Friedrich Heinemann*

Does Globalization Restrict Budgetary Autonomy?

Does globalization restrict the leeway for national budgetary policy? With the help of cluster and discriminant analysis this study provides evidence on the basis of the experience of OECD countries since the 1970s. The results suggest that while globalization does indeed matter for government budgets, substantial room is left for individual national policies particularly with regard to public expenditure structure and public debt.

The compatibility of national sovereignty and increasing global integration is at the heart of the globalization debate. In the fiscal field the question is to what extent the increasing mobility of production factors constrains budgetary policy. In Europe the introduction of the Euro has intensified this debate since a further increase in the mobility of real and financial capital is expected. An increasing number of politicians regard liberalization as a danger for the attainment of domestic policy goals, e.g. in the social security field. In reaction to that some advocate tax coordination or even restrictions on international capital mobility.

While the theoretical analysis of the impact of globalization on government budgets is already advanced, empirical analysis has not yet reached a comparable stage.[1] The existing empirical studies have two striking shortcomings. First, there is an analytical imbalance insofar as many studies are predominantly concerned with the development of government revenues. The impact of factor mobility on the complete government budget, i.e. revenues as well as expenditures and public deficits, is rarely taken account of in a comprehensive way. Second, there are only few studies that try to measure the impact of globalization on public finance explicitly. The following approach is frequently applied: trends in the structure of revenues in recent decades are identified and significant changes are then ascribed to globalization. Thus the implicit assumption of this traditional approach is that the time-scale is sufficient to measure the stage of globalization reached by a country. This assumption is highly questionable. For different industrial countries at a given point in time the extent of globalization has often been very different, e.g. because of the existence of restrictions to international transactions.

Due to this identification problem some conclusions found in the literature appear premature since changes in the fiscal structure might be motivated by reasons very different from factor mobility. The decreasing share of corporate taxation in the government revenues of some countries may serve as an example. This empirical fact seems to be in line with the prediction that with the increasing mobility of some factors the burden of taxation is shifted from the mobile to the immobile tax basis. However, an alternative explanation exists: the reduction of taxes on enterprises has been recommended by supply-side economists in order to improve the environment for investments and employment. Therefore, the tax shift away from corporate taxation might – independently of tax competition and purely on domestic grounds - be motivated by the desire to create a growth-stimulating tax system.

Against this background the approach of this study is the following. The impact of globalization on government budgets is analyzed in a multidimensional way: the consequences of the OECD countries'

* Centre for European Economic Research (ZEW), Mannheim, Germany. The author gratefully acknowledges financial support by the German Science Foundation (DFG) within the research program "Governance in the European Union". He also wishes to thank Thiess Büttner, ZEW and Olav Korn, University of Mannheim, for helpful comments and Gian Maria Milesi-Ferretti, IMF, for the provision of data on legal restrictions to international transactions.

[1] For a recent survey see Günther G. Schulze, Heinrich W. Ursprung: Globalization of the Economy and the Nation State, in: The World Economy, No. 3, 1999.

growing international integration are studied for different dimensions of public finance – for the size of the budget, the tax structure, the expenditure structure and the public debt. Theory suggests that these dimensions could be affected. The time perspective is long-run as changes in fiscal variables from the 1970s to the 1990s are analyzed. Furthermore this approach follows the relatively few studies that use explicit measures of globalization. International integration as a possible driving force for changes in government finance is measured in the form of variables for the existence of capital and current account restrictions, for the size of international trade and the exchange rate regime. Thus, an attempt is made to avoid the shortcomings of many existing empirical studies and to take account of national differences in globalization exposure.

The empirical tools employed are cluster and discriminant analysis. In a first step, cluster analysis helps to identify fiscal country clusters, i.e. subgroups of the total country sample with similar fiscal developments in recent decades. In a second step, the usefulness of globalization variables is tested with regard to their power to discriminate between these clusters.

The results suggest that globalization has indeed had an impact on government budgets, although this impact is limited and does not concern all budgetary dimensions. The growing international integration of a country has been associated with a relatively low growth of government although this growth remained substantial in absolute terms even for very globalized countries. The findings support the view that growing market integration restricts the tax burden on corporate income. Substantial leeway remains, however, on the expenditure side. Furthermore, the findings do not indicate any effective globalization restrictions on public debt.

The Hypotheses

Globalization might have an impact on four dimensions of the government budget: the revenue structure, the expenditure structure, the level of deficits and the level of the budget. Among these four dimensions the revenue structure impact – under the heading of "tax competition" – is the one most intensively analyzed in the theoretical public finance literature.[2] If capital is mobile and labor immobile and if the expenditure side of the government budget does not have the character of a production input, globalization will compete capital taxes down and lead to an underprovision of public goods. With increasing globalization the share of capital taxation would thus be expected to decrease and the share of taxes on immobile factors to increase.

