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' leeway, leading to increased budgetary pressure. As a consequence, we expect governments to reallocate expenditure in favour of transfers and subsidies, as benefits from capital expenditures largely accrue in the future. This tendency to reallocate expenditures is potentially enhanced by citizens' preferences to be compensated for the risks of globalization ("compensation hypothesis"). Employing two different datasets and three measures of globalization, the paper analyzes whether globalization has indeed influenced the composition of government expenditures. First, for a sample of 108 countries, and over the period 1970-2001, we examine the development of four broad expenditure categories: capital; goods and services; interest payments; and subsidies and other current transfers. The second dataset provides a much more detailed classification of government expenditures: public, defence, order, economic environment, housing, health, recreation, education, and social. However, this data is only available since 1990 – and only for the OECD countries.

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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 interests 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 extent of government welfare programs.

By focusing on the efficiency or discipline 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.

The basic rationale of this argument is summarized in Figure 1. The government balances the political benefits and costs of its social welfare activities. On the demand side, the marginal benefit (in terms of political support) of the activities decreases as the activities are increased, whereas on the supply side the marginal cost increases. Political support is maximized at the activity level associated with the intersection of the MB and the MC-curves. A deepening or widening of economic integration now increases the marginal cost of supplying social welfare programs as well as the marginal benefit via the demand effect thereby shifting the two curves upwards (MC_0 to MC_1 and MB_0 to MB_1). Whether the *efficiency effect* of globalization dominates the *compensation effect* or vice versa is a matter to be resolved by empirical research.

[Insert Figure 1 about here]

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, there is no robust impact of globalization on government expenditures. The reason might be that compensation and disciplining effects cancel themselves out. It is likely, however, that each of these two channels is more important for a particular type of expenditure. Therefore, the true test for any 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 expenditure shares in GDP (see the literature review below) none of them took this connection into account. In analyzing shifts in relative expenditure categories we might be able to track potential effects of globalization that remain otherwise hidden (given the small variation in expenditure shares in GDP).

So far, in Figure 1 we have only considered the direct effects of globalization on a particular type of government program. In general though, we do need to explicitly take into account that globalization will also affect other programs which may have an influence on the program considered. These indirect (mutual) effects may cause the MB and MC-curves to shift more or less upwards as compared to a situation where the considered policy is decided upon in isolation. The dashed lines indicate these indirect interaction effects that are in our example assumed to further increase marginal cost (MC_1 to MC_2) and to diminish marginal benefit (MB_1 to MB_2) thereby giving rise to a positive total effect (including interaction related influences). Figure 1 indicates that the *total effect of the globalization* shock is, in general, composed of a *direct effect* (consisting of the *efficiency* and the *compensation effect*) and an *interaction effect*. Our empirical method is designed to account for these hitherto neglected interaction effects.

We thus estimate whole systems of equations, analyzing to what extent the relative importance of specific expenditure categories is influenced by globalization. Arguably, according to the compensation hypothesis some categories might gain importance even if the overall level of government expenditures remains unchanged. This is particularly true for social expenditures. The disciplining effect of globalization, to the contrary, will most likely hit expenditure categories whose effects are not immediately visible. The relative share of expenditures on capital, e.g., would then be lower. The remainder of this paper analyzes whether and to what extent globalization influences governments' expenditure composition. For that purpose we will use two different datasets focusing upon different countries, periods and decompositions of government expenditures. To further ensure robustness of our results, different measures of economic globalization will be used. Overall, we do not find evidence that any of our expenditure categories has been significantly 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.

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[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

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 results, while, finally, 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, as a country becomes progressively 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 at al. (1993), Garrett (1995), Cusack (1997), Garrett and Mitchell (1997), Quinn (1997), Garrett 1998, Swank (1998), and Rodrik (1997).

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

"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 labor 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

example, Tytell (2004) and Schulze and Ursprung (2001), respectively.

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 run through some of these studies in turn.

In a reconsideration of their earlier unpublished study of 1997, Garrett and Mitchell (2001) arrive at conclusions that seem to contradict the received wisdom as summarized above. Kittel and Winner (2005) and Plümper, Manow and Troeger (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 efficiency 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 the uncertainty and dislocations caused by deindustrialization appear to have spurred electoral demands for welfare state compensation and risk sharing. Demand for welfare state activities thus appear to be home made and not to be induced by labour market risks related to international trade. Dreher and Gaston (2005) find that globalization induced 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 efficiency has an impact on the tax-mix, whereas compensation is provided through increased social expenditures. Dreher (2006a), finally, tests for the impact of globalization on the tax mix and government expenditures. Regarding overall and social expenditures, none of the three dimensions of globalization (economic, political, and social) investigated has a significant impact. 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 the measurement of the tax burden. While globalization increased implicit tax rates on capital over the last 30 years when the average effective tax rates constructed by Carey and Rabesona

(2002) are employed, data based on legislation as suggested by Devereux and Griffith (2003) lead to the opposite conclusion.

Studies focusing on specific groups of countries include in particular studies examining 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 where workers are not as well organized and therefore cannot overcome their collective action problems. 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, Brown and Hunter (2005) therefore control for the influence of the political regime. The empirical evidence uncovered by Kaufman and Segura-Ubiergo favors the *efficiency* hypothesis and suggests 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 also find that education is positively associated with openness (as do Rudra, 2004, and Ansell, 2004), but Avelino et al. 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, Gelleny and Sacko (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.

