	21.4	15.6	20.6	
Tierra del Fuego	0.1	0.99	0.1	97.1	35.1	0.421	15.5	270	0.60	0.30	21.7	7.4	62.9	18.1	53.2	
Tucumán	1.4	0.02	64.3	79.5	18.7	0.446	20.5	56	1.85	0.67	19.8	11.6	42.4	22.5	38.5	
<b>Total</b>	<b>Argentina*</b>	<b>40.1</b>	<b>3.75</b>	<b>10.7</b>	<b>89.4</b>	<b>21.3</b>	<b>0.488</b>	<b>14.3</b>	<b>100</b>	<b>48.83</b>	<b>21.31</b>	<b>21.3</b>	<b>19.8</b>	<b>47.0</b>	<b>43.1</b>	<b>46.2</b>

Source: (1) INDEC (National Institute of Statistics and Census), National Census of Population and Housing 2010. National Geographic Institute (IGN). (2) National Census of Population and Housing 2001 (INDEC). (3) Exports by provincial origin, INDEC. (4) Cont, Peluffo and Porto (2009), corresponds to year 2004. (5) calculated by the relationship between the value of each province against the national average, multiplied by 100. *Source revenues and expenditures*: Ministry of Economy and Production, Secretariat of Finance, National Budget Office (ONP) (1961-2004 serie). Own estimates based on ONP (2005-2008 period). \*Total population and total trade openness includes City of Buenos Aires (2.9 million people and 0.7 percent, respectively). Subnational corresponds to provinces and municipalities. More descriptive statistics on decentralization within the subnational level and trade openness between 1985 and 2005 can be found in Table A2 of the Appendix.



Both countries show remarkable regional disparities (Tables 2 and 3). As an example and for the most important variables considered in this paper, in Brazil, subnational fiscal decentralization –measured by municipal expenditures in relation to the total expenditures of the provincial plus municipal levels of government in each state- varies between 39.6 percent and 13.7 percent for the year 2005; in Argentina, between 27.3 percent and 8.1 percent. For revenues, decentralization varies from 5.2 percent to 22.2 percent for Brazil, and from 6.3 percent to 30.7 percent for Argentina. Openness in 2005 –measured by the state exports in terms of its GDP- varies between 30 percent and around 1 percent in Brazil and between 60 percent and 4 percent in Argentina. This variability, which is also found in other fiscal and non-fiscal variables, leads to the main question of this paper: if, at the level of each state (Brazil) or province (Argentina), economic integration is accompanied by higher or lower subnational fiscal decentralization. Identifying this relation, at the level of subnational units, is one of the most novel aspects of this paper.

#### METHODOLOGICAL APPROACH

This section introduces the methodological approach for estimating the relationship between fiscal decentralization within the subnational level and economic openness. The main question of the paper is if the (local) municipal participation has increased or decreased within the subnational public sector (municipalities plus provinces/states) due to economic openness. In other words, if the vertical structure of the subnational public sector has been modified and, in that case, in which direction, due to economic openness.

The dependent variable is the municipal share of expenditures and revenues on the total subnational public sector in the state  $i$ , in the year  $t$ , that is,

$$Dec_{it}^E = \frac{(E_m)_{it}}{(E_m + E_s)_{it}}; \text{ and } Dec_{it}^R = \frac{(R_m)_{it}}{(R_m + R_s)_{it}}$$

where  $E_m$  is municipal expenditure by state;  $E_s$  is the state expenditure;  $R_m$  are municipal own revenues and  $R_s$  are own state revenues.

To estimate the relationship between decentralization and economic openness, a linear panel data model with fixed effects for states (provinces) is considered –in order to capture the effects of invariant factors over time but variable among jurisdictions that cannot be observed or quantified. Year fixed effects are also included to get the effects of invariant factors by jurisdictions which vary over time. The equation to estimate is,

$$Dec_{it} = \beta_0 + \beta_1 \cdot open_{it} + \beta_2 \cdot lpop_{it} + \beta_3 \cdot urb_{it} + \beta_4 \cdot lgdp_{pc_{it}} \\ + \beta_5 \cdot gini_{it} + \beta_6 \cdot fcorr_{it} + c_i + \eta_t + u_{it}$$

$i$  = states or provinces;  $t$  = 1985, ..., 2005

where  $c_i$  is the non-observed effect which is constant over time,  $\eta_t$  is the temporary intercept for each time period, and  $u_{it}$  are the idiosyncratic errors. States (provinces) and year effects can contribute to reduce significant biases.

The interest of this paper is based on the variable referred to as economic integration, measured by an indicator of trade openness (OPEN). At an aggregate level, openness is measured by the relationship between exports (X) and imports (M) and the GDP, that is,  $(X+M)_t/GDP_t$ . At the state or provincial level, there is only information on exports, so that it is used  $X_{it}/GDP_{it}$ .<sup>13</sup>

Control variables are those that the theory of fiscal federalism identifies as determinants of decentralization: population (POP), income (GDP), urbanization (URB), income inequality (GINI) and fiscal correspondence at the state/provincial level (FCORR = provincial own resources/provincial public expenditures). When studying decentralization at the subnational level, the variable FCORR is important since it is expected that if fiscal correspondence at the provincial level is high, it will also be high the degree of decentralization since the province would transfer expenditures and the corresponding funds to municipalities to finance them. If fiscal correspondence is low, the incentive to transfer expenditures –which generates political benefits– will be low because there are no political costs for the financing.

## ESTIMATES

Based on the methodology proposed, in this section the relationship between fiscal decentralization (of expenditures and revenues) of the subnational level and economic openness is estimated, taking into account a panel data for Brazilian states and Argentinian provinces for the period 1985-2005.