If, however, the expenditure side of the budget has the character of a production input, the consequences of globalization on tax structure are less clear and lead to a debate on the validity of models in the tradition of Tiebout.[3] In this model local governments providing local public goods compete for mobile taxpayers, resulting in an efficient allocation. The resulting locational competition is regarded by some authors as a helpful disciplining mechanism to foster efficiency.[4] Sinn,[5] among others, rejects Tiebout due to his too restrictive assumptions. However, the theoretical debate on tax competition and its extension to the expenditure side of the budget leads to the identification of testable hypotheses with regard to two government budget dimensions:

☐ *Tax structure hypothesis:* Globalization forces governments to adjust the tax structure. Taxes have to be shifted away from mobile factors towards immobile ones.

☐ *Expenditure structure hypothesis:* Globalization forces governments to adjust expenditure structure. Expenditure shares must be changed in order to benefit the needs of mobile taxpaying factors at the cost of reducing benefits for immobile taxpayers.

Adjusting the expenditure structure for the benefit of mobile taxpayers has the character of a substitute for the adjustment of the revenue structure. Only empirical analysis can find out which strategy is actually applied by fiscal actors faced with the increasing mobility of some tax bases.

Globalization might be a relevant process not only for taxes and expenditures but also for public debt. This interrelationship has been touched on in the debate on EMU and public debt. Lane[6] ascribes a disciplining function to open capital markets in this context. If public debt exceeds the level that is sustainable, capital flight and increasing risk premia are the consequence. The disciplining function of open capital markets could, however, be neutralized if

[2] See Günther G. Schulze, Heinrich W. Ursprung, op.cit., for a non-technical summary of the main results.

[3] Charles M. Tiebout: A Pure Theory on Local Expenditures, in: Journal of Political Economy, Vol. 64, 1956, pp. 416-424.

[4] Horst Siebert: On the Concept of Locational Competition, Kiel Working Paper No. 731, Institut für Weltwirtschaft, Kiel 1996.

[5] Hans-Werner Sinn: How Much Europe? Subsidiarity, Centralization and Fiscal Competition, in: Scottish Journal of Political Economy, Vol. 41, 1994, pp. 85-107.

[6] Timothy D. Lane: Market Discipline, in: IMF Staff Papers, Vol. 40, 1993, No.1, pp. 53-88.

explicit or implicit bailout mechanisms were installed for a group of countries e.g. in the European Union. The following hypothesis should be included in the empirical testing:

☐ *Public debt hypothesis:* Globalization disciplines public debt policy. Governments become increasingly unable to finance expenditure by issuing debt.

With the effects of globalization on revenue sources discussed so far the expected effect on the size of the government budget follows. Since tax competition and increasing restrictions to public deficit make it harder to finance public expenditures the outcome should be a shrinking budget.

☐ *Size hypothesis:* Globalization restricts the size of government budgets.

Empirical Evidence

What do fiscal developments in recent decades reveal about the validity of these hypotheses? The findings of some analyses concerning the size and structure of government revenues in EU and OECD countries[7] can be summarized in the following way: the level of government revenues does not provide evidence in support of a negative impact of globalization on the financial base of modern governments in recent years. On the contrary, tax revenues (including social security contributions) expressed as a share of GDP have been rising for decades in OECD countries with a stabilization but no reversal in the most recent years. The structure of government revenues is clearly changing. Some of these changes are in line with theoretical predictions of a growing burden for immobile factors: in recent years the share of indirect taxation has been increasing as has the share of social security contributions. The prediction of a decreasing burden on mobile capital and companies cannot be clearly verified. While there has been a tendency for corporate income and capital income tax rates to be reduced this has often been accompanied by a widening of the tax base. There are clearly signs of convergence for corporate and capital taxation but so far there seems to be no race to the bottom.

It has to be stressed, however, that the value of these analyses as evidence of the impact of globalization is limited by the fact that the impact of globalization is not adequately identified. The impact of globalization is not simply a function of time since the speed of globalization has been very different between OECD countries. While some, like the USA, had already widely liberalized capital markets in the 1960s, others, like the Southern Europeans, did not abolish the last restrictions before the nineties.

Schulze and Ursprung[8] cite a few empirical studies to which this criticism does not apply because explicit globalization measures are taken into account. While these studies are silent on public debt effects they deal with the other three dimensions. The clearest effect according to his survey is the impact on tax structure while there is no strong evidence of the expenditure structure and size of government being affected.

The present author has looked into the determination of public deficits in OECD countries using panel regression and taking into account globalization variables such as openness and the existence of capital and current account restrictions.[9] Some support was found for the disciplining hypothesis.

With these limited insights from the literature it is the aim of this empirical study to provide evidence of the extent to which the above four hypotheses are supported when the impact of globalization is identified using appropriate indicators.

Variables for the Budgetary Dimensions

The following variables are used to measure developments along the four dimensions that according to theory should be influenced by growing international market integration:

☐ *Measuring tax structure:* Tax structure is measured by taxes on corporate income as a percentage of total taxation and taxes on goods and services as a percentage of total taxation. According to the tax structure hypothesis, with increasing globalization tax shares are expected to shift away from corporate income towards tax bases with a low mobility. The general consumption of goods and services is one of the less mobile tax bases.