As the literature review above shows, there is no robust impact of globalization on government expenditures. The reason might be that the compensation, disciplining and interaction effects as described in the introduction cancel themselves out. It is likely, however, that especially each of the first two channels is more important for a particular type of

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[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) and Gersbach and Schmutzler (2005).

expenditure. Therefore, the true test for any 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 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. First, the World Bank's (2004) World Development Indicators contains data for up to 108 countries covering the period 1970-2001. Data are classified according to four broad expenditure categories: capital; goods and services; interest payments; and subsidies and other current transfers. This data is available as a percent of total expenditures. Figure 2 shows the development of these 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 goods decreased from 46.1 percent to 40.3 percent, and those of capital from 20.4 to 15.7 percent. There is thus no obvious erosion in subsidies over time.[4]

[Insert Figure 2 about here]

The second dataset has been developed by the OECD. Its Public Expenditure Database (2004) provides a much more detailed classification of government expenditures. However, this data is only available since 1990 – and only for up to 15 OECD countries. For this smaller sample, the following ten expenditure categories are available: public services; defence; public order and safety; economic affairs; environment protection; housing and community amenities; health; recreation, culture and religion; education; and social. Figure 3 shows that the largest increases in shares have occurred for social (+4.2 percentage-points) and health (+3.2 percentage-points) expenditures; for public services, defence and economic affairs shares have decreased by -5.2, -3.0 and -2.1 percentage points, respectively.

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[3] The results obtained by Li and Reuveny (2003) are, however, much less supportive of this general hypothesis.
[4] This pattern also emerges in case we either restrict our attention to balanced samples, or focus upon OECD countries only. The largest balanced sample we were able to construct consists of 46 countries covering 1975-1995.

[Insert Figure 3 about here]

Our dependent variables are the respective expenditure categories in percent of total expenditures. Since some of the data are not available for all countries or years, the panel data are 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. In case 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 64 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 standard errors are estimated robustly. All variables, their precise definitions and data sources are listed in **Appendix**.

To measure globalization, we employ three proxies that have been suggested in the previous literature.[5] The first is openness to trade measured as the sum of imports and exports in percent of GDP. The second indicator of globalization is the sum of the absolute values of inflows and outflows of foreign direct investment (in percent of GDP)[6] and the third refers to restrictions on the capital account. The indicator of capital account restrictions is constructed with binary data from the International Monetary Fund's annual report *Exchange Arrangements and Exchange Restrictions*. We focus on four forms 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.

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[5] Some of the more recent studies employ a composite index of globalization developed at the Swiss KOF-institute (e.g. Ekman 2003; Dreher and Gaston 2005; Tsai 2005; Lamla 2005; Dreher 2006a, 2006b, 2006c). We do not employ this index here as it is not (yet) available on a yearly basis. See http://www.globalization-index.org.

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

While the first three restrictions can broadly be interpreted as a form of controls on capital, the third restriction has been included because current transactions can be used to circumvent restrictions on the capital account (Milesi-Ferretti, 1998: 225).[7] This data has been collected by Grilli and Milesi-Ferretti (1995) and Dreher and Siemers (2005).

Our index of 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] As an obvious shortcoming with this approach, our index does neither measure the intensity nor the effectiveness of controls. One would also like to distinguish between controls on inflows of capital and those on outflows. We do, however, neither have the data to adequately control for intensity and effectiveness,[9] nor those for an analysis of inflows and outflows.

[Insert Figure 4 about here]

Figure 4 reports the world averages of our three measures of globalization. As can be seen, globalization increased over the sample period of about 30 years: Trade and foreign direct investment volumes markedly increased, while capital account restrictions became less prevalent.

Table 1 reports the correlation among our three globalization measures. All correlations have the expected sign. However, the absolute degree of correlation never exceeds 41 percent. The lowest correlation is those between trade and capital account restrictions when focusing on our sample of 60 countries, i.e. 624 observations. All this clearly indicates the difficulties associated with measuring an economic 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

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

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[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, 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;

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 being a vector of control variables.

Clearly, this equation cannot be estimated given 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 $A_{i,t} = \sum_{j \neq i} \omega_{ij} y_{jt}$. Arguably, countries are more likely to respond to countries in their immediate neighborhood and less so to more distant ones. We therefore employ the inverse of the distance between the capital cities of the countries under study as weight ω_{ij}.

The system of equations to be estimated is

$$y_{it} = \alpha + \beta y_{it-1} + \gamma_1' G_{it} + \gamma_2 A_{it-1} + \eta' X_{it} + \eta_i + \varepsilon_{it}, \tag{2}$$

where G represents our measures of globalization, η_i is a country fixed effect, ε_{it} is an error term and i either goes from 1 to 4 (WB-dataset) or from 1 to 10 (OECD-dataset).

The lagged dependent variable is included, because government expenditure composition changes only slowly over time instead of being changed instantaneously. These changes might entail some adjustment costs on the private sector or might be politically blocked by interest groups (Devereux, Lockwood and Redoano 2002: 4). We cannot include fixed period effects, as they are largely included in the weighted average and the lagged dependent variable (see Devereux et al., 2002, for details). Note that the weighted average enters the regressions with a lag. From a theoretical perspective this is preferable, as 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).[10]

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, age dependency ratio, government expenditures, government debt, lending rate and inflation rate. Before including our globalization measures, we use a general-to-specific methodology to select only variables significant at the five percent level into our baseline specification.

The first variable – the growth rate of real GDP – accounts for the business cycle. Arguably, one may expect subsidies to rise in recession, while public investment is likely to

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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.

be reduced. According to Aubin et al. (1988), public capital spending is likely to be restrained when inflation accelerates and to be increased with rising unemployment levels. As Dreher (2006a) shows, government social spending is significantly lower in periods of low growth.

