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International Studies Program
Andrew Young School of Policy Studies
Georgia State University
Atlanta, Georgia 30303
United States of America

Phone: (404) 651-1144
Fax: (404) 651-4449
Email: ispaysps@gsu.edu
Internet: http://isp-aysps.gsu.edu

Georgia State University | ANDREW YOUNG SCHOOL OF POLICY STUDIES

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The new Spanish system of intergovernmental transfers[1]

Antoni Zabalza* and Julio López-Laborda**
** University of Valencia*
*** University of Zaragoza*

Abstract: This article analyses the workings of the new Spanish system of intergovernmental transfers, which has been in operation since 2009, and compares its expected effects with those of the model that was in force until 2008. The paper considers the effects of the new model at the base year of application and the growth over time of these effects. On the positive side, the reform has significantly reduced the dispersion of the distribution of resources per unit of need. On the negative side, the system has become very complex and obscure regarding the distribution criteria it uses; also, of the five (1987, 1992, 1997, 2002, 2009) major revisions of the system, this is the most expensive.

Key words: Spanish system of intergovernmental transfers, equalising transfers.
J.E.L. **classification:** H71, H73, H77.

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* Department of Economic Analysis, University of Valencia, Campus dels Tarongers, 46022-Valencia, antonio.zabalza@uv.es
** Department of Public Economics, University of Zaragoza, Gran Via, 2, 50005-Zaragoza, julio.López@unizar.es

1. Introduction

The purpose of this paper is to describe and evaluate the new system of intergovernmental transfers that has been in operation since 2009 (BOE, 2009). The article draws heavily on Zabalza and López-Laborda (2010) and the approach followed is fundamentally descriptive: the objective is to understand how the new system works for the fifteen "common regime" autonomous communities to which it applies[2] and how it differs from previous arrangements.

Since they were established in 1980's, intergovernmental transfers in Spain have aimed at the equalisation of resources per unit of need, so that the same service level could be provided by all autonomous communities irrespective of their fiscal capacity. The definition of expenditure needs and the identification of differences among communities regarding the cost of service provision have been the main areas of discussion between central and autonomous governments. The provisions regarding the growth of transfers have also come into scrutiny due to the lack of connexion between the variation of needs and that of resources. The reform that we analyse here addresses these questions and obtains improvements in both respects that, although not complete, we deem significant. More troublesome is the stated aim of the reform of restricting equalisation only to a particular subset of services, which the model calls fundamental: health, education and welfare assistance.

The law setting the different provisions that define the system (BOE, 2009)[3] makes a complex and unnecessarily circular presentation of the new model. The best way to untangle the effective workings of the system is to compare the basic structure of both new and old models, and go directly to the final distribution of resources that each of them generates. This approach allows us to distinguish elements that play an important role from those that are secondary.

We identify aspects of the reform that in our opinion could be improved, but we abstain from advancing normative proposals on the new model. For instance, we find unsatisfactory the way in which the index of needs enters into the model, but we leave

[2] That excludes the autonomous communities Pais Vasco and Navarra, whose regime is the "foral" ("cupo") system.

[3] In the rest of this article, the legal text that contains the model is called the "Law". This model is referred to interchangeably as the "model" and the "new model" as opposed to the substituted system, which is referred to as the "old" or "previous" model.

out from this paper any suggestion of improvement on this particular aspect.[4] With this, we intend to avoid as much as possible controversial issues and, in a purely positive vein, concentrate on the actual legal provisions.

In addition to identifying formally the workings of the model, the article quantifies empirically its different elements. Using empirical data from the period 2004-2007, the article presents an estimation not only of the starting position of the model, which we call year zero, but also of the growth that the system would undergo during the following five years of application.[5] The new model narrows significantly the dispersion of resources per unit of need among autonomous communities and takes into account the temporal variation of needs. On the other hand, its cost – an overall increase of resources of over 12 per cent – is by far the largest of the five major revisions undergone by the system.

There are several articles in Spanish that cover approximately the same ground (De la Fuente, 2009; Bosch, 2010a;[6] López-Laborda, 2010; López-Laborda and Zabalza, 2010; Zabalza and López-Laborda, 2010) but we feel that an additional account in English will balance the picture and serve as an appropriate complement for the benefit of the international reader interested in this subject. In comparison with the first two, this paper pays more attention to the growth of resources and differs from them in its interpretation of the distribution structure that the model implies.

The next section presents the formal structure of the new model. Section 3 compares the distribution of resources it generates with that of the old model. Section 4 describes a particular element of the model, the guarantee fund for fundamental public services, that serves as the main base for the introduction of the index of needs, and to which the Law attaches special importance. We show that despite this emphasis, this fund plays no role in the distribution of resources in year zero. Section 5 presents the growth structure of the model and shows the way in which the temporal variation of needs is taken into account. Whereas the guarantee fund does not enter into the definition of year zero, it has role in the way resources grow. This is discussed in Section 6, where an empirical simulation of the growth of the system is presented. The paper ends with a section of conclusions.

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[4] We do this in a separate paper: López-Laborda and Zabalza (2010).

[5] The Law states that the model should be reviewed every five years.

[6] A shortened version of this paper in English can be found in Bosch (2010b).

2. The basic structure of the model

Since they were established in the early eighties, intergovernmental transfers in Spain have aimed at the equalisation of resources per unit of need, so that the same service level could be provided by all autonomous communities irrespective of their fiscal capacity. The total amount of resources that at the base year $(t=0)$ the system would effectively put under the command of a given community,[7] and therefore the expenditure that it could undergo, E_i^{P0}, was equal to the revenue actually obtained out of the transferred fiscal base (the "ceded taxes"), T_i^{P0}, plus the transfer it received from the central government (called, initially, State Revenue Share and subsequently Sufficiency Fund), S_i^{P0}.

$$E_i^{P0} = T_i^{P0} + S_i^{P0}. \tag{1}$$

The transfer, S_i^{P0}, was defined as those resources that normatively the system would assign to the community, E_i^{*P0}, minus the revenue that for a given standard tax policy the system would assess that community *i* could obtain from the transferred fiscal base (i.e., the community's fiscal capacity), T_i^{*P0}. Thus,

$$S_i^{P0} = E_i^{*P0} - T_i^{*P0}. \tag{2}$$

The relative structure of needs and differences in the cost of providing services among communities was taken into account through the term E_i^{*P0}. Let α_i, $\left(\sum \alpha_i = 1\right)$, be the index for community *i* that measures the relative differences in needs and costs among communities, which for simplicity we call "the index of needs". Then, if E^{*P0} was the total amount of resources assigned by the system to the fifteen "common regime" autonomous communities, the transfer would be expressed as follows:

$$S_i^{P0} = \alpha_i E^{*P0} - T_i^{*P0}. \tag{3}$$

Substituting 3 into 1, we obtain the expression that shows the essential nature of the previous model:

