Fiscal disparities in Uruguay's regions: the role of a new system of intergovernmental equalization transfers

Leonel Muinelo-Gallo, Joana Urraburu Bordon and Pablo Castro Scavone

Abstract

This article conducts an empirical analysis of the role of intergovernmental transfers in a group of regions (departments) in Uruguay during the period 2006–2014. It examines the structure and evolution of regional fiscal disparities and the equalizing effects of the current transfer system. It then proposes an innovative methodology for simulating the effects of a new system of equalization transfers. The main finding is that implementing this new system would help to consolidate greater territorial fiscal homogeneity in Uruguay.

Keywords

Fiscal policy, tax administration, regional disparities, tax revenues, regional development, Uruguay

JEL classification

C33, H77, R11

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I. Introduction

The present article conducts an empirical analysis of the macroeconomic role of intergovernmental transfers in Uruguay.

One of the fundamental purposes of intergovernmental transfers is to lessen fiscal imbalances between units of government at the same level; more specifically, to reduce or remove any differences in the ability of units at the same level of government (e.g., different subnational governments) to generate resources of their own and execute spending.

Intergovernmental transfers are an extremely important tool for promoting regional fiscal cohesion in developed countries. The European Union's model of territorial cohesion, embodied in its European Structural and Investment Funds programme, is a clear example of this (Böhme, 2009). Likewise, most Organization for Economic Cooperation and Development (OECD) countries use redistribution programmes to reduce fiscal disparities at the regional level. In this way, these countries manage to reduce regional fiscal disparities by an average of more than two thirds (Martínez-Vázquez, 2015). The importance of designing an equalization transfer system lies in the fact that having a more fiscally homogeneous territory makes it possible to attain a minimum standard of subnational public service provision of a similar quality, thus avoiding inefficient migrations of resources within the country (Martínez-Vázquez and Sepúlveda, 2011). Likewise, such an equalization system can provide considerable support to an orderly fiscal decentralization agenda. Lastly, greater fiscal cohesion results in more balanced territorial development, with deconcentration of political power and economic activity (Martínez-Vázquez and Sepúlveda, 2012).

Uruguay has been seeking to move towards a greater degree of territorial decentralization since its constitutional reform of 1996.[1] It is important to realize that this process could lead to an increase in horizontal fiscal disparities by disadvantaging subnational governments with large spending needs or limited local revenue sources. In fact, although Uruguay is a small country, there are large fiscal differences between its different departmental governments. Map 1 shows these disparities, going by the different levels of per capita expenditure executed by the 19 departmental governments in the period under analysis.[2]

Map 1 reveals significant differences in per capita expenditure. Since all departmental governments in Uruguay must provide exactly the same public services, these differences would be expected to have considerable effects on the quantity and quality of public services provided by each of these governments.

Bearing in mind the context, this article conducts an empirical analysis of the effect of intergovernmental transfers on regional fiscal disparities in the group of 19 departments in Uruguay for the period 2006–2014. The statistical information available limits the analysis to this period because the departmental government of Montevideo began to receive transfers from central government only in 2006. However, this is a period of nine years, which we consider long enough to evaluate the relationships posited in this article.

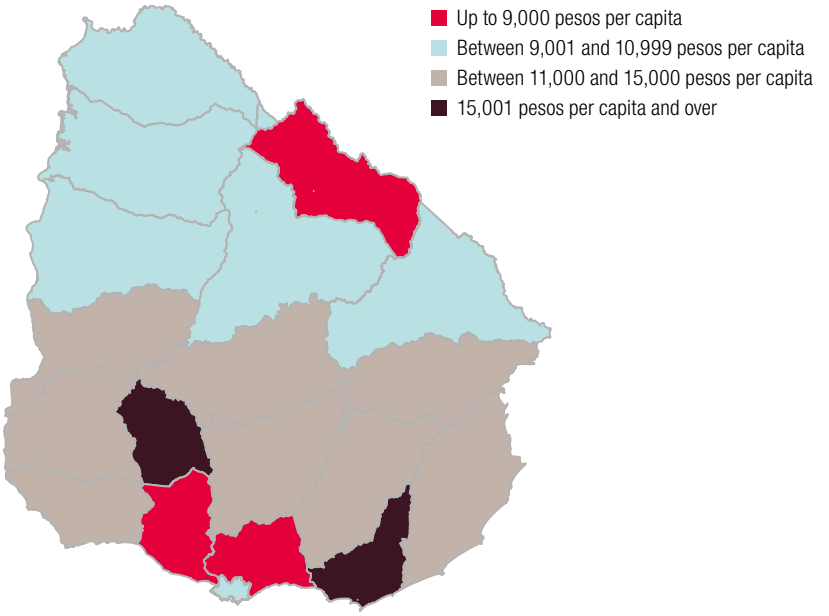
Two types of analysis are performed here. First, the equalizing impact of the intergovernmental transfer system currently operating in Uruguay is assessed. Second, the effects of implementing a new equalization transfer system in the country are posited and discussed.

There are two essential rationales for the research presented here. The first is the lack of earlier studies adequately analysing these regional fiscal relationships in a middle-income country such as Uruguay. The second is that a sound empirical treatment of the statistical information available will provide a basis for considering what an optimal design of subnational fiscal structures in the country fundamentally entails.

[1] Uruguay is still a highly centralized country, however. During the period under review (2006–2014), some 90% of public expenditure was carried out directly by central government, with departmental governments accounting for only 10%.

[2] Uruguay is divided into 19 departments, which are the second level of government below the central government. See annex 1 for details of Uruguay's political subdivisions.

Map 1
Uruguay: departmental governments' expenditure per capita, 2006–2014 average
(At constant 2014 prices)



Source: Office of Planning and Budget (OPP), on the basis of accounts submitted by departmental governments.

The paper is structured as follows. Section II discusses studies that have analysed both the determinants of different government transfer regimes and any effects intergovernmental transfers might have on regional disparities. Section III considers the current system of intergovernmental fiscal relationships in Uruguay, after which section IV evaluates the equalizing effects of the transfers involved. Then, for the first time in a study on Uruguay, section V develops an innovative methodology to simulate the effects of implementing a new equalization transfer system. Lastly, section VI presents some brief conclusions and policy recommendations.

II. Regional disparities and intergovernmental transfers

The traditional literature on regional public finances provides prescriptive guidance on how intergovernmental transfers should be distributed to improve both efficiency in the provision of local public goods and equality in the allocation of resources within a country (Musgrave, 1959; Oates, 1972).

In the interests of efficiency, the transfer regime should correct the underprovision of certain local public services. Subnational or regional governments may tend to underdeliver certain local public services, such as education, because they cannot harness all the benefits from them. Accordingly, when the provision of these local services creates positive externalities, central government could increase intergovernmental transfers in response to greater local expenditure needs (reflected, for example, in the number of school-age children in each region) in the interests of economic efficiency.