<sup>13</sup> The openness is measured by the relationship between exports and the GDP of each state or province. There is no reliable data on imports at the subnational level. The available data on imports at the state or provincial level refers to imports according to the importer's fiscal residence or entry port.

The basic estimate is made using a fixed effect model per state (province) and per year. An alternative specification considers year fixed effects and regional dummies,<sup>14</sup> and it shows more satisfactory results in terms of individual significance of the variables. The F test of joint significance on the regional and temporary dummies indicates the need to include them. The presence of heteroscedasticity and autocorrelation of first order in idiosyncratic errors,<sup>15</sup> reported by the modified Wald test for heteroscedasticity (Greene, 2000) and Wooldridge test for autocorrelation (Wooldridge, 2002) reveal the need to use the method of Panel Corrected Standard Errors (PCSE).<sup>16</sup>

A sequence of estimates was performed with OPEN -the variable which represents economic openness in each subnational unit- as the only independent variable. The result is that relations are positive and statistically significant for Brazil and they are only positive and significant for expenditures in Argentina.<sup>17</sup> Then population, GDP per capita, urbanization, fiscal correspondence and the Gini coefficient were added as controls. This last variable has a large amount of missing data in the panel corre-

<sup>14</sup> For Brazil, the regions are West-Central (Mato Grosso do Sul, Mato Grosso and Goiás), Northeast (Maranhao, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahía), North (Rondonia, Acre, Amazonas, Roraima, Pará, Amapá and Tocantins), Southeast (Minas Gerais, Espírito Santo, Río de Janeiro and Sao Paulo) and South (Paraná, Santa Catarina and Río Grande do Sul). In Argentina, regions correspond to Greater Buenos Aires (Buenos Aires), Northwest (Catamarca, Jujuy, La Rioja, Salta, Santiago del Estero and Tucumán), Northeast (Corrientes, Formosa, Misiones and Chaco), Cuyo (Mendoza, San Juan and San Luis), Pampa (Córdoba, La Pampa, Santa Fe and Entre Ríos) and Patagonia (Chubut, Neuquén, Río Negro, Santa Cruz and Tierra del Fuego).

<sup>15</sup> In this paper, idiosyncratic errors are not considered to be independent from time. For example, the level of expenditures or revenues in ( $t$ ) is probably associated with the level in ( $t - 1$ ).

<sup>16</sup> With this method, the parameters of the ordinary least squares model allowing consistent standard errors can be estimated when the idiosyncratic errors of each observation are not independent. Specifically, the aim is standard errors to be robust to the fact that each state or province has different variances in the error, and to the fact that each subnational observation is correlated with the observations of other states or provinces at different points in time. Beck and Katz (1995) show that the standard errors of this method are more accurate than those of the least squares generalized feasible model.

<sup>17</sup> These estimates are not included in the paper but they are available upon request to the authors.

sponding to Argentina, mainly in the early years, which substantially affects the results. For this reason, estimates are presented either including or excluding the Gini coefficient (Tables 4 and 5).

In the model with year fixed effects and regional dummies (model 2, shaded columns in tables), which is the preferred specification, the OPEN variable is positive and significant in Brazil for revenues but not for expenditures. For Argentina, the coefficients are not significantly different from zero for expenditures and revenues, which means that decentralization of fiscal variables is not modified when more open provinces are considered. One possible explanation for this lack of relationship is that the factors which work in opposite directions compensate their effects. Another explanation is that interferences from higher levels of government prevent modifications in the structure of the subnational public sector. The difference in the sign of the coefficients for revenue between the two countries may be explained by the broader tax bases of the intermediate level of government in Brazil. In fact Brazil finances more of its expenditures with its own revenues than Argentina.

The signs of the control variables vary between the two countries.<sup>18</sup>

Population is the only variable with the same sign, which is positive and significant, both for revenues and expenditures in the two countries. The sign is compatible with the theory of fiscal federalism: a large size of the states/provinces –population– implies decentralized expenditure to avoid congestion costs.

GDP per capita has a positive and significant sign both for revenues and expenditures in Argentina, but it is only positive and significant for expenditures in Brazil. The positive sign is expected from the theory of fiscal federalism because a higher GDP per capita permits to deal with higher administrative and decision-making costs of decentralized governments. It also permits to deal with the costs of tax administration and management of public expenditure.<sup>19</sup>

Urbanization, in general, is not a significant variable.<sup>20</sup> The result could be explained if the effects that act in different directions compensate

<sup>18</sup> In the model with year and state fixed effects (model 1) several variables modify the sign and the significance, thus requiring precaution in the interpretation of the results.

<sup>19</sup> For revenue decentralization for Brazil, GDPpc is significant but with a negative sign.

<sup>20</sup> It has a positive effect for revenues in Brazil and for expenditures in Argentina (only in the model 2 which includes the Gini and a small number of observations).