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[7] In this article we consider only system-related resources. In addition to these resources, the community may obtain other resources from own taxes, debt and other commercial and economic operations. For a recent review of the Spanish regional finance system, see López-Laborda and Monasterio (2007). We index variables of the "previous model" with the superscript *P*.

$$E_i^{P0} = \alpha_i E^{*P0} + \left(T_i^{P0} - T_i^{*P0}\right). \quad (4)$$

The resources that the system would effectively put under the command of community *i*, E_i^{P0}, were those normatively assigned to it, $\alpha_i E^{*P0}$, plus/minus a quantity that would depend on the extent to which revenue effectively obtained from the transferred fiscal base, T_i^{P0}, was larger/smaller than assessed revenue, T_i^{*P0}. For a tax policy equal to the standard tax policy $\left(T_i^{P0} = T_i^{*P0}\right)$, effective resources for this community would be the same as normatively assessed resources. That is,

$$E_i^{P0} = \alpha_i E^{*P0}, \quad (5)$$

and the system would equalise resources per unit of need for all communities.

We would like to argue in this paper that the basic structure of the new model is exactly the same as that of the previous model.[8] As with the previous model, actual resources, E_i^0, come from actual tax revenue obtained from the ceded tax capacity, T_i^0, plus the transfer, S_i^0.

$$E_i^0 = T_i^0 + S_i^0, \quad (6)$$

where

$$S_i^0 = E_i^{*0} - T_i^{*0}. \quad (7)$$

The new model enlarges significantly the fiscal capacity transferred to the communities, in terms of both their sharing in the main national taxes – Personal Income Tax, VAT and Excises – and their power to alter the corresponding tax rates and bases. However, the main changes occur in the definition of the transfer, which is now formed by four elements: the Guarantee Fund Transfer, GFT_i^0; the Sufficiency Fund, SF_i^0; the Competitiveness Fund, CF_i^0; and the Cooperation Fund, COF_i^0.[9] Thus,

[8] To distinguish them from those of the previous model, the variables of new model do not carry the superscript *P*.

[9] The complete names of the first two elements are: the "Guarantee Fund for Fundamental Public Services Transfer" and the "Global Sufficiency Fund". In what follows we will use the shortened version of both names. For the Competitiveness and Cooperation Funds, the Law also uses the generic term "Convergence Funds"; occasionally, we shall make use of this generic form.

$$S_i^0 = GFT_i^0 + SF_i^0 + CF_i^0 + COF_i^0. \quad (8)$$

It is useful to distinguish between the first two elements of expression 6 and the rest. The Competitiveness and Cooperation Funds may be called *primary* elements, in the sense that they are not derived from any other element in the system. The Guarantee Fund Transfer and the Sufficiency Fund, on the other hand, are *derived* elements, as they are obtained from other primary elements of the model.

The Guarantee Fund Transfer is defined as the Guarantee Fund, GF_i^0, minus 75 per cent of assessed tax revenue. That is,

$$GTF_i^0 = GF_i^0 - 0.75T_i^{*0}, \quad (9)$$

where assessed tax revenue is a primary element and the guarantee fund a derived element. The text of the Law puts a lot of emphasis on the guarantee fund. The Law refers to this fund as the source of resources that should cover the cost of fundamental services, and distributes it among communities by means of an index of needs – Adjusted Population – so that resources per unit of need (according to this index) are the same for all communities. We return to the guarantee fund in Section 4, below.

The Sufficiency Fund is defined as the difference between, on the one hand, the sum of resources of the previous system, which the model calls Status Quo, SQ_i^0, and a given amount of fresh resources, called Additional Resources AR_i^0, that the central government contributes to the system and, on the other hand, the sum of the assessed revenue that the community should obtain from the transferred tax base, T_i^{*0}, and the Guaranty Fund Transfer defined above. That is,

$$SF_i^0 = \left(SQ_i^0 + AR_i^0\right) - \left(T_i^{*0} + GFT_i^0\right), \quad (10)$$

where SQ_i^0, AR_i^0 and T_i^{*0} are all primary elements.

Substituting 10 into 8, we obtain the definition of the overall transfer of the new model, exclusively in terms of primary elements,

$$S_i^0 = \left(SQ_i^0 + AR_i^0 + CF_i^0 + COF_i^0\right) - T_i^{*0}. \quad (11)$$

From expression 11 two interesting results follow: First, the guarantee fund transfer, and with it the guarantee fund, cancel out of the system. Despite the emphasis put by the

model, the guarantee fund plays no role in determining the overall transfer in year zero, nor in its distribution among communities. Second, the basic structure of the new model is essentially the same as that of the old model. This can be seen by comparing expressions 11 and 2. They have exactly the same structure and the only difference refers to the definition of the resources that the system normatively assigns to each community, E_i^{*0}. In the old model, as can be seen in 3,

$$E_i^{*P0} = \alpha_i E^{*P0}, \tag{12}$$

whereas in the new model,

$$E_i^{*0} = SQ_i^0 + AR_i^0 + CF_i^0 + COF_i^0. \tag{13}$$

Also, substituting 11 into 6, we obtain

$$E_i^0 = \left(SQ_i^0 + AR_i^0 + CF_i^0 + COF_i^0\right) + \left(T_i^0 - T_i^{*0}\right). \tag{14}$$

As in the old model, community *i* commands a given amount of resources normatively assigned by the system (the four terms enclosed in the first parenthesis of the expression), plus/minus an amount of resources that depend on whether the community applies a tax policy which is stricter or more lax than the normatively determined standard tax policy. For a tax policy equal to the standard, $T_i^0 = T_i^{*0}$, which is the assumption that we will follow in the rest of the paper, the resources the system puts into the hands of community *i*, E_i^{*0}, are given by expression 13. Again, in year zero the guarantee fund plays no role in the determination of resources or in its distribution among communities.

It is important to point out from the outset that despite the different labels attached to each of the four elements of expression 13, all resources – both, those coming from the ceded taxes, T_i^0, and those coming from the general purpose grant, S_i^0 – are unconditional and their allocation depends exclusively on the autonomous community. The particular labels attached to the four terms of 13 must be seen simply as a way to motivate the different distribution rules of each of them. In the next section we evaluate empirically expression 13 over the whole set of communities to gain an idea of the extent to which fresh resources have been added into the system and how they have been distributed.