The second policy objective is to achieve an equitable distribution of public resources among the country's population. Thus, equalization transfer systems are often used to implement policies aimed at ensuring equal access to subnational public services at the regional level. Intergovernmental equalization

transfers play an important role within this framework by helping to meet the fiscal needs of fiscally disadvantaged regions (Martínez-Vázquez and Sepúlveda, 2012). More specifically, it is the principle of interjurisdictional equity that confers economic rationality on a system of equalization transfers. According to a general formulation of this principle, people in comparable circumstances should have access to similar public services in all geographical localities of a given territory (Boadway, 2015; Brosio and Jiménez, 2015; Muñoz and Radics, 2015). The equity framework of intergovernmental transfers implies that citizens' place of residence should not create differences between them, either in access to public services or in their unit cost. In this context, equity is achieved in the most advanced interjurisdictional equalization systems (Canada, for example) when intergovernmental equalization transfers provide subnational governments with sufficient revenues to ensure that people in similar circumstances can have access to comparable public services in all geographical locations.

A growing body of recent work has empirically analysed both the main determinants and the regional effects of intergovernmental transfers.[3] For example, Muinelo-Gallo, Rodríguez and Castro (2016) assess the effect of different economic, demographic and political variables on the level of intergovernmental transfers per capita in Uruguay. The authors point out that the level of these transfers is positively affected by the level of public spending implemented in the past by regional governments and negatively affected by the population size of the regions (departments). The first finding could reflect the impact of the fiscal needs of departmental governments, but it could also demonstrate the bargaining power of those governments when they demand resources from central government in the form of regional transfers. The negative effect of departmental population could be a response to the presence of economies of scale in the provision of subnational public services, or could be explained by the potentially disproportionate lobbying power of smaller subnational jurisdictions. Their estimates also show that regional inequalities have a large and negative impact on transfers. This result is also reflected in the fact that a department's GDP per capita has a positive and considerable effect on intergovernmental transfers. Lastly, the authors do not find transfers to have a substantial impact in reducing regional economic inequalities: in Uruguay, these intergovernmental transfers do not have a significant regional equalizing effect.

III. The system of intergovernmental fiscal relationships in Uruguay

1. Regional resources and public services

The powers formally assigned to Uruguay's departmental governments, which constitute the second level of government, are set out in the basic law on the government and administration of departments (Law No. 9515), which has not been amended since 1935. Under this statute, consistently with international practice, the departmental governments of Uruguay are responsible for carrying out activities of a typically municipal character. More specifically, formal competences are limited to the provision of basic services: road surfacing and maintenance; organization of traffic (including vehicle and driving licence fees); public transport; cleaning; street lighting; cemeteries; sanitary controls; and spatial planning.

[3] See Solé-Ollé and Sorribas-Navarro (2008) and Curto-Grau, Solé-Ollé and Sorribas-Navarro (2012) for examples from high-income countries.

The fiscal resources available to departmental governments, meanwhile, can be divided into two major categories:

(i) Local revenues: those originating within the department,[4] or taxes set by central government but collected and spent by the departmental governments.[5]

(ii) Transfers from central government to the departmental governments. These transfers may be of two kinds: conditional or unconditional.

2. The legal framework regulating the system of regional transfers in Uruguay

Of the two types of transfer revenues received by the departmental governments of Uruguay, conditional transfers, consisting of modest transfers from the different central government ministries, including the Ministry of Transport and Public Works and the Ministry of Tourism, and from other public agencies, are the lesser component. The great bulk of departmental revenue originating at the national level (90%) comes in the form of unconditional transfers. Table 1 details the composition of intergovernmental transfers by department and by degree of conditionality.

Although intergovernmental transfers are stipulated in the National Budget Act, laws adding supplementary items to the transfer legislation were enacted during the different periods of government analysed (2006–2014). In many cases, these additional transfers were justified by particular circumstances, such as financial crises in particular departmental governments, droughts or flooding. However, these one-off transfers often ended up as permanent budget items because of pressure from departmental governments to maintain or even increase resources in the next period of government (Muinelo-Gallo, Rodríguez and Castro, 2016).

The National Budget Act for the periods 2001–2005 and 2006–2010 incorporated the 1996 reforms into the national constitution, the hope being to improve the transfer system and forestall further ad hoc transfers not included in the National Budget Law. The new national constitution established two types of transfer mechanisms, set out in articles 214 and 298.

Article 214 stipulates that in each period of government a share of the total national budget must be distributed among the departmental governments. This share was 3.18% in 2001 and progressively increased to 3.54% in 2005 before being set at 3.33% from 2006. A large part of this share is financed by the municipal infrastructure and rural road maintenance programmes (both administered by central government). The remaining funds are distributed among departmental governments on the basis of two criteria. One is a formula involving population indicators, land area, the inverse of regional GDP and the percentage of households with unmet needs (25% each). The other criterion is the percentage distribution between departmental governments in the previous period of government. The final distribution of these transfers is arrived at by averaging out the two criteria in some way, although the distribution method is by no means clear. The percentage of remaining funds (published in National Budget Acts No. 17296 for 2001–2005 and No. 17930 for 2006–2014) is determined by political negotiations between the central government and the Congress of Mayors of the departmental governments.[6]

[4] The main revenues raised locally are from property taxes on urban and suburban real estate, vehicle licence fees, minor taxes (the tax on unused sites and inappropriate construction and contributions for improvements to properties benefiting from public works), levies, tariffs, profits and charges for the use of departmental goods or services.

[5] These include in particular the rural property tax and the tax on livestock sales (Law 12700 of 1960).

[6] The Congress was established by the 1996 constitution as a council representing the departmental governments.

Table 1
Uruguay: composition of intergovernmental transfer revenues by departmental government, 2006–2014 average
(At constant 2014 prices)

Department	Conditional transfers		Unconditional transfers	
	(thousands of 2014 pesos)	*(percentage of departmental GDP)*	*(thousands of 2014 pesos)*	*(percentage of departmental GDP)*
Artigas	51 117	0.302	352 560	2.130
Canelones	91 023	0.084	836 011	0.808
Cerro Largo	70 281	0.343	422 327	2.043
Colonia	45 775	0.085	316 667	0.607
Durazno	32 937	0.226	378 029	2.524
Flores	26 529	0.304	188 317	2.245
Florida	42 757	0.197	321 186	1.536
Lavalleja	30 810	0.184	346 930	1.873
Maldonado	213 865	0.329	511 705	0.858
Montevideo	508 798	0.084	1 064 770	0.190
Paysandú	49 369	0.161	454 127	1.444
Río Negro	108 262	0.380	300 256	1.165
Rivera	68 412	0.312	391 290	1.682
Rocha	8 877	0.055	420 386	2.022
Salto	62 376	0.218	492 114	1.684
San José	32 483	0.103	309 951	1.008
Soriano	35 591	0.142	381 748	1.520
Tacuarembó	8 838	0.050	424 911	1.928
Treinta y Tres	26 645	0.183	335 870	2.368

Source: Office of Planning and Budget (OPP), on the basis of accounts submitted by departmental governments.

