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## Fiscal Visibility in Spain: Two Types of Estimates

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## **FISCAL VISIBILITY IN SPAIN: TWO TYPES OF ESTIMATES**

### **ABSTRACT:**

*The size and pattern of any public budget depend, among other factors, on the **visibility** of both the burdens and the benefits of public revenue and public expenditure. Furthermore, such **visibility** is a necessary - not a sufficient - condition for an efficient allocation of resources between the private and public sectors of an economy.*

*The aim of this contribution, based on a recent research, is to simultaneously present additive and arithmetic indicators for local, intermediate and central territorial government levels and to initially apply them to Spain by using data and information provided by the International Monetary Fund. Conclusions and comments are offered for general criticism, discussion, theoretical development and future application to other OECD countries.*

## 1. INTRODUCTION

In 1903 a *Teoria della Illusione Finanziaria*, by Amilcare Puviani, was published in Italy. Starting from previous studies<sup>1</sup> and probably influenced by the political doctrine of Maquiavelo [Rodríguez Bereijo, 1972, page X], Puviani denounced the utilization of mechanisms and cunning arguments by governments to conceal taxpayers a significant part of their tax burdens. Subsequently several followers of the Public Choice school<sup>2</sup> drew important conclusions concerning a systematic trend to a public over-provision of goods and services as far as their benefits seemed evident to citizens and, quite the opposite, a substantial part of the tax burdens were hardly noticeable by them. On the other hand, other authors [Galbraith, 1958; Musgrave and Musgrave, 1989] considered that the political process drove or could drive to a public under-provision, remarking that "while tax-payers may underestimate their burden, they may also underestimate expenditure benefits... there is a cross-current of forces and the net effect is by no means evident" [Musgrave and Musgrave, 1989, pp. 100-1].

The importance of the visibility issue from both the Pareto allocative efficiency and the social equity points of view is evident: if the several types of economic burdens for citizens embedded in the public revenue (the income effect, the substitution effect, the compliance cost of taxes...) are lower than the benefits perceived by them from publicly provided goods and services, a permanent factor will permanently distort both the size - public over-provision - and the pattern - over-provision of goods and services with the most visible benefits -. Quite the opposite, if the several types of economic burdens of public revenue are more noticeable than the benefits of public expenditure, this asymmetry will drive to both a systematic under-provision of goods and services and a distorted pattern of public budget. Hence the unquestionable interest in knowing and measuring the phenomenon of *fiscal illusion* or, in other words, its opposite magnitude, *fiscal visibility*, since only measurable things can be controlled.

In order to assess the direct monetary burden of taxes, that is, their income effect, the Herfindahl index of concentration was initially used, starting from the supposition - not

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<sup>1</sup>"Teoria della Illusione nelle Entrate Pubbliche", *Annali della Facoltà di Giurisprudenza dell'Università di Perugia*, 1897; "Osservazioni sulla Spinta Contributiva delle Tasse", *Giornale degli Economisti*, vol. XV, II, 1897, pp. 106-28; "Illusione Finanziaria Mediante Associazione delle Pene delle Imposte fra Loro e con Altre Pene", *Giornale degli Economisti*, 1898, pp. 118-35.

<sup>2</sup>See, for instance, J.M. Buchanan in *Public Finance in a Democratic Process*, University of North Carolina Press, Chapel Hill, 1967.

always right - that the so called direct taxes (in rem and personal taxes on income and wealth, or income source taxes) were fully perceptible by tax-payers and indirect taxes (on expenditure or income use taxes) were not noticeable or less noticeable. In addition to this, attempts to estimate fiscal illusion mainly focused on public revenue, neglecting public expenditure probably because the visibility of its benefits seemed more evident given the interest displayed by politicians and bureaucrats to exaggerate such benefits.

However, such past approaches have suffered from two serious lacks or constraints:

A) First, the Herfindahl index does not take into consideration several factors which can decisively influence the perception of the burdens by taxpayers, such as:

a) The internal structure of every tax.

b) The possible economic shifting of the income effect by the legal taxpayer onto other economic agents according to both market structures and changing economic situation.

