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VISIBILITY OF PUBLIC EXPENDITURE BENEFIT IN EUROPEAN UNION MEMBER COUNTRIES: NEW ESTIMATES

ABSTRACT:

An efficient allocation of resources between the public and the private sectors of an economy requires that both the revenue burden and the expenditure benefit are fully noticeable by final taxpayers and public services consumers. For many and complex reasons this visibility is defective in OECD countries. From a technical point of view it is necessary to find indicators to quantify how well this principle is reached, at any moment, by local, intermediate, central or federal and supranational government levels.

This paper presents results and conclusions obtained by its author at the Public Finance and Public Sector Economics Research Unit, of University of Valencia, by developing a permanent research line - initially financed by the Inter-ministerial Commission for Science and Technology of the Spanish State - concerning a) the definition of visibility of public expenditure benefit in an operational way, b) the identification of relevant factors generating problems of invisibility of public expenditure, and c) the construction of indicators to carry out historical and international comparisons. In addition to this, new estimates relating to the European Union member countries are offered by using statistical data and information from the International Monetary Fund, with conclusions and comments for future prospects as regards the convergence characteristics required for the public expenditure systems of such countries.

1. INTRODUCTION

Improvements in the efficient allocation of resources between the private and public sectors of an economy - as well as among its several public sub-sectors - can be reached insofar as both public revenue and expenditure possess ***visibility***, that is to say, the *burden* of public revenue and the *benefit* of public expenditure should be fully noticeable by individuals[1].

Concerning public revenue, this property of visibility has changed in the course of history, depending on both economic (as the development level of a country) and political (as mechanisms of fiscal illusion used by politicians, bureaucrats, and interest groups to overcome taxpayers' resistance) factors [Wagner, 1976; Borcherding, 1977; Buchanan and Wagner, 1977; Fiorina and Noll, 1978; Pommerehne and Schneider, 1978; Brennan and Buchanan, 1980; Frey and Pommerehne, 1982; Oates, 1988; Tullock, 1989; Tabellini and Alesina, 1990; Dunleavy, 1991; Mueller, 1993; Roig-Alonso, 1998]. In a similar way, the compliance with such required property by fiscal systems now in force might differ remarkably among OECD countries.

With regard to public expenditure, the final or intermediate, the public or private nature, the spacial effects or dimensions, the administration costs, and other inherent characteristics of publicly provided goods and services represent major factors determining their benefit visibility [Weingast, Shepsle, and Johnsen, 1981; Solano, 1983; Hamilton, 1983; Becker, 1983, 1985; Mueller and Murell, 1985, 1986; Mueller, 1987; Wolff, 1987; Henrekson, 1992].

In any case, it is convenient to dispose of logical and general indicators permitting the measuring, as exactly as possible, of the extent to which the required property of visibility is achieved at all times by local, state, federal or confederal, supranational, and general fiscal sub-systems and systems of countries.

This contribution presents results and conclusions concerning:

A) The definition of visibility of public expenditure benefit in an operational way.

B) The identification of relevant factors generating problems of invisibility of public expenditure.

C) The construction of indicators to carry out historical and international comparisons.

In addition to this, new estimates relating to the European Union member countries are offered by using statistical data and information from the International Monetary Fund, with conclusions and comments for future prospects as regards the convergence characteristics required for the public expenditure systems of such countries.

A policy implication of these estimates is confirmed: allocation improvements could be obtained in these European countries by implementing changes and reforms aiming to raise the current values of public revenue and expenditure visibility.

2. INDEX OF BURDEN VISIBILITY OF TOTAL PUBLIC REVENUE

In general, for every level, **L**, of territorial public administrations of an economy, a visibility index, $\mathbf{V_L^R}$, of its total public revenue, **R**, can be defined in such a way that $\mathbf{0 \leq V_L^R \leq 1}$, 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) $\mathbf{x_{iL}^R}$ = 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:

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

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

c) $\mathbf{y_{iL}^R}$ = 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 $\mathbf{0 \leq y_{iL}^R \leq 1}$.