The other article of the national constitution regulating intergovernmental transfers is No. 298 on the Fund for the Development of the Interior (FDI). The objectives of the Fund are local and regional development and decentralization, and it is formed from a share (about 11%) of the taxes that central government collects from the different departments of the country, excluding Montevideo. However, only 33.5% of Fund resources go directly to departmental governments, with the remaining 66.5% executed directly by central government.

In short, the mechanisms used to allocate intergovernmental transfers in Uruguay under the different governments from 2006 to 2014 were unclear. There were some guiding criteria, but they were far from constituting clear formulas with technical definitions, which implies a great deal of political bargaining between the central government and the departmental governments. At the same time, there was a degree of inertia over time in most of the transfer allocation criteria (population, land area and even GDP per capita), quite apart from the explicit consideration given to the way resources had been allocated between departmental governments in the previous period of government. In view of all this, it may be said that fiscal equity does not seem to have played a prominent role in the system of intergovernmental transfers operating in Uruguay thus far.

Table 2 shows the revenues of departmental governments and calculates different measures of fiscal inequality between them. This analysis provides the basis for a preliminary assessment of the possible equalizing effects of the system of transfers currently operating in Uruguay.

Table 2
Uruguay: composition of departmental government revenues and equalizing effects, 2006–2014
(At constant 2014 prices)

Department	Local revenues			Local revenues and conditional transfers			Local revenues and unconditional transfers			Total revenues[a]		
	(thousands of 2014 pesos)	*(2014 pesos per capita)*	*(percentage of departmental GDP)*	*(thousands of 2014 pesos)*	*(2014 pesos per capita)*	*(percentage of departmental GDP)*	*(thousands of 2014 pesos)*	*(2014 pesos per capita)*	*(percentage of departmental GDP)*	*(thousands of 2014 pesos)*	*(2014 pesos per capita)*	*(percentage of departmental GDP)*
Artigas	385 228	5 028	2.39	436 345	5 698	2.69	737 787	9 639	4.52	788 905	10 308	4.82
Canelones	2 411 329	4 515	2.35	2 502 353	4 683	2.43	3 247 341	6 078	3.16	3 338 364	6 247	3.24
Cerro Largo	365 176	4 097	1.78	435 457	4 886	2.13	787 502	8 834	3.83	857 784	9 623	4.17
Colonia	985 357	7 775	1.86	1 031 132	8 136	1.94	1 302 023	10 277	2.46	1 347 799	10 637	2.55
Durazno	464 890	7 835	3.19	497 827	8 389	3.41	842 919	14 211	5.71	875 856	14 765	5.94
Flores	347 484	13 194	4.16	374 013	14 200	4.46	535 800	20 343	6.40	562 329	21 349	6.71
Florida	444 799	6 409	2.14	487 556	7 025	2.34	765 986	11 037	3.68	808 743	11 654	3.88
Lavalleja	392 354	6 466	2.19	423 164	6 970	2.37	739 284	12 198	4.06	770 094	12 703	4.24
Maldonado	3 091 817	18 465	5.22	3 305 682	19 704	5.55	3 603 522	21 511	6.08	3 817 387	22 750	6.41
Montevideo	11 896 980	8 682	2.15	12 405 777	9 052	2.23	12 961 750	9 458	2.34	13 470 548	9 828	2.42
Paysandú	608 747	5 197	1.97	658 116	5 618	2.14	1 062 874	9 071	3.42	1 112 243	9 493	3.58
Río Negro	376 338	6 708	1.50	484 600	8 635	1.88	676 594	12 057	2.67	784 856	13 983	3.05
Rivera	444 053	4 159	1.92	512 465	4 801	2.23	835 343	7 823	3.60	903 755	8 465	3.92
Rocha	756 862	10 356	3.73	765 739	10 479	3.78	1 177 248	16 101	5.75	1 186 125	16 224	5.80
Salto	748 458	5 822	2.63	810 834	6 306	2.85	1 240 572	9 645	4.32	1 302 948	10 129	4.53
San José	595 807	5 423	1.99	628 290	5 718	2.09	905 758	8 238	3.00	938 241	8 533	3.10
Soriano	525 706	6 185	2.14	561 297	6 604	2.28	907 453	10 679	3.66	943 044	11 098	3.80
Tacuarembó	528 658	5 676	2.41	537 495	5 771	2.46	953 568	10 239	4.34	962 406	10 334	4.39
Treinta y Tres	258 139	5 107	1.87	284 784	5 634	2.05	594 009	11 751	4.24	620 653	12 278	4.42
Average	1 348 852	7 216	2.51	1 428 575	7 806	2.70	1 783 018	11 536	4.06	1 862 741	12 126	4.26
Highest	11 896 980	18 465	5.22	12 405 777	19 704	5.55	12 961 750	21 511	6.40	13 470 548	22 750	6.71
Lowest	258 139	4 097	2.00	284 784	4 683	2.00	535 800	6 078	2.00	562 329	6 247	2.00
Highest/lowest	46.09	4.51	3.48	43.56	4.21	2.95	24.19	3.54	2.74	23.95	3.64	2.77
Standard deviation *(in logarithms)*	0.93	0.39	0.32	0.91	0.38	0.29	0.77	0.31	0.29	0.76	0.31	0.29
Coefficient of variation	0.97	0.49	0.37	0.94	0.47	0.36	1.59	0.35	0.30	0.58	0.35	0.29
Gini index	0.61	0.23	0.18	0.60	0.22	0.16	0.51	0.17	0.16	0.50	0.17	0.16
Theil index	0.87	0.09	0.06	0.85	0.09	0.05	0.61	0.05	0.04	0.60	0.05	0.04

Source: Office of Planning and Budget (OPP), on the basis of accounts submitted by departmental governments.
[a] Total revenues include conditional and unconditional transfers and revenues raised locally.

The statistical measures provided in table 2 indicate that transfers (conditional and unconditional) have reduced the disparity in tax revenues between departmental governments. It should be noted that the lesser impact of conditional transfers (which reduce the Gini index by 1 percentage point, whereas unconditional transfers reduce it by 6 percentage points) is explained by the simple fact that these types of transfers are much smaller than unconditional transfers (see second from last row of table 2). This reduction in the per capita income disparities between departmental governments is also observed when other disparity indicators such as the standard deviation (in logarithms), coefficient of variation and Theil index are used. A variation in the highest/lowest ratio is observed, whereby the difference in per capita revenues between the departments with the highest and lowest per capita revenues falls from 4.5 to 3.6 when transfers are included.

Although there is some equalizing effect in terms of departmental governments' revenues, fiscal equalization is not explicitly and clearly provided for in the regulations governing the distribution of intergovernmental transfers in Uruguay. The lack of an appropriate and explicit regulatory regime of equalization transfers, based exclusively on technical criteria, is due to several causes. First, there has been a degree of historical inertia in the political negotiations between the central government and departmental governments, which has prevented progress towards greater autonomy for the different departmental governments. The reluctance of the central government to grant regional governments greater autonomy could be important here. Mention should be made too of the inertial behaviour of departmental governments, which often obtain resources from central government through political negotiation without incurring the economic and political costs a greater fiscal effort would entail. A second reason is the existence of serious technical limitations in both central government and, principally, departmental governments, reflected in a lack of technical personnel and adequate databases with which to construct and update the technical indicators needed to design an objective and equalizing transfer scheme.