☐ *Measuring expenditure structure:* Expenditure structure is measured by government spending on social security as a percentage of total expenditure

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[7] Jacques Le Cacheux: Tax Competition in the European Monetary Union: Present and Prospects, Zentrum für Europäische Integrationsforschung Policy Paper B 16, Bonn 1998; Vito Tanzi: Globalization, Tax Competition and the Future of Tax Systems, in: Gerold Krause-Junk (ed.): Steuersysteme der Zukunft, Schriften des Vereins für Socialpolitik, Gesellschaft für Wirtschafts- und Sozialwissenschaften, N.F. Vol. 256, Berlin 1998, pp. 11-27; Francesco Paolo Mongelli: Effects of the European Economic and Monetary Union (EMU) on Taxation and Interest Spending of National Governments, IMF Working Paper, No. WP/97/93, Washington 1997; Thiess Büttner: Erosion of Capital Income Taxes? A Note on the Evolution of Tax Burdens across the EU, unpublished manuscript, Mannheim 1999.

[8] Günther G. Schulze, Heinrich W. Ursprung, op.cit.

[9] Friedrich Heinemann: Exchange Rate Regimes and Fiscal Discipline in OECD Countries, ZEW Discussion Paper No. 99-04, Mannheim 1999.

and government net investment as a percentage of total expenditure. Public investment seems to be the best proxy for public spending shares that have an input character for private production. Social security expenditures benefit the relatively immobile factor labor. Therefore, a shift away from social spending towards investment spending would support the expenditure structure hypothesis.

☐ *Measuring public debt:* The stock and flow dimension of public debt is included by taking into account the level of debt as a percentage of GDP and the primary surplus as a percentage of GDP. According to the public debt hypothesis both should react negatively to increasing integration of markets.

☐ *Measuring size:* Size is measured by total tax revenues including social security contributions as a percentage of GDP and government outlays as a percentage of GDP. With increasing difficulties in raising revenues the size hypothesis should be supported and increasing globalization should affect both variables negatively.

21 OECD countries are included in the database.[10] Due to missing variables not all of these countries are included in each single analytical step. The data originate from "OECD Revenue Statistics" and the "OECD Fiscal Positions and Business Cycles" database. The focus is on long-run changes of these variables, i.e. changes from the average of the seventies to the average of the nineties (with 1997 the last year included). Decade averages are the basis for the measurement of long-run changes in order to limit business cycle effects.

Globalization Indicators

Three variables are used to identify more clearly the impact of globalization. Openness is defined as the ratio between the sum of exports and imports and GDP. The motivation for this variable is the idea that economies for which international trade is of great importance will also be subject to more intensive globalization constraints than closed economies. For each country the average openness between 1970 and 1997 is the variable used below (OPENNESS).

Legal restrictions on international transactions reduce factor mobility and might thus alleviate pressures on the government budget arising from tax competition or capital flight. Therefore, the existence of legal restrictions as reported in "Exchange Arrangements and Exchange Restrictions" by the IMF is used as the basis for the second globalization variable. Four kinds of restrictions are taken into account: the existence of multiple exchange rates, restrictions on the current account, restrictions on the capital account and the obligation to surrender export proceeds to government authorities. For each country the variable RESTRICTIONS is calculated in a straightforward way: for each year between 1970 and 1997 a country receives 0 to 4 points for zero up to all four kinds of restrictions. The yearly points are then added up over the whole period. Thus, a high value indicates a low degree of globalization.

Finally, the characteristics of the exchange rate regime are included. McKinnon[11] regards the exchange rate regime as one of the important variables for fiscal behavior. He explains the rise of public debt after 1973 by the collapse of the Bretton Woods system and the modified restrictions for fiscal policy arising from the transition to floating exchange rates. This idea is tested below by the exchange rate regime variable FLOATING that for each country counts the number of years between 1970 and 1997 with a floating exchange rate regime. Data on the exchange rate regime also originate from "Exchange Arrangements and Exchange Restrictions".

A combination of cluster and discriminant analysis is used as the tool for the empirical work.[12] In a first step, cluster analysis serves to identify classes of countries that are largely homogeneous in relation to changes in fiscal variables since the 1970s. In a second step discriminant analysis is used to decide whether the globalization variables can be helpful for explaining the cluster structure. This two-step procedure is applied for each of the four public finance dimensions described above.

The Applied Methodology

Cluster analysis is a descriptive instrument. The aim is classification. A sample of objects is classified into subgroups (clusters) with a high degree of internal homogeneity and a high degree of external heterogeneity. The classification is performed by taking account of specified features of the objects. On the basis of these features, distances between objects and clusters can be measured if a criterion for distance is defined.

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[10] These countries are: Australia, Austria, Belgium, Canada, Denmark, Spain, Finland, France, Great Britain, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, New Zealand, Portugal, Sweden and the United States.

[11] Ronald I. McKinnon: Monetary Regimes, Government Borrowing Constraints, and Market-Preserving Federalism: Implications for EMU, in: Thomas J. Courchene (ed.): Nation State in a Global Information Era, Proceedings of a Conference held at Queen's University, 14-15 November 1996, Kingston, Ontario 1997, pp. 101-141.

[12] Klaus Backhaus, Bernd Erichson, Wulff Plinke, Rolf Weiber: Multivariate Analysemethoden, Berlin 1996.

