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# Integration and the Structure of Public Spending

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The voluminous tax competition literature suggests that increased economic integration leads to reduced tax rates and suboptimal levels of government spending as countries compete for mobile factors of production. Integration may influence not only the size of the government but also the structure of public spending. Comprehensive studies analyzing the effect of integration on the overall structure of government spending are rare, however. This article fills this void by providing an empirical analysis of the effects of economic integration on the overall structure of public spending in a number of Organisation for Economic Co-operation and Development countries using panel data on the different government spending components for the period 1970 to 2002. The authors find that integration negatively influences government consumption and investment but that there is no empirical evidence that transfers are positively or negatively affected by integration, as suggested by the compensation and efficiency views, respectively.

**Keywords:** *economic integration; the structure of public spending; tax competition*

Cross-border trade and international capital flows have grown dramatically in recent decades, lending to increased economic integration in developed and developing nations. Such integration is desirable for several reasons as, among other things, it enhances efficiency and stimulates economic growth. At the same time, however, integration may constrain individual countries' ability to conduct independent fiscal policy. In particular, increased factor

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mobility may induce countries to compete for mobile factors by offering lower tax rates, which in turn is likely to have consequences for the level of public expenditures. There is an ongoing debate within the European Union (EU)—the region where the integration process has been the most prominent so far—whether it will become increasingly difficult for countries to differ in redistribution ambitions and that integration may end generous welfare programs. However, economic integration may affect not only redistribution but also other components of public spending, although the exact relationship is unclear. Countries may, for example, increase public investment in education and infrastructure to attract mobile production factors while cutting government consumption spending. At the same time, integration may lead to increased economic uncertainty and, hence, raise the demand for redistributive government expenditures, thereby decreasing the scope for spending on other categories.

Although there is a vast amount of empirical work studying the effect of integration on tax rates, comprehensive studies analyzing the effect of integration on the overall structure of government are rare. The existing studies have typically focused on one component of government expenditures, namely social spending expenditures, and ignored the effect of integration on other types of government expenditures. These studies have generally not been able to successfully confirm the predictions of the tax competition model, however. If anything, existing empirical studies have found a positive relationship between integration and government spending on welfare programs. This finding has been explained by the increased economic uncertainty and a resulting higher demand for social protection to which integration gives rise.

In this article, we aim to undertake a comprehensive empirical study of the relationship between integration and the overall *structure* of government spending. Instead of looking only at a single component of government spending, we examine how integration has affected different spending components. This allows us to study whether integration has affected the various components of government spending differently and whether an increase in one component has been offset by a reduction in another component. Specifically, we study how different measures of integration affect government consumption, transfers, and investment using data for 20 Organisation for Economic Co-operation and Development (OECD) countries during the period 1970 to 2002. We find that deepened integration has led to slower growth in government consumption and possibly investment. We do not, however, find any evidence that integration has affected transfers.

The article is organized as follows. The second section briefly summarizes the theoretical literature on the relationship between integration and public spending, whereas the third section reviews previous empirical studies. Our empirical method and data are presented in the fourth section. The fifth and sixth sections provide a discussion of the results and sensitivity analysis, respectively, and the seventh section concludes the article.

## What Does Theory Say?

The impact of economic integration on public spending has been analyzed from a number of perspectives with varying consequences. In general, the approaches used can be divided between political and nonpolitical approaches, where the former emphasize the self-interest of policy makers as the driving force of public spending and the use of public spending for redistributive rather than welfare-maximizing purposes, whereas the latter are based on standard neoclassical theory where governments are assumed to maximize social welfare (e.g., Schulze & Ursprung, 1999).

Among the nonpolitical approaches, the literature on tax competition is the most well developed. In the standard tax competition model (e.g., Wildasin, 1988; Zodrow & Mierszkowski, 1986), the aim of the government is to supply a public good that is financed by levying taxes on factors of production employed within national borders. Economic integration increases factor mobility and hurts countries that impose higher tax rates than others by causing mobile production factors to emigrate away from high- to low-tax countries. Governments face substantial pressure, thus, to compete for mobile factors by offering lower tax rates, which leads to a downward spiral of tax revenues and public spending. In addition, when setting their tax rates, countries fail to incorporate the effect their tax rate cuts have on other countries' tax bases and, thus, set the tax rate too low, resulting in suboptimal levels of government spending.