The second variable we include in our basic regressions is the share of under 15-year old and over 64-year old people relative to total population ("age dependency ratio"). The dependency ratio controls for demographic factors – with a higher dependency ratio, subsidies are expected to be relatively higher, while capital outlays are reduced.[11]

Our third variable is the total amount of public expenditures (in percent of GDP) as there is good reason to expect expenditure composition to depend on its level also. For example, in countries with smaller state sectors we expect social expenditures to be relatively lower, while government consumption is likely to be higher in relative terms.

Government debt and the lending rate are included as they directly affect governments' leeway to set the desired expenditure mix. The rate of inflation finally reduces the real value of tax receipts, in turn making expenditure increases likely.

As the individual expenditure categories are not independent of each other – if measured correctly, they sum up to 100 percent of total expenditures – and the inclusion of the lagged dependent variables makes that each equation has a different set of regressors, we estimate our equations using 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 endogenous variable and fixed country effects, the OLS estimator is biased and inconsistent in a short panel. Especially for the OECD data which are available for 10 years only we have to analyze to what extent the bias is important to our results. To deal with this, we employ the GMM estimator as suggested by Arellano and Bond (1991) in addition to the SUR estimates. This estimator first-differences the estimating equation and uses lags of the dependent variable from at least two periods earlier as well as lags of the right-hand side variables as instruments. Since there are more instruments than right-hand side variables, the equations are over-identified and instruments must be weighted in an appropriate way. We only present results from the Arellano-Bond one-step estimator, which uses the identity matrix as a weighting matrix. The two-step estimator weighs the instruments asymptotically efficiently

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

using the one-step estimates. However, in small samples like the one used here, standard errors tend to be under-estimated by the two-step estimator (Arellano and Bond 1991: 291).

In what follows, we turn to the results of our empirical analysis.

4. Results

We start with analyzing the four-category dataset. Table 2 shows the overall significance of the independent variables in our four-equation system when focusing on our sample of 60 countries covering the 1971-2001 period. In each block one of our globalization variables is included. The F-statistics reported test whether a particular variable can be excluded from all four expenditure-share equations at the same time. Table 3 shows the same results this time focusing upon the sample of OECD countries only. In Table 4 all three globalization variables are included at the same time. With respect to the variables selected in the baseline model, the only difference is that the age dependency ratio is included when focusing on the world, i.e. it is highly significant in the system; its explanatory power for the OECD countries, however, renders insignificant so the variable is dropped from this specification. None of the globalization variables turns significant in any of the specifications.

[Insert Table 2, Table 3, Table 4 and Table 5 about here]

Turning to the individual impact of the control and globalization variables, Table 5 reports the individual coefficients and significance levels underlying the results presented in Table 4. The first thing to note is that the estimated coefficients for the lagged dependent variables are almost identical; only when showing the third digits, small differences do emerge. 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 do sum up to zero; given the almost same speed of adjustment of all four categories, it must be that in case one expenditure share reacts in a positive way the others must nullify this.

For the world sample, goods expenditures significantly rise with the age dependency ratio, while subsidies are affected significantly negative.[12] Especially goods expenditures are significantly lower in countries with a bigger state sector – interest payments are significantly higher. This holds up for both our world as well as our OECD sample and is rather intuitive. Bigger states rely on debt financing to a greater extent – implying relatively higher interest payments. In the world sample higher inflation and higher interest payment shares are

positively correlated. As this finding does not hold in the OECD sample, this appears suggestive for the thesis that especially developing countries' governments inflate their debt positions away by money creation. Note that the inflation rate clearly outperforms the lending rate in our sample covering 1970-2001. Inflation and goods expenditure shares are negatively correlated.

Turning to our variables of interest, the globalization variables, our results reveal a clear picture. In none of the specifications we tested even one of our measures of globalization turned significant. A potential reason might be our level of aggregation; the efficiency and compensation effects cancel out in case the different types of expenditures are not distinct enough from each other, and/or are getting blurred too much by potential indirect effects between the four different groups classified. The only solution in such a case would be to further disaggregate the different expenditure groups. Hence, in a next step we repeat the above analysis using our OECD database allowing us to distinguish between in total ten different expenditure classes.

[Insert Table 6 about here]

As can be seen from Table 6, two out of three baseline variables are this time replaced by others. Besides the age dependency ratio – which was already significant in the world sample before – the expenditure share in neighbouring countries and the lending rate turn out to be significant in this sample.

The lagged endogenous variable is positive and at the ten percent level significant in all regressions. This time, however, the coefficients do differ substantially across the equations. Whereas the lagged dependent variable of the housing equation has a coefficient of only 0.06 – implying a very high speed of adjustment – its coefficient for the education variable shows with a coefficient of 0.78 only slow adjustment over time.[13]

As before, the percentage of the dependent variable explained by the regressors is usually reasonably high. The only exception appears to be the economic affairs expenditure, with an R^2 of only 0.42.

Turning our attention to the impact of the weighted average of other countries' respective expenditure shares shows that overall these expenditures are significant in the public order (+), and recreation (-) equations.

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[12] Unless otherwise mentioned, we refer to the five percent level of significance.

Our measures of globalization are completely insignificant in almost all specifications, the only exception being the expenditure share on recreation which rises significantly with less globalization (as measured by restrictions on the capital account). The positive impact of restrictions is significant at the one percent level. However, the three globalization variables are all jointly insignificant in the system of equations. We therefore conclude that globalization did not affect expenditure composition.