Figure 1
Changes in Tax Structure

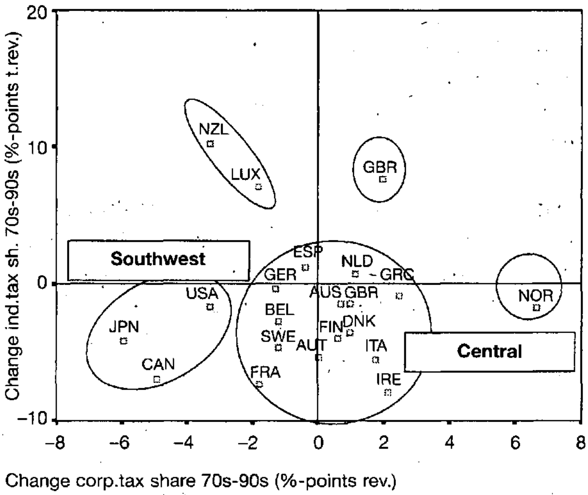

Figure 2
Dendrogram Agglomerative Clustering – Tax Structure Dimension

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     0         5        10        15        20        25
     +---------+---------+---------+---------+---------+

AUS   -+
SWE   -+
NLD   -+---+
GRC   -+   +---+
ESP   -+---+   I
GER   -+       +---------------+
IRE   -+-----+ I               I
ITA   -+     I I               I
BEL   -+-+   +-+               I
SWI   -+ +-+ I                 I
DNK   -+ I I I                 +-------------------+
FIN   -+-+ +-+                 I                   I
AUT   -+   I                   I                   I
FRA   -----+                   I                   I
CAN   ---+---+                 I                   +---+
JPN   ---+   +-----------------+                   I   I
USA   -------+                                     I   I
LUX   -----+-----------+                           I   I
NZL   -----+           +---------------------------+   I
GBR   -----------------+                               I
NOR   -------------------------------------------------+
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Given the objects (21 OECD countries – due to data availability not all are included in each analytical step) and the features (the four public finance dimensions discussed above), the standard approach of agglomerative clustering is used. This approach starts with each individual case being a cluster on its own. It proceeds by successively merging the two clusters with the lowest degree of dissimilarity until all cases are combined into one cluster. The results of this agglomerative procedure are summarized in the dendrogram. The dendrogram is a helpful tool in deciding the adequate number of clusters by depicting for each step the extent of the dissimilarity coefficient for those clusters that are combined. A significant jump in this coefficient indicates that this agglomerating step leads to a combination of dissimilar classes. The following methodological specifications are used. Euclidean distance is chosen as the measure of distance. Dissimilarity between clusters is assessed according to the concept of average linkage, i.e. the distance between clusters is calculated as the average of distances between single cases. In order to preclude scale effects, variables are standardized to have a mean of 0 and a variance of 1 before executing the agglomerating procedure.

Classification by means of cluster analysis is followed by discriminant analysis. Discriminant analysis helps to answer the following question: which variables are helpful in deciding whether an object belongs to a certain class? Thus it is the logical next step in the attempt to look into the impact of globalization on government budgets. While cluster analysis helps to identify country clusters with similar fiscal developments, discriminant analysis helps to find out whether these similarities can be explained by those variables that are proxies for the intensity of globalization.

In the procedure a discriminant function is calculated. The coefficients are determined so that they minimize the ratio between the sum of squares within a given group and the sum of squares between given groups. The goodness of the discriminant function in regard to its capability to discriminate between groups is assessed by Wilk's Lambda, which is defined to be the ratio between the sum of squares within the groups and the total sum of squares. Thus a small value of Lambda stands for a high goodness of discrimination. Wilk's Lambda can be transformed into a chi-square distributed variable. Therefore, the zero hypothesis that groups are not different with respect to the values of the discriminant function can be tested.

The maximum number of discriminant functions is equal to the number of groups less 1 or the number of discriminant variables, depending on which value is smaller. In the analysis the maximum number of functions included is two, due to the fact that with a higher number the marginal improvement in the goodness of the discrimination is very low. Only one function can be determined if only one explanatory variable is used. This can happen because the discriminant analysis is performed stepwise. Consecutively, one after the other, potential globalization variables are included. Wilk's Lambda is used as the criterion for the order of inclusion and for the decision as to whether a variable is included at all. A variable is not included if there is no significant reduction of Wilk's Lambda at a significance level of 5 percent. A further criterion for assessing the goodness of discrimination is the percentage share of cases that would be classified correctly on the basis of the discriminant functions. In addition, the results of an F-test for significant differences in the cluster means of globalization variables are reported.

In addition to the globalization variables, the starting levels of the fiscal variables are included among the discriminating variables. It is plausible to expect the intensity of globalization pressure also to depend on the initial situation before the opening of a country. A country with a relatively high tax burden on companies should for example show a more marked reduction of this burden once globalization starts than a country where the initial burden is low.

Tax Structure Hypothesis

The presumption of the theoretical literature is that globalization leads to a shift of the tax burden from mobile to immobile factors. Since companies are more mobile than consumers this effect should result in decreasing company taxes and increasing indirect taxes as shares of total taxation. Figure 1 depicts the changes of these shares from the average value of the 1970s to the average value of the 1990s (until 1997). The theoretical presumption would be supported if countries in the Northwest segment were globalized to a high degree and countries in the Southeast to a low degree.