With this context in mind, the following two sections will detail the data and empirical methodology we have used to explore the implementation of a new system of intergovernmental equalization transfers in Uruguay.

IV. Horizontal fiscal disparities and the equalizing effect of the current transfer system in Uruguay

This section identifies and analyses horizontal fiscal disparities between departmental governments in Uruguay. The ability of these governments to generate local revenue is illustrated by indicators of its distribution among them, including per capita estimates. On the expenditure side, indicators of disparities in per capita spending between departmental governments are included.

When these fiscal indicators are analysed (see table 3), large horizontal fiscal disparities can be detected by observing the great differences in revenue, transfer and spending levels between the different departmental governments. Since all departmental governments are required by law to provide the same services, the large differences in total per capita expenditure can be assumed to have significant implications for the quantity and quality of the services provided (for example, per capita expenditure is 3.5 times as high in Maldonado as in Canelones). There are also large differences in total per capita revenue (almost 4 times as high in Maldonado as in Canelones).

Table 3
Uruguay: per capita revenues, transfers and spending by department, 2006–2014
(Constant pesos and averages)

Department	Local revenues per capita (1)	Percentage of Uruguayan average (2)	Transfers per capita (3)	Percentage of Uruguayan average (4)	Total revenues per capita (5)	Percentage of Uruguayan average (6)	Total spending per capita (7)	Percentage of Uruguayan average (8)	Per capita GDP Uruguay=100
Artigas	5 028	70	5 280	108	10 308	85	9 781	81	73
Canelones	4 515	63	1 732	35	6 247	52	6 655	55	66
Cerro Largo	4 097	57	5 526	113	9 623	79	9 908	82	78
Colonia	7 775	108	2 862	58	10 637	88	11 064	91	141
Durazno	7 835	109	6 931	141	14 765	122	14 176	117	86
Flores	13 194	183	8 155	166	21 349	176	21 657	179	109
Florida	6 409	89	5 245	107	11 654	96	11 533	95	103
Lavalleja	6 466	90	6 237	127	12 703	105	12 451	103	103
Maldonado	18 465	256	4 285	87	22 750	188	23 562	195	121
Montevideo	8 682	120	1 147	23	9 828	81	9 879	82	139
Paysandú	5 197	72	4 296	87	9 493	78	9 999	83	91
Río Negro	6 708	93	7 275	148	13 983	115	13 694	113	168
Rivera	4 159	58	4 306	88	8 465	70	8 657	72	75
Rocha	10 356	144	5 868	119	16 224	134	14 988	124	95
Salto	5 822	81	4 307	88	10 129	84	10 734	89	78
San José	5 423	75	3 109	63	8 533	70	8 785	73	96
Soriano	6 185	86	4 913	100	11 098	92	11 198	93	103
Tacuarembó	5 676	79	4 657	95	10 334	85	9 668	80	80
Treinta y Tres	5 107	71	7 171	146	12 278	101	11 622	96	95
Uruguay	7 216	100	4 911	100	12 126	100	12 106	100	100

Source: Office of Planning and Budget (OPP), on the basis of accounts submitted by departmental governments.

To analyse these differences in total per capita revenue more thoroughly, it is necessary to examine the situation with local revenues and transfers. Departmental governments are found to differ greatly in the total per capita revenue they raise themselves, with some raising almost five times as much as others (Maldonado relative to Cerro Largo, for example). If information on per capita transfers from central government is added, large differences are again observed, although they are not as great as those detected in the case of local revenues. In addition, these intergovernmental transfers seem to bear little relation to levels of GDP per capita. For example, although Maldonado has considerably greater local revenues and per capita GDP than Canelones, the transfers it receives per capita, while considerably lower than the national average, are more than double those received by Canelones.

Following the same line of argument, we can find quite wealthy departments with similar levels of revenue (Maldonado and Colonia) that spend very different amounts. Likewise, if the comparison is between departments that are poorer but have similar revenues (Durazno and San José) or between departments that have per capita GDP levels close to the national average (Rocha and Flores), they can be seen to have very different levels of total revenue or expenditure, as well as very different levels of transfers.

In conclusion, there is very marked fiscal heterogeneity in levels of expenditure, local revenues and intergovernmental transfers that do not seem to bear any relation to the departments' per capita GDP and, consequently, to the tax-gathering potential of the different departmental governments.

Lastly, we shall present fiscal disparity indicators for each of the departmental governments and their relationship with the level of unconditional intergovernmental transfers, since it is these transfers that should theoretically have the greatest equalizing effect. To this end, the following fiscal disparity indicator is calculated for each departmental government i (DG_i):

$$Fiscal\ disparity_i = Spending\ needs_i - Fiscal\ capacity_i \quad (1)$$

In the absence of more suitable information, the national average per capita expenditure actually executed by departmental governments during the period 2006–2014 is taken as an indicator of spending needs. The per capita revenue raised locally by each of the departmental governments during the period will serve as an indicator of fiscal capacity.

The analysis in table 4 reveals a clear upward trend in both spending needs and fiscal capacity. At the same time, there was an even greater increase in the fiscal disparity per capita over the period under review.[7] In addition, there was a marked increase in the level of unconditional transfers expressed in per capita terms (with a growth rate of 61% over the period). This result suggests that, in dynamic terms, unconditional transfers do not appear to have had any equalizing effect in Uruguay. In other words, there is no sign that transfers reduced the level of fiscal disparity for departmental governments in the aggregate over the period analysed. In fact, we observe that fiscal disparities increased at a faster rate than intergovernmental transfers. This result could reflect a degree of fiscal indiscipline on the part of departmental governments. More specifically, because they receive resources in the form of intergovernmental transfers without having to bear the economic or political costs of raising their own revenue, these governments seem to take a cavalier attitude to spending.

Table 4
Uruguay: spending needs, fiscal capacity, fiscal disparity and unconditional transfers, 2006–2014
(At constant 2014 prices)

	Spending needs per capita	Fiscal capacity per capita	Fiscal disparity per capita	Unconditional transfers per capita
2006	9 978	6 713	3 265	3 475
2007	10 615	6 868	3 747	3 537
2008	11 396	7 214	4 182	3 824
2009	12 004	6 831	5 173	4 096
2010	11 389	6 975	4 414	4 128
2011	12 076	7 254	4 822	4 485
2012	12 442	7 418	5 024	4 632
2013	13 942	7 717	6 225	5 117
2014	15 111	7 951	7 160	5 592

Source: Office of Planning and Budget (OPP), on the basis of accounts submitted by departmental governments.

Table 5 presents information on the above variables, but disaggregated by department. This table reveals a generalized increase in the level of fiscal disparities measured in per capita terms, accompanied by a generalized increase in unconditional transfers per capita. Unconditional transfers had no very noticeable equalizing effect. Although the indices of disparity between the total revenues of the different departmental governments declined, they did so by less than a third, which can be considered a small effect, especially considering that, as Martínez-Vázquez (2015) points out, the OECD countries manage to reduce fiscal disparities by more than two thirds with their equalization transfers.