In Tables 7 and 8 we replicate the analysis employing the consistent Arellano-Bond GMM estimator. Again we only report results for the full models, including all three proxies of globalization. Table 7 contains results for the large sample, Table 8 reports those for the smaller but more detailed one. Applying the Arellano-Bond estimator leads to a dramatic loss of observations, since information from two periods is discarded by differencing and instrumenting. This results in generally lower t-statistics. Surprisingly, the coefficients of the lagged dependent variable are in most regressions smaller than in the within groups estimations, although econometric theory suggests that it should be biased negatively in the fixed effects specification. This could be interpreted as evidence that the bias described by Nickell (1981) is not present in the dynamic within groups specification and that the results displayed previously are valid.

Turning to the results for the globalization variables, the tables show that some of the coefficients are now significant. Table 7 shows that the expenditure share of capital is significantly positively influenced by openness to trade. The share of goods and services is significantly lower. Restrictions on the capital account now significantly reduce the share of capital expenditures. Foreign direct investments increase expenditures on capital and reduce the share of interest, with coefficients significant at the ten percent level.

According to table 5, relative expenditures on capital rise with greater foreign direct investmen, at the ten percent level of significance. Capital account restrictions reduce the share of goods and capital, with coefficients significant at the one and, respectively, five percent level of significance.

We employ a Sargan test to ensure that the instruments are not correlated with the error term, and we use the Arellano-Bond test for second-order autocorrelation in the first difference residuals because the estimator would not be consistent in the presence of second-order correlation. In line with the bulk of literature those tests are based on the two-step estimator. As can be seen, both tests accept the instruments.

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[13] Note that due to this it is no longer necessary that the coefficients of the same variables across the ten equations sum up to zero.

The next section provides a short summary.

5. Summary

Economic theory suggests different spending categories to be affected differently by globalization. The compensation effect is expected to imply a higher share of social expenditures, subsidies and other transfers. The efficiency/disciplining effect, on the other hand, is expected to reduce the share of capital expenditures.

In this paper, we examined the composition of public expenditures rather than their level. Simple correlation analysis already shows that the evidence is at best weak. More thorough econometric analyses do not find any significant effects. We therefore conclude that globalization has not affected expenditure shares of the central government.