3. Old and new models

Table 1 shows the estimated values of the four elements of expression 13 at year zero, which under the assumptions used in the simulation exercise corresponds to 2010. The first column gives the status quo, SQ_i^0, which amounts to a total of €92,024 million. This corresponds to the resources that the communities would have had with the old model and serves therefore as the reference to measure the effects of the reform. Column 2 shows the value of AR_i^0, which amounts to a total of €7,400 million. These resources are distributed among communities according to, among other criteria, the Adjusted Population index of needs. Columns 3 and 4 show the value of CF_i^0 and COF_i^0, which amount respectively to totals of €2,638 million and €1,200 million, and are distributed among two different subsets of communities. Although eligibility to each fund is determined by means of a complex set of rules, the outcome (and indeed the objective aimed by the new model) is that approximately the first fund benefits relatively rich communities while the second is directed to relatively poor communities. The competitiveness fund is also distributed according to the Adjusted Population index mentioned above, although subject to specific caps and complements, and the cooperation fund is distributed according to relative poverty.[10]

At year zero, and for a tax policy equal to the standard, the new system adds €11,238 million over and above the resources that the fifteen communities would have obtained with the old system; a 12.2 per cent increase. New resources are not distributed as the status quo. This is the case with the convergence funds, whose rules of eligibility are clearly income oriented, but to some extent it also happens with the specifically called additional resources, *AR*. The bias of the competitiveness fund in favour of relatively rich communities (which are also the communities that were less well treated by the old model) is only partially compensated by the bias of the cooperation fund in favour of relatively poor communities, as the first fund distributes 2.6 per cent of all resources versus 1.2 per cent the second fund.

[10] Data for columns 2, 3 and 4 are derived from the total nominal amounts specified in the Law. Data for column 1 is estimated from data for 2007, which is the last year for which officially settled final figures of the previous model exist.

Table1
Resources of the new model of intergovernmental transfers
(€ Million)

Autonomous Community	SQ_i^0 1	AR_i^0 2	CF_i^0 3	COF_i^0 4	E_i^{*0} $5=\sum_1^4$
Catalunya	15,353	1,365	845	0	17,563
Galicia	6,520	356	0	255	7,131
Andalucia	17,876	1,318	0	335	19,530
Asturias	2,556	106	0	95	2,757
Cantabria	1,543	94	0	18	1,654
La Rioja	805	73	0	0	878
Murcia	2,801	316	37	55	3,210
Valencia	9,585	902	723	0	11,210
Aragon	3,144	220	0	35	3,399
Castilla-La Mancha	4,516	366	0	81	4,963
Canarias	4,156	427	317	0	4,900
Extremadura	2,723	123	0	108	2,954
Baleares	1,974	234	221	0	2,429
Madrid	12,367	1,213	494	0	14,074
Castilla y Leon	6,105	287	0	218	6,610
Total	92,024	7,400	2,638	1,200	103,262
Relative weight (%)	89.1	7.2	2.6	1.2	100

Source: Zabalza and López-Laborda (2010)

Due to the different size of communities, the comparison between previous and new models is best done in terms of resources standardized by some normalizing factor. Community population would be an obvious one, but since the model explicitly advances an index of needs – Adjusted Population (*AP*) – it is useful to describe here such index and adopt it as the normalizing factor.[11]

The *AP* index is formed by eight empirical indicators of need, which together with their corresponding weights are: population (30 per cent), area (1.8), dispersion (0.6), insularity (0.6), welfare assisted population (38), population older than sixty five (8.5) and population younger than seventeen (20.5). Table 2 shows, in columns 2 and 3, the value of this index of needs expressed in population and relative terms. For comparison purposes, column 1 shows unadjusted population for 2007.[12]

[11] Approximately the same qualitative results would be obtained if instead of resources per adjusted inhabitant (which is the normalizing factor we obtain from the adjusted population index of needs) we simply used resources per capita.

[12] This is the year used by the central government to define this index.

Table 2
Adjusted Population index of needs

Autonomous Community	Population P_i^0 1	Adjusted Population N_i^0 2	Relative Index θ_i^0 3
Catalunya	7,210,508	7,117,437	0.1682
Galicia	2,772,533	2,929,898	0.0693
Andalucia	8,059,461	7,939,242	0.1877
Asturias	1,074,862	1,111,259	0.0263
Cantabria	572,824	570,318	0.0135
La Rioja	308,968	313,070	0.0074
Murcia	1,392,117	1,365,915	0.0323
Valencia	4,885,029	4,783,008	0.1131
Aragon	1,296,655	1,368,284	0.0323
Castilla-La Mancha	1,977,304	2,110,248	0.0499
Canarias	2,025,951	2,093,063	0.0495
Extremadura	1,089,990	1,158,764	0.0274
Baleares	1,030,650	1,033,742	0.0244
Madrid	6,081,689	5,703,404	0.1348
Castilla y Leon	2,528,417	2,709,305	0.0640
Total	42,306,958	42,306,958	1.0000

Sources: MEH (2009b) and Zabalza and López-Laborda (2010)

Table 3 shows in columns 1 and 2 resources per adjusted inhabitant, N_i^0, of respectively previous and new models. The old model distributes on average €2,167 per adjusted inhabitant, with a coefficient of variation (CV) around this mean of 9.7 per cent, while the new model distributes more money, €2,441 per adjusted inhabitant, and much more uniformly – a CV of 6.7 per cent. The new model, therefore, significantly flattens the distribution of resources per adjusted inhabitant around the mean. In the old model the distribution ranges from Cantabria that gets 24.2 per cent more resources per adjusted inhabitant than the mean, to Baleares that gets 12.3 per cent less – a difference of 36.5 percentage points. In the new model the two extremes of the distribution are Cantabria that gets 18.8 per cent more resources, and Canarias that gets 4.1 per cent less resources – a difference of 22.9 percentage points.[13]

The first five communities in terms of relative gain are Baleares (8.6 percentage points), Canarias (4.4), Valencia (3.9), Catalunya (2.1) and Madrid (1.9).[14] The first five

[13] It must be noted that Canarias, due to its particular geographical situation, has a special economic and fiscal regime that yields resources additional to those obtained from the system described here.

[14] The big gain experienced by Baleares is in part a consequence of the Third Additional Provision of the Law that establishes that those communities with resources per adjusted inhabitant below the mean, and with negative values for both the Guaranty Fund Transfer and the Sufficiency Fund, are entitled to a

communities in terms of relative loss are Cantabria (5.5 percentage points), Asturias (4.2), Aragon (4.1), Castilla y Leon (3.9) and Extremadura (3.8). The effect of the new model on each community can also be seen in Figure 1, where relative deviations are presented in an ordered fashion. The new model changes somewhat the ordering of communities and, as pointed out above, flattens significantly the distribution of relative deviations.