Again, although there has been an upward trend in the amount of intergovernmental transfers per capita in Uruguay, they have not played more of an equalizing role. On the contrary, the equalizing role of intergovernmental transfers diminished slightly during the period under analysis.

[7] For example, the simple rate of change in the fiscal disparity level was 119% for the period 2006–2014.

Table 5
Uruguay: spending needs and fiscal capacity by department, selected years
(At constant 2014 prices)

Department	Spending needs per capita			Fiscal capacity per capita			Fiscal capacity including unconditional transfers per capita		
	2006	2009	2014	2006	2009	2014	2006	2009	2014
Artigas	9 978	12 004	15 111	4 735	5 024	5 134	8 114	9 178	11 494
Canelones	9 978	12 004	15 111	4 411	3 971	5 072	5 642	5 577	7 034
Cerro Largo	9 978	12 004	15 111	3 990	3 505	4 670	7 866	7 439	10 842
Colonia	9 978	12 004	15 111	5 210	7 364	9 892	7 259	9 634	13 076
Durazno	9 978	12 004	15 111	7 328	7 125	7 970	12 297	13 261	15 720
Flores	9 978	12 004	15 111	11 658	11 361	15 665	17 780	17 942	24 699
Florida	9 978	12 004	15 111	6 085	6 411	8 068	10 421	10 656	14 151
Lavalleja	9 978	12 004	15 111	6 560	6 713	6 521	11 030	11 169	14 259
Maldonado	9 978	12 004	15 111	18 049	18 146	18 904	21 022	21 647	22 622
Montevideo	9 978	12 004	15 111	8 491	8 993	9 678	9 354	9 733	10 656
Paysandú	9 978	12 004	15 111	5 164	5 072	5 248	8 579	8 424	10 153
Río Negro	9 978	12 004	15 111	6 444	6 279	7 027	10 903	11 746	14 651
Rivera	9 978	12 004	15 111	3 634	3 917	4 514	6 776	7 315	9 230
Rocha	9 978	12 004	15 111	7 752	9 258	11 093	10 929	15 376	19 242
Salto	9 978	12 004	15 111	5 759	5 584	5 921	8 697	8 944	10 507
San José	9 978	12 004	15 111	5 538	5 446	5 606	8 077	8 158	9 243
Soriano	9 978	12 004	15 111	5 860	5 516	6 951	9 810	10 429	12 574
Tacuarembó	9 978	12 004	15 111	5 492	4 787	8 139	9 086	9 126	13 907
Treinta y Tres	9 978	12 004	15 111	5 380	5 324	4 998	9 921	11 866	13 261
Average	9 978	12 004	15 111	6 713	6 831	7 951	10 188	10 927	13 543
Highest	9 978	12 004	15 111	18 049	18 146	18 904	21 022	21 647	24 699
Lowest	9 978	12 004	15 111	3 634	3 505	4 514	5 642	5 577	7 034
Highest/Lowest	1	1	1	5.0	5.2	4.2	3.7	3.9	3.5
Standard deviation *(in logarithms)*	0	0	0	0.373	0.396	0.403	0.309	0.323	0.311
Coefficient of variation	0	0	0	0.49	0.495	0.482	0.361	0.356	0.334
Gini index	0	0	0	0.213	0.227	0.234	0.171	0.179	0.172
Theil index	0	0	0	0.09	0.095	0.094	0.049	0.055	0.049

Source: Office of Planning and Budget (OPP), on the basis of accounts submitted by departmental governments.

V. Reform options and projections

A regime of equalization transfers seeks to ensure that all subnational governments can provide services of similar quality with an equivalent tax effort (Martínez-Vázquez and Sepúlveda, 2012). Different options for designing a system of equalization transfers can be distinguished:

(a) The first option is to equalize the spending needs of subnational governments without regard to their differing capacity to raise revenues locally. This option applies in countries where subnational governments do not have their own sources of revenue.

(b) The second option is to equalize the capacity of subnational governments to generate revenues locally. This approach seeks to ensure that all subnational units obtain the same revenues with the same level of tax effort. It is the best option when the cost of providing the different local public services is very similar throughout the country.

(c) The third option is to equalize the difference between subnational governments' capacity to generate revenues locally and their spending needs, considering both the potential revenues and the spending needs of the different subnational governments, as is done in countries such as Australia, Denmark, China and Ethiopia.

The analysis in this paper centres on the third option, that of equalizing the difference between the revenues regional governments can raise themselves and their spending needs. The set of fiscal disparities of Uruguay's departmental governments provides the information needed to distribute the hypothetical equalization transfers fund.[8]

The criterion for distributing transfers between departmental governments remains to be defined. A starting point is to establish that resources can only benefit departmental governments whose fiscal disparity is positive. In our case, this criterion was considered appropriate because it improves the equalizing capacity of transfers by excluding from the group of beneficiaries those departmental governments with sufficient fiscal resources to cover their spending needs. As regards fiscal capacity (the ability of departments to raise their own revenues), the three main sources of revenue for departmental governments are considered separately: the rural property tax, the urban and suburban property tax, and the vehicle licence fee. All other departmental government revenues are grouped under "other".[9]

The vehicle licensing tax base was estimated from 2014 data on vehicle licensing debt issuance,[10] taking an average rate of 4.5% of vehicles' market value (tax base) to obtain the vehicle licensing amount payable (debt issuance). The tax base for calculating the urban and rural property tax in 2014 was the aggregate taxable value of urban, suburban and rural properties as supplied by the National Directorate of Cadastre (DNC).[11] Lastly, the variety of the levies and prices in the "others" category meant that the tax base could not be measured directly, so each department's GDP was used as a proxy.

To estimate the potential revenue of the different departmental governments, the country's average tax rate was applied to the relevant tax base, on the assumption that this rate matched the fiscal effort required for each tax. With this information on potential revenue from the main local revenue sources of the departmental governments of Uruguay as a base, the methodology of the typical tax system of these regional governments was employed. The data on tax bases by type of tax and effective tax rates are detailed in tables 6 and 7, respectively.

Given that departmental governments in Uruguay perform functions of a municipal nature, it is not appropriate to use the age distribution of the departmental population to estimate their spending needs. At the same time, nor is exhaustive, homogeneous information available on expenditure levels by function in the different departmental governments. In view of this, the spending needs of these governments were estimated from the nationwide per capita expenditure standard during the period 2006–2014. It was also considered that the per capita cost of providing these services varied between the different departments by population density. The higher the population density in a department (inhabitants per square kilometre), the lower the cost of the service was assumed to be.

[8] See annex 3 for more detail on the fiscal equalization methodology used.

[9] The "others" category comprises a wide range of smaller levies, particularly taxes on foodstuffs and administration and municipal services charges.