The data do not fit easily into this pattern because there is no clear cluster structure along the Northwest-Southeast direction. On the basis of the dendrogram in Figure 2 a five cluster structure seems appropriate. A further merger of clusters would imply a large increase in the measure of distance.

Three outlier clusters are identified: Norway is characterized by a strong increase in the corporate tax share, obviously a Northsea oil effect. Great Britain, Luxembourg and New Zealand are characterized by an increasing share of indirect taxation but do not form a common cluster because of the fact that in Britain the corporate tax share increased while it decreased in Luxembourg and New Zealand. The USA, Canada and Japan form a southwest cluster characterized by a relatively strong decrease in corporate taxation, while the remaining 14 (exclusively European apart from Australia) countries are combined to a central cluster with a slight average increase in corporate tax shares and a clear decrease in indirect tax shares. It is interesting to see that the long-run perspective which is applied here leads to different findings on indirect tax shares, which according to the studies cited above generally increase in a more short-run perspective.

In the next step we try to discriminate between clusters on the basis of the globalization indicators. Due to the non-availability of data for Portugal and Luxembourg discriminant analysis can be applied to only 19 countries. In the further analysis outliers are excluded and the focus is thus on discriminating

Table 1
Descriptive Statistics of Clusters
(2 Clusters – Tax Structure Dimension)

Cluster	Globalization variable	Mean	Standard deviation
Southwest 3 Cases	Openess	31.04	19.17
	Restrictions	4.06	7.02
	Floating	23.33	4.04
Central 13 Cases	Openess	64.49	30.45
	Restrictions	36.47	21.37
	Floating	3.31	7.52

Table 2
F-Test for Equality of Group Means
(2 Clusters – Tax Structure Dimension)

	F	DF1	DF2	Significance
Openess	3.412	1	14	0.086
Openess	3.412	1	14	0.086
Restrictions	6.427	1	14	0.024
Restrictions	6.427	1	14	0.024
Floating	13.904	1	14	0.002
Floating	13.904	1	14	0.002

Table 3
Results of Discriminant Analysis
(2 Clusters – Tax Structure Dimension)

Number included cases	Number discri-mininant functions	Variables included after stepwise procedure	Wilk's Lambda	Signifi-cance of discri-mination	%-share correct classi-fications
18	1	Floating Restrictions	0.247	0.000	93.8