Table 3
Comparison between the old and new models. Resources per adjusted inhabitant

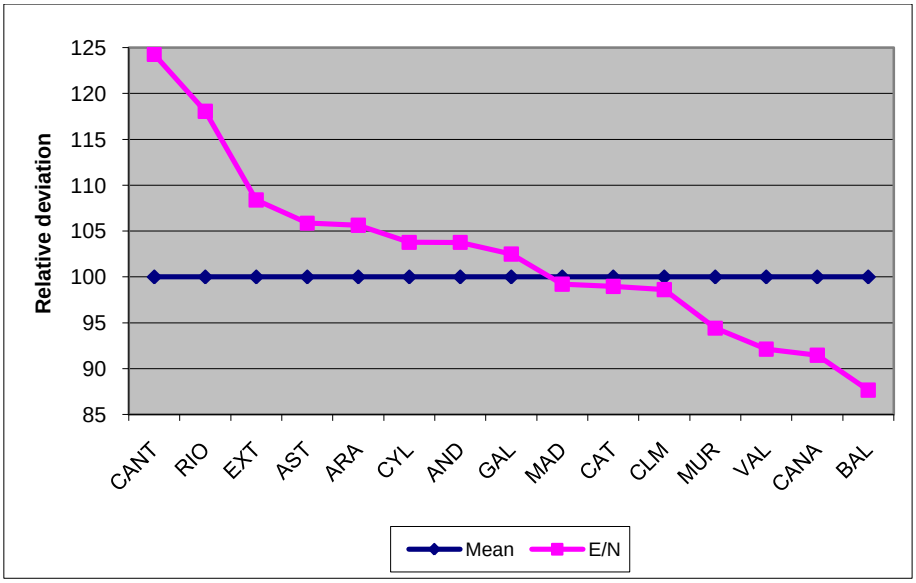
	€ per adjusted inhabitant		Relative deviation (%)		Relative
Autonomuos	SQ_i^0 / N_i^0	E_i^{*0} / N_i^0	SQ_i^0 / N_i^0	E_i^{*0} / N_i^0	gain (%)
Community	1	2	3	4	5=4-3
Catalunya	2,144	2,468	99.0	101.1	2.1
Galicia	2,221	2,434	102.5	99.7	-2.8
Andalucia	2,248	2,460	103.8	100.8	-3.0
Asturias	2,294	2,481	105.9	101.6	-4.2
Cantabria	2,692	2,901	124.2	118.8	-5.4
La Rioja	2,558	2,804	118.1	114.9	-3.2
Murcia	2,046	2,350	94.4	96.3	1.9
Valencia	1,996	2,344	92.1	96.0	3.9
Aragon	2,289	2,484	105.6	101.8	-3.9
Castilla-La Mancha	2,137	2,352	98.6	96.4	-2.3
Canarias	1,982	2,341	91.5	95.9	4.4
Extremadura	2,348	2,549	108.4	104.5	-3.9
Baleares	1,899	2,350	87.7	96.3	8.6
Madrid	2,149	2,468	99.2	101.1	1.9
Castilla y Leon	2,248	2,440	103.8	100.0	-3.8
Total	2,167	2,441	100.0	100.0	0.0
CV (%)	9.7	6.7			

Source: Zabalza and López-Laborda (2010)

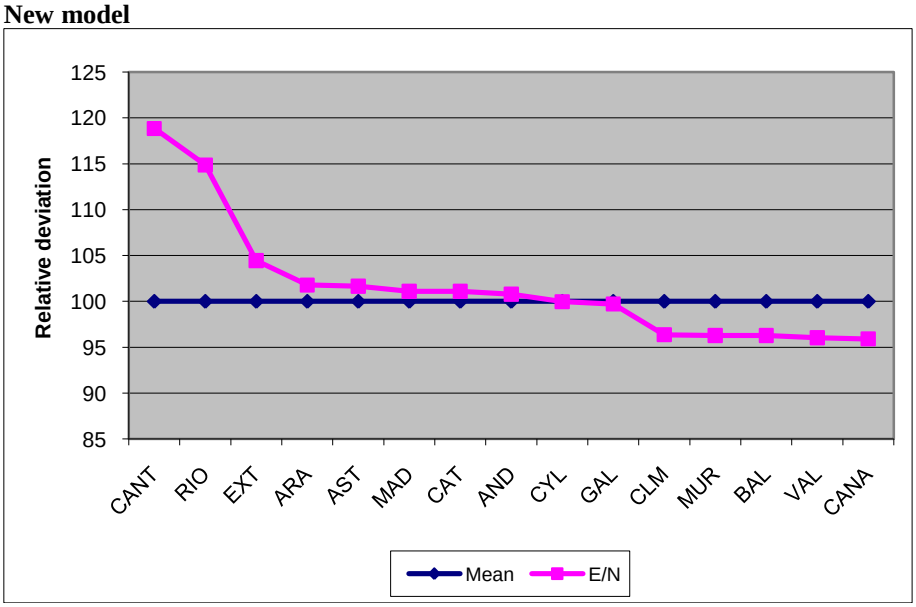
special complement. Baleares is the only community that fits these conditions, and the complement received is €65 million. This represents a 39.4 per cent increase of the resources this community would be entitled without such complement (€156 million).

Figure 1
Comparison between the old and new models
Relative deviation of resources per adjusted inhabitant. Year zero

Old model



New model



Source: Table 3

4. The Guarantee Fund

We now return to the guarantee fund. Substituting 9 into 8, and the resulting expression into 7, we obtain another expression of normative resources, this time as a function of the guarantee fund:

$$E_i^{*0} = 0.25T_i^{*0} + GF_i^0 + SF_i^0 + CF_i^0 + COF_i^0. \quad (15)$$

Table 4 evaluates empirically expression 15. The new elements that appear in this decomposition are those shown in columns 1 to 3, while columns 4 to 6 are the same as the corresponding ones in Table 1.

Table 4
Another decomposition of resources
(€ Million)

Autonomous Community	$0.25T_i^{*0}$ 1	GF_i^0 2	SF_i^0 3	CF_i^0 4	COF_i^0 5	E_i^{*0} 6=$\sum_1^5$
Catalunya	4,226	11,582	910	845	0	17,563
Galicia	1,082	4,768	1,026	0	255	7,131
Andalucia	3,174	12,919	3,101	0	335	19,530
Asturias	503	1,808	351	0	95	2,757
Cantabria	288	928	420	0	18	1,654
La Rioja	151	509	217	0	0	878
Murcia	553	2,223	342	37	55	3,210
Valencia	2,330	7,783	373	723	0	11,210
Aragon	684	2,227	453	0	35	3,399
Castilla-La Mancha	777	3,434	671	0	81	4,963
Canarias	395	3,406	783	317	0	4,900
Extremadura	348	1,886	613	0	108	2,954
Baleares	640	1,682	-115	221	0	2,429
Madrid	4,037	9,281	262	494	0	14,074
Castilla y Leon	1,119	4,409	865	0	218	6,610
Total	20,307	68,845	10,272	2,638	1,200	103,262
Relative weight (%)	19.7	66.7	9.9	2.6	1.2	100.0

Source: Zabalza and López-Laborda (2010)

For all communities, a quarter of assessed tax revenue equals €20,307 million, which implies that total assessed tax revenue is €81,228 million. The new model significantly enlarges the share of communities into the main tax figures. In terms of assessed revenue, the shares go from 33 to 50 per cent in Personal Income Tax; from 35 to 50 per cent in VAT; and from 40 to 58 per cent in Excises. As a result, in the new model assessed tax revenue, T^{*0}, represents 78.7 per cent of total resources and the overall transfer, S^0, 21.3 per cent. In the old model, for the same overall resources,

these percentages would have been 61.8 and 38.2 respectively. Tax revenue, therefore, gains almost 17 percentage points in the structure of resources.