[10] Vehicle licensing debt issuance is calculated from the tax base (vehicles by year and model) and a differential rate. The relevant tax base was estimated using debt issuance information from the Single Vehicle Revenue Collection System (SUCIVE [online] https://www.sucive.gub.uy/), assuming an average rate of 4.5%.

[11] See [online] http://catastro.mef.gub.uy/.

Table 6
Uruguay: tax base by type of tax, 2014
(Per capita)

Department	Tax base			
	Rural property tax	Urban and suburban property tax	Vehicle licensing fee	GDP (as proxy for all other taxes in the absence of specific information)
Artigas	147 719	101 196	35 417	271 696
Canelones	21 671	152 215	33 276	222 471
Cerro Largo	144 388	119 710	40 659	274 954
Colonia	87 191	234 410	138 602	490 967
Durazno	231 476	92 526	77 963	318 157
Flores	294 025	175 647	237 147	396 049
Florida	202 656	33 531	80 543	369 517
Lavalleja	164 964	145 774	49 848	377 115
Maldonado	23 437	722 437	130 833	409 574
Montevideo	4 620	344 286	41 212	487 462
Paysandú	135 909	140 369	50 705	329 880
Río Negro	240 600	129 280	58 499	616 314
Rivera	83 783	117 460	39 132	270 444
Rocha	120 669	154 112	47 757	342 635
Salto	105 601	154 265	46 721	282 289
San José	93 914	37 617	76 682	343 711
Soriano	188 106	167 995	60 388	393 306
Tacuarembó	155 466	123 548	56 237	280 089
Treinta y Tres	150 203	132 747	53 361	333 809
National average	61 765	250 199	54 258	386 826

Source: For the rural and the urban and suburban property taxes: National Directorate of Cadastre (DNC); for the vehicle licensing fee: Single Vehicle Revenue Collection System (SUCIVE); for GDP: Central Bank of Uruguay (BCU), Institute of Economics (IECON) and Office of Planning and Budget (OPP).

Table 7
Uruguay: estimated effective tax rates, by type of tax, 2014
(Percentages)

	Effective tax rate
Rural property tax	0.8
Urban and suburban property tax	0.7
Vehicle licensing fee	3.6
Other	1.1

Source: Prepared by the authors.

1. Equalization exercises

The demographic situation in the different departments of Uruguay means that population densities are low (most departments have fewer than 20 inhabitants per km^2) and that residents are very dispersed in small towns. Because services are situated in specific locations, the costs of per capita provision when potential demand is low and dispersed could be higher in such departments than in those with highly developed urban or semi-urban spaces. The existence of agglomeration economies could affect the costs of providing goods and services, with costs per user declining as population density increases. In other words, a greater dispersion of the population in the territory means that less advantage can be taken of economies of density associated with service provision, which inefficiently increases costs (Carruthers and Ulfarsson, 2003; Hortas-Rico and Solé-Ollé, 2010). A higher population density should

reduce the cost of producing these services, either because it would reduce the number of centres needed to provide a given level of service, because it would lower the transport costs associated with the service, or because it would reduce the average distance between potential users and the centre where the service was provided. Taking these assumptions into account, local spending needs were recalculated on the basis of the population densities of the different departments. The inverse of the logarithm of density was used, on the basis that as population density increases, costs decrease, but less than proportionately. The values were also normalized in the range from 1 to 2. When this adjustment factor is applied, the department with the highest population density, Montevideo, is found to have an adjustment factor of 1, and is therefore taken as a benchmark because its spending needs are not modified, whereas the spending needs of all other departments increase as a consequence of their lower population densities (see table 8).

Table 8
Uruguay: population density by department

Department	Density (inhabitants/km^2)	Correction factor
Artigas	6.30	1.843
Canelones	116.80	1.170
Cerro Largo	6.53	1.833
Colonia	20.64	1.417
Durazno	4.86	2.000
Flores	5.12	1.997
Florida	6.67	1.822
Lavalleja	6.06	1.879
Maldonado	34.54	1.317
Montevideo	2 554.50	1.000
Paysandú	8.37	1.703
Río Negro	5.87	1.881
Rivera	11.43	1.172
Rocha	6.93	1.800
Salto	9.20	1.670
San José	21.87	1.403
Soriano	9.46	1.654
Tacuarembó	5.83	1.882
Treinta y Tres	5.45	1.981

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics (INE) of Uruguay.

Incorporating this information into the equalization exercise makes it possible to consider different per capita spending needs by department and thence obtain different fiscal gaps (see table 9).

Under the methodology used here, eight departmental governments would receive a greater amount in transfers than they do at present. They are: Canelones, Rivera, Tacuarembó, Artigas, Salto, Paysandú, San José and Cerro Largo. At the other extreme, the departmental governments that would see the amount of their transfers reduced are Montevideo, Florida, Lavalleja, Rocha, Soriano, Durazno, Treinta y Tres, Río Negro, Colonia, Flores and Maldonado. These last three are the ones that would undergo the greatest reductions in the amount of transfers received, since they are departments with a relatively large fiscal capacity. Maldonado, in particular, is able to cover all its spending needs without recourse to transfers (see last column of table 10).

Table 9
Uruguay: estimated fiscal gaps by department, corrected for population density, 2014

Department	Spending needs		Revenues			Gap
	Per capita spending		Departmental		National[d]	
	Current	Standard[a]	Current[b]	Standard[c]		
	(1)	(2)	(3)	(4)	(5)	(2) – (4) – (5)
Artigas	9 764	19 408	5 026	5 298	667	13 443
Canelones	6 657	12 319	4 525	4 483	171	7 665
Cerro Largo	9 912	19 308	4 098	5 777	789	12 742
Colonia	11 088	14 918	7 795	11 410	362	3 146
Durazno	14 166	21 061	7 834	7 694	555	12 811
Flores	21 678	21 031	13 205	14 627	1 008	5 396
Florida	11 529	19 185	6 408	7 609	616	10 959
Lavalleja	12 438	19 787	6 466	7 155	508	12 125
Maldonado	23 604	13 868	18 472	13 630	1 278	-1 039
Montevideo	9 882	10 530	8 682	8 252	371	1 907
Paysandú	10 002	17 936	5 197	6 618	421	10 896
Río Negro	13 705	19 987	6 709	10 247	1 930	7 810
Rivera	8 661	16 671	4 160	5 147	641	10 883
Rocha	15 004	18 958	10 359	6 637	122	12 199
Salto	10 745	17 586	5 822	5 918	485	11 184
San José	8 806	14 792	5 422	6 665	296	7 831
Soriano	11 187	17 415	6 183	7 769	419	9 228
Tacuarembó	9 668	20 047	5 677	6 421	95	13 531
Treinta y Tres	11 622	20 743	5 107	6 880	527	13 336
Total	10 530	10 530	7 541	7 541	446	2 544

Source: Prepared by the authors, on the basis of Office of Planning and Budget (OPP), "Clasificador de ingresos y gastos" [online] https://otu.opp.gub.uy/sites/default/files/finanzas/clasificador_ingresos_egresos.pdf.

[a] The 2006–2014 national per capita average in 2014 Uruguayan pesos, adjusted for population density, is taken as the standard.