Integration may similarly have an effect on the structure of public spending. Because desired mobile factors create positive externalities, governments may be pressured to increase their spending on programs attractive to these factors and scale back on programs unattractive to them. To the extent that capital is more mobile than labor, increases in integration are thus expected to lead to a shift in expenditures toward those more likely to attract capital (e.g., infrastructure and research) at the expense of those benefiting individuals (e.g., education and health care). As labor becomes more mobile,

however, this effect will diminish as some expenditures benefiting individuals may also attract productive labor. Keen and Marchand (1997), for example, develop a model that distinguishes between productive government spending and spending on social services with redistributive aims. Importantly, in the presence of tax competition, expenditures on productive spending will expand at the expense of social transfers. The result that social protection will decline as economic integration deepens is also emphasized by Lejour (1995) and Tanzi (2002), for example, and is often referred to as the “efficiency view,” as declining expenditures on social protection is perceived to enhance efficiency.

Turning to public spending in the political economy framework, the main view seems to be that integration leads to increased economic uncertainty, and as uncertainty increases, so does the demand for social protection and, hence, redistribution. This view is often referred to as the “compensation view,” as losers from integration require compensation. If the demand for social protection increases with a country’s degree of openness, governments are anticipated to increase social transfers in light of deeper integration with the rest of the world to compensate the losers of integration. Partly, this view could be attributed to the empirical support for increased social protection found by, for example, Rodrik (1997).<sup>1</sup>

The view that economic integration could have an expansionary effect on redistributing transfers is not unthreatened in the political economy literature, however. Other models based on median voters suggest the opposite. For example, Razin, Sadka, and Swagel (2002) describes a phenomenon called the “fiscal leakage effect,” where the median voter may favor lower public spending because of increased integration. For this to be the case, however, the influx of low-skilled laborers needs to be large, and the median voter needs to be a native taxpayer who favors lower taxes and lower public spending. Similarly, the demand for public spending may decline if increased labor mobility boosts the heterogeneity of the population, as the utility the median voter derives from redistribution decreases when the distance between her or his and the net recipients’ preferred types of public spending grow larger (e.g., Alesina, Baqir, & Easterly, 1999; Böheim & Mayr, 2005).

In addition, in models focusing on political failures, integration and increased international competition are expected to reduce public spending as state monopoly power will diminish (see Schulze & Ursprung, 1999). In these models, increased integration and mobility are thought to have a disciplinary effect on wasteful governments.

From the political economy literature, it is thus unclear whether increased integration will increase or decrease public expenditures on redistribution. If social protection expenditures increase, however, it is uncertain how that may affect other categories of public spending and depends, of course, on what happens to the overall level of public expenditures. However, if total spending remains constant (as suggested by Barro, 1990), any growth in social transfer payments will necessarily reduce expenditures in other areas. Politically, it may be more attractive to cut down on public investment expenditures rather than public consumption or transfer expenditures.

### Earlier Empirical Studies

Surprisingly few studies have tried to empirically examine how integration affects government spending. Among those that have, many have been carried out by political scientists, who have focused on how political variables influence government spending and, in particular, social expenditures, and integration has been included as one of many control variables. For instance, several articles have studied the influence of political values, electoral rule, and regime type on government expenditures (e.g., Hicks & Swank, 1992; Persson & Tabellini, 1999, 2004; Tavits, 2004) and have controlled for some measure of openness. Others have more directly studied the influence of openness on government expenditures (e.g., Navarro, Schmitt, & Astudillo, 2004; Rodrik, 1997, 1998).

The studies generally differ in techniques employed, countries and periods covered, government spending components, measures of integration, and choice of control variables. Hence, they are hard to compare. To summarize, however, earlier studies tended to support the compensation view (i.e., a positive relationship between integration and expenditures), whereas later studies have at best been ambiguous.

Among the earlier studies is Hicks and Swank (1992), who found that integration, measured as trade volume, is positively and significantly correlated with welfare spending in a pooled time series of 18 capitalistic democracies from 1960 to 1982. Likewise, Huber, Ragin, and Stephens (1993) reported a positive and statistically significant relationship between trade and social security transfers, but not for social security benefits, using pooled time-series regression for 17 OECD countries from 1956 to 1988. Moreover, Rodrik (1998) found that trade positively affected government consumption, thus giving support to the compensation view. In addition to overall government consumption, Rodrik also broke down government

consumption spending into spending on general public services, education, health, housing and community amenities, and economic affairs and services and found them all to be positively associated with trade. Rodrik (1997), on the other hand, showed, using panel data for OECD countries and controlling for country and year effects, that increases in trade reduce social spending and government consumption, which supports the efficiency view.