Figure 3
Changes in Expenditure Structure

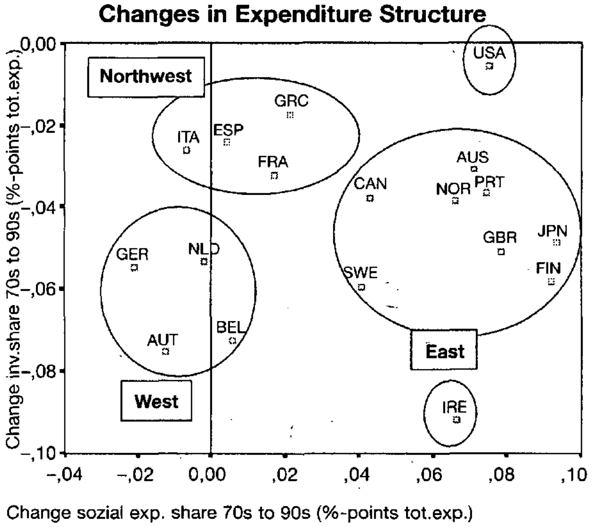

Figure 4
Dendrogram Agglomerative Clustering – Expenditure Structure Dimension

```
     0         5         10        15        20        25
     +---------+---------+---------+---------+---------+
NOR  -+
PRT  -+-+
AUS  -+ +---+
CAN  ---+   +---+
GBR  -+     I   I
JPN  -+-----+   +-------------+
FIN  -+         I             +---------+
SWE  -----------+             I         I
USA  -------------------------+         I
ESP  -+-+                               +-------------+
ITA  -+ I                               I             I
FRA  ---+---------------------+         I             I
GRC  ---+                     +---------+             I
AUT  -+-----+                 I                       I
BEL  -+     +-----------------+                       I
GER  -+-----+                                         I
NLD  -+                                               I
IRE  -------------------------------------------------+
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between the southwest cluster USA, Japan, Canada (decreasing corporate tax share) and the central, mainly European, country cluster (slight increase in corporate tax share).

In line with the tax structure hypothesis the southwest cluster has significantly less restrictions than the central cluster (Tables 1 and 2). It is also characterized by a significant predominance of floating exchange rates. Differences in openness between both clusters are not significant at the 5 percent level. This result carries over to the discrimination procedure, where OPENNESS is not included as a significant discriminating variable. The discrimination on the basis of FLOATING and RESTRICTIONS is, however, successful and leads to a correct classification of 15 out of a total of 16 cases (Table 3).

The finding that globalization variables are relevant is not robust with regard to catching-up effects. The inclusion of the starting levels of corporate and indirect tax shares leads to the following (not reported) results: only the starting level of the corporate tax share survives the stepwise procedure and leads to a good discrimination between both clusters. Those countries that initially had high corporate tax shares reduced the burden on corporate income.

Thus, these findings support the tax structure hypothesis to a certain degree, though not overwhelmingly.

Expenditure Structure Hypothesis

Theory suggests that the structure of public expenditures should increasingly reflect the needs of mobile factors when integration increases. The expenditure shares of social security spending and of public investment outlays can serve as indicators. Given a fixed size of the budget and a fixed revenue structure, a country can try to become more attractive for mobile and taxpaying factors by reducing social spending and increasing the quality of infrastructure.

Denmark, Luxembourg and New Zealand are not included in this analysis due to missing data. Figure 3 depicts the changes along these two dimensions from the 1970s to the 1990s for 18 countries (decade averages). The absolute values of the changes are remarkable: there is no country where investment shares have increased. On the contrary, there have been marked reductions in relative spending on public infrastructure. The opposite is true for social spending, where for most countries' expenditure shares have risen strongly, reflecting the growth of the welfare state. Thus, if globalization has had an impact on expenditure structure it can only be one of serving to limit the relative (and even larger absolute) growth of social security spending and the relative shrinking of public investment. In the country cross-section a higher/lower degree of globalization should be associated with a location in the northwest/southeast of Figure 3.

Cluster analysis recommends a five-cluster structure with two single case clusters, the USA and Ireland (Figure 4). A South European cluster (Italy, Spain, Greece and France) is identified in the northwest, a Central European cluster (Germany, Netherlands, Belgium and Austria) in the west and a worldwide cluster in the east. Dropping single case clusters, discrimination analysis between clusters is successful on the basis of the globalization variables RESTRICTIONS and OPENNESS while the exchange rate regime variable is rejected (Table 6). However, the impact of globalization does not always have the direction predicted by theory: contrary to theory, the northwest cluster where the growth of social security spending and the shrinkage of investment expenditure was limited is the least globalized cluster (most restrictions and lowest openness, Table 4; Table 5 shows that cluster differences of means are significant for all three globalization variables). The east cluster shows a high relative increase in social spending while it has about average values for restrictions and openness. The most globalized cluster is the Central European one which, in line with the theoretical prediction, shows a slight decrease in relative social security spending. But at the same time it is characterized by a particularly large drop in investment spending.

The findings are robust for the inclusion of the starting levels of investment and social security shares in the 1970s (results not reported; these findings show that the countries with an initially low share of social spending also tended to be the countries that have increased this share in the last two decades). As a whole the expenditure structure hypothesis is not supported by these findings.

Table 4
Descriptive Statistics of Clusters
(3 Clusters – Expenditure Structure Dimension)

Cluster	Globalization variable	Mean	Standard deviation
East 8 cases	Openess	53.09	18.00
	Restrictions	29.15	19.96
	Floating	15.63	8.88
West 4 cases	Openess	89.18	32.60
	Restrictions	16.29	15.00
	Floating	0.00	0.00
Northwest 4 cases	Openess	40.66	2.62
	Restrictions	59.63	12.08
	Floating	12.50	6.35

Table 5