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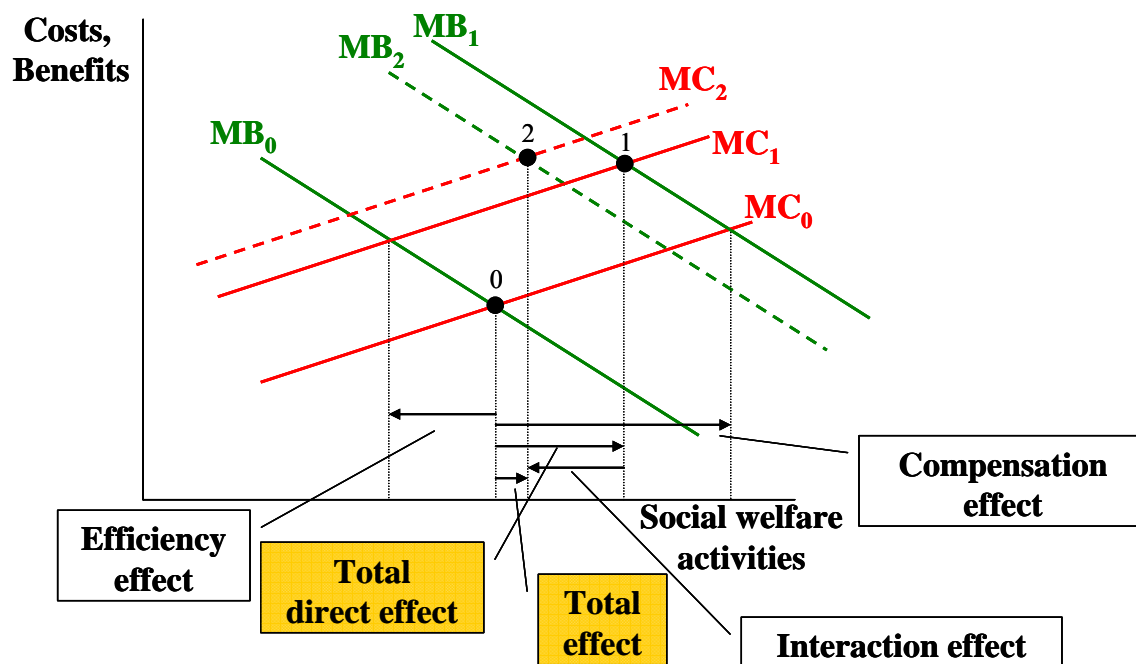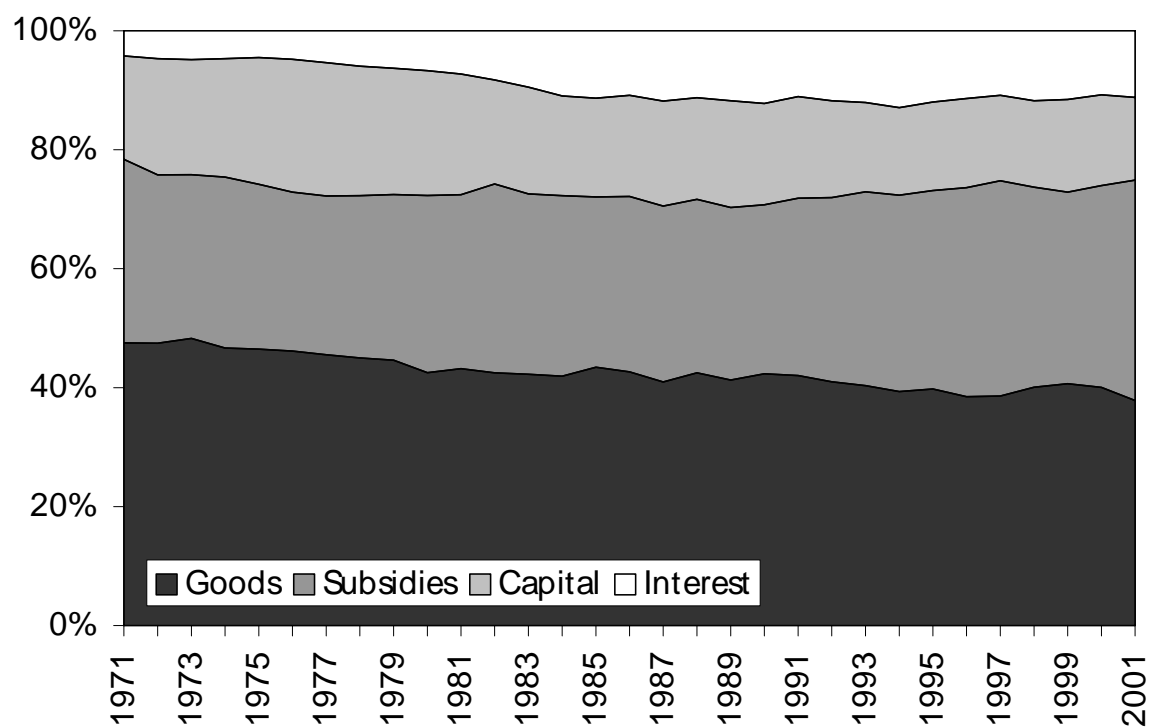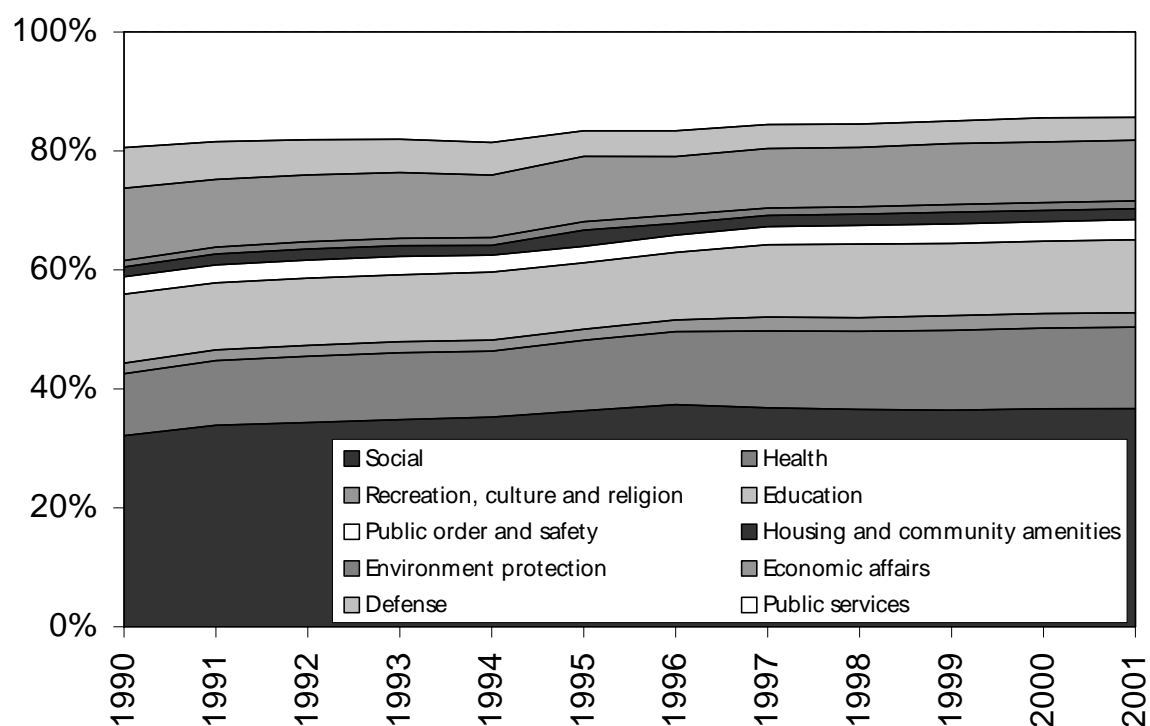**Figure 1: Effects of globalization on social welfare activities.**

Figure 2: Development of average expenditure shares for a sample of 108 countries.


Source: World Development Indicators (2004). Data ordered with respect to shares.

Figure 3: 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.