**Table 5. Estimate of expenditure decentralization. Brazil and Argentina, 1985-2005**

	Brazil		Argentina	
	(1)	(2)	(1)	(2)
<b>OPEN</b>	0.0023	0.0369	-0.0545*	0.0315
<i>(exports/GDP)</i>	[0.963]	[0.218]	[0.055]	[0.282]
<b>POP (in logs)</b>	-0.0117	0.0209***	0.0107	0.0194***
<i>(population)</i>	[0.725]	[0.442]	[0.687]	[0.128]
<b>URB</b>	0.0246	-0.0734*	-0.3056***	0.0601
<i>(urbanization)</i>	[0.773]	[0.465]	[0.143]	[0.147]
<b>FCORR</b>	0.0728***	0.1006***	0.0302**	-0.028
<i>(fiscal corresp.)</i>	[0.000]	[0.001]	[0.040]	[0.118]
<b>GDPpc (in logs)</b>	-0.0263*	-0.0407***	-0.0465***	0.0298**
<i>(per capita gdp)</i>	[0.057]	[0.057]	[0.002]	[0.019]
<b>GINI</b>	0.0234	0.0472	-0.0647	-0.0561
<i>(gini index)</i>	[0.770]	[0.542]	[0.310]	[0.393]
<b>Constant</b>	0.3872	0.1191	0.7023	-0.3521**
	[0.402]	[0.235]	[0.196]	[0.010]
<b>Obs. (states)</b>	531 (26)	455 (26)	483 (23)	483 (23)
<i>p-val Het</i>	0.0000	0.0000	0.0000	0.0000
<i>p-val AC</i>	0.0000	0.0006	0.0000	0.0001
<i>F test states</i>	0.0000	0.0000	0.0000	0.0000
<i>F test years</i>	0.0000	0.0000	0.0459	0.1366

Notes: OLS estimate with Panel Corrected Standard Errors (xtpssc in Stata 11.1). (1) State and year fixed effects; (2) year fixed effects and regional dummies.

p-value in brackets \* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

each other. According to the theory of fiscal federalism, many functions –that with a scattered population provides the central government (national, provincial)- could pass into the hands of subnational governments (provincial, municipal) when population concentrate in urban areas (zoo, policeman, and so on). In the same way, certain services of urban areas could arise (such us, transit police, traffic lights, urban control, etc.). In contrast, increased urbanization can generate strong interjurisdictional externalities that favor centralization.

Income inequality (GINI) becomes only statistically significant in the case of revenues, being negative in Brazil and positive in Argentina but only at 10 percent. The expected sign of the Gini coefficient is negative: greater inequality means more centralization to avoid migration and incompatible policies between different levels of government.

Fiscal correspondence (FCORR) measures the relationship between own revenues and expenditures at the state/provincial level. In Brazil, states with higher fiscal correspondence have higher expenditure decentralization. The government transfers expenditures to the municipalities. This reduces the political benefit of the expenditures but also diminishes the political cost because it allows tax reductions. For Argentina, the coefficient for expenditures is not significant. In both countries the sign of fiscal correspondence is negative and significant for revenues. In Brazil there is an asymmetry response of revenues and expenditures, which is a signal of potential conflicts between jurisdictions and a issue of concern for local governments. To increase their fiscal correspondence, the state governments implement policies that increase the relative share of the municipalities in expenditures and reduce it in revenues. The ways of adjustment at the municipal level will be higher transfers or deterioration in the quality of the services and/or debt. For Argentina, the coefficient of fiscal correspondence is negative for revenues. In this case, if provincial governments are in a fiscal stress situation and, as a consequence, increase the fiscal correspondence, this will have a negative impact over the share of municipalities in subnational revenues –maintaining the expenditure share relatively constant.<sup>21</sup>

To check the robustness of the results, the model is estimated with year fixed effects and regional dummies (model 2), including a dummy for

<sup>21</sup> For comparative purposes, the same sequence of estimates as in tables 4 and 5 was carried for the pooled model with and without fixed effects for years. The results are similar to previous ones; they are available from the authors.



**Table 6. Expenditure and revenue decentralization with a dummy for MERCOSUR - Brazil and Argentina - 1985-2005**

	Expenditure				Revenue			
	Brazil		Argentina		Brazil		Argentina	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<b>OPEN</b>	0.0332	0.0327	0.0315	0.0281	0.0864***	0.0983***	0.0401	0.0379
( <i>exports/GDP</i> )	[0.260]	[0.253]	[0.282]	[0.339]	[0.002]	[0.001]	[0.189]	[0.214]
<b>POP (in logs)</b>	0.0210***	0.0188***	0.0194***	0.0201***	0.0181***	0.0191***	0.0727***	0.0733***
( <i>population</i> )	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
<b>URB</b>	-0.0781**	-0.0944**	0.0601	0.0519	0.0955**	0.1117***	0.0135	0.0021
( <i>urbanization</i> )	[0.043]	[0.012]	[0.147]	[0.220]	[0.013]	[0.001]	[0.765]	[0.965]
<b>FCORR</b>	0.0991***	0.1029***	-0.028	-0.0313*	-0.1361***	-0.1431***	-0.4289***	-0.4318***
( <i>fiscal corresp.</i> )	[0.000]	[0.000]	[0.118]	[0.082]	[0.000]	[0.000]	[0.000]	[0.000]
<b>GDPpc (in logs)</b>	-0.0400***	-0.0418***	0.0298**	0.0325**	0.0306***	0.0312***	0.0769***	0.0791***
( <i>per capita gdp</i> )	[0.000]	[0.000]	[0.019]	[0.012]	[0.001]	[0.000]	[0.000]	[0.000]
<b>MERCOSUR</b>	0.1507***	0.0955***	0.0155**	0.0176***	-0.0467***	-0.0557***	-0.0495***	-0.0460***
(=1 <i>mercosur period</i> )	[0.000]	[0.000]	[0.025]	[0.010]	[0.000]	[0.000]	[0.000]	[0.000]
<b>Constant</b>	0.1199	0.1661*	-0.3521**	-0.4409***	-0.3629***	-0.3864***	-1.3023***	-1.2420***
( <i>states</i> )	[0.146]	[0.052]	[0.010]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
<b>Obs. (states)</b>	531 (26)	510 (25)	483 (23)	462 (22)	533 (26)	512 (25)	483 (23)	462 (22)

Note: OLS estimates with year fixed effects and regional dummies. (1) All the provinces/states; (2) Exclude Buenos Aires and San Pablo as outliers. p-value in brackets \* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.



outliers in both countries (San Pablo in Brazil and Buenos Aires in Argentina) and another dummy variable for distinguishing the periods pre-MERCOSUR and post-MERCOSUR, with a zero value between 1985 and 1992 and a one value between 1993 and 2005 (Table 6).<sup>22</sup> The main results of model 2 remain stable. MERCOSUR variable, which represents a common effect to all states or provinces, is statistically significant and positive in the case of expenditures and negative in the case of revenues. This implies –the rest of the variables being equal– that MERCOSUR, as an indicator of greater economic openness, is linked, on average, to lower revenue decentralization and higher expenditure decentralization. Considering the outliers, the previous results remain constant.