The aggregate figure for the guarantee fund is approximately two thirds of total resources (€68,845 million) and is distributed among communities according to the *AP* index of needs. Thus,

$$GF_i^0 = \theta_i^0 GF^0,$$

where θ_i^0 (shown in Table 2) is the *AP* index that corresponds to community *i*. GF_i^0, therefore, could be seen as a measure of what the new model considers the expenditure needs for fundamental services or, taking notice of the denomination of this fund, as a guaranteed amount of resources that the community, if so wishes, can assign to this type of services.

However, it is necessary to keep in mind that all resources, those needed to finance fundamental services and those needed to finance the rest of services, are unconditional. The fact that the model assigns €17,563 million to Catalunya, of which €11,582 million are in principle provided for fundamental services, is somewhat that does not generate any practical obligation for the Catalan government. Neither the model contains any mechanism that will insure that the Catalan government will use these €11,582 million on fundamental services, nor would the Catalan government agree with such mechanism as it would seriously cut out the legally granted expenditure autonomy that it enjoys.[15]

To view this fund as the guarantee of a given amount of resources is a reasonable interpretation. But notice that, for a standard tax policy, the actual guarantee of resources goes significantly beyond the amount notionally earmarked for fundamental services: in fact, using the Catalan example above and assuming as we have done above that the eligibility conditions of the competitiveness fund are met, the guarantee applies to the full €17,563 million.

These are important points in order to understand the distribution structure of the new model in year zero, and it is therefore convenient to elaborate further on the role played by the guarantee fund. From the description so far, we have two ways of representing the amount of resources that, for a standard tax policy, the system puts

[15] The same could be said of any of the fifteen common regime autonomous communities.

under the command of communities: expressions 13 and 15, which for convenience we repeat here.

$$E_i^{*0} = SQ_i^0 + AR_i^0 + CF_i^0 + COF_i^0. \quad (13)$$

$$E_i^{*0} = 0.25T_i^{*0} + GF_i^0 + SF_i^0 + CF_i^0 + COF_i^0. \quad (15)$$

It is tempting to conclude from expression 15 that tax capacity and the guarantee fund play a role in the distribution of resources of the new model, but this would be a mistake. Assessed tax revenue and the guarantee fund appear in 15 due only to the fact that this expression still contains the equalising transfer SF_i^0.

If in 15, expression 10 is substituted for SF_i^0, then we go back to expression 13, where neither tax capacity nor the guarantee fund play any role. The distribution structure of the new model emerges from the criteria that guide the distribution of the four primary elements in 13. As far as the status quo is concerned, the distribution is guided by the indicators of expenditure need of the previous model; and the other three terms – additional resources and the two convergence funds – are distributed according to another set of variables and rules of eligibility, which are explicitly defined by the new model.

We may convene, as the Law seems keen to pretend, that a part of total resources, namely the guarantee fund, is distributed according to the index *AP*. But then, the rest must be distributed in such a way that all resources respect the distribution implicit in expression 13. This can be seen perhaps more clearly, adding and subtracting GF_i^0 to expression 13,

$$E_i^{*0} = GF_i^0 + \left(SQ_i^0 + AR_i^0 + CP_i^0 + COF_i^0 - GF_i^0\right). \quad (16)$$

The fact that the Law identifies a portion of resources, calls it guarantee fund and distributes it according to the *AP* index, does not alter the overall distribution of resources. The guarantee fund will effectively be distributed according to *AP*, but the parenthesis in expression 16 will be distributed so that the effect of *AP* in the system is neutralized and the joint distribution of the four primary elements in 13 emerges again.[16]

[16] López-Laborda and Zabalza (2010) use this argument to define a global index of needs for all the resources of the system.

After year zero, however, the guarantee fund has an influence on resources because, according to the rules that determine the growth of the system, the distribution of the sufficiency fund gets fixed in year zero and ceases to act as an equalising mechanism in subsequent years; it simply grows according to the ITE rate of growth that we define in the next section, which is common for all communities. Thus, the way in which in year zero total resources (net of the convergence funds) are partitioned between (25 per cent of) tax capacity, guarantee fund and sufficiency fund matters for the distribution of resources among communities in subsequent years. We turn to the growth of the system in the following section.

5. Growth of resources

In the previous model, the growth of resources between period 0 and period *t* followed a very simple set of rules: assessed tax revenue, T_i^{*P0}, grew at its own rate of growth τ_i, and the transfer, S_i^{P0}, grew at the common rate τ^I – called the ITE (*Ingresos Tributarios del Estado*) rate of growth – for all autonomous communities. The ITE rate of growth τ^I measures the growth between year zero and year *t* of the revenue of the State sharing in Personal Income Tax, VAT and Excises. For a tax policy equal to the standard, equation 1 above reads

$$E_i^{*P0} = T_i^{*P0} + S_i^{P0}.$$

Then, according to the above rules, resources at year *t* in the previous model were:

$$E_i^{*Pt} = T_i^{*P0}\left(1+\tau_i\right) + S_i^{P0}\left(1+\tau^I\right),$$

which can be rewritten as:

$$E_i^{*Pt} = E_i^{*P0}\left[\lambda_i\left(1+\tau_i\right) + \left(1-\lambda_i\right)\left(1+\tau^I\right)\right], \tag{17}$$

where $\lambda_i = T_i^{*P0} \big/ E_i^{*P0}$. That is, in the previous model, the factor of growth of resources (the expression in brackets) was a weighted average of $1+\tau_i$ and $1+\tau^I$, where the respective weights were the participation of assessed tax revenue and transfer in total resources.

In the new model things are somewhat more complicated. The rules of growth are given with reference to equation 15 above. Assessed tax revenue, T_i^{*0}, grows over time according to its own rate of growth, τ_i.

As far as the guarantee fund, GF_i^0, is concerned, the model proceeds in two steps: first, the total amount of the fund grows according to a weighted average of the rate of growth of total assessed tax revenue, τ, and the ITE rate of growth defined above; and second, the *AP* index for year *t* is applied to this total. That is, differently from the previous model, the new model takes into account the change in regional expenditure needs.