Using several different indicators of integration, Garrett and Mitchell (1997) studied how these affect a number of income transfers in OECD countries from 1976 to 1990. They reported that import penetration from low-wage countries and financial market integration has significant positive effects on several of the transfer programs, including total transfer income, although they find that total trade by itself never is significantly associated with any of the transfer programs. Likewise, Swank (1997) reported that capital market integration (measured as the inverse of covered interest rate differentials) was positively associated with social transfers. Quinn (1997) also found a positive correlation between government expenditures (excluding defense and education) and welfare spending and integration measured as capital account liberalization, an index measuring inward and outward capital account transactions. This result, however, became insignificant when regional dummies were included.

In all but one of the above studies, integration was found to positively affect government expenditures or, in most cases, social expenditures. Among more recent studies, the results have been more ambiguous, however. For instance, Castles (2001) obtained no evidence that exposure to international trade leads to reductions in social expenditures using data from 19 OECD countries during the period 1984 to 1997. Likewise, Navarro et al. (2004) found no decline in social public expenditures and no indication that globalization has resulted in a convergence toward smaller welfare states. In addition, Swank (1997) found no evidence of financial openness affecting social welfare spending. Similarly, Dreher (2006) reported no support for the notion that the rise in international capital mobility has significantly affected taxes and social policies in OECD countries.

Several researchers have investigated whether integration leads to convergence in government expenditures. For instance, Redoano (2004) studied whether there is interdependency among EU countries when it comes to tax policy and government expenditures. Using panel data from 1980 to 1995, she found interdependency among EU members regarding both tax rates and government expenditures. Sanz and Velázquez (2004) reported similar results using standard deviations and box plots in a sample of 26 OECD countries from 1970 to 1997. Specifically, they provided support for convergence in

most government components, with the fastest harmonization process in public services, defense, and education. Skidmore, Toya, and Merriman (2004) also showed empirical evidence of convergence in government expenditures but argued that this convergence was not due to globalization but to a general trend for government expenditures to converge, just like per capita gross domestic product (GDP). That is, countries with lower initial expenditures catch up by increasing public spending, whereas those with higher initial expenditures will do the opposite.

All empirical studies suffer from shortcomings, but many of the existing studies of integration and government spending seem especially prone to shortcomings. For example, many of them included both developing and developed countries in their analyses (e.g., Quinn, 1997; Rodrik, 1998), which is unsuitable because developed and developing countries differ considerably not only regarding exposure to integration but also in most other respects. In addition, many failed to incorporate important explanatory variables. For instance, several used cross-section data (e.g., Quinn, 1997; Rodrik, 1998) or employed panel data but failed to include time- and country-specific effects (Hicks & Swank, 1992; Swank, 1997); time- and country-specific factors are certainly important factors explaining government expenditures. The inclusion of both developed and developing countries and the failure to include time- and country-specific factors in Rodrik (1998) can surely help explain why the results differ from Rodrik (1997). A large portion of the studies focused on political variables and fell short when it came to including economical variables, or vice versa. Moreover, many used inadequate estimation techniques. Some only compared various government expenditures as shares of GDP across time (Navarro et al., 2004), whereas others used bivariate correlations (Castles, 2001) or simple ordinary least squares (OLS). Few dealt with such important econometric issues as endogeneity in an adequate manner. In addition, most previous studies have not incorporated more recent data. Several of them used data from the 1980s, whereas others included data from the late 1990s at best. Because the potential effect of integration on transfers, for instance, is likely to be recent, it is important to incorporate the latest data available. Liberati (2006), for instance, found that integration, measured as trade and financial openness, negatively affected government size after 1990 but not prior to 1990.

Apart from studying the overall structure of government spending, we try to overcome many of these problems by using more recent data and by addressing the endogeneity problem. An important difference is that we try to mitigate the endogeneity problem by looking at how integration affects the change in, rather than the level of, the various government spending components.

## Empirical Approach

To examine whether and how integration influences the structure of government expenditures, we estimate the relationship using country-specific data on a sample of 20 OECD countries from 1970 to 2002. Specifically, we regress government consumption expenditures, government transfers, and government investment on variables measuring integration in addition to variables known to affect government expenditures. Because many important factors are not measurable or are unobservable and therefore impossible to include in a regression framework and to control for trends over time, we use the panel nature of the data to explicitly control for country- and time-invariant factors using fixed- and random-effects regression. Country-specific effects may be particularly important, as several articles have found electoral rule and regime type to matter for government spending (e.g., Hicks & Swank, 1992; Navarro et al., 2004; Persson & Tabellini, 1999, 2004). Because these variables generally do not change over time (Persson & Tabellini, 2004), they would be picked up by the country-specific effects.