B) Second, it is not evident, in spite of the political and bureaucratic publicity, that citizens are fully aware of benefits received from all services provided to them by public expenditure. Because of the non-rival consumption nature of some services, many economic agents are neither fully aware of the goods they are consuming nor the quantities or costs of public services.

Hence the need to estimate burdens and benefits of public revenue and expenditure by using more complete indicators covering both sides of the public budget simultaneously.

After referring to some contributions on the topic of fiscal illusion, the aim of this contribution is to combine two types of indicators - multiplicative and additive -, recently used for measuring such a phenomenon, and to apply them to the three levels of Spanish territorial governments. Then important conclusions to guide a future reform of the public revenue and expenditure sub-system at the municipal level of government in such a country is drawn.

## **2. BACKGROUND**

The visibility of the burdens of the public revenue has been changing in the course of time depending on both economic, technical and cultural circumstances (development level of a country, degree of tax literacy of taxpayers...) and political and administrative (mechanisms of fiscal illusion utilized by governments, bureaucrats and interest groups to overcome resistance of taxpayers) factors [Wagner, 1976; Borcharding, 1977; Buchanan and Wagner, 1977; Fiorina and Noll, 1978; Pommerehne and Schneider, 1978; Brennan and Buchanan, 1980; Frey y Pommerehne, 1982; Oates, 1988; Tullock, 1989; Tabellini and Alesina, 1990; Dunleavy, 1991; Mueller, 1993; Roig-Alonso, 1998; Roig-Alonso, 2002]. In a similar way, the degree of compliance of such a visibility requirement by fiscal

systems now in force can vary remarkably among OECD countries [Roig-Alonso, 2003].

As regards public expenditure, the public or private, the final or intermediate nature, the spacial effects or dimensions, the administrative costs and other characteristics of publicly provided goods and services are factors determining the visibility of their benefits [Weingast, Shepsle and Johnsen, 1981; Solano, 1983; Hamilton, 1983; Becker, 1983, 1985; Mueller and Murell, 1985, 1986; Mueller, 1987, Wolff, 1987; Henrekson, 1992; Roig-Alonso, 1998, 2002].

In any case it is necessary to have logical indicators to measure, insofar as it is possible, how much the burdens and benefits of public local, intermediate, central or federal budgets are visible for the economic agents of any country at any moment.

### 3. AN INDEX OF BURDEN VISIBILITY OF TOTAL PUBLIC REVENUE

In general, for every level, **L**, of territorial public administrations of an economy, a visibility index,  $V_L^R$ , of its total public revenue, **R**, was defined in such a way that  $0 \leq V_L^R \leq 1$ , based on the following formula:

$$V_L^R = \sum_{i=1}^n x_{iL}^R y_{iL}^R$$

where:

- a) **n** = number of types of public revenue **R** for level **L** of territorial public administrations;
- b)  $x_{iL}^R$  = relative financial weight of public revenue **R** of type **i** for level **L** of territorial public administrations, with **i** = 1, 2, ..., **n**; that is to say:

$$0 \leq x_{iL}^R = \frac{GF_{iL}^R}{\sum_{i=1}^n GF_{iL}^R} \leq 1$$

with  $GF_{iL}^R$  = absolute quantity of public revenue **R** of type **i** for level **L** of territorial public administrations;

- c)  $y_{iL}^R$  = visibility or perceptibility (for the policy intended - or legal - revenue-provider) factor of burden of public revenue **R** of type **i** to which level **L** of territorial public administrations is entitled, with  $0 \leq y_{iL}^R \leq 1$ .

