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The impact of globalization on the composition of government expenditures: Evidence from panel data

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Abstract According to the disciplining hypothesis, globalization restrains governments by inducing increased budgetary pressure. As a consequence, governments may attempt to curtail the welfare state, which is often seen as a drag on international competitiveness, by reducing especially their expenditures on transfers and subsidies. This globalization-induced welfare state retrenchment is potentially mitigated by citizens' preferences to be compensated for the risks of globalization ("compensation hypothesis"). Employing two different datasets and various measures of globalization, we analyze whether globalization has indeed influenced the composition of government expenditures. For a sample of 60 countries, we examine the development of four broad expenditure categories for the period 1971–2001: capital expenditures, expenditures for goods and services, interest payments, and subsidies and other current transfers. A second dataset provides a much more detailed classification: public expenditures, expenditures for defence, order, economic affairs, environment, housing, health, recreation, education, and social expenditures. However, this second data set is only available since 1990—and only for OECD countries. Our results show that globalization did not influence the composition of government expenditures in a notable way.

Keywords Globalization · Economic policy · Government expenditure composition · Tax competition

JEL Classification H7 · H87 · C23

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1 Introduction

The number of scholarly investigations of the nexus between globalization and the welfare state is impressive and the literature is still growing at a rapid pace. The scientific community contributing to this literature is by no means restricted to the economics profession; political scientists, in particular, but also sociologists and other social scientists have been strongly involved in this ongoing academic endeavour. Even though there can be no doubt that one of the driving forces behind this research activity is intellectual curiosity regarding the essential consequences of one of the arguably most important economic phenomena of our time, it appears that many social scientists are also attracted to the subject because of the public debate that the globalization issue has aroused. Since globalization has far reaching effects on so many important aspects of everyday life, it is a topic well suited for political entrepreneurs to rig the public political discourse and to mobilize political support. The political agents who have used the globalization issue as a vehicle to advance their agendas range from well-meaning public figures concerned about the globalization induced social dynamic, to political demagogues and street rioters.

The worries of the well-meaning objectors to global economic integration originate in the conviction that globalization will bring about a loss of power of the nation states in general, and a reduction in welfare state activities, in particular. The reasoning behind these fears runs as follows: trade liberalization and liberalization of factor mobility, via indirect factor price equalization and direct arbitrage effects, erode the developed countries' income and capital tax bases and will eventually give rise to a global tax race to the bottom which, in turn, results in the nation states' fading ability to finance welfare state activities. This downward pressure on the supply side of public welfare programs, depending on the viewpoint of the observer, reduces the efficiency of *benevolent governments* (cf. Sinn 2003) and/or disciplines *egoistic governments* who transform discretionary power into benefits for their clientele (cf. Breton and Ursprung 2002). The so-called "efficiency" or "discipline" effect of globalization thus reduces the range and size of government welfare programs.

By focusing on the efficiency effect of globalization, the opponents of global economic integration and unchecked systems competition neglect, however, the demand side of the political market. The demand-side effects of globalization derive from the governments' political support maximization motives that direct the political process towards a redistribution of the globalization induced economic gains, i.e., losers from globalization are to some extent compensated via an increase of social welfare programs. The so-called "compensation" effect of globalization thus undermines the "efficiency" effect, implying that from a theoretical point of view the total effect of globalization on the extent of national welfare programs remains ambiguous.

Given the theoretical ambiguity of the nexus between globalization and national welfare policies, it is not surprising that much of the respective literature is empirical. However, as the literature review in the next section shows, a robust impact of globalization on government expenditures does not appear to exist. The reason might be that compensation and disciplining effects neutralize each other. It is possible, however, that the impact of these two effects depends on the type of expenditure. Therefore, any true test investigating the impact of globalization on expenditures has to focus upon shifts in the relevant expenditure shares. It is this link between globalization and expenditure shares that our paper deals with. We follow the strategy of using disaggregated data and superior econometric techniques that characterize the second-generation studies on the globalization-welfare state nexus. In contrast to the existing literature we do, however, not estimate the impact of globalization on *individual* policy dimensions, but acknowledge that all policy measures are to some extent

substitutes or complements vis-à-vis each other, implying that *indirect* globalization effects, working through changes in related welfare-state activities, may play an important role. Mutual interdependence is clearly an issue if one focuses, as we do, on disaggregated government *spending* since all categories of government spending are connected via the overall budget policy.[1] While previous studies investigated the impact of globalization on a range of individual expenditure shares in GDP (see the literature review below) none of them took indirect effects into account. Applying our research strategy, we might be able to uncover globalization effects that remain otherwise hidden.

Our empirical strategy is thus to estimate whole systems of equations in order to uncover to what extent the relative importance of specific expenditure categories is influenced by globalization. According to the compensation hypothesis some categories may become more important even if the overall level of government expenditures remains unchanged. This particularly applies to social expenditures. The disciplining effect of globalization, on the other hand, will have a detrimental effect on all kinds of welfare state expenditures.

In the remainder of this paper we analyze whether and to what extent globalization influences the composition of government expenditures. We use two different datasets that focus on different countries, periods and decompositions of government expenditures. In an attempt to obtain robust results, we employ different measures of globalization. Our results indicate that none of the investigated expenditure categories has been robustly affected by any of our globalization indicators. In our view, this implies that either the hitherto neglected interaction effects blur the two direct effects to a rather large extent, or governments throughout the world have not rearranged their expenditure shares as a result of globalization.

The next section summarizes the mainly empirical literature on the effect of globalization on government programs. Subsequently, we will describe our data and method of estimation. Section 4 contains the estimation results. Section 5 concludes.

2 Literature overview

The earlier literature on the globalization-welfare state nexus (for a survey, see Schulze and Ursprung 1999) mainly dealt with three issues, the first one being the structural tax-competition effect. Economic reasoning suggests that the tax burden is shifted away from the increasingly mobile factors, i.e., in particular capital, when a country becomes increasingly more integrated in the world economy. Notable contributions are Garrett (1995), Quinn (1997), Rodrik (1997) and Swank (1997). The second issue directly addresses the question whether globalization has a positive or negative effect on welfare state activities as measured by the relative size of the government sector. The third avenue of investigation takes a more differentiated approach to measuring welfare state activities by focusing not on the *level* of government spending but on the *structure* thereof, i.e., on specific categories such as social security and welfare expenditures. Notable contributions to these two lines of inquiry are Hicks and Swank (1992), Huber et al. (1993), Garrett (1995), Cusack (1997), Garrett and Mitchell (1997), Quinn (1997), Garrett (1998a, 1998b), Swank (1997), and Rodrik (1998).

After having surveyed the early literature, Schulze and Ursprung (1999, pp. 345–347) arrive at the following conclusion:

[1] Interaction effects may, however, also emanate from policies that are not primarily fiscal in nature, such as macroeconomic or environmental policies. For globalization induced effects on these policy fields, see, for example, Tytell and Wei (2004) and Schulze and Ursprung (2001), respectively.

"The general picture drawn by the few econometric studies available thus far does not lend any support to any alarmist view. At an aggregate level, many of these studies find no negative relationship between globalization and the nation states' ability to conduct independent fiscal policies. ... Viewing the income and expenditure side of government budgets separately, a cautious interpretation of the empirical evidence suggests that ... it cannot be rejected out of hand that the tax structure may have been influenced by the globalization process—the observed decline in effective average CIT (corporate income tax) rates and the convergence of CIT rates across countries is certainly compatible with such an interpretation. ... Given the small corporate income tax base and the fact that no shift of the tax burden from capital to labour has taken place, it is not surprising that, on the expenditure side, no strong evidence points to a significant globalization-induced change of the level of public spending. But also accustomed expenditure patterns do not appear to have changed in the course of globalization. This may be due, however, to a lack of studies using strongly disaggregated public expenditure data."

Many contributions to the more recent globalization literature have indeed taken up this implicit challenge and have used disaggregated data in order to focus on specific welfare-state programs; others have focused on specific groups of countries or have refined the empirical methods. We briefly comment on some of these studies in turn.