Figure 4: Average development of the globalization indicators for up to 190 countries.
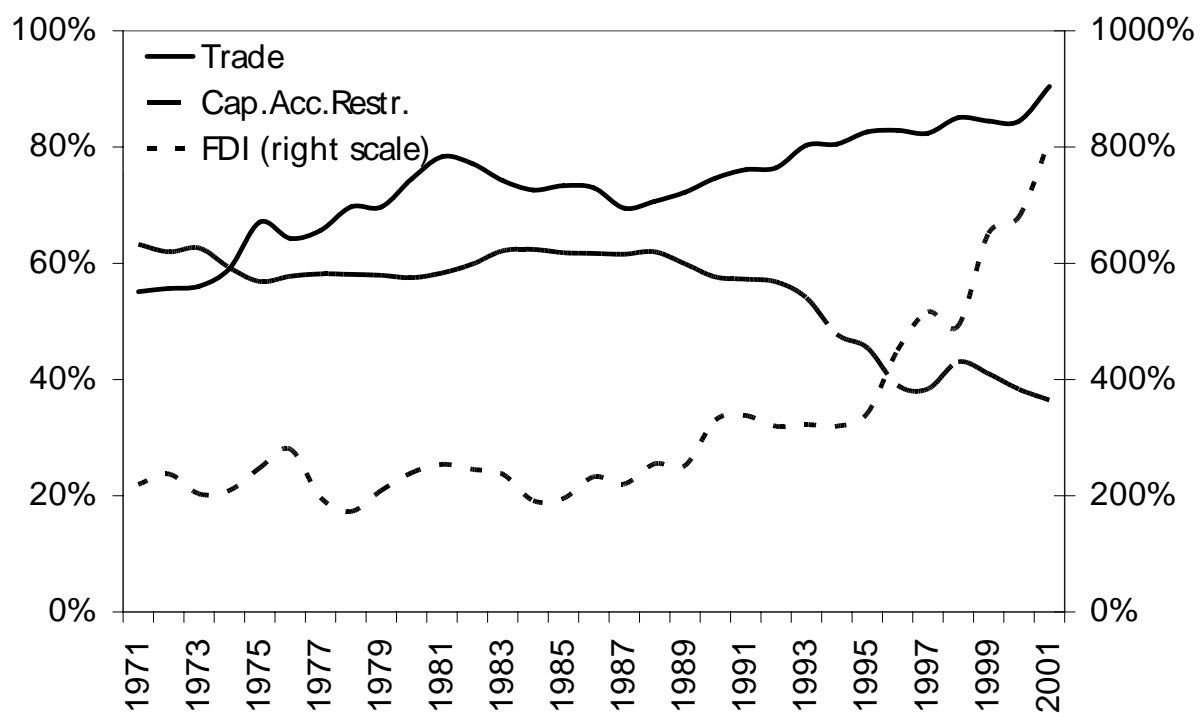
Source: World Bank (2004), Grilli and Milesi-Ferretti (1995), Dreher and Siemers (2005).

Table 1: Correlation matrices globalization indicators.

Obs.\Cor.	Trade	FDI	Cap.Acc.Restr. (Full sample)	Trade	FDI	Cap.Acc.Restr. (Estimation sample)	Trade	FDI	Cap.Acc.Restr. (Est.sample, OECD)
Trade	4623	40.6%	-26.4%	624	39.9%	-9.5%	65	23.1%	-15.0%
FDI	2991	3096	-28.8%	624	624	-34.8%	65	65	-21.0%
Cap.Acc.Restr.	3357	2428	3548	624	624	624	65	65	65

Table 2: Significance of variables in system regressions, 4 expenditure categories and 60 countries.

	World - Trade		World - FDI		World - Cap.Rst.	
	F-test	p-value	F-test	p-value	F-test	p-value
Exp.share (-1)	1,035.03	0.00 ***	1,031.58	0.00 ***	1,025.36	0.00 ***
Age Dep.	5.86	0.02 **	4.66	0.03 **	4.53	0.03 **
CG Exp.	21.84	0.00 ***	19.85	0.00 ***	20.88	0.00 ***
Inflation	21.63	0.00 ***	19.35	0.00 ***	16.12	0.00 ***
Trade	2.08	0.15				
FDI			0.48	0.49		
Cap.Acc.Restr.					0.26	0.61
# Obs., # Cnt	624 , 60		624 , 60		624 , 60	
Start-End	1971 - 2001		1971 - 2001		1971 - 2001	

Notes: Test for joint significance of the respective variable in the system of equations. ***, **, * means significant at the 1, 5 and 10 percent levels, respectively.

Table 3: Significance of variables in system regressions, 4 expenditure categories and 18 OECD countries.

	OECD - Trade		OECD - FDI		OECD - Cap.Rst.	
	F-test	p-value	F-test	p-value	F-test	p-value
Exp.share (-1)	555.97	0.00 ***	585.32	0.00 ***	584.57	0.00 ***
CG Exp.	12.79	0.00 ***	11.59	0.00 ***	12.03	0.00 ***
Inflation	24.65	0.00 ***	22.35	0.00 ***	14.24	0.00 ***
Trade	1.27	0.26				
FDI			0.01	0.91		
Cap.Acc.Restr.					0.35	0.56
# Obs., # Cnt	255 , 18		255 , 18		255 , 18	
Start-End	1971 - 2001		1971 - 2001		1971 - 2001	

Notes: Test for joint significance of the respective variable in the system of equations. ***, **, * means significant at the 1, 5 and 10 percent levels, respectively.

Table 4: Significance of variables in system regressions including all globalization indicators, 4 expenditure categories.

	World sample		OECD sample	
	F-test	p-value	F-test	p-value
Exp.share (-1)	1,027.34	0.00 ***	537.52	0.00 ***
Age Dep.	5.98	0.01 **		
CG Exp.	21.05	0.00 ***	12.76	0.00 ***
Inflation	17.07	0.00 ***	14.92	0.00 ***
Trade	1.78	0.18	1.58	0.21
FDI	0.15	0.70	0.19	0.67
Cap.Acc.Restr.	0.15	0.70	0.34	0.56
# Obs., # Cnt	624 , 60		255 , 18	
Start-End	1971 - 2001		1971 - 2001	

Notes: Test for joint significance of the respective variable in the system of equations. ***, **, * means significant at the 1, 5 and 10 percent levels, respectively.