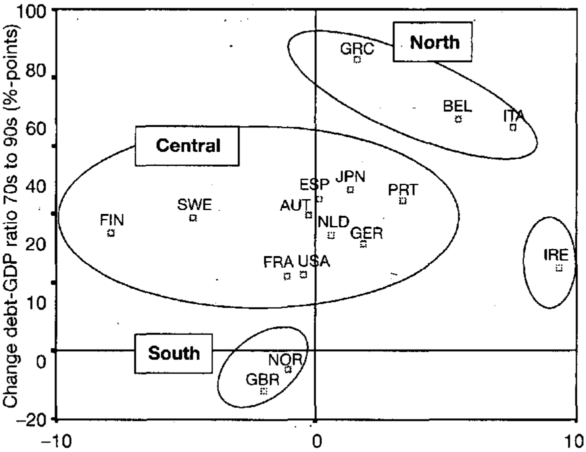
F-Test for Equality of Group Means
(3 Clusters – Expenditure Structure Dimension)

	F	DF1	DF2	Significance
Openess	6.252	2	13	0.013
Openess	6.252	2	13	0.013
Restrictions	6.774	2	13	0.010
Restrictions	6.774	2	13	0.010
Floating	6.415	2	13	0.012
Floating	6.415	2	13	0.012

Table 6
Results of Discriminant Analysis
(3 Clusters – Expenditure Structure Dimension)

Number included cases	Number discri-mininant functions	Variables included after stepwise procedure	Wilk's Lambda	Signifi-cance of discri-mination	%-share correct classi-fications
16	2	Restrictions Openess	0.192	0.000	87.5

Figure 5
Changes of Debt Level and Primary Surplus



Change primary surplus 70s to 90s (%-points)

Figure 6
Dendrogram Agglomerative Clustering – Public Debt Dimension

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       0         5        10        15        20        25
       +---------+---------+---------+---------+---------+

FRA    -+-----+
USA    -+     I
GER    -+-+   I
NLD    -+ I   +---------------+
CAN    -+ +-+ I               I
ESP    -+ I I I               I
AUT    -+-+ +-+               +---------+
JPN    -+   I                 I         I
PRT    -----+                 I         +---------------+
FIN    -----+-----------------+         I               I
SWE    -----+                           I               I
GBR    -+-------------------------------+               I
NOR    -+                                               I
BEL    -+-------------+                                 I
ITA    -+             +---------------------------+     I
GRC    ---------------+                           +-----+
IRE    -------------------------------------------+
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Public Debt Hypothesis

Can increasing globalization help to discipline fiscal policy-makers with regard to the extent of deficit financing? If this is the case, countries with an early liberalization of international transactions should consequently have lower deficits and/or lower increases in their debt level. Figure 5 depicts the changes in two public debt variables, the debt-GDP ratio and the primary surplus. The changes refer to the difference between the average of the 1970s and that of the 1990s. In this analytical step, Australia, Denmark, Luxembourg and New Zealand are not included due to missing data.

Only two countries, Great Britain and Norway, resisted the general tendency towards a huge build-up of public debt in recent decades. The increase in the stock of debt was paralleled by wide differences in the development of flows: a number of countries experienced a large improvement in the primary surplus. The logic behind this development is obvious: a country with a large increase in the debt level and, consequently, rising interest rate payments is forced to improve its primary balance even if it only aims at stabilizing the debt ratio.

According to the dendrogram, cluster analysis seems to suggest 4 to 6 clusters as appropriate (Figure 6). In the following, the analysis is based on a four-cluster structure; the main results are, however, robust for a finer differentiation. Besides the outlier Ireland, which is dropped before applying discriminant analysis, 3 clusters along the debt level dimension are identified. The northern cluster combines Greece, Belgium and Italy as the countries with an exploding debt level. The southern cluster combines Great Britain and Norway, the countries resisting debt increases. The remaining countries are integrated into the central cluster with a medium debt performance.

The high debt-increase country group is also the cluster where restrictions on international transactions were most frequent (Table 7). However, neither the differences in RESTRICTIONS nor those in OPENNESS or FLOATING prove significant between

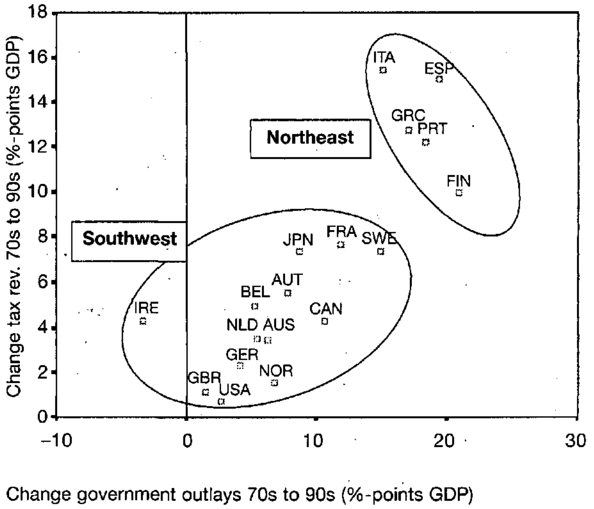
Table 7
Descriptive Statistics of Clusters (3 Clusters – Public Debt Dimension)

Cluster	Globalization variable	Mean	Standard deviation
North	Openess	69.21	48.79
3 cases	Restrictions	56.61	21.93
	Floating	10.33	9.61
Central	Openess	53.52	24.34
11 cases	Restrictions	23.88	22.95
	Floating	10.55	9.84
South	Openess	65.92	19.33
2 cases	Restrictions	37.67	13.67
	Floating	14	12.73

Table 8
F-Test for Equality of Group Means (3 Clusters – Public Debt Dimension)

	F	DF1	DF2	Significance
Openess	0.425	2	13	0.662
Openess	0.425	2	13	0.662
Restrictions	2.640	2	13	0.109
Restrictions	2.640	2	13	0.109
Floating	0.106	2	13	0.900
Floating	0.106	2	13	0.900

Figure 7
Changes in Levels of Public Revenues and Outlays



clusters (Table 8). Consistent with this result, all these variables are rejected in the stepwise procedure as not useful for discrimination at the 5 percent level of significance (results not reported).

According to these results, in recent decades debt policy has not been subject to significant globalization constraints.

Size Hypothesis

The final testing concerns the evolution of the size of government. Figure 7 depicts the change in the tax-GDP ratio (taxes including social security contributions) and the change of the ratio between government outlays and GDP. The change is the difference between the average level of the 1970s and the average of the 1990s (up to 1997). Data availability allows the inclusion of 18 countries (Denmark, Luxembourg and New Zealand are excluded). Obviously, a departure from the 45-degree line to the right indicates that the growth of outlays is not paralleled by the growth of tax revenues.

It is important to note that according to these indicators the growth of public activity has been substantial. This corresponds to the findings cited above that there are no signs of a shrinking state sector in the era of globalization. A statement parallel to the results for the expenditure structure and the growth of social security spending applies: if globalization has had an impact, this has been to limit the growth of public outlays and taxes.

Figure 8
Dendrogram Agglomerative Clustering – Size Dimension