In a reconsideration of their earlier unpublished study of 1997, Garrett and Mitchell (2001) arrive at conclusions that contradict the received wisdom as summarized above: their panel-data analysis appears to show that increases in trade are associated with less total government spending, in particular lower security benefits as a share of GDP, which would imply a preponderance of the disciplining effect over the compensation effect. Kittel and Winner (2005) and Plümper et al. (2005) show, however, that the results obtained by Garrett and Mitchell (2001) cannot be reproduced if the econometric model is properly specified. Both follow-up studies rather come to the conclusion that government spending is primarily driven by the state of the domestic economy and thus independent of international economic openness, implying not only the absence of significant disciplining effects but also the absence of compensatory measures. This result is in line with the study by Iversen and Cusack (2000) who do not find any relationship between globalization and the level of labour-market risks (in terms of employment and wages), whereas uncertainty and dislocations caused by deindustrialization appear to have spurred electoral demands for welfare state compensation and risk sharing. The demand for welfare state activities thus appears to be homemade and not to be induced by labour market risks related to international trade. Dreher and Gaston (2007a) find that globalization gave rise to deunionization. However, in delving further into the issue, they find that it is social integration, rather than economic integration, that has been the main contributor to the decline in union membership. Bretschger and Hettich (2002) use an ingenious novel measure of openness which corrects for country size and find that globalization has a negative and significant impact on corporate income taxes and tends to raise labour taxes. On the other hand, they also find that globalization increases social expenditures. As a consequence, the disciplining effect impacts on the tax-mix, whereas compensation is provided through increased social expenditures. Dreher (2006a), finally, investigates the impact of various dimensions of globalization on the tax mix and government expenditures. None of the three dimensions of globalization have a significant influence on either social spending or spending overall. The same is true for average effective tax rates on consumption and labour. When it comes to tax rates on capital, however, the result depends on how the tax burden is measured. While a globalization-induced increase in implicit tax rates on capital is compatible with the data when the average effective tax rates constructed by Carey and Rabesona (2002) are employed, the opposite conclusion can be drawn when one uses the legislation-based data by Devereux and Griffith (2003).

Studies focusing on specific groups of countries usually examine the impact of global economic integration on developing countries. Rudra (2002), for example, observes that defending welfare benefits under the pressures of globalization is much easier in OECD countries that in LDCs. This result points to the crucial role of the political regime in accommodating the demand side of the political market. Analyzing Latin American countries, Kaufman and Segura-Ubiergo (2001) and Avelino et al. (2005) therefore control for the influence of the political regime. The empirical evidence uncovered by Kaufman and Segura-Ubiergo favours the *disciplining* hypothesis. On the other hand, their results also suggest that democracies may be more responsive to compensation demands than other regimes, at least when it comes to social spending on health and education.[2] Avelino, Brown and Hunter confirm that education is positively associated with openness (as do Rudra 2004, and Ansell 2004, April), but obtain a more robust impact of democratic regimes and their estimates are generally supportive of the *compensation* hypothesis; their overall results are quite in line with those obtained by Adsera and Boix (2002) who used a more encompassing sample of countries.

Apart from responding to globalization pressures in different ways, political regimes may also be linked to globalization in a causal relationship. On the one hand, Richards et al. (2001) discover systematic evidence that both foreign direct investment and portfolio investment are reliably associated with increased government respect for human rights. This finding is corroborated by Rudra (2005) who finds that globalization in general strengthens democracy in the developing world if social safety nets are used to provide stability and to build political support.[3] On the other hand, quite a few studies show that civil and political freedom in turn attract foreign direct investments (see, for example, Harms and Ursprung 2002; Bengoa and Sanches-Robles 2003; Busse 2004), thus giving rise to a virtuous globalization-democratization cycle.

This literature review indicates that there is no consensus on the impact of globalization on government expenditures. The reason might be that the compensation, disciplining and interaction effects as described in the introduction neutralize each other. It is likely, however, that the compensation and disciplining effects vary in size across the various types of government expenditure. Therefore, the true test for any investigation of the impact of globalization on government expenditures has to focus on shifts in the relevant expenditure *shares*.[4] It is this link between globalization and expenditure shares that the remainder of our paper deals with.

3 Data and method

In order to test whether and to what extent globalization affects the composition of government expenditures, we estimate combined cross-section time-series (panel) regressions with yearly data. To check for robustness over time, across countries and especially with respect to the number of expenditure categories, we employ two datasets. The first dataset is taken from the World Bank's (2003) World Development Indicators. It contains data for up

[2] Globalization has also an effect on education via migration. This aspect has up to now mainly been analyzed from a theoretical point of view; see, for example, Ansell (2003, August) and Gersbach and Schmutzler (2005).

[3] The results obtained by Li and Reuveny (2003) are, however, much less supportive of this general hypothesis.

[4] See also the recent model in Exbrayat et al. (2006), who show how trade integration might affect the pattern of public spending.

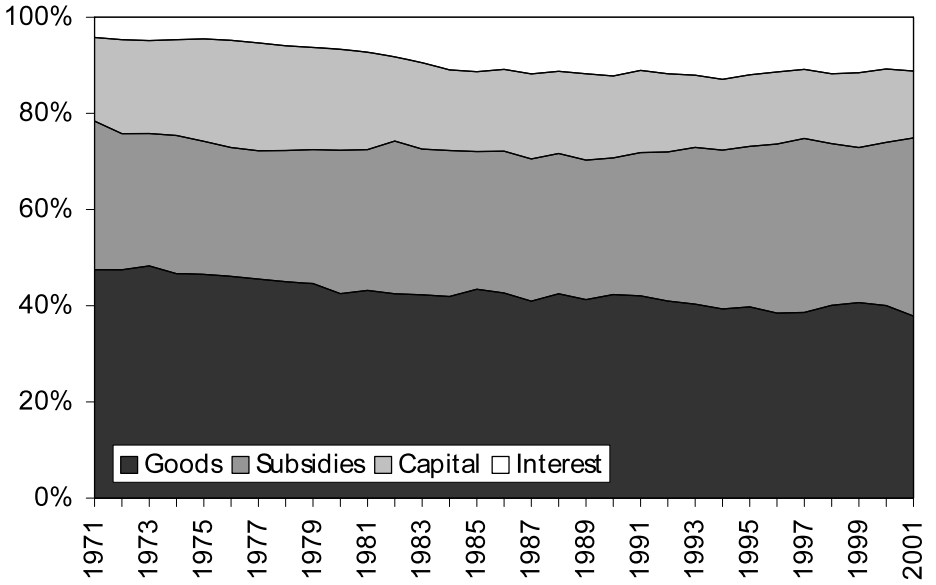

Fig. 1 Development of average expenditure shares for a sample of 108 countries. Source: World Bank (2003). Data ordered with respect to shares

to 108 countries covering the period 1970–2001. Data are classified according to four broad expenditure categories: capital expenditures, expenditures for goods and services, interest payments, and subsidies and other current transfers. This data is available as a share of total expenditures. However, it covers central government expenditure only.

Figure 1 shows the development of the average expenditure shares over time for the largest sample possible. The most prevalent feature of the graph is the increase in interest payments over time (from 5 percent to 11.5 percent). The share of subsidies increased from 28.5 percent to 32.5 percent over the sample period, while the share of expenditures on goods decreased from 46.1 percent to 40.3 percent, and the share of capital expenditures from 20.4 to 15.7 percent. There is thus no obvious erosion in subsidies over time.[5]

The second dataset has been developed by the OECD and refers to general government expenditures. The OECD Public Expenditure Database (2004) provides a much more detailed classification of government expenditures. However, these data are available only since 1990—and only for up to 15 OECD countries. For this smaller sample, the following ten expenditure categories are available: expenditures on public services; defence; public order and safety; economic affairs; protection of the environment; housing and community amenities; health; recreation, culture and religion; education; and social expenditures. Figure 2 shows that the largest increases in shares have occurred for social expenditures (+4.2 percentage-points) and health expenditures (+3.2 percentage-points); for public services, defence and economic affairs shares have decreased by 5.2, 3.0 and 2.1 percentage points, respectively.

Our dependent variables are the respective expenditure categories as a (percentage) share of total expenditures. Since some of the data are not available for all countries or years, the

[5]This pattern also emerges for balanced samples, and for OECD countries only.