Table 5: Detailed results including all globalization indicators, 4 expenditure categories, SUR.

	World sample				OECD sample			
	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest
Exp.share (-1)	0.71	0.71	0.71	0.71	0.75	0.75	0.75	0.75
	(31.84)	(31.75)	(31.43)	(31.64)	(23.04)	(22.84)	(21.59)	(22.36)
Age Dep.	0.39	-0.43	0.18	-0.14				
	(2.44)	(-2.86)	(1.30)	(-1.15)				
CG Exp.	-0.29	0.08	0.11	0.10	-0.18	0.07	-0.04	0.15
	(-4.59)	(1.32)	(2.10)	(2.05)	(-3.57)	(1.28)	(-1.08)	(2.55)
Inflation	-0.13	0.02	0.02	0.09	-0.16	0.11	0.02	0.03
	(-4.13)	(0.62)	(0.69)	(3.88)	(-3.86)	(2.44)	(0.65)	(0.68)
Trade	0.03	-0.01	-0.01	-0.01	-0.03	0.02	-0.01	0.03
	(1.34)	(-0.71)	(-0.31)	(-0.53)	(-1.26)	(0.58)	(-0.62)	(0.88)
FDI	0.02	-0.04	0.00	0.02	0.02	-0.02	0.00	0.00
	(0.39)	(-0.80)	(-0.04)	(0.54)	(0.43)	(-0.47)	(0.11)	(0.02)
Cap.Acc.Restr.	-0.47	0.61	-0.16	0.01	-0.54	0.07	0.16	0.31
	(-0.39)	(0.54)	(-0.15)	(0.01)	(-0.58)	(0.07)	(0.25)	(0.28)
R^2	0.86	0.83	0.87	0.86	0.84	0.79	0.78	0.77

Notes: t-statistics in parentheses: ***, **, * significant at the 1, 5 and 10 percent levels, respectively.

Table 6: Detailed results including all globalization indicators, 10 expenditure categories and 15 OECD countries, SUR.

	F-test	p-value	Public services	Defence	Public order	Economic affairs	Environment	Housing	Health	Recreation	Education	Social
Exp.share (-1)	304.36	0.00 ***	0.63	0.56	0.69	0.32	0.70	0.08	0.54	0.47	0.78	0.35
			(7.69)	(7.60)	(10.46)	(4.07)	(6.14)	(1.64)	(7.76)	(6.90)	(8.97)	(3.49)
A_exp.share (-1)	28.12	0.00 ***	-0.33	0.13	0.63	0.27	-0.16	-0.18	-0.22	-0.33	0.14	0.00
			(-1.54)	(0.68)	(2.55)	(0.95)	(-0.74)	(-1.29)	(-1.32)	(-2.64)	(0.67)	(-0.01)
Age Dep.	9.88	0.00 ***	4.48	1.84	-0.13	-2.37	-0.22	0.16	-2.08	-0.21	-0.20	-0.99
			(3.14)	(2.92)	(-0.57)	(-1.70)	(-1.61)	(0.50)	(-3.35)	(-2.07)	(-0.60)	(-0.92)
Lending rate	7.26	0.01 ***	0.51	0.20	-0.05	-0.14	-0.04	-0.02	-0.23	-0.02	-0.05	-0.33
			(2.70)	(2.18)	(-1.55)	(-0.76)	(-1.79)	(-0.44)	(-2.83)	(-1.83)	(-1.21)	(-2.13)
Trade	0.62	0.43	0.05	0.02	-0.01	-0.05	0.00	-0.01	0.01	0.00	0.01	-0.03
			(0.79)	(0.78)	(-1.19)	(-0.73)	(-0.65)	(-0.46)	(0.45)	(-0.66)	(0.67)	(-0.61)
FDI	0.10	0.76	0.01	0.02	0.00	-0.01	0.00	0.00	-0.01	0.00	-0.01	-0.02
			(0.31)	(1.11)	(-0.07)	(-0.27)	(-0.42)	(-0.58)	(-0.42)	(-0.00)	(-0.71)	(-0.64)
Cap.Acc.Restr.	0.30	0.58	-1.72	-2.05	0.01	2.49	0.16	-0.20	-0.59	0.58	0.02	1.57
			(-0.55)	(-1.44)	(0.01)	(0.79)	(0.52)	(-0.28)	(-0.44)	(2.67)	(0.03)	(0.63)
# Obs., # Cnt	64 , 10											
Start-End, R^2	1991 - 2001		0.81	0.73	0.75	0.42	0.84	0.90	0.86	0.90	0.84	0.73

Notes: Test for joint significance of the respective variable in the system of equations. ***, **, * means significant at the 1, 5 and 10 percent levels, respectively. t-statistics in parentheses: ***, **, * significant at the 1, 5 and 10 percent levels, respectively.