A summary of the sign and the significance of OPEN for estimates that include all the explanatory variables is presented in Table 7. With the exception for the significant and positive sign for revenues in Brazil, OPEN is not a significant explanatory variable. As previously mentioned, a possible explanation is that the lack of a significant relationship is due to effects which compensate each other. Another explanation is that national and subnational interferences could prevent changes in the structure of the subnational sector.

**Table 7. Relationship between decentralization and openness – summary**

	Expenditures		Own revenues	
	Brazil	Argentina	Brazil	Argentina
<i>Year and States fixed effects</i>	ns	(-) *	(+) ***	(-) *
<i>Year fixed effects and regional dummies</i>	ns	ns	(+) ***	ns
<i>Year fixed effects, regional dummies, MERCOSUR dummy and outliers</i>	ns	ns	(+) ***	ns

Note: ns: not significant. \* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

<sup>22</sup> In this case a specification is only estimated without including GINI since for Argentina. There is missing data in the initial years that would make irrelevant the inclusion of the variable MERCOSUR. Also, other estimates were tested, including a variable measuring the difference of product per capita between states/provinces and the particular conditions of provinces that receive oil and gas royalties. No significant results were obtained, and for that reason they are not included in the text. All exercises were also done considering fixed effects for states (provinces) with similar results. These results are available from the authors.

## CONCLUSIONS

In international literature, there are very few papers that investigate the determinants of subnational public sector decentralization; instead, they deal with it in contexts of closed economies. A novelty of this paper is to extend the study to open economies. The main question is if the (local) municipal participation has increased or decreased within the sub-national public sector (municipalities plus provinces/states) due to economic openness (ratio between exports and GDP).

The results show no relationship between subnational decentralization and economic openness since the estimated coefficients are only significant (positive) for revenues in Brazil. The control variables have signs compatible with the theory of fiscal federalism; in particular, population (positive and significant in all cases), GDP per capita (positive and significant for expenditures and revenues in Argentina, and for expenditures in Brazil) and provincial/state fiscal correspondence (positive for expenditures and/or negative for revenues).

The expected broader role for local governments is not confirmed in the estimates, which reveal rigidity in the vertical structure of the subnational public sector, both at the aggregate level and at the subnational level, to changes in the economic openness. The bids and tensions between the levels of government can explain this rigidity (de Figueiredo and Weingast, 2005; Oates, 2005; Boadway and Shah, 2009). National and provincial governments have constitutional and political roles stronger than those of local governments and they pose obstacles in the path of decentralization at least in the short and medium term. Two obstacles are in the way: on the one hand, the resistance of provincial governments to lose fiscal powers in favor of lower levels of government; on the other hand, direct interference from the national government to local governments.<sup>23</sup>

To the extent that the mentioned phenomena linked to modernity are, as they are, irreversible phenomena, their forces will join to the other variables that lead to greater relative participation of local governments. The challenge is to modernize and strengthen them so that they can face the new stage. To achieve this, they must overcome the barriers from higher levels of government.

<sup>23</sup> These interferences generate opportunistic behavior of subnational governments seeking to obtain benefits for their jurisdictions by transferring costs to the rest of the country.

In summary, there is not a clear result in the scarce literature which studies decentralization measured by the relationship between subnational expenditures (revenues) as a percentage of the public total expenditures (revenues). When the relationship between subnational sector decentralization and economic openness for Argentina and Brazil is estimated, the results, again, are not conclusive. The variety of results -which may be due, among other factors, either to the various definitions of the dependent and independent variables, to the different econometric methods, or to the countries and periods covered- invite to keep the topic on the agenda of research.

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**Table A1. Descriptive statistics. Decentralization measures within the subnational level and trade openness. Brazil**