### 4. BURDEN VISIBILITY OF A SPECIFIC PUBLIC REVENUE

An objective estimate of  $y_{iL}^R$  - factor of perceptibility of the direct burden by a policy intended - or legal - revenue-provider of a public revenue **R** of type **i** for level **L** of territorial public administrations - was initially defined [Roig-Alonso, 1998] according to the following criteria:

$$y_{iL}^R = v_{iL}^R p_{iL}^R m_{iL}^R q_{iL}^R i_{iL}^R \quad (1)$$

where:

- a)  $v_{iL}^R$  = voluntary ( $v_{iL}^R = 0$ ) or coercive ( $v_{iL}^R = 1$ ) nature of public revenue  $R$  of type  $i$  for its policy intended - or legal - revenue-provider (coerciveness parameter), with  $0 \leq v_{iL}^R \leq 1$ .
- b)  $p_{iL}^R$  = full ( $p_{iL}^R = 0$ ) or null ( $p_{iL}^R = 1$ ) proportionality of the quantity of public revenue  $R$  of type  $i$  - the burden of which is borne by a policy intended - or legal - revenue-provider - to the cost of efficiently producing the good or service *specifically* received by him in return for his burden (proportionality parameter), with  $0 \leq p_{iL}^R \leq 1$ .
- c)  $m_{iL}^R$  = full ( $m_{iL}^R = 1$ ) or null ( $m_{iL}^R = 0$ ) information to the policy intended - or legal - revenue-provider on the concept of the direct burden he is bearing when providing public revenue  $R$  of type  $i$  (concept-information parameter), with  $0 \leq m_{iL}^R \leq 1$ .
- d)  $q_{iL}^R$  = full ( $q_{iL}^R = 1$ ) or null ( $q_{iL}^R = 0$ ) information to the policy intended - or legal - revenue-provider on the quantity of the direct burden he is bearing when providing public revenue  $R$  of type  $i$  (quantity-information parameter), with  $0 \leq q_{iL}^R \leq 1$ .
- e)  $i_{iL}^R$  = intermediate ( $i_{iL}^R = 0$ ) or final ( $i_{iL}^R = 1$ ) position of the policy intended - or legal - revenue-provider in relation to his direct burden (burden-shifting parameter), with  $0 \leq i_{iL}^R \leq 1$ .

In any case, all  $V_L^R$ ,  $x_{iL}^R$ ,  $y_{iL}^R$ ,  $v_{iL}^R$ ,  $p_{iL}^R$ ,  $m_{iL}^R$ ,  $q_{iL}^R$  and  $i_{iL}^R$  were continuous variables ranging from 0 to 1,  $i$  and  $L$  were subscripts for the type of revenue and level of territorial public administration respectively and  $R$  was a superscript - non an exponent - for public revenue.

Because of the multiplicative combination of such five significant parameters in  $y_{iL}^R$ , as any one of them takes a null value a 0 estimate will necessarily result, although other parameters can show high values.

In order to avoid this problem, this visibility or perceptibility factor can be redefined in an additive - instead of multiplicative - form, as follows:

$$y_{iL}^R = [v_{iL}^R + p_{iL}^R + m_{iL}^R + q_{iL}^R + i_{iL}^R] / 5 \quad (2)$$

## 5. AN INDEX OF BENEFIT VISIBILITY OF TOTAL PUBLIC EXPENDITURE

Similarly to the case of public revenue, for every level of territorial public administrations,  $L$ , a general index,  $V_L^E$ , of benefit visibility of total public expenditure,  $E$ , was be defined in such a way that  $0 \leq V_L^E \leq 1$ , based on the following formula:

$$V_L^E = \sum_{f=1}^q x_{fL}^E y_{fL}^E$$

where:

- a)  $q$  = number of types of public expenditure  $E$  performed by level  $L$  of territorial public administrations;

b)  $x_{fL}^E$  = relative financial weight of public expenditure  $E$  of type  $f$  performed by level  $L$  of territorial public administrations, with  $f = 1, 2, \dots, q$ ; that is to say:

$$0 \leq x_{fL}^E = \frac{GF_{fL}^E}{\sum_{f=1}^q GF_{fL}^E} \leq 1$$

with  $GF_{fL}^E$  = absolute quantity of public expenditure  $E$  of type  $f$  performed by level  $L$  of territorial public administrations;

c)  $y_{fL}^E$  = visibility or perceptibility (by the policy intended - or legal - consumer) factor of benefit of public expenditure  $E$  of type  $f$  performed by level  $L$  of territorial public administrations, where  $0 \leq y_{fL}^E \leq 1$ .