As pointed out above, the sufficiency fund, SF_i^0, grows for all communities at the common growth rate τ^I, and the two convergence funds grow at rates that end up being specific to each community due not only to the change of needs, but also to the eligibility rules and, in the case of the competitiveness fund, the Third Additional Provision of the Law referred to in note 13.

The resulting growth pattern is obviously different from that of the previous model. To gain some insight on this difference, it is useful to identify the rate of growth of resources of the new model in terms of the framework given by equation 17. To this end, substituting 9 into 8 we obtain

$$S_i^0 = GF_i^0 - 0.75T_i^{*0} + SF_i^0 + CF_i^0 + COF_i^0.$$

The outcome of the above growth rules is that, for the new model, the rate of growth of the overall transfer, S_i^0, is the composite result of applying these rules to each of the five elements of the above expression. For the period that goes between year zero and year *t*, we call this rate τ_i^s. Thus, from 7 we have

$$E_i^{*0} = T_i^{*0} + S_i^0$$

and

$$E_i^{*t} = E_i^{*0}\left[\phi_i\left(1+\tau_i\right)+\left(1-\phi_i\right)\left(1+\tau_i^s\right)\right], \qquad (18)$$

where $\phi_i = T_i^{*0} / E_i^{*0}$. Assessed tax revenue grows as in the old model, but the transfer grows at a rate that is specific for each community and, among other things, incorporates the change in needs.[17]

6. Empirical simulation

The simulation methodology can be described as follows: First, empirical data for the growth rates of assessed tax revenue, ITE, need variables and GDP are used. Growth rates of assessed tax revenue and ITE are estimated from the observed growth rates of these concepts from 2004 to 2007, and are taken from MEH (2006 and 2009a). The growth rates of each of the need indicators and GDP (used in the eligibility rule of the cooperation fund and its distribution) correspond also to the average of period 2004 to 2007 and are taken from the National Statistics Institute. Only one rate of growth for each concept is estimated, and this rate is used as the average annual rate over the whole simulated quinquennium. The years 2004 to 2007 correspond to a period of cyclical expansion and this explains the relatively high growth rates used. However, it is considered preferable to work with empirical rather than with hypothetical data. This choice may influence absolute effects of the simulation, but should make little difference to relative effects, which are the main object of the exercise.

Second, despite working with average annual rates, the five years of the quinquennium are simulated.[18] This is done to obtain a more realistic profile of the annual growth of the convergence funds. Because of the eligibility rules, this profile turns out to be specific to each community and subject to potential discontinuities. Had the simulation restricted the period of interest to only one year (or equivalently to the whole of the quinquennium), these particularities would have gone unnoticed.

Table 5 repeats for year one the information of Table 2 and shows the average annual rates of growth of adjusted population. Although the new model uses in fact the growth of the relative structure of needs, τ^{θ}, in order to see how needs change over

[17] For an expression that formally shows how the growth factor of total resources (the term in brackets in expression 18) is related to the growth factors of needs, fiscal capacity, ITE, and convergence funds, see López-Laborda and Zabalza (2010).

[18] This article only shows the simulation results corresponding to the last year of the quinquennium, but the intervening years are available upon request.

time, it is more informative to use the growth of adjusted population, τ^{ap}. As the following derivation shows, the relation between the two concepts is straightforward:

$$1+\tau_i^{\theta}=\frac{\theta_i^t}{\theta_i^0}=\frac{AP_i^t/AP^t}{AP_i^0/AP^0}=\frac{AP_i^t/AP_i^0}{AP^t/AP^0}=\frac{\left(1+\tau_i^{ap}\right)}{\left(1+\tau^{ap}\right)}.$$

As can be seen in column 4, total needs are assumed to grow at an annual average rate of 1.6 per cent. Valencia, Baleares and Murcia are the three communities with the largest growth of needs, and Asturias, Extremadura and Galicia the three communities with the smallest growth.[19]

Table 5
Growth of needs

	Population	Adjusted Population	Relative Index	Growth of	
				AP	θ
	P_i^1	AP_i^1	θ_i^1	$1+\tau^{ap}$	$1+\tau^{\theta}$
Autonomous Community	1	2	3	4	5
Catalunya	7,347,985	7,257,699	0.1689	1.020	1.004
Galicia	2,779,753	2,943,242	0.0685	1.005	0.989
Andalucia	8,187,399	8,055,204	0.1874	1.015	0.999
Asturias	1,075,229	1,113,916	0.0259	1.002	0.987
Cantabria	578,967	576,663	0.0134	1.011	0.995
La Rioja	314,284	318,679	0.0074	1.018	1.002
Murcia	1,426,194	1,397,263	0.0325	1.023	1.007
Valencia	5,004,556	4,902,312	0.1141	1.025	1.009
Aragon	1,312,736	1,383,908	0.0322	1.011	0.996
Castilla-La Mancha	2,022,064	2,147,754	0.0500	1.018	1.002
Canarias	2,064,151	2,130,479	0.0496	1.018	1.002
Extremadura	1,094,936	1,162,030	0.0270	1.003	0.987
Baleares	1,057,159	1,058,695	0.0246	1.024	1.008
Madrid	6,176,880	5,810,546	0.1352	1.019	1.003
Castilla y Leon	2,540,022	2,723,926	0.0634	1.005	0.990
Total	42,982,316	42,982,316	1.0000	1.016	1.000

Sources: MEH (2009b) and Zabalza and López-Laborda (2010)

The ITE annual average growth rate is 10.9 per cent, $\left(1+\tau^{I}\right)=1.109$, and Table 6 shows the annual average growth rate of assessed tax revenue. Tax capacity for all

[19]As noted by López-Laborda and Zabalza (2010), the way the new model measures the change in total needs, which may be surmised by the rules it applies to determine the growth of the guarantee fund, is not entirely satisfactory. According to the new model, total needs always grow as total population, while in general total needs should correspond to total population (the chosen metric) only in year zero; in subsequent years, total needs should reflect not only the growth of population, but also the growth of all other indicators of need included in *AP*. However, given the large weight of population-related variables in the *AP* index (97 per cent), the difference is bound to be small.

communities grows 9.7 per cent per year. Madrid, Canarias and Castilla-La Mancha are the three communities where assessed tax revenue grows most, and at the other end we find Baleares, Asturias and Galicia.