Adequately specifying the econometric model is complicated by a generally poor understanding of the determinants of government spending. In addition to integration, numerous other factors, such as political views and values, income level, indicators of the macro economy, national culture, legal-political institutions, and historical background, are also probable determinants, though some of these are hard to quantify and therefore difficult to include in empirical analyses. We explicitly control for as many of these factors as possible in the regression to limit the effect of confounding factors. Moreover, the fixed-effects regression framework controls for any other time-invariant, country-specific factor that might otherwise confound the estimates. Specifically, we estimate the following equation,

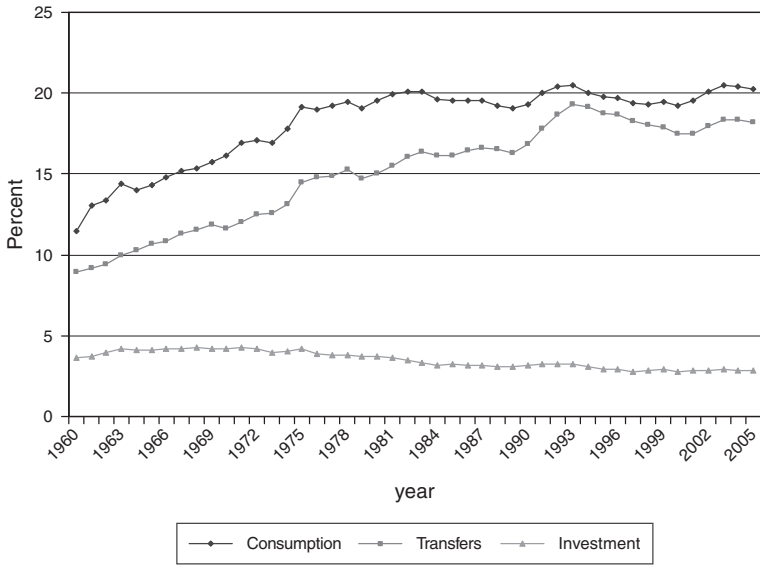
$$\Delta g_{it} = \alpha + \Delta X_{it}\beta + Z_{it}\gamma + \mu_t + \tau_i + v_{it} \quad (1)$$

where  $\Delta g_{it}$  is the logarithmical change in government outlays on consumption, transfers, and investment for country  $i$  in year  $t$ ;  $\Delta X_{it}$  is a vector of the logarithmic change in variables measuring integration, unemployment, and income that are theoretically motivated and have been found to explain government expenditures in the literature; and  $Z_{it}$  is a vector of measures of various political variables and indicators of the macro economy that are not expressed as changes and are thought to be equally important explanatory variables. Also,  $\mu_t$  is a vector of country-specific fixed effects,  $\tau_i$  is a vector of time-specific fixed effects, and  $v_{it}$  is the disturbance term that varies by country and year.

Starting with the dependent variables, our categories of public spending are based on the economic classification. Government consumption contains spending on goods and services, such as defense, judicial system, education, and so on. This category has traditionally been the largest component of public spending and has therefore gained much attention in the literature. Total transfers include payments for unemployment compensation, welfare payments, government pensions, and so on and is probably the category that best reflects redistributive aims of the government. Finally, government investment consists of spending on public infrastructure and is therefore most closely related to what is called productive spending. The average developments of these components for our OECD sample, expressed as shares of GDP, between 1960 and 2005 are showed in Figure 1. In general, government consumption and government transfers have increased during the observed period, at least until the beginning of the 1990s. The share of government investment, on the other hand, seems to have slightly decreased over time.

Our main concern in this article is the effect of economic integration on the components of public spending. Because there are several measures of integration that potentially reflect different aspects of the integration process, we consider the impact of trade volumes and the flow of foreign direct investment and capital account liberalization. However, trade is our preferred variable as it has the longest time series and exhibits enough variation to be estimated with accuracy. As for the other explanatory variables, we include the change in GDP per capita. Because of Wagner's law—that is, the richer the individual gets, the higher the demand for public services—we would expect this variable to be positive. In addition, we also consider real GDP, where, based on the tax competition literature and the insights from new economic geography, larger countries are expected to keep higher taxes and expenditure levels than smaller countries. On the other hand, if there are diminishing returns and indivisibility in public spending, this relationship may not be true, and therefore the impact of the variable is ambiguous. We include both change in unemployment and the level of unemployment. The change in unemployment, we believe, should have a positive influence on government spending, as higher unemployment leads to higher government consumption expenditures and transfers. The level of unemployment is interpreted as a macroeconomic variable and, hence, is expected to have a negative influence because the government may be financially constrained in recessions. It could also be argued, however, that governments expand during recessions in attempts to dampen recessions (i.e., Keynesian economic policy). Likewise, the dependency ratio, measured as the share of the population younger than 15 and older than 65, is expected to have a positive

**Figure 1**  
**Government Consumption, Transfers, and Investment**  
**(Share of GDP), Organisation for Economic**  
**Co-operation and Development Averages**



effect on government consumption and transfers. We incorporate two political economy variables in the analysis: the number of seats in the cabinet occupied by left-wing parties, which is believed to have a positive impact on the growth in government expenditures, and a dummy for election year, expected to have a positive impact, in particular on consumption and transfers. Finally, an EU dummy is added because European integration is likely to put particular constraints on public expenditures of members, in later years, for instance, through the growth and stability pact. The data are further described in the appendix.