## 6. BENEFIT VISIBILITY OF A SPECIFIC PUBLIC EXPENDITURE

An objective estimate of  $y_{fL}^E$  (factor of perceptibility by a policy intended - or legal - consumer of the direct benefit of a public expenditure  $E$  of type  $f$  performed by level  $L$  of territorial public administrations) was initially defined according to the following criteria:

$$y_{fL}^E = v_{fL}^E \cdot p_{fL}^E \cdot m_{fL}^E \cdot q_{fL}^E \cdot i_{fL}^E \quad (3)$$

where:

a)  $v_{fL}^E$  = null ( $v_{fL}^E = 0$ ) or full ( $v_{fL}^E = 1$ ) consumption of a publicly supplied good of type  $f$  by its policy intended - or legal - user or beneficiary (consumption parameter), with  $0 \leq v_{fL}^E \leq 1$ .

b)  $p_{fL}^E$  = full ( $p_{fL}^E = 0$ ) or null ( $p_{fL}^E = 1$ ) proportionality of cost of efficient production of the publicly supplied good of type  $f$  to a *specifically requited monetary burden* borne by the policy intended - or legal - user or beneficiary (proportionality parameter), with  $0 \leq p_{fL}^E \leq 1$ .

c)  $m_{fL}^E$  = full ( $m_{fL}^E = 1$ ) or null ( $m_{fL}^E = 0$ ) information to the policy intended - or legal - consumer or user on the concept of the direct benefit he is receiving when public expenditure  $E$  of type  $f$  is being performed (concept-information parameter), with  $0 \leq m_{fL}^E \leq 1$ .

d)  $q_{fL}^E$  = full ( $q_{fL}^E = 1$ ) or null ( $q_{fL}^E = 0$ ) information to the policy intended - or legal - consumer or user on the quantity of the direct benefit he is receiving when public expenditure  $E$  of type  $f$  is performed (quantity-information parameter), with  $0 \leq q_{fL}^E \leq 1$ .

e)  $i_{fL}^E$  = intermediate ( $i_{fL}^E = 0$ ) or final ( $i_{fL}^E = 1$ ) position of the policy intended - or legal - user or beneficiary of the publicly supplied good of type  $f$  in relation to his direct benefit (benefit-shifting parameter), with  $0 \leq i_{fL}^E \leq 1$ .

Similarly to the previous case of public revenue, all  $V_L^E$ ,  $x_{fL}^E$ ,  $y_{fL}^E$ ,  $v_{fL}^E$ ,  $p_{fL}^E$ ,  $m_{fL}^E$ ,  $q_{fL}^E$  and  $i_{fL}^E$  were continuous variables always ranging from 0 to 1,  $f$  and  $L$  were subscripts

for the type of public expenditure and level of territorial public administration respectively and  $E$  was a superscript - non an exponent - for public expenditure.

Again, as anyone of such five parameters takes value 0, the multiplicative combination of them in  $y_{\Pi}^E$  necessarily results in a 0 estimate although other parameters can show high values; and in order to avoid this problem, this visibility or perceptibility factor can be redefined in an additive - instead of a multiplicative - form, as follows:

$$y_{\Pi}^E = [v_{\Pi}^E + p_{\Pi}^E + m_{\Pi}^E + q_{\Pi}^E + i_{\Pi}^E] / 5 \quad (4)$$

## 7. VISIBILITY ESTIMATES OF BURDENS AND BENEFITS FROM TOTAL PUBLIC REVENUE AND EXPENDITURE FOR SPAIN

Tables 1 to 4 respectively present multiplicative and additive estimates on burden and benefit visibility of public revenue and expenditure for the three territorial government levels in Spain by applying indices previously defined, to the central, intermediate and local fiscal sub-systems now in force in such country.