3. BURDEN VISIBILITY OF A SPECIFIC PUBLIC REVENUE

An objective estimate of $\mathbf{y_{iL}^R}$ - 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 - can be defined according to the following criteria:

$$\mathbf{y_{iL}^R = v_{iL}^R \; p_{iL}^R \; m_{iL}^R \; q_{iL}^R \; i_{iL}^R}$$

where:

a) $\mathbf{v_{iL}^R}$ = voluntary ($\mathbf{v_{iL}^R = 0}$) or coercive ($\mathbf{v_{iL}^R = 1}$) nature of public revenue **R** of type **i** for its policy intended - or legal - revenue-provider (coerciveness parameter), with $\mathbf{0 \leq v_{iL}^R \leq 1}$.

b) $\mathbf{p_{iL}^R}$ = full ($\mathbf{p_{iL}^R = 0}$) or null ($\mathbf{p_{iL}^R = 1}$) 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 $\mathbf{0 \leq p_{iL}^R \leq 1}$.

c) $\mathbf{m_{iL}^R}$ = full ($\mathbf{m_{iL}^R = 1}$) or null ($\mathbf{m_{iL}^R = 0}$) 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 $\mathbf{0 \leq m_{iL}^R \leq 1}$.

d) $\mathbf{q_{iL}^R}$ = full ($\mathbf{q_{iL}^R = 1}$) or null ($\mathbf{q_{iL}^R = 0}$) 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 $\mathbf{0 \leq q_{iL}^R \leq 1}$.

e) $\mathbf{i_{iL}^R}$ = intermediate ($\mathbf{i_{iL}^R = 0}$) or final ($\mathbf{i_{iL}^R = 1}$) position of the policy intended - or legal - revenue-provider in relation to his direct burden (burden-shifting parameter), with $\mathbf{0 \leq i_{iL}^R \leq 1}$.

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

4. INDEX OF BENEFIT VISIBILITY OF TOTAL PUBLIC EXPENDITURE

The social benefit of a publicly supplied good or service is equal to its social production cost when these four conditions are simultaneously met:

A) Resources of an economy are Pareto-efficiently allocated in both public and private sectors and sub-sectors.

B) Private and public production of goods and services of such an economy is technically efficient (which means that minimum inputs are used to reach a pre-determined mix of outputs, or, alternatively, that maximum outputs can be obtained out of a pre-determined mix of inputs).

C) Production is made at constant returns to scale.

D) There is no consumer surplus.

When one or several of the previous conditions are not kept, the social cost of publicly supplying a good or service has to be corrected upward or downward in order for it to approximate its social benefit in money terms.

In any case, it is possible to consider the accounting production cost of a publicly supplied good or service as a first estimate of its social benefit in money terms, trying to identify final beneficiaries by applying a set of imputation criteria according to the economic nature of every type of good or service. In such a case, we should remember that every publicly supplied good or service can be:

A) Public (rival consumption is null), private (rival consumption is full), or mixed (rival consumption is partial).

B) Intermediate (production resource) or final (consumption resource).

Besides, a final good or service can be complementary, substitute, or independent in relation to the available personal income of a final consumer, and its re-distributive incidence will be regressive, progressive, or proportional. According to income-elasticities of demand, publicly supplied substitute goods are inferior (negative coefficient), whereas complementary goods are normal (positive coefficient).

In most cases a policy intended - or legal - consumer or user is quite aware of his personal benefit from a publicly supplied private good (for instance, a money grant), has an incomplete notion of the social benefit from a mixed good (like an education or health service), and fails to properly perceive the social benefit of a public good (defense, law and order, etc.). So, he faces important difficulties for assessing, in money terms, the social benefit - and even the countable cost - from many publicly supplied goods and services.

Usually, the problem of evaluating benefits of public supplied goods and services turns out to be complicated because the following considerations have to be taken into account:

A) Many types of publicly supplied services (*complex goods*) simultaneously have a) intermediate and final, b) public and private, c) substitute and complementary components, and these different parts are to be identified, characterized, and measured in separate ways.

B) The number and variety of types of publicly supplied goods and services is greater than that corresponding to types of public revenue.

C) A good or service can be supplied by a level of territorial public administration out of funds collected and granted by another level of territorial public administration.

Similarly to the case of public revenue, for every level of territorial public administrations, **L**, a general index, $\mathbf{V_L^E}$, of benefit visibility of total public expenditure, **E**, can be defined in such a way that $\mathbf{0 \leq V_L^E \leq 1}$, 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) $\mathbf{x_{fL}^E}$ = relative financial weight of public expenditure **E** of type **f** performed by level **L** of territorial public administrations, with **f = 1, 2, ..., q**; that is to say:

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

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

c) $\mathbf{y_{fL}^{E}}$ = 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 $\mathbf{0 \leq y_{fL}^{E} \leq 1}$.