	Expenditure Decentralization						Revenue Decentralization						Trade Openness (X/GDP)												
	1985-1989		1990-1994		1995-2000		2001-2005		1985-1989		1990-1994		1995-2000		2001-2005		1985-1989		1990-1994		1995-2000		2001-2005		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Acre	15.1 (5.9)	7.4 (3.7)	17.8 (3.6)	17.3 (2.0)	14.1 (11.0)	6.7 (7.3)	11.0 (3.4)	8.5 (3.4)	8.5 (3.4)	0.6 (0.6)	0.5 (0.1)	0.2 (0.2)	0.6 (0.1)	20.7 (1.8)	25.3 (3.8)	32.9 (4.2)	34.2 (6.2)	7.9 (3.8)	7.8 (7.2)	11.6 (2.2)	10.2 (2.2)	9.8 (2.1)	9.7 (1.7)	6.7 (1.9)	9.7 (0.6)
Alagoas	7.9 (3.5)	4.8 (3.8)	11.7 (2.6)	13.1 (2.0)	34.9 (24.0)	6.5 (6.1)	14.6 (3.4)	9.8 (3.9)	13.0 (4.4)	7.4 (3.3)	5.1 (1.4)	2.8 (1.2)	21.2 (8.9)	15.6 (11.6)	25.1 (4.3)	27.3 (2.3)	6.4 (5.6)	3.9 (4.8)	9.0 (2.4)	8.7 (1.4)	1.5 (0.4)	2.2 (0.5)	3.0 (2.6)	13.4 (2.8)	
Amazonas	21.5 (1.4)	27.2 (4.4)	31.1 (7.7)	31.4 (2.6)	10.0 (4.9)	6.5 (3.3)	11.0 (2.8)	10.0 (2.2)	12.1 (3.2)	8.8 (1.0)	6.2 (0.8)	13.4 (2.7)	21.0 (5.0)	26.0 (5.9)	34.3 (5.2)	31.7 (4.1)	7.0 (4.7)	6.0 (6.0)	11.7 (3.1)	14.2 (1.7)	5.7 (1.2)	4.1 (0.6)	2.9 (0.9)	6.2 (0.8)	
Ceará	24.1 (4.2)	27.3 (1.2)	27.7 (2.3)	28.5 (4.0)	9.8 (2.7)	10.8 (4.4)	11.7 (2.1)	10.5 (1.8)	30.7 (3.9)	26.9 (3.7)	19.4 (3.5)	29.4 (3.5)	20.9 (3.0)	24.9 (3.5)	38.0 (7.9)	30.2 (2.6)	6.6 (1.4)	7.8 (3.9)	11.7 (1.9)	12.9 (1.4)	2.4 (1.6)	3.5 (0.3)	3.0 (0.9)	7.2 (1.7)	
Goiás	23.2 (5.5)	28.8 (3.3)	28.7 (5.5)	35.0 (2.9)	2.6 (1.5)	9.4 (5.4)	14.9 (3.0)	11.9 (3.8)	13.4 (5.9)	15.4 (1.5)	12.2 (2.4)	13.6 (1.9)	19.7 (5.9)	25.0 (3.7)	30.4 (3.8)	29.7 (2.1)	5.8 (1.1)	6.9 (2.4)	9.6 (2.5)	9.5 (1.6)	5.0 (2.2)	8.3 (1.0)	9.7 (2.9)	24.7 (1.6)	
Matô Grosso	20.7 (3.4)	23.8 (4.0)	29.5 (5.0)	29.8 (3.3)	8.3 (5.0)	7.7 (3.6)	13.4 (4.4)	13.7 (0.7)	4.1 (2.7)	4.4 (1.3)	3.6 (0.8)	9.1 (2.2)	21.2 (3.0)	26.4 (1.4)	31.1 (6.0)	33.0 (1.7)	8.3 (2.5)	9.9 (3.8)	13.9 (2.7)	15.3 (1.0)	14.3 (2.4)	13.6 (1.9)	9.8 (1.9)	15.2 (1.8)	
Minas Gerais	24.9 (3.1)	25.1 (2.5)	27.1 (5.1)	35.4 (4.6)	9.3 (2.3)	7.9 (5.9)	11.5 (2.4)	13.4 (2.6)	22.3 (6.3)	21.1 (5.0)	18.6 (3.7)	27.9 (2.7)	22.5 (2.5)	25.9 (3.4)	28.5 (7.4)	33.7 (3.6)	6.7 (1.9)	8.0 (3.4)	8.8 (4.9)	6.3 (3.0)	2.9 (0.6)	2.1 (0.4)	1.4 (0.3)	3.3 (0.7)	
Paraná	29.2 (1.9)	36.6 (2.4)	33.0 (4.5)	31.8 (2.7)	11.7 (2.2)	16.5 (6.3)	21.5 (4.0)	22.8 (1.3)	12.0 (3.5)	10.0 (1.6)	10.0 (1.6)	19.6 (1.9)	21.8 (0.6)	23.7 (1.3)	30.2 (4.5)	29.0 (1.9)	9.6 (1.4)	9.9 (5.8)	14.5 (2.8)	13.4 (0.7)	4.5 (0.9)	3.5 (0.5)	1.9 (0.5)	3.1 (0.6)	
Pernambuco	21.5 (4.3)	22.6 (3.3)	25.3 (5.0)	31.0 (2.9)	8.1 (5.7)	7.6 (5.9)	9.0 (1.0)	13.0 (4.1)	2.8 (0.8)	2.7 (0.8)	1.8 (0.4)	20.9 (5.7)	17.5 (4.9)	31.1 (6.2)	32.0 (2.3)	16.4 (5.5)	12.7 (9.5)	25.4 (3.7)	23.3 (1.3)	5.6 (1.4)	4.2 (0.6)	2.3 (0.3)	7.1 (2.1)		
Piauí	22.4 (3.7)	24.0 (2.9)	26.7 (4.3)	33.6 (4.5)	12.4 (5.4)	9.9 (5.0)	13.8 (4.4)	13.1 (1.8)	2.7 (0.6)	2.9 (0.4)	2.0 (0.6)	6.7 (2.5)	20.0 (3.6)	24.7 (2.2)	28.5 (5.3)	32.0 (2.7)	8.2 (1.7)	9.8 (2.2)	12.3 (3.6)	17.9 (1.6)	15.3 (2.8)	13.0 (2.4)	10.2 (1.6)	18.4 (2.0)	
Rio Grande do Sul	12.7 (1.0)	29.2 (28.4)	20.7 (5.6)	26.9 (2.3)	9.4 (3.3)	16.9 (19.1)	8.5 (3.0)	7.6 (1.6)	2.3 (1.2)	1.3 (0.5)	1.3 (0.5)	3.1 (0.6)	5.4 (3.7)	5.0 (6.8)	13.0 (3.0)	18.8 (3.9)	4.7 (4.4)	4.0 (5.5)	12.0 (2.4)	11.1 (2.5)	0.0 (0.0)	1.1 (1.1)	0.6 (0.4)	0.7 (0.2)	
Roraima	25.6 (2.5)	30.0 (1.0)	33.7 (5.0)	34.9 (4.3)	7.1 (0.6)	11.8 (2.7)	15.2 (3.2)	18.4 (2.6)	13.2 (2.9)	13.2 (2.5)	10.5 (1.6)	16.6 (1.2)	26.4 (4.6)	24.9 (4.3)	34.9 (10.6)	32.4 (2.5)	13.7 (3.7)	12.8 (5.6)	19.7 (5.2)	21.6 (0.8)	11.1 (1.9)	9.4 (1.5)	7.4 (1.7)	12.6 (1.0)	
Santa Catarina	25.0 (3.3)	21.0 (2.0)	22.8 (2.3)	27.6 (2.4)	11.6 (4.5)	6.3 (3.0)	10.8 (3.7)	13.1 (3.1)	1.6 (0.4)	1.5 (0.5)	0.9 (0.3)	1.0 (0.3)	18.1 (5.8)	29.1 (2.9)	25.7 (6.0)	6.6 (3.6)	12.7 (1.8)	6.0 (2.0)	6.0 (2.0)	0.2 (0.2)	0.5 (0.3)	2.3 (1.8)			
Sergipe	20.6	22.7	27.8	29.5	10.0	8.9	13.1	12.9	8.4	7.3	5.8	10.4	20.6	22.7	27.8	29.5	10.0	8.9	13.1	12.9	8.4	7.3	5.8	10.4	
Tocantins	18.1	5.8	29.1	2.9	25.7	6.0	6.6	3.6	12.7	1.8	6.0	2.0	0.2	0.2	0.5	0.3	2.3	1.8							
<b>Total</b>	<b>20.6</b>	<b>22.7</b>	<b>27.8</b>	<b>29.5</b>	<b>10.0</b>	<b>8.9</b>	<b>13.1</b>	<b>12.9</b>	<b>8.4</b>	<b>7.3</b>	<b>5.8</b>	<b>10.4</b>													