To obtain a sensitivity analysis, three hypotheses on minimum, plausible, and maximum shifting of tax burden and expenditure benefit have been assumed, giving rise to the corresponding series of maximum,  $V_M$ , plausible,  $V_p$ , and minimum,  $V_m$ , values of weighted-visibility estimates of revenue burden for policy intended - or legal - revenue-providers and expenditure benefit for policy intended - or legal - beneficiaries or consumers. The initial values for the fiscal visibility parameters  $v$ ,  $p$ ,  $m$ ,  $q$ ,  $i_m$ ,  $i_p$ ,  $i_m$  are the same previously used [Roig-Alonso, 1998, 2000, 2001, 2003].

As regards results, according to:

A) Table 1, presenting multiplicative  $V_M$ ,  $V_p$ , and  $V_m$  visibility estimates of burdens from revenue and grants, shows that the central government level has the most visible sub-system and the intermediate level the least visible one: plausible values range from 42.38 to 17.53, with a very significant difference of 24.85 points.

B) Table 2, presenting additive  $V_M$ ,  $V_p$ , and  $V_m$  visibility estimates of burdens revenue and grants, confirms that the central government level has the most visible sub-system and the intermediate level the least visible one. Now plausible values range from 83.01 to 40.47, increasing the previous difference to 42.54 points.

C) Table 3, presenting multiplicative  $V_M$ ,  $V_p$ , and  $V_m$  visibility estimates of benefit of public expenditure, shows that the central government level again has the most visible sub-system and the intermediate level the least visible one, but now plausible values range from 32.28 to 26.31, with a difference of 5.97 points only.

C) Table 4, presenting additive  $V_M$ ,  $V_p$ , and  $V_m$  visibility estimates of benefit of public expenditure, confirms that the central government level has the most visible sub-system



and the intermediate level the least visible one, with plausible values ranging from 81.25 to 77.39, with a non-significant difference of 3.86 points.

**TABLE 1**  
**Burden Visibility of Public Revenue in Spain by Territorial Government Levels**  
**Multiplicative Estimates (in percent)**

<b>Territorial Levels</b>	<b>V<sub>M</sub></b>	<b>V<sub>n</sub></b>	<b>V<sub>m</sub></b>
Central level	69.53%	42.38%	15.74%
Intermediate level	26.42%	17.53%	8.91%
Local level	47.31%	32.16%	17.54%

*Source:* The author's elaboration from data on *Government Finance Statistics Yearbook 2002* [IMF, Washington, 2003].

**TABLE 2**  
**Burden Visibility of Public Revenue in Spain by Territorial Government Levels**  
**Additive Estimates (in percent)**

<b>Territorial Levels</b>	<b>V<sub>m</sub></b>	<b>V<sub>n</sub></b>	<b>V<sub>m</sub></b>
Central level	88.69%	83.01%	76.20%
Intermediate level	42.47%	40.47%	38.48%
Local level	64.67%	60.98%	57.31%

*Source:* The author's elaboration from data on *Government Finance Statistics Yearbook 2002* [IMF, Washington, 2003].

**TABLE 3**  
**Benefit Visibility of Public Expenditure in Spain by Territorial Government Levels**  
**Multiplicative Estimates (in percent)**

<b>Territorial Levels</b>	<b>V<sub>m</sub></b>	<b>V<sub>n</sub></b>	<b>V<sub>m</sub></b>
Central level	41.36%	32.28%	23.10%
Intermediate level	35.22%	26.31%	15.83%
Local level	37.52%	27.13%	16.83%

*Source:* The author's elaboration from data on *Government Finance Statistics Yearbook 2002* [IMF, Washington, 2003].

**TABLE 4**  
**Benefit Visibility of Public Expenditure in Spain by Territorial Government Levels**  
**Additive Estimates (in percent)**

<b>Territorial Levels</b>	<b>V<sub>M</sub></b>	<b>V<sub>n</sub></b>	<b>V<sub>m</sub></b>
Central level	85.61%	81.25%	76.97%
Intermediate level	82.26%	77.39%	72.53%
Local level	84.04%	79.10%	74.19%

*Source:* The author's elaboration from data on *Government Finance Statistics Yearbook 2002* [IMF, Washington, 2003].