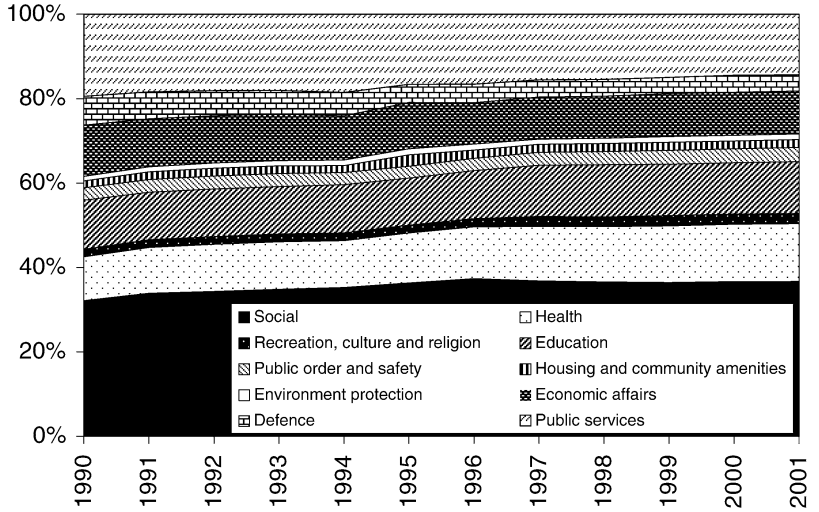

Fig. 2 Development of average expenditure shares for a sample of 15 OECD countries. Source: OECD Public Expenditure Database (2004). Data ordered with respect to changes over the sample; bottom series have largest positive change, upper series have largest negative change

panel is unbalanced and the number of observations depends on the choice of explanatory variables. For ease of comparison, we keep the sample fixed (to those countries and years for which all variables are available). Furthermore, we select our sample to only include those observations for which these four or ten categories do indeed sum up to total government expenditures (i.e., 100 percent). This results in a world sample of 624 observations containing 60 countries over the period 1971–2001. When we restrict this dataset to cover only OECD countries, we have 255 observations for 18 countries over the years 1971–2001. In both cases most observations stem from the 1980s and 1990s. Using the OECD dataset, i.e., focusing on ten expenditure categories, leaves us with 66 observations for only 10 countries covering the years 1991–2001. We found significant fixed country effects in all specifications. However, the coefficients of the country dummies are not reported in the tables. All variables, their precise definitions and data sources are listed in Appendix 1.

One potential problem with the World Bank data is that it excludes expenditures at lower levels of government which might result in a blurring of our results. Even if central government expenditure composition does not change, expenditure provided by lower tiers might still do. However, Garrett and Rodden (2000) show that globalization increases centralization. With increasing globalization, our data thus cover a larger share of overall expenditures. If this increase is not evenly distributed across the spending categories, our analysis, which uses central government data, is more likely to find an effect than an analysis based on total government spending. Moreover, globalization is arguably more likely to affect the central government than its lower-tiered jurisdictions. In many countries, horizontal competition between jurisdictions has always been strong. This competition is likely to dominate external pressure, while central governments have to some extent been sheltered from competition before the onset of globalization. Finally, our analysis includes fixed country effects and thus controls for the federal structure of the countries in our sample. Overall, we therefore conclude that data limitations when using the World Bank data do not pose a major problem. In any event, given the availability of general government expenditure data for OECD

countries we can test for the consistency of our results to the inclusion of all government sectors in the analysis.

To measure globalization, we employ various proxies that have been suggested in the literature. The first is openness to trade as measured by the sum of imports and exports as a share of GDP. The second indicator of globalization is the sum of the absolute values of inflows and outflows of foreign direct investment (as a share of GDP)[6] and the third refers to restrictions on capital account transactions. The indicator of capital account restrictions is constructed with binary data from the International Monetary Fund's annual report on *Exchange Arrangements and Exchange Restrictions*. We focus on four types of restrictions:

- restrictions on payments for capital account transactions,
- separate exchange rate(s) for some or all capital transactions and/or some or all invisibles,
- surrender requirements for proceeds from exports and/or invisible transactions, and
- restrictions for payments on current transactions.

While the first three types of restrictions can broadly be interpreted as some kind of controls on capital flows, the fourth restriction has been included because current transactions can be used to circumvent restrictions on the capital account (Milesi-Ferretti 1998, 225).[7] The respective data has been collected by Grilli and Milesi-Ferretti (1995) and Dreher and Siemers (2005).

Our index of capital account restrictions aggregates the four measures. The index takes the value of 1 for fully restricted capital accounts, and 0 if no restrictions are in place.[8] An obvious shortcoming of this approach is that it neither measures the intensity nor the effectiveness of controls. One would also like to distinguish between controls on inflows and outflows of capital. We do, however, neither have the data to adequately control for intensity and effectiveness,[9] nor the data that would allow an analysis of inflows and outflows.

Clearly, globalization is a broad concept that cannot be captured completely by the three indicators discussed above. We therefore employ the globalization indicator as published by the KOF Swiss Economic Institute. This KOF Index of Globalization has originally been developed in Dreher (2006b), and is updated and calculated on a yearly basis over the period 1970–2003.[10] The index captures the three main dimensions of globalization—economic integration, political integration and social integration. It is based on a large number of

[6] Ideally, we would like to have the stocks of FDI instead of their flows as a measure of globalization. However, FDI stocks are neither available over the entire period under study nor for all countries included.

[7] In 1997 the IMF changed the format of its survey. Following Glick and Hutchison (2000) and Dreher and Siemers (2005) we coded "restrictions on payments for capital account restrictions" to be unity if controls were in place in 5 or more of the sub-categories of capital account restrictions, and "financial credit" was one of the categories restricted.

[8] A similar procedure has been employed, among others, by Gruben and McLeod (2001), Bai and Wei (2001) and Dreher and Siemers (2005).

[9] To proxy the intensity or effectiveness of capital controls, black market premiums, onshore-offshore interest differentials and deviations from covered interest parity have been employed (e.g., Giavazzi and Pagano 1988; Dooley and Isard 1980). However, those variables measure other aspects as well. We focus on the existence rather than the degree of controls and do not use them.

[10] We use the 2006 version of the KOF index where the most recent data refers to the year 2003. The KOF index has recently been used to analyze the impact of globalization on various economic, political and social outcomes. For example, Dreher (2006a) studies the impact on the size of government, Dreher (2006b) focuses on economic growth, Tsai (2007) examines human well-being, Dreher and Gaston (2007a) examine the impact on trade union membership, Bjørnskov (2006) studies the effects on institutional quality, Bergh (2006) analyzes the impact of globalization on the welfare state, Lamla (2005) the impact of globalization on pollution, and Dreher and Gaston (2007b) those on inequality. The data and detailed description is available at

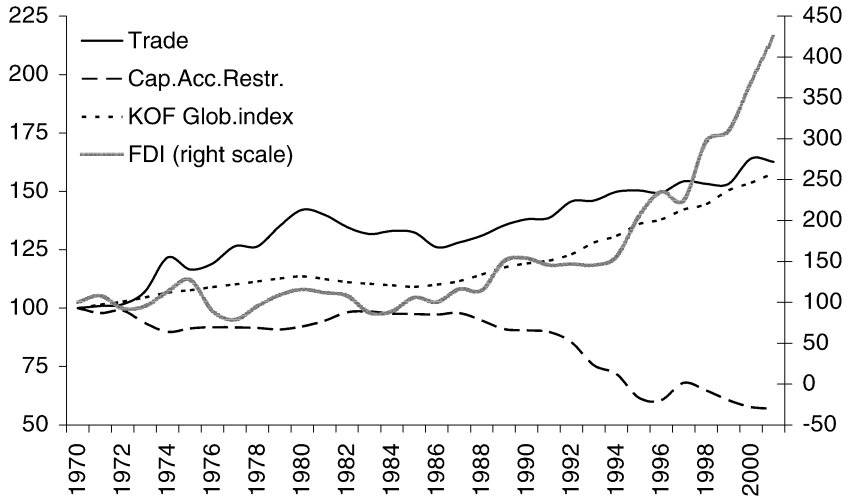

Fig. 3 Average development of the globalization indicators (1970 = 100). Source: World Bank (2003), Grilli and Milesi-Ferretti (1995), Dreher and Siemers (2005), Dreher (2006b): www.kof.ethz.ch/globalization

variables that relate to the three main dimensions of globalization. These variables have been combined to form six groups: actual flows of trade and investment, restrictions of international transactions, variables measuring the degree of political integration, variables quantifying the extent of personal contacts with people living in foreign countries, variables measuring trans-border flows of information, and a proxy for cultural integration. These six groups are combined to form the three sub-indices and one overall index of globalization with the help of an objective statistical method—the same method that has been applied by Gwartney and Lawson (2001) in constructing their well-known economic freedom index. We employ the overall index in addition to the more conventional proxies of globalization.