5. BENEFIT VISIBILITY OF A SPECIFIC PUBLIC EXPENDITURE

An objective estimate of $\mathbf{y_{fL}^{E}}$ (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) can be defined according to the following criteria:

$$\mathbf{y_{fL}^{E} = v_{fL}^{E}\ p_{fL}^{E}\ m_{fL}^{E}\ q_{fL}^{E}\ i_{fL}^{E}}$$

where:

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

b) $\mathbf{p_{fL}^{E}}$ = full ($\mathbf{p_{fL}^{E} = 0}$) or null ($\mathbf{p_{fL}^{E} = 1}$) 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 $\mathbf{0 \leq p_{fL}^{E} \leq 1}$.

c) $\mathbf{m_{fL}^{E}}$ = full ($\mathbf{m_{fL}^{E} = 1}$) or null ($\mathbf{m_{fL}^{E} = 0}$) 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 $\mathbf{0 \leq m_{fL}^{E} \leq 1}$.

d) $\mathbf{q_{fL}^{E}}$ = full ($\mathbf{q_{fL}^{E} = 1}$) or null ($\mathbf{q_{fL}^{E} = 0}$) 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 $\mathbf{0 \leq q_{fL}^{E} \leq 1}$.

e) $\mathbf{i_{fL}^{E}}$ = intermediate ($\mathbf{i_{fL}^{E} = 0}$) or final ($\mathbf{i_{fL}^{E} = 1}$) 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 $\mathbf{0 \leq i_{fL}^{E} \leq 1}$.

Similarly to the previous case of public revenue, all $\mathbf{V_{L}^{E}}$, $\mathbf{x_{fL}^{E}}$, $\mathbf{y_{fL}^{E}}$, $\mathbf{v_{fL}^{E}}$, $\mathbf{p_{fL}^{E}}$, $\mathbf{m_{fL}^{E}}$, $\mathbf{q_{fL}^{E}}$ and $\mathbf{i_{fL}^{E}}$ are continuous variables always ranging from 0 to 1, **f** and **L** are subscripts for the type of public expenditure and level of territorial public administration respectively and **E** is a superscript - non an exponent - for public expenditure.

6. ESTIMATES ON BURDEN VISIBILITY OF TOTAL PUBLIC REVENUE

Table 2 presents estimates on burden visibility of public revenue and grants of the European Union member countries, obtained by applying index

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

previously defined, to fiscal central sub-systems now in force in these countries.

Such values have been calculated mainly from information and primary data on public cash flows provided by both the Commission of the European Communities[2], reflecting tax structures of - and the institutional situation in - every member country on January 1, 1992, and the International Monetary Fund[3].

To obtain a sensitivity analysis, three hypotheses on minimum, plausible and maximum shifting of tax burden have been assumed, giving rise to the corresponding series of maximum, $\mathbf{V_M}$, plausible, $\mathbf{V_p}$, and minimum, $\mathbf{V_m}$, values of weighted-visibility estimates of revenue burden for policy intended - or legal - revenue-providers. The initial values for the fiscal visibility parameters **v**, **p**, **m**, **q**, $\mathbf{i_M}$, $\mathbf{i_p}$, $\mathbf{i_m}$ - shown in Table 1 - have been deducted and imputed after carefully analysing all the information provided by both the International Monetary Fund and the Commission of the European Communities on the internal structure of each type of public revenue.

As regards results, according to Table 2, presenting $\mathbf{V_p}$ visibility estimates of revenue and grants for the European Union member countries, Finland, with a value of 49.19%, has the most visible central sub-system, Greece having the least visible one, with 25.74%.