We start by running a simple OLS estimation. Because time series often exhibit heteroscedasticity across panels, we also estimate the relation using generalized least squares. Furthermore, it is possible that several of the explanatory variables are endogenous. For instance, there is an ongoing discussion about whether growth in government expenditures (and transfers in particular) retards economic growth. If that is the case, real GDP is

likely endogenous. In addition, unemployment may be endogenous as well. To deal with this, we finally estimate equation (1) using two-stage least squares (2SLS).

## Results

Table 1 reports results for the determinants of the annual change in consumption, transfers, and investment (as percentage of GDP) using the trade variable and the change in foreign direct investment flows as our measures of increased economic integration.<sup>2</sup> We only present the fixed-effects regressions as this specification generally is favored by specification tests. The results show no definite impact of trade growth on the change in the components of public spending. The significance level of the coefficient is quite low in all estimations; only in the consumption specification is it significant at the 10% level. The magnitude of the coefficient in the consumption specification is modest, however; a 1.0% increase in trade growth is associated with a decrease in the change of government consumption by 0.05%. For growth in total foreign direct investment flows, the effect is even weaker. In contrast, GDP per capita growth has a clearly negative effect on the change in consumption and the change in transfers in both the trade and foreign direct investment specifications, which suggests that Wagner's law is not applicable. For the change in investment, though, the influence seems to be the opposite. Contrary to insights from the tax competition and new economic geography literature, the size of the economy (real GDP) has no significant impact on either of the components. The level of unemployment, our macro economy variable, has a statistically significant negative impact on both consumption and investment growth but no significant impact on transfer growth. This is in line with our hypotheses, that high unemployment levels constrain fiscal policy. The change in the unemployment rate, on the other hand, positively affects consumption and transfers while having no impact on investment. With respect to the remaining variables in Table 1, only the percentage of left-party legislative seats in the parliament has a positive and significant impact on change in consumption, and the EU dummy is found to be significant in the estimation of investment, where it has a negative sign. Thus, EU membership seems to have a negative impact on the change in government investment.

We also employ feasible generalized least squares (FGLS) to correct for heteroscedasticity across panels. The results from the FGLS estimations for trade and foreign direct investment are reported in Table 2. Now the trade

**Table 1**  
**Effects of Integration on Consumption, Transfers, and Investment**

	Fixed Effects Estimations												
	Consumption				Transfers				Investment				
	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	
Growth in trade	-0.05*	-1.88											
Growth in total FDI flows			0.02	0.00005	-0.03	-0.98	-0.003	-0.98	-0.11	-1.25	-0.004	-0.47	
Growth in GDP per capita	-0.54***	-7.09	-0.46***	-5.75	-0.94***	-8.42	-0.94***	-7.69	0.50***	2.02	0.60**	2.26	
Real GDP	$2.51 \cdot 10^{-15}$	0.91	$3.23 \cdot 10^{-15}$	1.15	$1.73 \cdot 10^{-15}$	0.46	$2.15 \cdot 10^{-15}$	0.54	$-8.40 \cdot 10^{-15}$	-0.92	$-8.38 \cdot 10^{-15}$	-0.92	
Unemployment	-0.002***	-3.76	-0.002***	-3.72	-0.001	-1.00	-0.001	-1.16	-0.005**	-2.22	-0.004**	-2.12	
Growth in unemployment	0.02**	2.26	0.02**	2.33	0.04***	2.92	0.03**	2.42	0.03	1.01	0.03	1.14	
Dependency ratio	-0.001	-0.68	-0.0008	-0.82	-0.003	-0.18	-0.0004	-0.30	-0.003	-0.83	-0.003	-0.83	
Left-party legislative seats	0.0001*	1.70	0.0001*	1.70	-0.00004	-0.83	-0.00004	-0.87	0.0001	0.45	0.00002	0.17	
Election year	0.002	0.83	0.002	0.62	0.004	1.31	0.005	1.33	-0.0002	-0.00	0.001	0.17	
European Union membership	0.004	0.77	0.004	0.80	-0.001	-0.18	-0.0002	-0.03	-0.04**	-2.40	-0.04***	-2.58	
Countries	20		18		20		18		20		18		
Observations	607		557		573		523		606		556		
R <sup>2</sup>	.49		.47		.50		.48		.13		.13		