Figure 3 reports the world averages of the traditional measures of globalization and the KOF Index of Globalization. As can be seen, globalization increased over the sample period of about 30 years: The volume of trade and foreign direct investments markedly increased, while capital account restrictions became less prevalent. Also, the KOF globalization index increased substantially over this period.

Table 1 reports the correlations among our globalization measures. All correlation coefficients have the expected sign. However, the absolute degree of correlation varies between 1 and 77 percent. This clearly indicates the difficulties associated with measuring a concept like globalization.

Instead of (or in addition to) being affected by globalization, the expenditure composition in a particular country might also depend directly on the composition in other countries. Following Devereux et al. (2002), a country's policy reaction function can be written as

$$y_{i,t} = R_i(y_{-i,t-1}, X_{i,t}), \tag{1}$$

with $y_{i,t}$ being the respective expenditure category, $y_{-i,t-1}$being the vector of expenditure shares in all other countries at time $t-1$, and $X_{i,t}$ being a vector of control variables.

www.kof.ethz.ch/globalization. A detailed description of the underlying methodology is provided in Dreher et al. (2007).

Table 1 Correlation matrices globalization indicators

Obs\Cor	World-4 sample				Country corrected			
	Trade	FDI	Cap. Acc. Restr.	KOF Glob. index	Trade	FDI	Cap. Acc. Restr.	KOF Glob. index
Trade	624	40%	−10%	8%		20%	−11%	29%
FBI	624	624	−35%	40%			−22%	46%
Cap. Acc. Restr.	624	624	624	−70%				−48%
KOF Glob. index	624	624	624	624				

Obs\Cor	OECD-4 sample				Country corrected			
	Trade	FDI	Cap. Acc. Restr.	KOF Glob. index	Trade	FDI	Cap. Acc. Restr.	KOF Glob. index
Trade	255	24%	−1%	19%		35%	−10%	54%
FBI	255	255	−32%	40%			−26%	52%
Cap. Acc. Restr.	255	255	255	−65%				−57%
KOF Glob. index	255	255	255	255				

Obs\Cor	OECD-10 sample				Country corrected			
	Trade	FDI	Cap. Acc. Restr.	KOF Glob. index	Trade	FDI	Cap. Acc. Restr.	KOF Glob. index
Trade	66	28%	−14%	−22%		34%	−7%	77%
FBI	66	66	−22%	8%			−7%	41%
Cap. Acc. Restr.	66	66	66	−52%				−40%
KOF Glob. index	66	66	66	66				

Note: In the last four columns, the data have been corrected for country-specific effects before correlation coefficients are calculated

Clearly, this equation cannot be estimated given the available degrees of freedom. Following the earlier literature, Devereux et al. (2002) therefore suggest replacing the vector $y_{-i,t-1}$ by the weighted average $A_{i,t} = \sum_{j \neq i} \omega_{ij} y_{jt}$. Since countries are more likely to respond to countries in their immediate neighbourhood and less so to more distant ones, we employ the inverse of the distance between the capital cities of the countries to arrive at the weights ω_{ij}.[11]

The system of equations to be estimated is

$$y_{it}^n = \alpha_i^n + \beta_i^n y_{it-1}^n + \gamma_i^n G_{it} + \delta_i^n A_{it-1}^n + \eta_i^{n\prime} X_{it} + \varepsilon_{it}^n, \tag{2}$$

[11] We also experimented with trade share as weights. As the qualitative results are not affected by this, we refrain from reporting these results. They are available on request.

where G represents our measure of globalization, α_i is a country fixed effect, ε_{it} is an error term, n either ranges from 1 to 4 (WB-dataset) or from 1 to 10 (OECD-dataset), i represents the country and t the time period.[12]

The lagged dependent variable is included because the composition of government expenditures changes only slowly over time and β_i^n should be interpreted as a speed-of-adjustment parameter. The reason for this inertia might be costs of adjustment on the part of the private sector or constraints imposed by interest groups (Devereux et al. 2002: 4). As a consequence, the estimated coefficients in front of the remaining explanatory variables need to be interpreted as reflecting the initial impact on the respective expenditure share. The long-run effect is given by the same coefficient divided by $(1 - \beta_i^n)$.

We do not include fixed period effects, since they are already present in the weighted average and the lagged dependent variable (see Devereux et al. 2002 for details). Note that the weighted average variable enters the regressions with a lag. From a theoretical perspective this is preferable, since it takes time for a country to respond to changes in other countries' policies. Econometrically, this allows estimation without instrumenting the potentially endogenous contemporaneous average policy variables (Devereux et al. 2002).[13]

A general problem in empirical research when there is no accepted theoretical model is the appropriate choice of covariates, i.e., variables entering our X-vector. We opt for a list of seven variables to enter our model: real economic growth, the age dependency ratio, government expenditures, government debt, the lending rate charged by banks on loans to prime customers and the inflation rate.

The first variable—the growth rate of real GDP—accounts for the business cycle. Arguably, one may expect subsidies to rise in recessions, while public investments are likely to be reduced. According to Aubin et al. (1988), public capital spending is likely to decrease when inflation accelerates and to increase with increasing unemployment. As Dreher (2006a) shows, social spending is significantly lower in periods of low growth.

The second variable which we include in our basic regressions is the share of under 15-year and over 64-year old people relative to total population ("age dependency ratio"). The dependency ratio controls for demographic factors. It is expected to vary positively with subsidies and negatively with capital outlays.[14]

Our third variable is the total amount of public expenditures (in percent of GDP) since there is good reason to believe that the composition of government expenditures also depends on its level. In countries with smaller state sectors we expect social expenditures to be relatively low, while government consumption is likely to be higher than in countries with large state sectors.

Government debt and the lending rate are included since they directly affect the governments' expenditure behavior. The rate of inflation, finally, has been shown to affect government expenditure in previous work (e.g., Lin 1992).

Since the individual expenditure categories are not independent of each other—they sum up to 100 percent of total expenditures—and the inclusion of the lagged dependent variables implies that each equation has a different set of regressors, we estimate our equations using

[12]Note that our measures of globalization enter the regressions with their contemporaneous values. Lagging these variables by one year does not qualitatively change the results.

[13]Dreher (2006a) and Dreher et al. (2007) apply the same methodology to test for the impact of globalization on the size of public overall and social spending and effective tax rates on labour, consumption and capital.

[14]Overall, however, government total and social expenditure levels are not robustly related to the age dependency ratio (Dreher 2006a).

Seemingly Unrelated Regressions (SUR). The SUR model permits nonzero covariance between the error terms of the expenditure share equations, allowing for an improvement in efficiency of SUR relative to the classical OLS estimator.

There are additional methodological problems. Given the inclusion of the lagged dependent variable and fixed country effects, the OLS estimator is biased and inconsistent in a short panel (Nickell 1981). Especially for the OECD data which are available for only 10 years we have to check whether the bias significantly affects our results. To deal with this problem, we employ the system GMM estimator as suggested by Arellano and Bover (1995) and Blundell and Bond (1998) in addition to the SUR estimates. The dynamic panel GMM estimator exploits an assumption about the initial conditions to obtain moment conditions that remain informative even for persistent data and is considered most appropriate in the presence of endogenous regressors. Results are based on the two-step estimator implemented by Roodman (2005) in Stata, including Windmeijer's (2005) finite sample correction.

4 Results

We start by analyzing the four-category dataset. Table 2 shows the overall significance of the independent variables in our four-equation system when using our balanced sample of 60 countries covering the 1971–2001 period. In each block one of our globalization variables is included. The reported F-statistics test whether a particular variable can be excluded from all four expenditure-share equations. Table 3 shows the results for the sample of OECD countries only.

In both tables, the upper panel includes all control variables introduced above, while—in order to increase efficiency (at the potential price of introducing an omitted variables bias)—the lower panel includes only those covariates that are jointly significant at the five percent level. As can be seen, the results are not affected by this. The results show that expenditure shares are significantly affected by the level of government expenditures. The same is true for the rate of inflation. In the world sample, the age dependency ratio also affects expenditure shares, at the one percent level of significance. At the five percent level, central government debt is significant in the OECD sample. Lending interest rate, GDP growth and the average expenditure shares in neighbouring countries do not enter the systems of equations significantly. Most important for our analysis, none of the globalization variables turns out to be significant in any of the specifications.