[b] Excludes equalization transfers and revenues originating at the national level, subsection II of the document "Clasificador de ingresos y gastos" (earmarked funds).

[c] Calculated on the basis of potential revenue from vehicle licensing fees, rural, urban and suburban property taxes and "other" taxes and charges at the relevant national average effective rate.

[d] Revenues originating at the national level, paragraphs 2.1 and 2.3 of the document "Clasificador de ingresos y gastos" (resources established under provisions of the Constitution and resources established under other provisions).

Table 10
Uruguay: distribution of intergovernmental transfers in terms of fiscal gaps, corrected for population density, 2014

Department	Gap index	Population weighting factor	Coefficient of distribution	Equalizing distribution	Current distribution	Change	
	a	b	c=a*b	*(millions of pesos)*		*(millions of pesos)*	*(percentage)*
Artigas	5.28	0.02	0.12	416	353	63.14	18
Canelones	3.01	0.16	0.47	1 648	836	811.88	97
Cerro Largo	5.01	0.03	0.13	458	422	35.85	8
Colonia	1.24	0.04	0.05	160	317	-156.18	-49
Durazno	5.04	0.02	0.09	307	378	-71.25	-19
Flores	2.12	0.01	0.02	57	188	-131.02	-70
Florida	4.31	0.02	0.09	307	321	-14.25	-4
Lavalleja	4.77	0.02	0.09	297	347	-50.07	-14
Maldonado	0.00	0.05	-	-	512	-511.70	-100
Montevideo	0.75	0.40	0.30	1 054	1 065	-10.29	-1
Paysandú	4.28	0.03	0.15	515	454	60.89	13
Río Negro	3.07	0.02	0.05	177	300	-123.50	-41
Rivera	4.28	0.03	0.13	469	391	77.47	20
Rocha	4.80	0.02	0.10	360	420	-60.77	-14
Salto	4.40	0.04	0.17	580	492	88.02	18
San José	3.08	0.03	0.10	347	310	37.30	12
Soriano	3.63	0.03	0.09	317	382	-65.13	-17
Tacuarembó	5.32	0.03	0.15	508	425	83.51	20
Treinta y Tres	5.24	0.01	0.08	272	336	-63.87	-19

Source: Prepared by the authors.

Lastly, the same equalization exercise is performed on the assumption of a 10% (Δ UCT=10%) and 20% (Δ UCT=20%) increase in the volume of unconditional transfers, respectively (see annex 4). Gradually increasing the volume of unconditional transfers has two advantages. First, it solves the cash flow problem, at least in the short term, of some departmental governments that would receive less in the way of transfers when the new system was implemented. With a 10% increase in unconditional transfers, the departments of Florida and Montevideo would receive 5% and 9% more in transfers, respectively, than they do at present. If the increase were 20%, three departmental governments, namely Lavalleja, Rocha and Soriano, would receive more in transfers than under the equalization scenario with no increase in transfers. Secondly, increasing the volume of unconditional transfers would bring progress towards greater fiscal homogeneity. If the amount were to increase by 10% or 20%, the reduction in fiscal disparity would be 30% or 32%, respectively (see table 11).

Table 11
Uruguay: horizontal fiscal disparities

Inequality measures	Before equalization	After equalization		
		Δ UCT=0[a]	*Δ UCT*=10%	*Δ UCT*=20%
Coefficient of variation	0.34763	0.25057	0.23926	0.22939
Standard deviation (in logarithms)	0.31423	0.22548	0.21892	0.21343
Gini index	0.17386	0.12434	0.12089	0.1178
Theil coefficient	0.05204	0.02731	0.02521	0.02346
Maximum/Minimum	3.64037	2.53571	2.43888	2.34916

Source: Prepared by the authors.
[a] UCT: unconditional transfers.

VI. Conclusions

This article has analysed the equalizing role of intergovernmental transfers by means of an empirical analysis applied to a group of regions in Uruguay during the period 2006–2014. More specifically, two types of analysis have been carried out. First, the equalizing impact of the system of intergovernmental transfers currently operating in Uruguay was evaluated. Second, the effects of implementing a new system of equalization transfers in the country were discussed. The proposed system, based on objective criteria linked to the values of certain variables, would clearly reduce the level of horizontal fiscal disparities. Transfers from central government would play a more important role in terms of their egalitarian or equalizing effects.

It should be noted that the proposal formulated here results in greater per capita transfers for a certain number of departments, which of course might not contribute to the objective of a better territorial balance of economic activity. Nonetheless, it should be stressed that the amount of decentralized resources controlled by departmental governments is still very small in Uruguay (around 10% of public expenditure) and that these resources are earmarked for the provision of basic and very specific local public services, whose quality might be expected to be fairly uniform throughout the country. Thus, if policies to reduce territorial imbalances in economic activity were desired, it would probably be more effective for the central government to design more specific and powerful instruments for improving territorial cohesion. For example, programmes of investment in transport and communications infrastructure and strategies to encourage business investment in certain areas or regions could be used for this purpose.

As already indicated, the design of a financing system for departmental governments should be grounded in the debate on technical criteria such as those proposed here, which should not be subject to the uncertain outcomes of political negotiation between departmental governments and central government authorities. Within this framework, the most important reform, one that would strengthen the tax position of departmental governments by stimulating their fiscal effort, is to set clear, objective and simple rules for the transfer system. Such rules should be established for a period of time long enough to prevent them being periodically subject to political changes. It is also extremely important to have a few clearly defined economic policy objectives, since the costs in terms of efficiency or equity when policy effects conflict can be large. For example, one objective would be to cover the spending needs involved in providing the services assigned to departmental governments, while other objectives would be to increase regional convergence and reduce the dispersion of population.

When it comes to implementing the new system of equalization transfers, the most appropriate strategy is judged to be a process of gradual implementation based on the "hold harmless" principle, which, as in the case of Mexico, would enable costs to be spread over time, thus reducing potential political resistance to the reform process.

Lastly, we consider the most important reform to be the establishment of a transparent system for quantifying intergovernmental transfers. As already indicated, this would require far-reaching political negotiations with the different actors. However, in the process of implementing this reform, and on a temporary basis, certain immediately applicable measures may be considered. These include increasing the fiscal capacity of departmental governments with less administrative capacity by creating support agencies that enable them to optimize revenues from property taxes and other fiscal instruments if deemed necessary. Attention could also be paid to possible differences in the costs of providing public goods and services in the different departments, with per capita spending needs calculated in a way that takes the dispersion of the population into account. If possible, the total amount of transfers should be increased so that departmental governments can afford to provide the goods and services for which they have been made responsible. These proposals do not require major political negotiation or long transition periods, since they can be implemented with little delay. However, it should be stressed once again that the greatest reform required is the creation of a clear, transparent, simple and generally accepted system for calculating equalization transfers.

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Annex A1

Map A1.1
Political subdivisions of Uruguay

Source: Prepared by the authors.