Source: Ministry of Finance, National Treasury Secretariat Base FINBRA e IPEA, Foreign Trade Secretariat (SECEX), Department of Development and Planning of Foreign Trade (DEPLA).

**Table A2. Descriptive statistics. Decentralization measures within the subnational level and trade openness. Argentina**

	Expenditure Decentralization						Revenue Decentralization						Trade Openness (X/GDP)											
	1985-1989		1990-1994		1995-2000		2001-2005		1985-1989		1990-1994		1995-2000		2001-2005		1985-1989		1990-1994		1995-2000		2001-2005	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Buenos Aires	24.8 (3.2)	31.4 (1.6)	26.7 (1.2)	26.7 (0.7)	30.0 (3.1)	31.1 (2.2)	27.9 (2.1)	25.8 (3.1)	7.4 (2.8)	6.7 (0.7)	10.4 (0.6)	23.9 (7.0)	29.3 (13.2)	24.0 (8.2)	16.8 (0.7)	15.8 (1.4)	19.6 (6.4)	28.9 (7.2)	18.5 (7.0)	7.7 (1.5)	0.2 (0.2)	6.2 (0.8)	14.2 (12.3)	36.5 (9.4)
Catamarca	8.5 (1.7)	14.9 (1.6)	14.3 (1.1)	15.1 (1.3)	21.3 (6.4)	35.5 (3.9)	24.4 (3.4)	18.1 (5.2)	6.3 (1.5)	6.2 (2.1)	8.6 (3.3)	9.4 (3.2)	9.3 (1.3)	17.2 (0.5)	18.3 (1.2)	19.5 (1.0)	4.5 (3.7)	30.4 (7.7)	33.3 (2.7)	21.6 (3.8)	13.4 (3.8)	13.5 (3.7)	26.8 (3.9)	56.5 (12.7)
Chaco	20.9 (4.5)	28.8 (0.8)	30.9 (1.4)	27.1 (1.1)	32.9 (6.8)	34.7 (1.8)	33.2 (0.8)	32.1 (1.7)	3.5 (1.4)	5.5 (2.5)	12.8 (1.2)	29.4 (8.5)	7.4 (1.0)	11.6 (1.3)	12.6 (0.7)	13.7 (1.3)	17.7 (5.5)	23.2 (1.0)	23.0 (2.2)	24.2 (6.4)	2.1 (1.1)	1.8 (0.9)	3.6 (0.6)	5.2 (1.7)
Corrientes	14.9 (3.1)	22.5 (1.2)	19.7 (1.0)	18.8 (0.7)	24.7 (4.2)	33.2 (3.0)	27.0 (3.5)	28.5 (2.8)	5.7 (2.3)	4.4 (0.9)	7.1 (1.3)	18.6 (6.9)	6.9 (1.1)	8.6 (0.4)	8.5 (0.5)	7.9 (0.3)	9.2 (3.7)	12.6 (2.0)	16.7 (3.4)	17.3 (8.1)	0.1 (0.1)	1.5 (1.0)	2.5 (1.3)	3.1 (1.3)
Formosa	11.7 (1.9)	13.3 (2.8)	17.4 (2.1)	17.5 (2.1)	11.8 (4.4)	8.9 (3.2)	17.9 (6.5)	20.5 (5.0)	5.2 (1.5)	5.1 (2.6)	5.7 (1.1)	11.2 (3.6)	9.7 (2.7)	19.0 (0.8)	19.5 (1.6)	19.7 (2.1)	9.0 (3.6)	18.3 (3.4)	20.3 (1.2)	19.5 (3.4)	0.4 (0.1)	2.7 (3.0)	6.7 (1.1)	12.5 (4.5)
La Pampa	10.2 (2.4)	18.1 (2.0)	21.5 (2.4)	20.3 (1.2)	15.9 (10.0)	12.6 (1.7)	12.0 (4.8)	9.1 (1.3)	0.7 (0.5)	2.5 (2.2)	9.8 (1.2)	25.1 (7.7)	10.2 (2.4)	18.1 (2.0)	21.5 (2.4)	20.3 (1.2)	15.9 (10.0)	12.6 (1.7)	12.0 (4.8)	9.1 (1.3)	0.7 (0.5)	2.5 (2.2)	9.8 (1.2)	25.1 (7.7)
Mendoza	10.7 (2.9)	18.3 (1.9)	16.0 (1.5)	16.2 (1.0)	6.2 (1.3)	10.3 (2.6)	9.8 (1.7)	10.4 (0.5)	3.8 (2.8)	5.3 (0.8)	7.9 (0.6)	15.5 (5.2)	10.4 (2.6)	13.7 (0.5)	10.8 (0.6)	11.0 (0.7)	23.2 (4.2)	24.8 (2.4)	20.3 (3.0)	17.9 (3.7)	6.6 (1.7)	5.2 (1.3)	7.0 (0.7)	18.4 (6.5)