Turning now to the individual impact of the control and globalization variables, Table 4 reports the individual coefficients and significance levels underlying the results presented in (the parsimonious specification of) Table 2. Table 5 shows the coefficients corresponding to the OECD sample reported in Table 3. First, note that the estimated coefficients of the lagged dependent variables are almost identical and mostly somewhat above 0.7. This implies that there indeed is some inertia in expenditure shares and that a shock has a half-life of over two years. Furthermore, for the interpretation of the remaining coefficients, this similarity implies that the sum of the coefficients of a particular variable across the equations should (and actually does) sum up to zero. Given the identical speed of adjustment across all four categories, it must be the case that a positive impact on one expenditure share is neutralized by a negative impact on some other expenditure shares.[15]

[15] Given the inclusion of a lagged dependent variable, the estimated coefficients of the other variables need to be interpreted as impact multipliers. To calculate the long-run effect of a particular variable, one has to multiply it with $1/(1-0.72) \approx 3.6$.

Table 2 Significance of variables in system regressions, 4 expenditure categories, SUR, 60 countries, 624 observations, 1971–2001

	World - Trade		World - FDI		World - Cap. Rst.		World - KOF	
	F-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
Exp. shares (−1)	2,039.17	0.00**	2,036.53	0.00**	2,027.52	0.00**	1,975.58	0.00**
Weighted avg. shares	1.71	0.79	2.26	0.69	2.18	0.70	0.66	0.96
Central gov. exp.	37.00	0.00**	35.09	0.00**	36.55	0.00**	37.53	0.00**
Inflation	15.32	0.00**	14.73	0.00**	12.23	0.00**	15.70	0.00**
Interest rate	0.10	0.76	0.12	0.73	0.22	0.64	0.17	0.68
GDP growth	1.65	0.20	1.93	0.16	1.90	0.17	1.89	0.17
Age dependency	9.72	0.00**	10.41	0.00**	10.29	0.00**	7.77	0.01**
Central gov. debt	0.10	0.75	0.10	0.75	0.07	0.80	0.02	0.89
Trade	0.33	0.57						
FDI			0.64	0.42				
Cap. Acc. Restr.					0.56	0.46		
KOF Glob. index							0.01	0.94

	World - Trade		World - FDI		World - Cap. Rst.		World - KOF	
	F-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
Exp. share (−1)	2,614.56	0.00	2,604.80	0.00**	2,592.38	0.00**	2,591.02	0.00**
Age dependency	9.48	0.00**	9.15	0.00**	8.78	0.00**	6.96	0.01**
Central gov. exp.	41.22	0.00**	38.87	0.00**	40.82	0.00**	40.76	0.00**
Inflation	41.48	0.00**	38.55	0.00**	32.47	0.00**	39.84	0.00**
Trade	1.03	0.31						
FDI			0.84	0.36				
Cap. Acc. Restr.					0.46	0.50		
KOF Glob. index							0.02	0.87

Notes: Each *F*-test reports whether the respective variable is jointly significant in the system of equations. ** or * indicates significant at the 1 or 5 percent level, respectively. Fixed country effects are included

For the "world" sample shown in Table 4, the share of goods expenditures declines significantly with inflation.[16] Specifically, an increase in our measure of inflation by one point decreases the share of goods expenditures by 0.13 percentage points. This is largely compensated by an increase in interest payments, where a corresponding increase raises the share by 0.09 percentage points.[17] Goods and capital expenditures significantly increase with an increasing age dependency ratio, while subsidies and interest payments represent the other

[16]To alleviate the interpretation of the regression coefficients, Appendix 2 contains an overview of the different averages and standard errors across the different samples we use throughout this paper.

[17]Looking at standardized beta coefficients (not shown) reveals that a one standard deviation shock to inflation ultimately results in roughly 2/3 of a standard deviation shock in both goods and interest expenditures.

Table 3 Significance of variables in system regressions, 4 expenditure categories, SUR, 18 countries, 255 observations, 1971–2001

	OECD - Trade		OECD - FDI		OECD - Cap. Rst.		OECD - KOF	
	F-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
Exp. shares (−1)	1,056.71	0.00**	1,061.96	0.00**	1,074.83	0.00**	1,022.26	0.00**
Weighted avg. shares	3.07	0.55	2.66	0.62	2.40	0.66	1.90	0.75
Central gov. exp.	18.98	0.00**	17.77	0.00**	18.90	0.00**	19.37	0.00**
Inflation	27.05	0.00**	32.65	0.00**	30.09	0.00**	35.40	0.00**
Interest rate	0.92	0.34	1.46	0.23	1.39	0.24	1.65	0.20
GDP growth	0.06	0.81	0.00	0.97	0.01	0.91	0.01	0.94
Age dependency	0.34	0.56	0.89	0.35	1.15	0.28	0.87	0.35
Central gov. debt	6.18	0.01*	9.55	0.00**	9.32	0.00**	10.14	0.00**
Trade	0.51	0.47						
FDI			0.68	0.41				
Cap. Acc. Restr.					0.61	0.44		
KOF Glob. index							0.65	0.42

	OECD - Trade		OECD - FDI		OECD - Cap. Rst.		OECD - KOF	
	F-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
Exp. share (−1)	1,219.94	0.00**	1,225.72	0.00**	1,219.27	0.00**	1,190.74	0.00**
Central gov. exp.	20.01	0.00**	17.78	0.00**	19.95	0.00**	18.80	0.00**
Inflation	66.56	0.00**	62.44	0.00**	43.30	0.00**	57.77	0.00**
Central gov. debt	5.69	0.02*	9.18	0.00**	8.60	0.00**	9.92	0.00**
Trade	0.58	0.45						
FDI			0.66	0.42				
Cap. Acc. Restr.					0.58	0.45		
KOF globalization							0.47	0.49

Notes: Each *F*-test reports whether the respective variable is jointly significant in the system of equations. ** or * indicates significant at the 1 or 5 percent level, respectively. Fixed country effects are included

side of the coin and significantly decrease. According to the coefficients, an increase in the age dependency ratio by one increases the share of goods expenditures by 0.33 percentage points and those of capital by 0.21 percentage points, while it reduces the share of subsidies by 0.4 and those of interest by 0.14 percentage points. The result for the age dependency ratio also holds for the OECD sample (as reported in Table 5), where—in addition—the share of subsidies rises with inflation and the effect on interest expenditures is smaller in magnitude. Years in which total government expenditures as a share of GDP are above average, are years in which goods expenditures are relatively low and especially interest expenditures relatively high. In the world sample, the share of capital is also higher.[18] In this sample, an

[18]Looking at standardized beta coefficients for the world sample (not shown) reveals that a one standard deviation shock to total government expenditures ultimately results in roughly 2/3 of a standard deviation

Table 4 Detailed results, 4 expenditure categories, SUR, 60 countries, 624 observations, 1971–2001

	World sample				World sample				World sample				World sample			
	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest
Exp. share	0.73	0.73	0.73	0.73	0.72	0.72	0.73	0.73	0.72	0.72	0.73	0.73	0.72	0.72	0.73	0.73
(−1)	(49.98**)	(49.70**)	(48.88**)	(50.11**)	(49.89**)	(49.59**)	(48.79**)	(50.01**)	(49.75**)	(49.45**)	(48.63**)	(49.86**)	(49.80**)	(49.51**)	(48.72**)	(49.89**)
Central gov.	−0.28	0.08	0.11	0.09	−0.27	0.07	0.11	0.09	−0.27	0.07	0.11	0.09	−0.27	0.07	0.11	0.09
exp.	(6.42**)	(1.93)	(2.83**)	(3.61**)	(6.23**)	(1.65)	(2.90**)	(3.63**)	(6.39**)	(1.85)	(2.91**)	(3.55**)	(6.38**)	(1.85)	(2.92**)	(3.54**)
Inflation	−0.13	0.03	0.01	0.09	−0.12	0.02	0.02	0.09	−0.12	0.02	0.02	0.09	−0.13	0.03	0.02	0.08
	(6.44**)	(1.39)	(0.81)	(7.48**)	(6.21**)	(1.03)	(0.93)	(7.48**)	(5.70**)	(0.79)	(0.96)	(6.92**)	(6.31**)	(1.35)	(0.93)	(7.15**)
Age	0.33	−0.40	0.21	−0.14	0.31	−0.38	0.18	−0.11	0.32	−0.39	0.19	−0.12	0.29	−0.32	0.18	−0.14
dependency	(3.08**)	(3.94**)	(2.19*)	(2.15*)	(3.03**)	(3.88**)	(1.94)	(1.78)	(2.96**)	(3.77**)	(1.93)	(1.83)	(2.64**)	(3.09**)	(1.84)	(2.23*)
Trade	0.05	−0.07	0.04	−0.03												
	(1.02)	(1.48)	(1.06)	(0.96)												
FDI					0.04	−0.07	0.00	0.03								
					(0.92)	(1.56)	(0.02)	(0.92)								
Cap. Acc.									−0.57	0.77	−0.19	−0.02				
Restr.									(0.68)	(0.97)	(0.25)	(0.03)				
KOF Glob.													−0.08	0.40	0.02	−0.33
index													(0.16)	(0.82)	(0.05)	(1.09)
R^2	0.59	0.58	0.53	0.71	0.59	0.58	0.53	0.71	0.59	0.58	0.53	0.71	0.59	0.58	0.53	0.71