Table 7: Detailed results including all globalization indicators, 4 expenditure categories, GMM

	World Sample				OECD Sample			
	Goods	Subsidies	Capital	Interest	Goods	Subsidies	Capital	Interest
Expenditure Share (t-1)	0.449	0.561	0.491	0.674	0.529	0.601	0.637	0.875
	(6.68***)	(7.98***)	(7.89***)	(9.56***)	(7.95***)	(6.87***)	(9.64***)	(25.4***)
Age Dependency Ratio	4.381	9.160	12.331	4.421	11.973	-22.728	-0.062	6.998
	(0.29)	(1.32)	(1.64)	(0.53)	(1.17)	(2.25**)	(0.01)	(1.08)
Government Expenditure	-0.207	-0.013	0.121	0.108	-0.107	-0.040	-0.040	0.219
	(2.61***)	(0.21)	(1.39)	(1.66*)	(1.21)	(0.24)	(0.89)	(2.41**)
Inflation	0.026	0.025	0.061	0.081	-0.126	0.123	0.006	-0.104
	(0.45)	(0.49)	(1.52)	(2.04**)	(0.84)	(1.09)	(0.25)	(2.68***)
Trade	-0.058	-0.007	0.062	-0.006	-0.036	-0.027	-0.023	-0.009
	(2.27**)	(0.22)	(2.41**)	(0.39)	(0.71)	(0.35)	(1.35)	(0.38)
FDI	-0.189	-0.026	0.094	-0.068	0.034	-0.007	0.021	0.001
	(1.22)	(0.67)	(1.74*)	(1.69*)	(1.11)	(0.17)	(1.76*)	(0.03)
Capital Account Restrictions	-0.297	-0.137	-2.314	1.333	-4.018	-1.585	-2.008	1.805
	(0.19)	(0.11)	(2.32**)	(1.53)	(3.08***)	(0.92)	(2.17**)	(1.57)
Number of countries	109	108	109	109	27	27	27	27
Number of observations	1714	1710	1752	1711	540	540	540	541
Sargan test (prob>chi2)	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Arellano Bond test (pr>z)	0.44	0.76	0.94	0.18	0.45	0.59	0.38	0.70

Notes: t-statistics in parentheses: ***, **, * significant at the 1, 5 and 10 percent levels, respectively.

Table 8: Detailed results including all globalization indicators, 10 expenditure categories, GMM

	Public Services	Defence	Public Order	Economic Affairs	Environment	Housing	Health	Recreation	Education	Social
Expenditure Share (t-1)	0.613	0.350	0.602	0.042	0.738	0.079	0.352	0.304	0.538	0.374
	(4.88***)	(2.48**)	(7.25***)	(0.29)	(10.07***)	(0.89)	(4.85***)	(2.46**)	(4.52***)	(3.17***)
Expenditure Share, Average (t-1)	-0.744	0.581	-0.542	-0.594	-0.077	-0.188	0.028	-0.037	0.435	-0.143
	(2.1**)	(1.63)	(1.61)	(1.5)	(0.26)	(1.8*)	(0.19)	(0.15)	(1.78*)	(1.43)
Age Dependency Ratio	57.398	31.470	-5.761	-58.083	-9.074	18.684	-13.407	-9.554	-0.921	30.777
	(1.6)	(0.91)	(1.2)	(1.26)	(1.54)	(1.95*)	(0.64)	(1.67*)	(0.06)	(1.32)
Lending Rate	0.324	-0.011	-0.017	-0.211	-0.018	-0.010	-0.053	-0.014	0.037	-0.208
	(2.42**)	(0.5)	(1.08)	(1.56)	(2.8***)	(0.5)	(1.32)	(0.92)	(1.57)	(4.44***)
Trade	-0.039	0.031	-0.001	-0.022	0.005	0.010	-0.006	0.000	-0.001	-0.023
	(1.11)	(1.68*)	(0.24)	(0.71)	(1.59)	(0.97)	(0.32)	(0.01)	(0.2)	(0.63)
FDI	-0.013	0.002	0.002	0.017	0.000	-0.001	0.007	0.001	0.000	-0.009
	(1.13)	(0.45)	(0.91)	(1.61)	(0.19)	(0.36)	(1.21)	(0.47)	(0.01)	(1.42)
Capital Account Restrictions	-1.868	-0.301	0.333	3.779	-0.108	-0.150	-0.450	0.128	-0.161	-0.902
	(1.43)	(0.67)	(0.92)	(2.76***)	(0.63)	(0.37)	(0.77)	(0.52)	(0.34)	(0.83)
Number of countries	15	15	15	15	14	15	15	15	15	16
Number of observations	110	103	110	110	93	110	110	110	110	115
Sargan test (prob>chi2)	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Arellano Bond test (pr>z)	0.42	0.28	0.4	0.52	0.92	0.32	0.27	0.29	0.51	0.99

Notes: t-statistics in parentheses: ***, **, * significant at the 1, 5 and 10 percent levels, respectively.

Appendix I: 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 (2004)
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 (2004)
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 (2004)
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 (2004)
Public Services	Expenditures on general public services. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Defence	Expenditures on defence. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Public Order	Expenditures on public order and safety. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Economic Affairs	Expenditures on economic affairs. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Environment	Expenditures on environment protection. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Housing	Expenditures on housing and community amenities. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Health	Expenditures on health. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)

Appendix I (continued)

Variable	Description	Source
Recreation	Expenditures on recreation, culture and religion. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Education	Expenditures on education. Data are shown for central government only and are in percent of total expenditure.	OECD (2004)
Social	Social expenditures. Data are shown for central government only 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 (2004)
Trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	World Bank (2004)
Capital Account Restrictions	See text.	Grilli and Milesi-Ferretti (1995), Dreher and Siemers (2005)
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 (2004)
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 (2004)
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 (2004)
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 (2004)
Lending Rate	Lending interest rate is the rate charged by banks on loans to prime customers.	World Bank (2004)
Inflation	Inflation, GDP deflator, (Inflation)/(1+Inflation)	World Bank (2004)