Misiones	7.6 (1.7)	15.6 (2.3)	16.2 (1.7)	17.3 (0.3)	3.7 (1.3)	13.6 (3.7)	14.3 (0.3)	12.3 (1.9)	1.2 (0.4)	5.3 (5.5)	17.1 (2.1)	24.2 (5.4)	8.8 (1.8)	16.5 (2.2)	15.2 (1.1)	14.4 (1.0)	11.4 (2.2)	20.1 (1.4)	19.6 (1.5)	17.1 (2.8)	7.3 (1.9)	6.6 (0.8)	10.6 (1.0)	18.0 (4.4)
Río Negro	11.8 (1.9)	14.0 (0.8)	14.4 (0.6)	15.2 (1.0)	9.4 (3.7)	19.5 (1.5)	21.1 (2.1)	21.6 (5.8)	6.6 (1.8)	5.7 (1.5)	10.0 (0.9)	25.2 (7.3)	8.8 (1.9)	14.0 (0.8)	14.4 (0.6)	15.2 (1.0)	9.4 (3.7)	19.5 (1.5)	21.1 (2.1)	21.6 (5.8)	6.6 (1.8)	5.7 (1.5)	10.0 (0.9)	25.2 (7.3)
Salta	7.5 (1.5)	11.3 (0.8)	13.2 (1.4)	13.5 (1.0)	13.3 (8.4)	28.5 (14.4)	12.3 (2.6)	12.8 (1.8)	1.9 (1.4)	2.1 (0.5)	5.2 (1.0)	14.8 (5.5)	9.2 (1.5)	14.3 (1.5)	11.2 (1.2)	9.4 (1.4)	25.7 (4.4)	34.0 (13.5)	11.8 (2.2)	10.6 (1.8)	0.5 (0.5)	2.5 (1.6)	10.8 (1.7)	21.3 (4.6)
San Juan	11.8 (1.5)	14.9 (1.4)	12.4 (0.9)	13.2 (2.4)	9.5 (5.7)	21.7 (5.3)	12.0 (2.4)	8.7 (0.8)	9.4 (4.6)	14.9 (5.6)	32.3 (6.0)	39.3 (8.7)	11.8 (1.5)	14.9 (1.4)	12.4 (0.9)	13.2 (2.4)	9.5 (5.7)	21.7 (5.3)	12.0 (2.4)	8.7 (0.8)	9.4 (4.6)	14.9 (5.6)	32.3 (6.0)	39.3 (8.7)
Santa Fe	19.4 (2.7)	28.0 (1.1)	27.4 (1.7)	26.8 (1.4)	29.2 (5.1)	34.2 (7.2)	28.6 (0.9)	30.1 (2.0)	7.1 (3.2)	10.0 (4.6)	20.8 (1.3)	52.8 (17.0)	10.4 (1.7)	14.6 (0.9)	16.6 (0.9)	14.7 (1.6)	16.6 (13.2)	41.5 (21.0)	16.9 (1.2)	14.7 (3.1)	0.4 (0.2)	1.3 (1.1)	5.7 (1.8)	9.0 (4.5)
Santiago del Estero	11.0 (3.7)	23.5 (1.4)	22.0 (1.8)	20.2 (2.0)	3.1 (4.6)	24.1 (12.2)	19.3 (2.5)	10.8 (4.3)	1.6 (0.7)	9.6 (4.9)	16.3 (2.4)	37.2 (13.7)	13.6 (2.3)	21.2 (2.3)	22.1 (1.8)	19.6 (0.5)	28.5 (10.0)	42.0 (11.9)	26.8 (2.9)	17.0 (5.3)	3.6 (1.6)	3.7 (1.1)	7.6 (0.6)	17.5 (5.7)
Tucumán	12.4 (2.4)	18.1 (1.7)	17.5 (1.5)	17.1 (1.6)	16.4 (10.0)	25.4 (11.9)	20.3 (2.9)	17.8 (5.3)	4.1 (2.2)	5.3 (1.1)	11.3 (2.8)	22.8 (7.5)	12.4 (2.4)	18.1 (1.7)	17.5 (1.5)	17.1 (1.6)	16.4 (10.0)	25.4 (11.9)	20.3 (2.9)	17.8 (5.3)	4.1 (2.2)	5.3 (1.1)	11.3 (2.8)	22.8 (7.5)
<b>Total</b>	<b>12.4 (2.4)</b>	<b>18.1 (1.7)</b>	<b>17.5 (1.5)</b>	<b>17.1 (1.6)</b>	<b>16.4 (10.0)</b>	<b>25.4 (11.9)</b>	<b>20.3 (2.9)</b>	<b>17.8 (5.3)</b>	<b>4.1 (2.2)</b>	<b>5.3 (1.1)</b>	<b>11.3 (2.8)</b>	<b>22.8 (7.5)</b>	<b>12.4 (2.4)</b>	<b>18.1 (1.7)</b>	<b>17.5 (1.5)</b>	<b>17.1 (1.6)</b>	<b>16.4 (10.0)</b>	<b>25.4 (11.9)</b>	<b>20.3 (2.9)</b>	<b>17.8 (5.3)</b>	<b>4.1 (2.2)</b>	<b>5.3 (1.1)</b>	<b>11.3 (2.8)</b>	<b>22.8 (7.5)</b>