Notes: Absolute t-statistics are in parentheses. ** or * indicates significant at the 1 or 5 percent levels, respectively. Fixed country effects included. R^2 values are adjusted for the country-specific effects

Table 5 Detailed results, 4 expenditure categories, SUR, 18 OECD countries, 255 observations, 1971–2001

	OECD sample				OECD sample				OECD sample				OECD sample			
	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest
Exp. share	0.71	0.71	0.71	0.71	0.71	0.72	0.73	0.73	0.72	0.71	0.71	0.71	0.70	0.70	0.70	0.69
(−l)	(34.24**)	(33.91**)	(31.49**)	(32.29**)	(34.37**)	(49.45**)	(48.63**)	(49.86**)	(34.33**)	(34.01**)	(31.20**)	(32.05**)	(33.64**)	(33.36**)	(30.69**)	(31.87**)
Central gov.	−0.17	0.08	−0.02	0.11	−0.16	0.07	−0.02	0.10	−0.16	0.08	−0.02	0.10	−0.16	0.10	-0.03	0.09
exp.	(4.47**)	(1.84)	(1.07)	(4.86**)	(4.22**)	(1.63)	(1.05)	(4.80**)	(4.47**)	(1.78)	(0.97)	(4.88**)	(4.34**)	(2.21*)	(1.46)	(4.24**)
Inflation	−0.20	0.13	0.02	0.05	−0.20	0.13	0.02	0.05	−0.19	0.13	0.01	0.05	−0.20	0.16	0.01	0.03
	(8.16**)	(4.70**)	(1.58)	(3.72**)	(7.90**)	(4.47**)	(1.50)	(3.66**)	(6.58**)	(3.91**)	(0.91)	(2.94**)	(7.60**)	(5.13***)	(0.83)	(2.29*)
Central gov.	−0.03	0.01	−0.01	0.03	−0.03	0.01	−0.01	0.03	−0.03	0.01	−0.01	0.03	−0.03	0.00	−0.01	0.04
debt	(2.38*)	(0.57)	(2.47*)	(4.65**)	(3.03**)	(0.97)	(2.80**)	(5.25**)	(2.93**)	(0.87)	(2.87**)	(5.31**)	(3.15**)	(0.39)	(2.33**)	(6.17**)
Trade	−0.04	0.03	−0.01	0.02												
	(0.76)	(0.52)	(0.37)	(0.53)												
FDI					0.03	−0.03	0.00	0.00								
					(0.81)	(0.66)	(0.23)	(0.15)								
Cap. Acc.									−0.47	0.07	0.27	0.12				
Restr.									(0.76)	(0.09)	(0.82)	(0.32)				
KOF Glob.													0.23	0.69	−0.36	−0.56
index													(0.69)	(1.69)	(2.03*)	(2.84**)
R^2	0.84	0.72	0.73	0.81	0.84	0.72	0.73	0.81	0.84	0.72	0.73	0.81	0.84	0.72	0.74	0.82

Notes: Absolute t-statistics are in parentheses. ** or * indicates significant at the 1 or 5 percent levels, respectively. Fixed country effects included. R^2 values are adjusted for the country-specific effects

increase in total expenditure by one percentage point reduces the share of goods by 0.28 percentage point. The same increase raises the share of capital by 0.11 and those of interest by 0.09 percentage points. In the OECD sample, the corresponding decrease in the expenditure share of goods is 0.16 percentage points, while the increase in the share of interest amounts to 0.1 percentage points. More indebted OECD countries, finally, spend relatively less on goods and capital, and (obviously) relatively more on interest. The quantitative impact of a one percentage point increase in total expenditures is −0.16 percentage points for the share of goods, and +0.1 percentage points regarding the share of expenditures on interest.

Turning to the globalization variables, our results reveal a rather clear picture. Trade, foreign direct investment and capital account restrictions never have a significant impact on any of the expenditure shares. An increase in the KOF index of globalization gives, however, rise to a significant decrease in the share of capital and interest expenditures in the OECD sample. Subsidies, in particular, appear to have profited from this regrouping of expenditures. Taking this result at face value, there is some evidence in favour of the compensation hypothesis. Note, however, that compared to the other explanatory variables the size of this effect appears to be rather small. Using standardized coefficients (not shown), a one standard deviation change in the KOF globalization index leads to only an 0.08 standard deviation impact in the interest payment share. The effect of central government debt, for example, is roughly three times larger. Furthermore, the index of globalization is not significant in the system of regressions, casting some doubts about its actual relevance for expenditure composition.

As our next step, we repeat the above analysis using our OECD database which allows us to distinguish between ten different expenditure classes.[19]

Table 6 shows the overall significance of the independent variables in our ten-equation system when using the sample of 10 countries covering the 1991–2000 period. As before, the reported F-statistics test whether a particular variable can be excluded from all ten expenditure-share equations. The upper panel includes all control variables, while the lower panel includes only those that are jointly significant at the five percent level. Again, the results are not affected by this. For this more detailed system of expenditure shares, the distance weighted averages, total general government expenditure share in GDP, the interest rate as well as the age dependency ratio appear to have a highly significant influence. The inflation rate and economic growth do, however, not enter the systems of equations in a significant way. In line with the two four-equation samples, none of the globalization variables is significant.

The upper half of Table 7 reports individual coefficient estimates of the system in which no globalization variables are included. The bottom half summarizes the results of four systems of equations, each adding one of our globalization variables at a time while the covariates listed in the upper half remain included in each regression.[20] As compared to the previous models, this time the speed of adjustment coefficients differ substantially across the expenditure categories. Also the degree to which our model can explain the variation in these expenditure categories varies much more. Whereas we explain no more than 8 percent

shock in goods expenditures. For the largest part this is compensated by reductions in capital and interest expenditure shares.

[19]Note that for matters of consistency the world sample includes central government expenditures, while the 10 category OECD sample uses general government expenditure.

[20]Due to space restraints and because the coefficient estimates of the baseline variables are hardly affected, only the coefficients of the globalization variables are reported in the bottom half.

Table 6 Significance of variables in system regressions, 10 expenditure categories, SUR, 10 OECD countries, 66 observations, 1991–2000

	OECD - Trade		OECD - FDI		OECD - Cap. Rst.		OECD - KOF	
	F-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
Exp. shares (−1)	579.79	0.00**	601.19	0.00**	592.77	0.00**	525.60	0.00**
Weighted avg. shares	28.92	0.00**	41.99	0.00**	42.24	0.00**	34.23	0.00**
General gov. exp.	9.93	0.00**	9.29	0.00**	10.12	0.00**	8.83	0.00**
Inflation	0.33	0.57	0.13	0.71	0.48	0.49	0.09	0.77
Interest rate	10.39	0.00**	7.76	0.01**	9.71	0.00**	8.79	0.00**
GDP growth	0.09	0.77	0.42	0.51	1.09	0.30	0.66	0.42
Age dependency	20.84	0.00**	20.04	0.00**	22.01	0.00**	19.47	0.00**
Trade	1.26	0.26						
FDI			0.14	0.70				
Cap. Acc. Restr.					1.14	0.29		
KOF Glob. index							0.18	0.67

	OECD - Trade		OECD - FDI		OECD - Cap. Rst.		OECD - KOF	
	F-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
Exp. share (−1)	557.71	0.00**	580.92	0.00**	570.17	0.00**	561.02	0.00**
Weighted avg. shares	28.30	0.00**	42.00	0.00**	42.85	0.00**	32.49	0.00**
General gov. exp.	11.50	0.00**	11.41	0.00**	11.49	0.00**	11.49	0.00**
Interest rate	11.74	0.00**	7.25	0.01**	9.44	0.00**	7.61	0.01**
Age dependency	20.52	0.00**	20.38	0.00**	21.11	0.00**	20.67	0.00**
Trade	1.47	0.22						
FDI			0.16	0.69				
Cap. Acc. Restr.					0.29	0.59		
KOF Glob. index							0.02	0.88

Notes: Each *F*-test reports whether the respective variable is jointly significant in the system of equations. ** or * means significant at the 1 or 5 percent level, respectively. Fixed country effects are included

of the variation in housing expenditures, for the public services categories this rises to 78 percent.[21]

As can be seen from Table 7, occasionally one of the globalization variables appears to have a significant influence in individual equations. Spending on recreation, for example, becomes more important when capital account restrictions are more severe, and spending on economic affairs becomes less important with deepening globalization as measured by the KOF index, while the shares of health and education increase. Nevertheless, the four globalization variables are all jointly insignificant in the system of equations. We therefore conclude that globalization did not affect the composition of government expenditures.