TABLE 1
Values Imputed to Fiscal Visibility Parameters
(approximate average values)

Public Revenue Concepts	**v**	**p**	**m**	**q**	$\mathbf{i_M}$	$\mathbf{i_p}$	$\mathbf{i_m}$
1. Income, profits, capital gains taxes							
1.1. Individual	1.00	1.00	1.00	1.00	1.00	0.75	0.50
1.2. Corporate	1.00	1.00	1.00	1.00	1.00	0.50	0.00
1.3. Other unallocable taxes	1.00	1.00	1.00	1.00	1.00	0.62	0.25
2. Social security contributions							
2.1. Employees	1.00	0.50	1.00	1.00	1.00	0.75	0.50
2.2. Employers	1.00	1.00	1.00	1.00	1.00	0.50	0.00
2.3. Self-employed or non-employed	1.00	0.50	1.00	1.00	1.00	0.50	0.00

2.4. Other unallocable contributions	1.00	0.50	1.00	1.00	1.00	0.50	0.00
3. Taxes on payroll and work force	1.00	1.00	1.00	1.00	1.00	0.75	0.50
4. Taxes on property							
4.1. Recurrent on immovable property	1.00	1.00	1.00	1.00	1.00	0.75	0.50
4.2. Recurrent on net wealth							
4.2.1. Individual	1.00	1.00	1.00	1.00	1.00	0.75	0.50
4.2.2. Corporate	1.00	1.00	1.00	1.00	1.00	0.50	0.00
4.3. Estate, inheritance, gift taxes	1.00	1.00	1.00	1.00	1.00	0.75	0.50
4.4. Financial and capital transactions	1.00	1.00	1.00	1.00	1.00	0.50	0.00
4.5. Nonrecurrent taxes on property	1.00	1.00	1.00	1.00	1.00	0.50	0.00
4.6. Other recurrent taxes on property	1.00	1.00	1.00	1.00	1.00	0.75	0.50
5. Domestic taxes on good and services							
5.1. General sales and value-added	1.00	1.00	1.00	0.75	1.00	0.87	0.75
5.2. Excises	1.00	1.00	0.00	0.00	1.00	0.87	0.75
5.3. Profits of fiscal monopolies	1.00	1.00	0.00	0.00	1.00	0.87	0.75
5.4. Taxes on specific services	1.00	1.00	1.00	1.00	1.00	0.87	0.75
5.5. Taxes on use of goods or activities							
5.5.1. Business/professional licenses	1.00	1.00	1.00	1.00	1.00	0.50	0.00
5.5.2. Motor vehicle taxes	1.00	1.00	1.00	1.00	1.00	0.75	0.50
5.5.3. Other taxes on use of goods	1.00	1.00	1.00	1.00	1.00	0.75	0.50
5.6. Other taxes on goods and services	1.00	1.00	1.00	1.00	1.00	0.50	0.00
6. Taxes on international trade							
6.1. Import duties							
6.1.1. Customs duties	1.00	1.00	0.00	0.00	1.00	0.75	0.50
6.1.2. Other import charges	1.00	1.00	0.00	0.00	1.00	0.75	0.50
6.2. Export duties	1.00	1.00	0.00	0.00	1.00	0.75	0.50
6.3. Profits export/import monopolies	1.00	1.00	0.00	0.00	1.00	0.75	0.50
6.4. Exchange profits	1.00	1.00	0.00	0.00	1.00	0.75	0.50

6.5. Exchange rates	1.00	1.00	1.00	1.00	1.00	0.75	0.50
6.6. Other taxes on international trade	1.00	1.00	0.50	0.50	1.00	0.50	0.00
7. Other taxes							
7.1. Poll taxes	1.00	1.00	1.00	1.00	1.00	0.75	0.50
7.2. Stamp taxes	1.00	1.00	1.00	1.00	1.00	0.50	0.00
7.3. Taxes not elsewhere classified	1.00	1.00	1.00	1.00	1.00	0.50	0.00
8. Entrepreneurial and property income							
8.1. Cash operating surpluses	0.00	0.00	1.00	1.00			
8.2. From public financial institutions	0.00	0.00	1.00	1.00			
8.3. Other property income	0.00	0.00	1.00	1.00			
9. Administrative fees and charges	0.50	0.00	1.00	1.00	1.00	0.50	0.00
10. Fines and forfeits	1.00	1.00	1.00	1.00	1.00	0.75	0.50
11. Contributions to government employee pensions							
11.1. Employees	1.00	0.50	1.00	1.00	1.00	0.75	0.50
11.2. Employer	1.00	1.00	1.00	1.00	1.00	0.50	0.00
12. Other nontax revenue	0.00	0.50	1.00	1.00			
13. Sales on fixed capital assets	0.00	0.00	1.00	1.00			
14. Sales of stocks	0.00	0.00	1.00	1.00			
15. Sales of land and intangible assets	0.00	0.00	1.00	1.00			
16. Capital transfers from nongovernmental sector							
16.1. From residents	0.00	1.00	1.00	1.00			
16.2. From abroad	0.00	1.00	1.00	1.00			
17. Grants from abroad							
17.1. Current	0.00	1.00	0.00	0.00			
17.2. Capital	0.00	1.00	0.00	0.00			
18. Grants from other levels of national government							
18.1. Current	0.00	1.00	0.00	0.00			