Note: FDI = foreign direct investment. Year dummies included but not reported.  
 \*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

coefficient is significant in both the consumption and investment estimation, where it has a negative sign, but the foreign direct investment coefficient is still insignificant in all estimations. The magnitude of the significant coefficients is increased but still modest. A 1.0% increase in trade growth results in reductions of the growth in government consumption and investment of 0.08% and 0.20%, respectively. The results for growth in GDP per capita are upheld, and the effect of real GDP on transfer payments is now significant at the 10% level, indicating that richer or larger economies can increase their transfer payments. Now, only employment has a negative and statistically significant influence on government consumption growth, and the positive effect of the change in unemployment on consumption and transfers is further statistically strengthened. In addition, the dependency ratio is now positively related to the change in consumption and transfers, as expected, whereas the positive impact of the percentage of left-party legislative seats found in Table 1 has vanished. Finally, the negative effect of EU membership in the investment specifications is somewhat reduced, but the variable now seems to have a clear negative effect on transfers.

Given the concerns for reverse causality, we also estimate the model using 2SLS. Table 3 presents the results from the 2SLS estimation for trade and foreign direct investment. In both tables, we treat real GDP and unemployment as endogenous explanatory variables to the change in government consumption, transfers, and investment. The instruments we use are third lags of the levels and second lags of the change in real GDP and unemployment.<sup>3</sup>

The results for our integration measures are somewhat changed by the use of 2SLS compared with the estimations in Table 1 and Table 2. The coefficient for trade is now significant at 1%, compared to 10% in Table 1, and although the coefficient for trade in the investment specification is still insignificant at conventional significance levels, its t-statistics increased from 1.25 to 1.47. The significance and magnitudes of the other coefficients are fairly unaffected by the use of instruments. One change is that in Table 3, unemployment is no longer a significant explanatory factor for the change in investment, however.

Because of the similarity of the OLS and 2SLS results, it is natural to ask whether the relationship is really characterized by reverse causality. Although the instrumental variables (IV) approach is still consistent when the explanatory variables are not endogenous, OLS is more efficient and potentially unbiased and, hence, preferred. The Durbin–Wu–Hausman test uses an augmented regression to test the difference between OLS and 2SLS (Davidson & MacKinnon, 1993). In Table 3, the hypothesis that real GDP and

**Table 2**  
**Effects of Integration on Consumption, Transfers, and Investment**

	FGLS													
	Consumption				Transfers				Investment					
	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>		
Growth in trade	-0.08***	-3.68	-0.002	-1.07	0.0003	0.01	0.0003	0.01	-0.001	-0.44	-0.20***	-3.11	-0.001	-0.11
Growth in total FDI flows	-0.50***	-7.63	-0.45***	-6.32	-0.85***	-9.42	-0.90***	-8.97	0.42**	2.05	0.48**	2.22		
Growth in GDP per capita	9.32·10 <sup>-16</sup>	1.22	8.96·10 <sup>-16</sup>	1.14	1.97·10 <sup>-15*</sup>	1.89	2.00·10 <sup>-15*</sup>	1.85	1.77·10 <sup>-16</sup>	0.08	-6.41·10 <sup>-17</sup>	-0.03		
Real GDP	-0.001***	-2.90	-0.001***	-3.10	2.73·10 <sup>-5</sup>	0.01	0.0003	0.58	0.00002	0.02	-0.0002	-0.15		
Unemployment	0.02***	3.08	0.02***	2.74	0.05***	4.78	0.04***	3.38	0.02	0.98	0.03	1.19		
Growth in unemployment	0.002***	3.16	0.001***	3.04	0.002***	2.74	0.002***	2.75	-0.001	-0.38	-0.0004	-0.27		
Dependency ratio	0.00004	1.51	0.0004	1.50	-0.00002	-0.73	-0.00003	-0.94	-0.00001	-0.13	-0.00003	-0.36		
Left-party legislative seats	0.002	0.78	0.001	0.33	0.003	1.11	0.004	1.36	-0.003	-0.51	-0.003	-0.45		
Election year	-0.001	-0.38	-0.001	-0.70	-0.01***	-3.98	-0.01***	-3.89	-0.01*	-1.88	-0.01*	-1.90		
European Union membership	20	18	20	18	20	18	20	18	20	18	20	18		
Countries	607	557	573	523	606	556	606	556	606	556	606	556		
Observations	1425.18	1301.26	1214.23	1094.44	709.76	660.12	709.76	660.12	709.76	660.12	709.76	660.12		
Log likelihood	707.28	582.43	786.01	662.01	123.72	107.09	123.72	107.09	123.72	107.09	123.72	107.09		
$\chi^2$														