[21] Note that the R^2-values are adjusted for country-specific effects.

Table 7

	Public services	Defence	Public order	Economic affairs	Environment	Hiousing	Health	Recreation	Education	Social
R^2	0.78	0.58	0.58	0.18	0.65	0.08	0.74	0.46	0.73	0.35
Exp. share (−1)	0.59	0.58	0.68	0.31	0.77	0.16	0.61	0.57	0.69	0.39
	(15.22**)	(9.25**)	(11.53**)	(4.71**)	(11.87**)	(1.69)	(12.29**)	(7.53**)	(10.89**)	(4.29**)
Weighted avg. shares	−0.20	0.05	0.12	0.14	−0.13	−0.29	−0.10	0.06	0.00	−0.20
	(4.33**)	(0.56)	(1.88)	(1.66)	(1.42)	(2.70**)	(1.65)	(0.70)	(0.07)	(1.64)
General gov. exp.	−0.24	−0.21	0.13	0.51	−0.01	0.10	0.02	0.07	−0.28	0.06
	(3.37**)	(2.14*)	(1.29)	(3.96**)	(0.16)	(0.72)	(0.29)	(0.66)	(3.43**)	(0.53)
Interest rate	0.24	0.06	−0.13	0.29	−0.20	−0.01	−0.36	−0.06	−0.35	−0.43
	(3.16**)	(0.53)	(1.35)	(2.18*)	(1.93)	(0.10)	(4.24**)	(0.50)	(4.37**)	(2.87**)
Age dependency	0.28	0.17	−0.07	−0.06	−0.15	0.10	−0.23	−0.13	−0.15	−0.10
	(4.58**)	(2.00*)	(0.87)	(0.59)	(2.03*)	(0.84)	(3.46**)	(1.29)	(1.98*)	(0.95)
Trade	0.10	−0.01	−0.02	−0.09	−0.01	−0.03	0.00	0.00	0.05	0.04
	(1.21)	(0.14)	(0.78)	(0.68)	(0.77)	(1.23)	(0.04)	(0.01)	(1.68)	(0.33)
FDI	−0.01	0.01	0.01	0.03	0.00	−0.01	−0.02	0.00	−0.01	−0.02
	(0.39)	(0.39)	(0.74)	(0.62)	(0.75)	(0.87)	(0.81)	(0.28)	(0.97)	(0.53)
Cap. Acc. Restr.	−0.81	−1.17	−0.21	1.42	0.04	−0.43	−0.47	0.51	−0.17	0.59
	(0.54)	(0.98)	(0.51)	(0.60)	(0.21)	(1.13)	(0.47)	(3.08**)	(0.29)	(0.32)
KOF Glob. index	−0.09	−0.68	0.22	−1.84	0.03	−0.07	1.34	0.07	0.79	−0.68
	(0.15)	(1.28)	(1.52)	(1.99*)	(0.41)	(0.50)	(3.06**)	(0.98)	(4.56**)	(0.74)

Notes: The upper half of the table reports results of the model without globalization variables. Each row of the bottom half shows the coefficients estimates when one globalization variable is added to this system of equations. Hence, the bottom half of the table reports the results for the globalization variables of four different systems of equations. Absolute t-statistics are in parentheses. ** or * indicates significant at the 1 or 5 percent levels, respectively. Fixed country effects are included. R^2 values are adjusted for the country-specific effects

In order to check for the robustness of our results, we experimented with using log transformations of those series which might be expected to be skewed. Taking the logarithms of the individual expenditure shares and the logarithm of total expenditures as a share of GDP does, however, not affect our results.[22]

Next, we replicate the entire analysis employing the consistent system GMM estimator. Again, the covariates introduced above are included in all regressions, but are not shown. We employed a Hansen test to check whether the instruments are not correlated with the error term, and the Arellano-Bond test for second-order autocorrelation in the first difference residuals. With very few exceptions, both tests clearly do not reject the specifications. The results are summarized in Table 8.

The upper-left part of Table 8 reports results for the world sample, while the upper-right part contains those for the restricted sample of OECD countries. As can be seen, the GMM estimates generally confirm the previous results. In most regressions, our measures of globalization are completely insignificant. In the world sample, not one coefficient is significant at the five percent level, strongly indicating that globalization did not affect expenditure composition across the world. Turning to the OECD, the results are less obvious. In four out of 16 regressions, globalization does significantly affect specific expenditure shares, without, however, showing a consistent picture. We take this result as further evidence against the existence of a robust impact of globalization.

The bottom half of Table 8, finally, reports the coefficients and t-values for the detailed expenditure categories. The results confirm those reported previously. While some of the globalization measures appear to influence specific expenditure shares, the results are far from showing a clear picture. Overall, we believe it is safe to say that globalization does not robustly affect the composition of government expenditures.

5 Summary

In this paper, we examined the *composition* of public expenditures rather than the overall level. Economic theory suggests that different kinds of government expenditures are likely to react differently to globalization. According to the disciplining hypothesis, globalization restrains governments by inducing increased budgetary pressure. As a consequence, governments shift their expenditures away from transfers and subsidies towards, e.g., capital expenditures.

The compensation effect, on the other hand, is expected to give rise to a higher share of social expenditures. The expenditure shift induced by the disciplining effect might therefore be diminished, neutralized, or even reversed by citizens' preferences to be compensated for the risks of globalization.

We employed two different datasets and various measures of globalization to analyze whether globalization has influenced the composition of government expenditures. For a sample of 108 countries, we examined the development of four broad expenditure categories for the period 1970–2001: capital expenditures; expenditures for goods and services; interest payments; and subsidies and other current transfers. For the OECD countries in the post-1990 period, we examined a dataset providing a much more detailed classification: expenditures on public services; defence; public order and safety; economic affairs; protection of the environment; housing and community amenities; health; recreation, culture and religion; education; and social expenditures.

[22] Note that this reduces the number of observations somewhat as reported expenditure shares sporadically equal zero.

Table 8 Detailed GMM results, World-, OECD and OECD-10 samples

	World sample				OECD sample			
	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest
Trade	−0.10	−0.21	0.21	−0.14	0.09	−0.02	−0.02	−0.20
	(0.66)	(1.23)	(1.75)	(1.08)	(2.02*)	(0.51)	(0.89)	(1.98*)
FDI	0.03	−0.06	−0.03	−0.02	0.05	−0.04	0.03	−0.03
	(0.36)	(1.12)	(0.49)	(0.48)	(1.57)	(1.09)	(1.28)	(1.34)
Cap. Acc. Restr.	1.30	0.77	−0.83	−0.93	−2.76	2.45	1.10	2.16
	(0.40)	(0.33)	(0.43)	(0.64)	(2.41)**	(−1.33)	(1.42)	(0.84)
KOF Glob. index	−0.70	−0.27	−0.38	−0.36	−0.07	1.21	−0.60	−1.70
	(0.85)	(0.41)	(0.39)	(0.79)	(0.10)	(1.04)	(1.43)	(3.08**)

	Public services	Defence	Public order	Economic affairs	Environment	Housing	Health	Recreation	Education	Social
Trade	0.08	0.02	−0.01	−0.01	−0.01	0.00	−0.01	0.01	0.00	0.01
	(1.05)	(0.20)	(0.80)	(0.07)	(1.32)	(0.18)	(0.29)	(0.87)	(0.05)	(0.23)
FDI	−0.04	−0.01	0.00	0.04	0.00	0.00	−0.02	0.00	0.00	0.01
	(2.27*)	(1.37)	(0.79)	(1.45)	(0.30)	(0.03)	(1.47)	(0.23)	(0.11)	(0.87)
Cap. Acc. Restr.	1.41	−2.58	0.28	3.44	−0.04	−0.17	0.02	0.51	0.93	−2.19
	(0.84)	(1.18)	(0.82)	(2.96**)	(0.31)	(0.23)	(0.05)	(2.24**)	(2.08*)	(1.22)
Index of Glob.	0.67	0.32	0.08	0.26	−0.01	−0.30	0.83	0.08	0.52	−2.19
	(1.25)	(1.10)	(0.77)	(0.35)	(0.36)	(0.66)	(2.50*)	(0.46)	(2.19*)	(2.95**)