18.2. Capital	0.00	1.00	0.00	0.00			
19. Grants from supranational authorities to member countries							
19.1. Current	0.00	1.00	0.00	0.00			
19.2. Capital	0.00	1.00	0.00	0.00			
20. Grants to supranational authorities							
20.1. Current	0.00	1.00	0.00	0.00			
20.2. Capital	0.00	1.00	0.00	0.00			
DEFICIT	0.00	0.00	1.00	1.00			

Notes for table 1:
v = degree of coercion of public revenue for its legal provider.
p = degree of specific requital of public revenue for its legal provider.
m = degree of information on the public revenue concept for its legal provider.
q = degree of information on the public revenue quantity for its legal provider.
$\mathbf{i_M}$ = maximum incidence of the direct monetary burden onto the legal provider of public revenue.
$\mathbf{i_p}$ = plausible incidence of the direct monetary burden onto the legal provider of public revenue.
$\mathbf{i_m}$ = minimum incidence of the direct monetary burden onto the legal provider of public revenue.

Source: own elaboration from data on *Government Finance Statistics Yearbook 1994*, volume XVIII, International Monetary Fund, Washington, 1994.

TABLE 2
Estimates of Public Revenue Visibility in the European Union: Consolidated Central Government Level

Member countries / Years	$\mathbf{V_M}$	$\mathbf{V_p}$	$\mathbf{V_m}$
Austria, 1992	62.92%	42.93%	22,95%
Belgium, 1992	68.87%	46.72%	24.57%
Denmark, 1993	62.79%	46.76%	30.74%
Finland, 1990	66.70%	49.19%	31.68%
France, 1992	65.60%	43.51%	21.42%
Germany, 1992	56.28%	37.08%	17.88%
Greece, 1993	32.49%	25.74%	18.98%

Ireland, 1991	64.17%	46.01%	27.86%
Italy, 1993	57.45%	39.53%	21.61%
Luxembourg, 1991	56.22%	37.81%	19.41%
Netherlands, 1993	66.60%	47.33%	28.05%
Portugal, 1989	53.67%	36.57%	19.46%
Spain, 1991	66.88%	43.09%	19.30%
Sweden, 1992	65.51%	40.62%	15.73%
United Kingdom, 1992	63.68%	45.49%	27.31%

Footnotes for table 2:
$\mathbf{V_M}$ = maximum visibility estimates of revenue burden for the legal revenue provider.
$\mathbf{V_p}$ = plausible visibility estimates of revenue burden for the legal revenue provider.
$\mathbf{V_m}$ = minimum visibility estimates of revenue burden for the legal revenue provider.
- = non-existing government level for the year considered.
... = datum lacking for the year considered.

Source: own elaboration from data in *Government Finance Statistics Yearbook 1994*, volume XVIII, International Monetary Fund, Washington, 1994.

7. ESTIMATES ON BENEFIT VISIBILITY OF TOTAL PUBLIC EXPENDITURE

In turn, table 4 presents estimates on benefit visibility of public expenditure and grants obtained by applying index

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

to the consolidated central fiscal sub-systems in these European Union countries. Such values have been calculated mainly from information and primary data on public cash flows provided by the International Monetary Fund[4].

As before, three hypotheses on minimum, plausible and maximum shifting of expenditure benefit have been assumed to obtain a sensitivity analysis, giving rise to the corresponding series of maximum, $\mathbf{V_M}$, plausible, $\mathbf{V_p}$, and minimum, $\mathbf{V_m}$, values of weighted-visibility estimates of expenditure benefit for the policy intended - or legal - beneficiary of every type of good and service publicly provided. The initial approximate values for the fiscal visibility parameters **v**, **p**, **m**, **q**, $\mathbf{i_M}$, $\mathbf{i_p}$, $\mathbf{i_m}$ - now shown in Table 3 - have been deducted and imputed after carefully analysing all the information facilitated by the International Monetary Fund on the internal structure of each type of public expenditure.