Annex A2

List of departments

- Artigas
- Canelones
- Cerro Largo
- Colonia
- Durazno
- Flores
- Florida
- Lavalleja
- Maldonado
- Paysandú
- Salto
- San José
- Soriano
- Río Negro
- Rivera
- Rocha
- Tacuarembó
- Treinta y Tres
- Montevideo.

Annex A3

Equalization exercise: methodology

The procedure is to assess departmental governments' capacity for generating their own revenues relative to their spending needs and reassigning intergovernmental transfers on that basis with a view to equalization.

The procedure for determining equalization transfers will now be summarized. For explanatory purposes, it is divided into six steps.

The first step is to calculate the fiscal capacity or standard revenue per capita of a given departmental government (DG_i). This standard revenue (SR_i) is defined as the potential capacity of a departmental government to raise its own revenue, given its tax base and assuming that the tax rate is the same for all the departments in the country:

$$SR_i = \sum_{i=1}^{i=19} TB_{i,j} * AETR_j \quad (1)$$

Where $TB_{i,j}$ is the per capita tax base of revenue item j in department i, while $AETR_j$ is the annual effective tax rate of revenue item j:

$$AETR_j = \frac{Total\ local\ revenue_j}{Tax\ base_j}$$

The second step is to calculate the spending needs or adjusted standard expenditure (ASE_i) of each DG_i. Here it is assumed that scale plays a determining role in the provision of public goods, giving advantages in public goods provision to departments with greater population density by reducing fixed costs (agglomeration economies). Greater population density may lower costs by reducing the number of centres needed to provide a given service, transport costs or the average distance between potential users and the centre providing the service (Carruthers and Ulfarsson, 2003).

Given the importance of scale in the provision of departmental public goods, an adjustment to standard expenditure by department is proposed, with average spending needs (SN) being adjusted by a factor reflecting population density. The $DENS_i$ factor is calculated as the inverse of the logarithm of normalized population density between 1 and 2. We thus obtain adjusted standard expenditure (ASE_i).

$$ASE_i = SN * DENS_i \quad (2)$$

The third step is to calculate the standardized fiscal gap of each DG_i (Gap_i). The standard revenue of each DG_i is deducted from its standard expenditure, as are the conditional transfers (CT_i) received by it, on the basis that these transfers also cover part of the spending needs of departmental governments.

$$Gap_i = ASE_i - IE_i - CT_i \quad (3)$$

This indicator provides the basic information needed to distribute a hypothetical fund of equalization transfers.

The fourth step is to construct the gap index (GI_i), which captures the relative size of the fiscal imbalance of each DG_i as a percentage of the aggregate fiscal imbalance of all the country's departmental governments:

$$GI_i = \frac{Gap_i}{Average\ gap} \tag{4}$$

It is assumed that the reallocation of transfers will only benefit departmental governments whose fiscal gap is positive, enhancing the equalization capacity of transfers. Thus, departments with a negative fiscal gap will be assigned a GI_i of zero.

The fifth step is to calculate the weighted relative need index ($WRNI_i$) with a view to arriving at an equalizing conditional transfer coefficient of distribution. This is a factor that serves to evaluate the departmental gap index in terms of the average weighted gap and the population of each department.

$$WRNI_i = \frac{GI_i * \left(\frac{Population_i}{Total\ population}\right)}{\sum_{i=1}^{i=19} INRP_i} \tag{5}$$

Lastly, the system's equalization transfers (ET) are calculated by multiplying the total amount of unconditional transfers (UCT) by the weighted relative need index for the DG_i ($WRNI_i$). This yields the amount of transfers per capita for each DG_i:

$$ET_i = WRNI_i * UCT \tag{6}$$

Annex A4

Calculation of gaps when total transfers are increased

Table A4.1

Uruguay: distribution of intergovernmental transfers considering gaps corrected for population density (increase of 10%), 2014

Department	Gap index	Population weighting factor	Coefficient of distribution	Equalizing distribution	Current distribution	Change	
	a	b	c=a*b	*(millions of pesos)*		*(millions of pesos)*	*(percentage)*
Artigas	5.28	0.02	0.12	457	353	104.71	30
Canelones	3.01	0.16	0.47	1 813	836	976.67	117
Cerro Largo	5.01	0.03	0.13	504	422	81.66	19
Colonia	1.24	0.04	0.05	177	317	-140.13	-44
Durazno	5.04	0.02	0.09	337	378	-40.58	-11
Flores	2.12	0.01	0.02	63	188	-125.29	-67
Florida	4.31	0.02	0.09	338	321	16.44	5
Lavalleja	4.77	0.02	0.09	327	347	-20.38	-6
Maldonado	0.00	0.05	-	-	512	-511.70	-100
Montevideo	0.75	0.40	0.30	1 160	1 065	95.16	9
Paysandú	4.28	0.03	0.15	567	454	112.39	25
Río Negro	3.07	0.02	0.05	194	300	-105.82	-35
Rivera	4.28	0.03	0.13	516	391	124.35	32
Rocha	4.80	0.02	0.10	396	420	-24.81	-6
Salto	4.40	0.04	0.17	638	492	146.03	30
San José	3.08	0.03	0.10	382	310	72.02	23
Soriano	3.63	0.03	0.09	348	382	-33.47	-9
Tacuarembó	5.32	0.03	0.15	559	425	134.35	32
Treinta y Tres	5.24	0.01	0.08	299	336	-36.67	-11

Source: Prepared by the authors.

Table A4.2
Uruguay: distribution of intergovernmental transfers considering gaps corrected for population density (increase of 20%), 2014

Department	Gap index	Population weighting factor	Coefficient of distribution	Equalizing distribution	Current distribution	Change	
	a	b	c=a*b	*(millions of pesos)*		*(millions of pesos)*	*(percentages)*
Artigas	5.28	0.02	0.12	499	353	146.28	41
Canelones	3.01	0.16	0.47	1 977	836	1 141.46	137
Cerro Largo	5.01	0.03	0.13	550	422	127.48	30
Colonia	1.24	0.04	0.05	193	317	-124.08	-39
Durazno	5.04	0.02	0.09	368	378	-9.90	-3
Flores	2.12	0.01	0.02	69	188	-119.57	-63
Florida	4.31	0.02	0.09	368	321	47.13	15
Lavalleja	4.77	0.02	0.09	356	347	9.31	3
Maldonado	0.00	0.05	-	-	512	-511.70	-100
Montevideo	0.75	0.40	0.30	1 265	1 065	200.61	19
Paysandú	4.28	0.03	0.15	618	454	163.89	36
Río Negro	3.07	0.02	0.05	212	300	-88.14	-29
Rivera	4.28	0.03	0.13	563	391	171.22	44
Rocha	4.80	0.02	0.10	432	420	11.15	3
Salto	4.40	0.04	0.17	696	492	204.04	41
San José	3.08	0.03	0.10	417	310	106.74	34
Soriano	3.63	0.03	0.09	380	382	-1.81	0
Tacuarembó	5.32	0.03	0.15	610	425	185.19	44
Treinta y Tres	5.24	0.01	0.08	326	336	-9.47	-3

Source: Prepared by the authors.