Table 6
Growth of assessed tax revenue

	Assessed Tax Revenue $1+\tau_i$
Catalunya	1.095
Galicia	1.087
Andalucia	1.096
Asturias	1.086
Cantabria	1.093
La Rioja	1.093
Murcia	1.103
Valencia	1.097
Aragon	1.097
Castilla-La Mancha	1.105
Canarias	1.106
Extremadura	1.089
Baleares	1.078
Madrid	1.109
Castilla y Leon	1.090
Total	1.097

Sources: MEH (2006 and 2009a)

Table 7 shows the values of the rate of growth of the overall transfer, τ_i^s. Baleares shows a negative rate because its transfer goes from negative to positive, and Madrid has a negative overall transfer for the whole period. Leaving aside these two cases, the transfer that grows most is that of Catalunya (an average annual rate of 22.4 per cent), followed by Valencia (13.5) and La Rioja (11.5). The transfer with the smallest growth is that of Aragon (8.8 per cent) followed by Asturias (9.1) and Castilla y León (9.1).

Table 7
Growth of overall transfer in new model

Autonomous Community	$1+\tau_i^s$ Average annual rate
Catalunya	1,224
Galicia	1,093
Andalucia	1,103
Asturias	1,091
Cantabria	1,104
La Rioja	1,115
Murcia	1,112
Valencia	1,135
Aragon	1,088
Castilla-La Mancha	1,098
Canarias	1,099
Extremadura	1,092
Baleares	-0,716
Madrid	1,142
Castilla y Leon	1,091
Total	1,104

Source: Zabalza and López-Laborda (2010)

The growth of the system is obtained by applying these rates of growth to the procedure described above. Table 8 shows the figures for the last year of the quinquennium. Total resources grow 9.9 per cent per year, a very similar rate to that of assessed tax capacity, and the guarantee and sufficiency funds. The cooperation fund grows at the ITE rate, 10.9 per cent, and the competitiveness fund grows somewhat less, at 10.4 per cent. Regarding individual results, the set of communities that benefits from the competitiveness fund remains stable during the whole quinquennium, while that of the cooperation fund experiences the addition of Canarias, which becomes eligible in the second year. The complex rules of eligibility, thus, generate a very particular and variable pattern of distribution. The economic logic of the eligibility rules of the competitiveness fund is not apparent from the text of the Law, but the final outcome suggests that this instrument somewhat compensates those (mostly rich) communities that were worst treated by the old model. The logic of the cooperation fund is more familiar, but the doubt remains whether this fund is an instrument of regional policy rather than an element of an equalising system of intergovernmental grants. Overall, judging from the way these funds work, they seem designed to satisfy particular demands of communities.

Table 8
Resources of the new model in year five
(€ Million)

Autonomous Communitiy	$0,25T_i^{*5}$ 1	GF_i^5 2	SF_i^5 3	CF_i^5 4	COF_i^5 5	E_i^{*5} $6=\sum_1^5$
Catalunya	6,657	18,892	1,321	1,566	0	28,435
Galicia	1,642	7,217	1,692	0	396	10,946
Andalucia	5,013	20,550	5,146	0	517	31,226
Asturias	759	2,707	573	0	148	4,188
Cantabria	448	1,451	690	0	29	2,618
La Rioja	236	824	355	0	0	1,415
Murcia	904	3,683	558	73	94	5,311
Valencia	3,695	13,022	544	1,080	0	18,341
Aragon	1,089	3,487	732	0	56	5,364
Castilla-La Mancha	1,279	5,548	1,110	0	136	8,073
Canarias	653	5,509	1,296	366	121	7,945
Extremadura	533	2,830	1,025	0	171	4,559
Baleares	932	2,804	-215	232	0	3,753
Madrid	6,768	15,070	196	1,003	0	23,037
Castilla y Leon	1,720	6,700	1,421	0	348	10,189
Total	32,329	110,294	16,443	4,320	2,015	165,401
Relative weights	19.5	66.7	9.9	2.6	1.2	100.0
Annual average growth	9.7	9.9	9.9	10.4	10.9	9.9

Source: Zabalza and López-Laborda (2010)

Finally, Table 9 and Figure 2 compare, in terms of resources per adjusted inhabitant, the base year and the last year of the quinquennium. The most noticeable feature of this comparison is the widening of the distribution: the coefficient of variation goes from 6.7 per cent in year zero to 7.8 per cent in year five. In part, this is due to the loss in year five of the special complement received by Baleares during the previous four years as a result of the Third Additional Provision (see note 13 above), but even without Baleares the coefficient of variation would increase from 6.8 per cent to 7.2 per cent. In general, communities than gain with the new model are the ones that tend to loose with the passing of time and vice versa. The pattern of growth, therefore, eliminates in part the gains in uniformity obtained with the new model. Uniformity may not be a sufficiently strong criterion on which to judge the adequacy of the rules of growth of the system. But it is strange that, as column 5 of the table shows, despite the explicit objective of the new model to take into account the temporal change of needs, the five communities that gain most are, all of them, the ones for which adjusted population grows below the mean (see Table 5); while the five communities with the highest loses are, also all of them, the ones for which adjusted population grows above the mean.

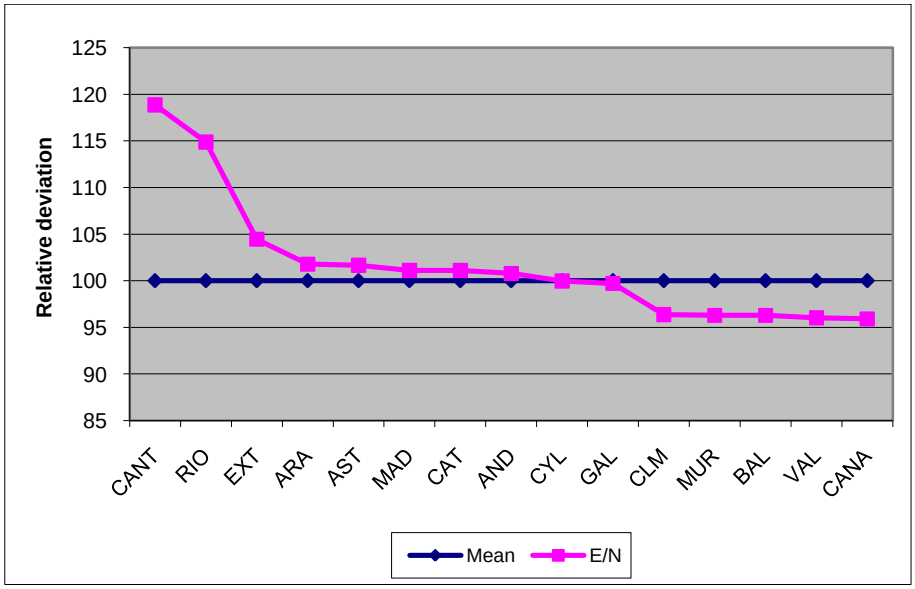
Table 9
Growth of resources per adjusted inhabitant (t5 vs t0)