As regards plausible results, according to Table 4, presenting $\mathbf{V_p}$ visibility estimates of expenditure, Austria, with a value of 34.15%, has the most visible central sub-system, Portugal having the least visible one, with 26.02%.

TABLE 3
Values Imputed to Fiscal Visibility Parameters of Public Expenditure
(approximate average values)

Public Expenditure Concepts	**v**	**p**	**m**	**q**	$\mathbf{i_M}$	$\mathbf{i_p}$	$\mathbf{i_m}$
1. General public services							
1.1. Executive and legislative organs, financial and fiscal affairs, external affairs other than foreign aid	1.00	1.00	1.00	0.50	0.75	0.50	0.25
1.2. Foreign economic aid	1.00	1.00	1.00	0.50	0.75	0.50	0.25
1.3. Fundamental research affairs and services	1.00	1.00	0.25	0.25	0.75	0.50	0.25
1.4. General services	1.00	1.00	1.00	0.50	0.75	0.50	0.25
1.5. General public services not elsewhere classified	1.00	1.00	1.00	0.50	0.75	0.50	0.25
2. Defense affairs and services							
2.1. Military and civil defense administration and operation	1.00	1.00	1.00	0.50	0.75	0.50	0.25
2.2. Foreign military aid	1.00	1.00	1.00	0.50	0.75	0.50	0.25
2.3. Defense-related applied research and experimental development	1.00	1.00	0.25	0.25	0.75	0.50	0.25
2.4. Defense affairs not elsewhere classified	1.00	1.00	1.00	0.50	0.75	0.50	0.25
3. Public order and safety affairs							
3.1. Police and fire protection	1.00	1.00	1.00	0.50	0.75	0.50	0.25
3.2. Law courts	1.00	0.75	1.00	0.50	0.75	0.50	0.25
3.3. Prison administration and operation	1.00	1.00	1.00	0.50	0.75	0.50	0.25
3.4. Public order and safety affairs not							

elsewhere classified	1.00	1.00	1.00	0.50	0.75	0.50	0.25
4. Education affairs and services							
4.1. Pre-primary and primary education affairs and services	1.00	1.00	1.00	0.50	0.75	0.50	0.25
4.2. Secondary education affairs and services	1.00	1.00	1.00	0.50	0.75	0.50	0.25
4.3. Tertiary education affairs and services	1.00	0.50	1.00	0.50	0.75	0.50	0.25
4.4. Education services not definable by level	1.00	0.75	1.00	0.50	0.75	0.50	0.25
4.5. Subsidiary services to education	1.00	1.00	1.00	0.50	0.75	0.50	0.25
4.6. Education affairs and services not elsewhere classified	1.00	1.00	1.00	0.50	0.75	0.50	0.25
5. Health affairs and services							
5.1. Hospital affairs and services	1.00	1.00	1.00	0.50	1.00	0.75	0.50
5.2. Clinics, and medical, dental, and paramedical practitioners	1.00	0.75	1.00	0.50	1.00	0.75	0.50
5.3. Public health affairs and serv.	1.00	1.00	1.00	0.50	1.00	0.75	0.50
5.4. Medicaments, prostheses, medical equipment and appliances, or other prescribed health-related products	1.00	0.75	1.00	0.50	1.00	0.75	0.50
5.5. Applied research and experimental development related to the health and medical delivery system	1.00	1.00	0.50	0.50	1.00	0.75	0.50
5.6. Health affairs and services not elsewhere classified	1.00	1.00	1.00	0.50	1.00	0.75	0.50
6. Social security and welfare affairs and services							
6.1. Social security affairs and services	1.00	0.25	1.00	0.75	1.00	0.75	0.50
6.2. Welfare affairs and services	1.00	1.00	1.00	0.75	1.00	1.00	1.00
6.3. Social security and welfare affairs							