```
        0         5        10        15        20        25
        +---------+---------+---------+---------+---------+

AUS   -+
NLD   -+
BEL   -+-+
GER   -+ +-------+
NOR   -+ I       I
GBR   -+-+       +---+
USA   -+         I   I
IRE   -----------+   +-------------------------------+
FRA   -+---+         I                               I
SWE   -+   +---------+                               I
AUT   -+-+ I                                         I
JPN   -+ +-+                                         I
CAN   ---+                                           I
GRC   -+-+                                           I
PRT   -+ I                                           I
ESP   ---+---+                                       I
ITA   ---+   +---------------------------------------+
FIN   -------+
```

Cluster analysis leads to straightforward results. The dendrogram in Figure 8 recommends a 2 cluster structure. Five countries (Greece, Portugal, Spain, Italy and Finland) form the northeast cluster with high growth of public activities, the remaining 13 countries form the low-growth southwest cluster. Comparing both clusters in regard to globalization variables only the difference in the number of restrictions is significant: the countries of the northeast high-growth cluster have been more restrictive on international transactions (Tables 9 and 10).

As in the preceding part only the RESTRICTIONS variable turns out to be useful in the discriminant analysis (Table 11). Wilk's Lambda indicates a significant discrimination function on the basis of this variable alone. Three-quarters of the cases are correctly classified. Neither OPENNESS nor FLOATING leads to a significant improvement of the discrimination.

Robustness was checked by the inclusion of the initial levels of taxes and outlays in the stepwise discriminating procedure in order to control for the existence of a catching-up process in government activity (results not reported). The catching-up presumption is confirmed: the initial level of government outlays is helpful for discriminating. At the same time, the discriminating power of the RESTRICTIONS variable is not reduced, but it remains important – even more important than the catching-up variable.

These results are in line with the size hypothesis. Governments of countries that liberalized international transactions early were not able to increase outlays and taxes to a similar extent as the governments in countries with continuing restrictions. Due to the

Table 9
Descriptive Statistics of Clusters
(2 Clusters – Size Dimension)

Cluster	Globalization variable	Mean	Standard deviation
Southwest	Openess	64.0688	33.7860
13 cases	Restrictions	23.7308	18.9958
	Floating	9.6923	10.8042
Northeast	Openess	48.2199	12.0460
5 cases	Restrictions	56.4333	18.0495
	Floating	13.6000	4.0373

Table 10
F-Test for Equality of Group Means
(2 Clusters – Size Dimension)

	F	DF1	DF2	Significance
Openess	1.016	1	16	0.328
Openess	1.016	1	16	0.328
Restrictions	10.969	1	16	0.004
Restrictions	10.969	1	16	0.004
Floating	0.602	1	16	0.449
Floating	0.602	1	16	0.449

Table 11
Results of Discriminant Analysis
(2 Clusters – Size Dimension)

Number included case	Number discri-mininant functions	Variables included after stepwise procedure	Wilk's Lambda	Signifi-cance of discri-mination	%-share correct classi-fications
18	1	Restrictions	0.593	0.0045	77.8

generally positive sign of the changes this does not, however, support the hypothesis of liberalization undermining the financial basis for the modern fiscal state.

Conclusion

The above findings show the existence of interrelationships between globalization and government budgets in the OECD. These links are not equally strong for all budgetary dimensions. The clearest evidence concerns the size of the budget. It is affected as predicted by theory. Countries with an early liberalization of international transactions had lower increases in government outlays and taxes. Nevertheless, even for the liberal countries there was, relative to their GDP, a substantial increase in government activity since the 1970s. This fact is worth underlining since it contradicts the theoretical prediction of global markets' undermining the welfare state. The abolition of barriers to the free flow of factors has limited the growth of the welfare state, but this growth remained positive with high rates of expansion.

The compatibility of the welfare state with globalization is also impressively demonstrated by the findings concerning the expenditure structure where public investment has been reduced and social security expenditure shares have been increased. National deviations from this general tendency do not in all cases correspond to the relative speed of opening. The very countries for which the expenditure shift towards social security has been relatively small have been the most reluctant ones as regards the lifting of restrictions on international transactions.

Concerning the revenue structure there is some support for the predictions of tax competition theory. The countries that have been more globalized than others have tended to shift relative tax burdens away from corporate income. Combined with the fact of a high growth of government and especially social spending this indicates the following: with globalization there are limits to the financing of an *increasing* welfare state by higher tax burdens on mobile factors.

The results concerning public debt are disappointing to those who hope that open capital markets can fulfill a disciplining function in the presence of the deficit bias of modern democracies. There is no indication that the abolition of capital restrictions has limited the build-up of large debt levels since the 1970s. Different clusters of debt performance cannot be discriminated on the basis of globalization variables.

The relative performance of the three globalization variables might offer some indications in regard to the channel over which global integration influences budgetary policy. The exchange rate regime and the openness variable are almost always rejected in the discrimination procedure. This contrasts to the impact of the variable counting the number of restrictions on international transactions. It seems that a liberal approach towards a free flow of capital and goods is a more important restriction for fiscal policy-makers than the exchange rate regime or the size of international trade.

Summing up, the message of this analysis is: globalization does indeed matter for government budgets, but substantial leeway is left for individual national budgetary policies.