Note: FDI = foreign direct investment; FGLS = feasible generalized least squares. Year dummies included but not reported.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

**Table 3**  
**Effects of Integration on Consumption, Transfers, and Investment**

2SLS Estimations												
	Consumption				Transfers				Investment			
	Coef.	<i>t</i>	Coef.	<i>t</i>	Coef.	<i>t</i>	Coef.	<i>t</i>	Coef.	<i>t</i>	Coef.	<i>t</i>
Growth in trade	-0.06**	-2.13	-0.0001	-0.06	-0.02	-0.62	-0.003	-0.90	-0.13	-1.47	-0.004	-0.48
Growth in total FDI flows												
Growth in GDP per capita	-0.51***	-6.58	-0.44***	-5.24	-0.94***	-8.18	-0.94***	-7.47	0.46*	1.79	0.53**	1.97
Real GDP	2.98·10 <sup>-15</sup>	0.98	3.96·10 <sup>-15</sup>	1.28	3.81·10 <sup>-15</sup>	0.91	4.30·10 <sup>-15</sup>	0.99	-1.45·10 <sup>-14</sup>	-1.46	-1.37·10 <sup>-14</sup>	-1.37
Unemployment	-0.002**	-2.47	-0.002**	-2.56	-0.002	-1.52	-0.002	-1.49	-0.004	-1.50	-0.004	-1.53
Growth in unemployment	0.02***	2.59	0.02***	2.65	0.04***	2.87	0.04**	2.41	0.03	1.15	0.03	1.15
Dependency ratio	-0.0003	-0.31	-0.0004	-0.43	-0.0001	-0.07	-0.0004	-0.24	-0.003	-0.90	-0.003	-0.83
Left-party legislative seats	0.0001	1.45	0.0001	1.47	-0.00005	-0.94	-0.00005	-0.98	0.0001	0.50	0.00003	0.23
Election year	0.002	0.64	0.001	0.46	0.004	1.17	0.004	1.16	-0.003	-0.41	-0.0008	-0.10
European Union membership	0.002	0.40	0.003	0.55	-0.0003	-0.04	0.0006	0.07	-0.06***	-2.97	-0.07***	-3.01
Countries	20	20	18	20	20	20	18	18	20	20	18	18
Observations	574	574	526	546	546	498	498	574	574	574	526	526
Durbin-Wu-Hausman ( <i>p</i> value)	.0141		.013	.1449			.167	.070			.064	
Overidentification	2.45	5.99	1.99	1.85	1.85	5.99	1.60	5.99	14.73	5.99	13.82	5.99
Critical value			5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99

Note: FDI = foreign direct investment; 2SLS = two-stage least squares. Year dummies included but not reported.  
 \*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

unemployment are jointly exogenous is rejected in the consumption and investment specification. For transfers, the  $p$  values are generally higher, and the hypothesis that real GDP and unemployment are jointly exogenous cannot be rejected at conventional significance levels.

The credibility of the 2SLS results depends on the quality of the instruments. It is not possible to directly test the validity of the instruments, but a test of the joint hypothesis that the overidentifying restrictions are valid and the model correctly specified can be undertaken if the number of instruments exceeds the number of endogenous variables (Davidson & MacKinnon, 1993). The test statistics are obtained by multiplying the number of observations with the uncentered  $R^2$  from the regression of the IV residuals on the instruments. The overidentification test does not reject the hypothesis that the instruments are valid, and the model correctly specified for consumption and transfers but not for investment. This, together with the result from the Durbin–Wu–Hausman test, suggests that our consumption specification may be our most reliable specification.

In sum, our estimations suggest that integration in terms of increased trade flows has a negative impact on government consumption and possibly government investment. On the other hand, government transfers seem unaffected by integration. These results add to the findings in newer studies that in general find no clear impact of integration on social expenditures. Thus, although integration may not affect one component of government expenditures, namely transfers, it may very well influence other components of public spending.

## Further Estimations

The results presented in Tables 1 to 3 are based on data covering the period from 1970 to 2002. As the integration process intensified in the early 1990s, it is natural to expect that the effect of integration on government spending and its structure increased after that. To test this, we divide the sample into two subsamples, one covering the period from 1970 to 1990 and one covering the period after 1990. The results from the FGLS and 2SLS specifications based on these subsamples are presented in Table 4. The first four columns present the results when the change in trade and the other control variables are regressed on the change in consumption before and after 1990, using FGLS and 2SLS specifications, respectively. The last four columns show the results for the change in transfers and investment. A noteworthy

result is that growth in trade negatively and statistically significantly affects the change in consumption and investment in the later period but insignificantly affects it in the earlier period. The coefficient in the later period is more than twice as large as the coefficients reported in Tables 2 and 3 for the whole sample. This suggests that the effect of increased integration on government consumption and investment is a relatively recent phenomenon and is consistent with results from, for example, Liberati (2006). The change in government transfers, on the other hand, is unaffected by increased integration in both periods.