not elsewhere classified	1.00	1.00	1.00	0.50	1.00	0.75	0.50
7. Housing and community amenity affairs and services							
7.1. Housing and community development	1.00	0.50	1.00	0.50	1.00	0.75	0.50
7.2. Water supply affairs and services	1.00	0.50	1.00	0.50	1.00	0.75	0.50
7.3. Sanitary affairs and services including pollution abatement and control	1.00	1.00	1.00	0.50	1.00	0.75	0.50
7.4. Street lighting affairs and services	1.00	1.00	1.00	0.50	1.00	0.75	0.50
7.5. Housing and community amenity affairs and services not elsewhere classified	1.00	1.00	1.00	0.50	1.00	0.75	0.50
8. Recreational, cultural affairs							
8.0. Recreational, cultural, and religious affairs and services	1.00	1.00	1.00	0.50	1.00	0.75	0.50
9. Fuel and energy affairs and services							
9.1. Fuel affairs and services	1.00	0.75	1.00	0.50	0.75	0.50	0.25
9.2. Electricity and other energy sources	1.00	0.75	1.00	0.50	0.75	0.50	0.25
9.3. Fuel and energy affairs and services not elsewhere classified	1.00	0.75	1.00	0.50	0.75	0.50	0.25
10. Agriculture, forestry, fishing. and hunting affairs and services							
10.1. Agriculture affairs and services	1.00	0.50	1.00	0.50	0.75	0.50	0.25
10.2. Forestry affairs and services	1.00	0.50	1.00	0.50	0.75	0.50	0.25
10.3. Fishing and hunting affairs and services	1.00	0.75	1.00	0.50	0.75	0.50	0.25
10.4. Agricultural research and experimental development not elsewhere classified	1.00	1.00	0.25	0.50	0.75	0.50	0.25
10.5. Agriculture, forestry, fishing, and hunting affairs and services not							

elsewhere classified	1.00	1.00	1.00	0.50	0.75	0.50	0.25
11. Mining and mineral resource affairs and services, other than fuels; manufacturing affairs and services; and construction affairs and services							
11.1. Mining and mineral resource affairs and services, other than fuels	1.00	1.00	1.00	0.50	0.75	0.50	0.25
11.2. Manufacturing affairs and services	1.00	1.00	1.00	0.50	0.75	0.50	0.25
11.3. Construction affairs and services	1.00	1.00	1.00	0.50	0.75	0.50	0.25
11.4. Mining and mineral resource affairs and services not elsewhere classified; manufacturing affairs and services not elsewhere classified; and construction affairs and services not elsewhere classified	1.00	1.00	1.00	0.50	0.75	0.50	0.25
12. Transportation and communication affairs and services							
12.1. Road transport affairs and services	1.00	0.75	1.00	0.50	0.75	0.50	0.25
12.2. Water transport affairs and services	1.00	0.75	1.00	0.50	0.75	0.50	0.25
12.3. Railway affairs and services	1.00	0.50	1.00	0.75	0.75	0.50	0.25
12.4. Air transport affairs and services national government	1.00	0.25	1.00	0.75	0.75	0.50	0.25
12.5. Pipeline transport and other transport system affairs and services	1.00	0.75	1.00	0.50	0.75	0.50	0.25
12.6. Transportation system affairs and services not elsewhere classified	1.00	0.75	1.00	0.50	0.75	0.50	0.25
12.7. Communication affairs and services	1.00	0.25	1.00	0.75	0.75	0.50	0.25
12.8. Transportation and communication affairs and services							

not elsewhere classified	1.00	0.50	1.00	0.75	0.75	0.50	0.25
13. Other economic affairs and services							
13.1. Distribution trade affairs and services including storage and warehousing; hotel and restaurant affairs and services	1.00	0.75	1.00	0.50	0.75	0.50	0.25
13.2. Tourism affairs and services	1.00	0.75	1.00	0.50	1.00	0.75	0.50
13.3. Multipurpose development project affairs and services	1.00	0.75	1.00	0.50	0.75	0.50	0.25
13.4. General economic and commercial affairs other than general labour affairs	1.00	0.75	1.00	0.50	0.75	0.50	0.25
13.5. General labour affairs and services	1.00	1.00	1.00	0.50	0.75	0.50	0.25
13.6. Other economic affairs and services not elsewhere classified	1.00	0.75	1.00	0.50	0.75	0.50	0.25
14. Expenditures not classified by major group							
14.0. Expenditures not classified by major group	1.00	1.00	1.00	0.50	0.75	0.50	0.25

Notes for table 3:

v = degree of consumption of a publicly supplied good by the policy-intended or legal beneficiary.

p = degree of proportional cost of the efficient production of the publicly supplied good to a specifically requited monetary burden born by the policy-intended or legal beneficiary.

m = degree of information to the policy-intended or legal beneficiary on the concept of the direct benefit he is receiving when public expenditure is being performed.

q = degree of information to the policy-intended or legal beneficiary on the quantity of the direct benefit he is receiving when public expenditure is being performed.