Source: Ministry of Economy and Production, Secretariat of Finance, National Budget Office (ONP) (1961-2004 series). Own estimates based on ONP (2005-2008 series). Exports by provincial origin, INDEC.

**Tabla A3. Expenditure and revenue decentralization at the aggregate level and trade openness. Brazil and Argentina, 1985-2005**

	Expenditures				Revenues			
	Brazil		Argentina		Brazil		Argentina	
	CSS	SSS	CSS	SSS	CSS	SSS	CSS	SSS
<b>OPEN</b>	0.2831	0.3442	-0.1246*	-0.3340***	-0.2337	-0.3697	0.1244	0.0515
<i>(x+m/gdp)</i>	[0.455]	[0.395]	[0.085]	[0.010]	[0.603]	[0.477]	[0.463]	[0.774]
<b>POP (logs)</b>	-0.655	-0.6403	0.2843	0.1055	-2.7185**	-2.9455**	-0.3108	-0.4607
<i>(population)</i>	[0.437]	[0.475]	[0.175]	[0.759]	[0.013]	[0.019]	[0.534]	[0.390]
<b>GDPpc (logs)</b>	0.0045	0.0351	0.067	0.1121	1.4382**	1.6565**	-0.0866	-0.1043
<i>(per capita gdp)</i>	[0.992]	[0.939]	[0.299]	[0.303]	[0.012]	[0.012]	[0.578]	[0.530]
<b>MERCOSUR</b>	0.0642	0.1177**	-0.0202	0.0656**	-0.0503	-0.035	0.0679	0.0888*
<i>(=1 mercosur period)</i>	[0.165]	[0.024]	[0.285]	[0.048]	[0.353]	[0.572]	[0.146]	[0.080]
<b>Constant</b>	3.6619**	3.3408**	-1.1069**	-0.75	1.622	0.9245	2.0564*	2.8039**
	[0.017]	[0.037]	[0.033]	[0.361]	[0.338]	[0.632]	[0.094]	[0.037]
<b>Observations</b>	21	21	21	21	21	21	21	21
<b>R-squared</b>	0.347	0.290	0.632	0.787	0.550	0.424	0.146	0.269

Notes: OLS estimates. CSS: expenditures/revenues of social security are included in the dependent variable; SSS: expenditures/revenues of social security are not included. p-value in brackets \* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

**Tabla A4. Expenditure and revenue decentralization at the aggregate level and KOF index. Brazil and Argentina, 1985-2005**

	Expenditures				Revenues			
	Brazil		Argentina		Brazil		Argentina	
	CSS	SSS	CSS	SSS	CSS	SSS	CSS	SSS
<b>KOF</b>	2.3895***	2.5390***	-0.2778	-0.1291	2.1427**	2.4563**	0.5851	0.4725
<i>(KOF index)</i>	[0.003]	[0.003]	[0.301]	[0.803]	[0.033]	[0.036]	[0.335]	[0.462]
<b>POP (logs)</b>	-2.3826***	-2.4406**	0.1221	-0.5094	-4.6654***	-5.2604***	-0.2391	-0.4985
<i>(population)</i>	[0.009]	[0.012]	[0.500]	[0.161]	[0.001]	[0.001]	[0.559]	[0.260]
<b>GDPpc (logs)</b>	0.4410	0.4921	0.1155*	0.2057	1.9079***	2.2113***	-0.1531	-0.1454
<i>(per capita gdp)</i>	[0.226]	[0.211]	[0.097]	[0.129]	[0.001]	[0.001]	[0.318]	[0.371]
<b>MERCOSUR</b>	-0.0470	-0.0022	0.0031	0.0875	-0.1305**	-0.1228*	0.0245	0.0557
<i>(=1 mercosur period)</i>	[0.285]	[0.963]	[0.907]	[0.101]	[0.038]	[0.087]	[0.679]	[0.382]
<b>Constant</b>	7.4592***	7.2668***	-0.8494*	0.5755	6.2493***	6.4843**	2.1175*	3.0671**
	[0.000]	[0.000]	[0.093]	[0.545]	[0.007]	[0.015]	[0.067]	[0.017]
<b>Observations</b>	21	21	21	21	21	21	21	21
<b>R-squared</b>	0.620	0.577	0.583	0.675	0.658	0.552	0.167	0.290

Notes: OLS estimates. CSS: expenditures/revenues of social security are included in the dependent variable; SSS: expenditures/revenues of social security are not included. p-value in brackets \* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.