## 8. CONCLUSIONS

The quality of public revenue and expenditure sub-systems and systems as policy instruments for efficiently allocating economic resources among private and public sectors and sub-sectors varies as a result of economic, political, and social factors.

The new and alternative indices of fiscal visibility previously redefined by combining significant parameters in multiplicative and additive formulas bring forward a better measurement methodology which can be used to make relevant quantified comparisons among member countries of the International Monetary Fund provided that detailed statistic figures on execution of public budgets as well as information about the nature of the different types of public administrations' revenue and expenditure programmes are available to researchers.

Estimates obtained from different assumptions on tax and expenditure shifting by combining these multiplicative and additive indices to measure the visibility of revenue burden and public expenditure benefit of central, intermediate, and local fiscal sub-systems now in force in Spain offer, in addition to the previous remarks, the following observations: **First**, low multiplicative visibility values of burdens of public revenue for all territorial government levels. On the other hand, divergences among estimated values by levels of government are very significant as a result of the concurrence of several asymmetrical factors such as non-coerciveness, non-existence of specific requitals, lack of information on concepts and quantities, partial shifting of burdens by tax-payers, intergovernmental grants, etc.

**Second**, additive visibility values of burdens of public revenue for the same territorial government levels which are far from the optimal value - 100.00 -, specially at the intermediate level. Divergences among estimates values are now very significant - more than 40 points - between the central and intermediate levels, although less relevant for the local level - about 20 and 23 points -.

**Third**, also low multiplicative visibility values of benefits of public expenditure for the three territorial government levels, particularly owing to the lack of sufficient information to consumers and users on concepts, quantities or costs of publicly provided goods and services. Now the main existing divergence - about 6 points - among government levels has been considerably reduced.

**Fourth**, additive visibility values of benefits of public expenditure for the same territorial government levels which are far from the optimal value. Divergences among estimated values are now little significant - about 4 points - between the central and the intermediate levels.

**Fifth**, by comparing multiplicative estimates from public revenue and expenditure, the

following traits can be remarked:

A) At the central level of government the burden visibility of public revenue is significantly higher than the benefit visibility, suggesting a clear trend to public sub-provision of goods and services.

B) At the intermediate level of government the burden visibility of public revenue is significantly lower than the benefit visibility, suggesting a clear trend to public over-provision of goods and services.

C) At the local level of government the burden visibility of public revenue is higher than the benefit visibility, suggesting a smooth trend to public sub-provision of goods and services.

**Sixth**, by comparing additive estimates from public revenue and expenditure, the following traits can be remarked:

A') At the central level of government the burden visibility of public revenue is slightly higher than the benefit visibility, suggesting a trend to a balance in the public provision of goods and services.

B) At the intermediate level of government the burden visibility of public revenue is again significantly lower than the benefit visibility, confirming a clear trend to a public over-provision of goods and services.

C) On the contrary, at the local level of government the burden visibility of public revenue is lower than the benefit visibility, suggesting a trend to a public over-provision of goods and services.

**Seventh**, in any case economic policy implications of both types - multiplicative and additive - of estimates seem clear for all territorial government levels: as, in general, present visibility values of both burdens of public revenue and benefits of public expenditure are far their optimal values, important allocation improvements can be reached with reforms and changes raising all values in general.

**Eighth**, estimates shown on tables 1 to 4 suggest without doubt that the Spanish local level of government, mainly consisting of municipalities, can result very benefited with future reforms and changes simultaneously aiming the following objectives:

A) Reductions in a) the public deficit of the local public administration, b) grants received from higher government levels (by strengthen the local taxation) and c) fundamental changes of the local taxes by replacing present levies which can be easily deducted or shifted by legal taxpayers by other types of revenue (as a local share in the personal income tax) which are more difficult to be shifted onto non legal tax-payers.

B) More and better specific and personalized information to consumers of publicly provided goods and services on the nature, quantities and costs of all types of such goods

and services.



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