Notes: The upper half of the table reports results applying GMM to the data containing 4 expenditure categories. The bottom half applies GMM to the OECD data containing 10 expenditure categories. Each row shows the coefficients estimates when one globalization variable is to the model. Absolute t-statistics are in parentheses. ** or * indicates significant at the 1 or 5 percent levels, respectively. The set of covariates included are the same as those listed in the bottom halves of Tables 2, 3 and 6

Our econometric analyzes did not reveal any robust globalization-induced effects. We therefore conclude that globalization has not affected the composition of government expenditures. There are three potential explanations for this result. First, taking a Public Choice perspective, the efficiency and compensation effects might neutralize each other, implying that the marginal increase in political support deriving from extending the size and scope of compensation programs is offset by the marginal loss in political support associated with raising the requisite additional funds. Second, the effects of globalization might be blurred by potential indirect effects between different expenditure categories. And third, the effects of globalization might be exaggerated in the popular discussion and might simply not exist.

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Appendix 1: Data description and sources

Variable	Description	Source
Capital expenditure	Capital expenditure is spending to acquire fixed capital assets, land, intangible assets, government stocks, and nonmilitary, nonfinancial assets. Also included are capital grants. Data are shown for central government only and are shown in percent of total expenditure.	World Bank (2003)
Goods and services expenditure	Goods and services include all government payments in exchange for goods and services, whether in the form of wages and salaries to employees or other purchases of goods and services. Data are shown for central government only and are shown in percent of total expenditure.	World Bank (2003)
Interest payments	Interest payments are payments made to domestic sectors and to nonresidents for the use of borrowed money. (Repayment of principal is shown as a financing item, and commission charges are shown as purchases of services.) Interest payments do not include payments by government as guarantor or surety of interest on the defaulted debts of others, which are classified as government lending. Data are shown for central government only and are shown in percent of total expenditure.	World Bank (2003)

(*Continued*)

Variable	Description	Source
Subsidies and other current transfers	Subsidies and other current transfers include all unrequited, nonrepayable transfers on current account to private and public enterprises, and the cost of covering the cash operating deficits of departmental enterprise sales to the public by departmental enterprises. Data are shown for central government only and in percent of total expenditure.	World Bank (2003)
Public services	Expenditures on general public services. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Defence	Expenditures on defence. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Public order and safety	Expenditures on public order and safety. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Economic affairs	Expenditures on economic affairs. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Environment	Expenditures on environment protection. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Housing and community amenities	Expenditures on housing and community amenities. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Health	Expenditures on health. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Recreation, culture and religion	Expenditures on recreation, culture and religion. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
Education	Expenditures on education. Data are shown for general government and are in percent of total expenditure.	OECD (2004)

(*Continued*)

Variable	Description	Source
Social	Social expenditures. Data are shown for general government and are in percent of total expenditure.	OECD (2004)
FDI	Gross foreign direct investment is the sum of the absolute values of inflows and outflows of foreign direct investment recorded in the balance of payments financial account. It includes equity capital, reinvestment of earnings, other long-term capital, and short-term capital. This indicator differs from the standard measure of foreign direct investment, which captures only inward investment. Data are in percent of GDP.	World Bank (2003)
Trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product, $(x)/(1+x)$.	World Bank (2003)
Capital Account Restrictions	See text.	Grilli and Milesi-Ferretti (1995), Dreher and Siemers (2005)
Globalization, index	Index constructed with Principal Components Analysis comprising 23 variables measuring globalization.	Dreher (2006b)
Age Dependency Ratio	Age dependency ratio is the ratio of dependents—people younger than 15 and older than 64—to the working-age population —those ages 15–64. For example, 0.7 means there are 7 dependents for every 10 working-age people.	World Bank (2003)
GDP growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 1995 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.	World Bank (2003)

(*Continued*)

Variable	Description	Source
Central Government Expenditure	Total expenditure includes both current and capital expenditures. It does not include government lending or repayments to the government or government acquisition of equity for public purposes. Data are shown for central government only and are in percent of GDP.	World Bank (2003)
General Government Expenditure	Total expenditure defined as the sum of the above-list 10 categories. Data are shown for the general government and are in percent of nominal GDP, where GDP is taken from the World Bank (2003).	OECD (2004), World Bank (2003)
Government Debt	Total debt is the entire stock of direct, government, fixed term contractual obligations to others outstanding at a particular date. It includes domestic debt (such as debt held by monetary authorities, deposit money banks, nonfinancial public enterprises, and households) and foreign debt (such as debt to international development institutions and foreign governments). It is the gross amount of government liabilities not reduced by the amount of government claims against others. Because debt is a stock rather than a flow, it is measured as of a given date, usually the last day of the fiscal year. Data are shown for central government only and are in percent of GDP.	World Bank (2003)
Lending Rate	Lending interest rate is the rate charged by banks on loans to prime customers, $(x)/(1+x)$.	World Bank (2003)
Inflation	Inflation, growth in GDP deflator, $(x)/(1+x)$.	World Bank (2003)

Appendix 2: Descriptive statistics of data used in the regression analyzes

	World sample		OECD sample			OECD sample	
	Mean	Std. Err.	Mean	Std. Err.		Mean	Std. err.
Goods and service expenditure	36.81	15.07	26.15	9.05	Public services	17.83	7.48
Subsidies and other curr. transfers	38.62	21.42	57.47	11.91	Defence	5.55	3.24
Caital expenditure	13.51	10.01	6.26	3.27	Public order and safety	3.17	1.46
Interest payments	11.06	7.25	10.11	5.97	Economic affairs	10.41	2.74
					Environment protection	1.04	0.66
					Housing and comm. amenities	1.67	0.77
					Health	12.13	3.78
					Recreation, culture and religion	1.65	0.72
					Education	11.76	2.76
					Social	34.79	7.86
Weighted avg. goods	39.91	1.72	39.95	1.93	Weighted avg. public services	18.14	1.70
Weighted avg. subsidies	33.91	1.93	34.07	2.08	Weighted avg. defence	5.45	1.12
Weighted avg. capital	15.46	2.25	15.64	2.40	Weighted avg. public order	3.04	0.24
Weighted avg. interest	10.73	2.30	10.34	2.55	Weighted avg. economic affairs	10.47	0.89
					Weighted avg. environmemt	1.12	0.17
					Weighted avg. housing	1.91	0.42
					Weighted avg. health	11.47	0.83
					Weighted avg. recreation	1.72	0.13
					Weighted avg. eduction	11.33	0.36
					Weighted avg. social	35.36	2.17

(Continued)

	World sample		OECD sample			OECD sample	
	Mean	Std. Err.	Mean	Std. Err.		Mean	Std. err.
Central gov. exp.	29.72	9.47	33.79	8.29	General gov. exp.	42.38	7.53
Inflation	7.94	9.82	5.65	6.06	Inflation	3.26	3.17
Interest rate	13.53	9.45	10.45	4.43	Interest rate	9.53	4.35
GDP growth	3.49	3.90	2.56	2.12	GDP growth	2.36	2.22
Age dependency	37.29	5.61	33.80	1.82	Age dependency	33.45	1.25
Central gov. debt	46.74	33.52	43.74	28.27	Central gov.debt	54.41	36.95
Trade	40.81	11.77	37.72	8.19	Trade	37.50	11.49
FDI	3.60	4.68	4.24	5.06	FDI	5.68	7.70
Cap. Acc. Restr.	0.40	0.34	0.19	0.27	Cap. Acc. Restr.	0.07	0.17
KOF Glob. Index	2.35	0.86	3.15	0.60	KOF Glob.Index	3.49	0.76

Notes: The world sample contains 60 countries, 624 observations and covers 1971–2001. The first OECD sample contains 18 OECD countries, 255 observations and covers 1971–2001. The second OECD sample contains 10 OECD countries, 66 observations and covers 1991–2000

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