$\mathbf{i_M}$ = maximum incidence of the direct monetary benefit onto the policy-intended or legal beneficiary of a publicly supplied good.

$\mathbf{i_p}$ = plausible incidence of the direct monetary benefit onto the policy-intended or legal beneficiary of a publicly supplied good.

$\mathbf{i_m}$ = minimum incidence of the direct monetary benefit onto the policy-intended or legal beneficiary of a publicly supplied good.

Source: own elaboration from *A Manual on Government Finance Statistics*, International Monetary Fund, Washington, 1986, and Roig-Alonso, 1989.

TABLE 4
Estimates of Public Expenditure Visibility in European Union member countries: Consolidated Central Government Level

Member countries / Years	V_M	V_p	V_m
Austria, 1995	44.25%	34.15%	24.07%
Belgium, 1988	40.30%	30.52%	20.63%
Denmark, 1995	40.88%	31.01%	21.33%
Finland, 1995	38.39%	28.76%	19.79%
France, 1993	41.35%	31.92%	18.17%
Germany, 1991	43.99%	33.85%	23.79%
Greece, 1995	37.60%	26.90%	16.29%
Ireland, 1994	37.99%	28.22%	18.47%
Italy, 1988	39.29%	29.73%	20.20%
Luxembourg, 1995	42.39%	32.85%	23.33%
Netherlands, 1996	40.85%	30.91%	21.15%
Portugal, 1988	35.46%	26.02%	16.58%
Spain, 1994	41.00%	30.80%	20.61%
Sweden, 1996	42.90%	33.05%	23.23%
United Kingdom, 1995	39.40%	29.43%	19.48%

Notes for table 4:
V_M = maximum visibility estimates of expenditure benefit for the policy-intended or legal beneficiary.
V_p = plausible visibility estimates of expenditure benefit for the policy-intended or legal beneficiary.
V_m = minimum visibility estimates of expenditure benefit for the policy-intended or legal beneficiary.

Source: own elaboration from data in *Government Finance Statistics Yearbook 1997*, International Monetary Fund, Washington, 1997.

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 indices of fiscal visibility previously defined bring forward a general 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 applying these indices to measure the visibility of revenue burden and expenditure benefit of central sub-systems now in force in the European Union member countries show:

First.- Low values of burden visibility for all these countries in general, especially for Greece. Such general low values of revenue visibility stem from the concurrence of several factors such as non-coerciveness, non-existence of specific requitals, lack of information on concepts and quantities, partial shifting of burden by tax-payers, intergovernmental grants, etc.

Second.- Still lower values of benefit visibility for the same countries, specially for Portugal, Greece, Ireland, Finland, United Kingdom and Italy.

Third.- The burden visibility is higher than the benefit visibility in all countries excepting Greece, so that for central level governments in such countries there is a tendency to under-provide goods and services publicly. On the contrary, the burden visibility is similar to the benefit visibility for Greece.

Fourth.- Policy implications of these estimates seem straightforward for all these European countries: as both present revenue and benefit visibility are low in general, allocation improvements could be obtained by implementing changes and reforms to raise values in general and by approaching these two types of budget visibility.

FOOTNOTES

[1]By revenue visibility we mean visibility *of direct burden* of public revenue. Some types of public revenue (for instance, revenue from public property) do not involve any burden in the strict sense here reserved for this term. Symmetrically, by public expenditure visibility, visibility *of direct benefit* of public expenditure must be understood. Again, some types of public expenditure (for example, public purchases of private financial assets at market prices) might not carry any benefit with them.

[2]*Inventory of Taxes Levied in the Member States of the European Communities*, 15th edition, Commission of the European Communities, Luxembourg, 1993.

[3]*A Manual on Government Finance Statistics*, International Monetary Fund, Washington, 1986, and *Government Finance Statistics Yearbook 1994*, volume XVIII, International Monetary Fund, Washington, 1994.

[4] *A Manual on Government Finance Statistics*, International Monetary Fund, Washington, 1986.

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