Autonomous Communtiy	€ per capita		Relative deviation (%)		Relative gain (%)
	E_i^{*0}/N^0	E_i^{*5}/N^5	E_i^{*0}/N^0	E_i^{*5}/N^5	
	1	2	3	4	5=4-3
Catalunya	2,468	3,624	101.1	100.4	-0.7
Galicia	2,434	3,651	99.7	101.1	1.4
Andalucia	2,460	3,658	100.8	101.3	0.5
Asturias	2,481	3,724	101.6	103.1	1.5
Cantabria	2,901	4,344	118.8	120.3	1.5
La Rioja	2,804	4,134	114.9	114.5	-0.4
Murcia	2,350	3,472	96.3	96.2	-0.1
Valencia	2,344	3,391	96.0	93.9	-2.1
Aragon	2,484	3,704	101.8	102.6	0.8
Castilla-La Mancha	2,352	3,503	96.4	97.0	0.7
Canarias	2,341	3,472	95.9	96.2	0.3
Extremadura	2,549	3,878	104.5	107.4	3.0
Baleares	2,350	3,223	96.3	89.3	-7.0
Madrid	2.468	3,680	101.1	101.9	0.8
Castilla y Leon	2,440	3,661	100.0	101.4	1.4
Total	2,441	3,610	100,0	100.0	0.0
CV (%)	6.7	7.8			

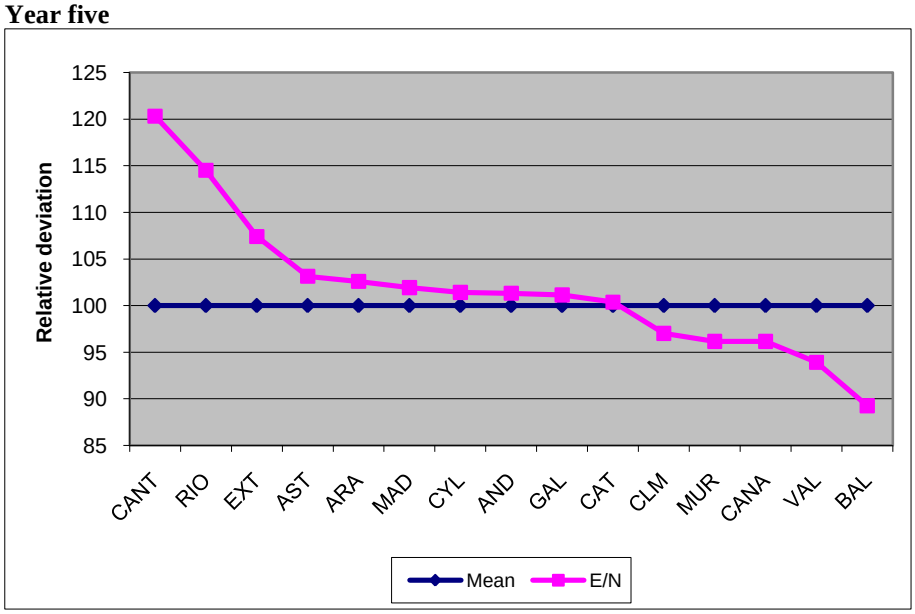
Sources: Zabalza and López-Laborda (2010) and own calculations

Figure 2
New model; comparison between year zero and year five
Relative deviation of resources per adjusted inhabitant

Year zero



Year five



Source: Table 9

7. Conclusion

The reform of the Spanish system of intergovernmental transfers takes as its starting point the resources distributed by the old model (the status quo), and adds to this point fresh resources by means of the so called additional resources and the two convergence funds. The status quo represents 89.1% of total resources. Despite that, the distribution is significantly different from that of the old model: it is much less dispersed and there are important changes in the effects upon particular communities. That is, the distribution of fresh resources contributed to the system is not neutral with respect the distribution of the status quo.

In the distribution of the term named additional resources, population growth plays an important role and this benefits communities such as Murcia, Baleares, Canarias, Madrid, Valencia and Catalunya, which in the old model were not particularly well treated. These are also the communities that benefit from the competitiveness fund, which in that sense reinforces the distributive effect of additional resources. Finally, the cooperation fund, although it counteracts somewhat theses two effects, is not big enough to cancel them completely. The final result is a significant flattening of the distribution of resources per unit of need or adjusted inhabitants (a reduction of the coefficient of variation from 9.7 to 6.7 per cent) and a relative improvement of the financial position of these communities.

This paper has examined the growth structure of resources that the new model implies. Growth of resources per unit of need is not uniform across communities. Part of the narrowing of the distribution obtained with the substitution of the new for the old model is offset over time, so that the coefficient of variation in the last year of the quinquennium is 7.8 per cent; 1.1 percentage points above its level in year zero.

The new model is rather obscure concerning the distribution structure it implies. The model introduces an index of needs, the adjusted population, from which it is not possible to deduce the way in which resources are effectively distributed. For that, it is necessary to look at the specification of resources in year zero, which, departing from previous reforms, are given not only in terms of global magnitudes but also in terms of specific allocations to communities. Also, the leading role that the model assigns to the guarantee fund is exaggerated. Given the unconditional nature of resources, the only guarantee that this fund offers is that over two thirds of resources will grow taking into account a series of need indicators.

The practical application of the model will not be easy. To take into account the temporal variation of needs adds an evident complication to the model, but this is amply compensated by the closer response of resources to changes in communities' socio-demographic characteristics. Also, given the structural nature of needs and the gradual way in which they change, we should not expect great differences between provisional and final transfers, although the period in which provisional transfers become final will inevitably lengthen. The biggest management problem will be that of the two convergence funds and, particularly, that of the competitiveness fund. The eligibility conditions and the adjustments contemplated by the model depend on the change of economic and demographic variables, the evolution of which is sometimes measured with significant delays. The potential exit of some community after having received provisional transfers during perhaps several years, may pose non negligible political difficulties.[20]

Of the five major revisions of the system, this reform is the most expensive. It is not clear that the return per euro invested is particularly high. On the positive side we have a significant reduction in the dispersion of the distribution of resources per unit of need. On the negative side, the system has become complex and obscure regarding the distribution criteria it uses; also, it introduces changes in relative positions and potential discontinuities that may cause problems of management in the future. The main two shortcomings of the model are, on the one hand, an explicit index of needs applicable to all resources and, on the other, a growth mechanism that, subject to the change of needs, keeps the year zero distribution unchanged. To practically overcome these shortcomings we will have to wait until the next reform, but the analysis of normative proposals on these issues opens an interesting agenda of future work for the academic community.

[20] Although not considered in the Law, a subsequent public statement from the Spanish Economics and Finance Minister, Ms. Salgado, seems to suggest that the usual procedure consisting of provisional advances followed by final payments will not be available in the case of convergence funds, and that the corresponding transfers will be made only when the final figures can be assessed.

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