To further test the robustness of our results, we include additional control variables to our FGLS and 2SLS specifications. The results from this sensitivity analysis are presented in Table 5. Here, we only report the results from our trade growth variable and the additional control variable to save space. The first column presents the coefficient for the trade growth variable, whereas the subsequent columns show the coefficients for the additional control variables included. In the rows, the coefficients for the change in government consumption, transfers, and investment are presented for the different specifications.

First, we test whether government spending patterns in one country are influenced by government spending patterns in other countries. Specifically, we regress

$$\Delta g_{it} = \alpha + \Delta X_{it}\beta + Z_{it}\gamma + \theta A_{it-1} + \mu_i + \tau_i + v_{it} \quad (2)$$

where  $A_{it} = \sum \omega_{ij} \Delta g_{jt}$  and  $\omega = \frac{1}{d_{ij}} / \sum_j \frac{1}{d_{ij}}$ , where  $d_{ij}$  is the geographical distance

between the capital of country  $i$  and country  $j$ . We thus assume that countries close by have a larger impact on a country's public spending patterns than do countries that are farther away. We lag this weight because it takes time for countries to respond to policy changes in other countries. Including this variable does not noticeably change the results, however, and the variable itself insignificantly affects the change in government spending.

Next, we include some constitutional variables to further test the robustness of our results.<sup>4</sup> In our base estimation, we treat these variables as fixed over time, and they are thus assumed to be controlled for by fixed effects. As those variables generally have been found to be important explanatory variables, we now include them. Specifically, we include a dummy for whether the country has a presidential or parliamentary system to determine whether the constitutional system matters for public spending (as suggested by Persson

*(text continues on p. 1022)*

**Table 4**  
**Sensitivity Analysis: Before and After 1990**

	Consumption												Transfers											
	FGLS				2SLS				FGLS				2SLS											
	Before 1990	After 1990	Before 1990	After 1990	Before 1990	After 1990	Before 1990	After 1990	Before 1990	After 1990	Before 1990	After 1990	Before 1990	After 1990										
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t										
Growth in trade	-0.03	-1.00	-0.18***	-5.06	-0.01	-0.36	-0.13***	-2.97	-0.005	-0.14	0.02	0.33	-0.008	-0.15	-0.06	-0.89								
Growth in GDP	-0.47***	-5.29	-0.57***	6.01	-0.46***	-3.90	-0.86***	-6.57	-0.92***	-7.56	-0.81***	-6.04	-1.04***	-5.84	-0.90***	-4.84								
per capita																								
Real GDP	1.34·10 <sup>-15</sup>	0.97	2.39·10 <sup>-16</sup>	0.28	1.86·10 <sup>-14</sup> *	1.82	1.16·10 <sup>-14</sup> *	1.65	-3.26·10 <sup>-16</sup>	-0.18	2.99·10 <sup>-15</sup> **	2.28	-7.20·10 <sup>-15</sup>	-0.51	7.21·10 <sup>-16</sup>	0.72								
Unemployment	-0.001**	-2.19	-0.0004	-0.90	-0.002	-0.99	-0.002	-1.34	-0.001	-0.12	-0.0003	-0.65	-0.006**	-2.27	0.0006	0.26								
Growth in unemployment	0.03***	3.00	0.01	0.99	0.032***	3.01	-0.03	-1.35	0.04***	3.34	0.06***	3.14	0.05**	2.46	0.04	1.60								
Dependency ratio	0.002**	2.42	0.001*	1.87	-0.001	-0.40	0.004	1.23	0.001	1.17	0.002**	2.07	-0.004	-1.09	0.007	1.59								
Left party legislative seats	0.00005	1.44	-2.39·10 <sup>-6</sup>	0.06	0.00006	1.09	0.0001	0.27	-0.00003	-0.72	-0.00006	-1.27	-0.00003	-0.32	-0.00003	-0.39								
Election year	0.0006	0.24	0.003	1.22	-0.0002	-0.05	0.005	1.56	0.001	0.39	0.005	1.58	0.005	0.99	0.002	0.52								
European Union membership	-0.002	-0.81	0.0005	0.17	0.02*	1.75	-0.0008	-0.08	-0.01**	-3.86	-0.002	-0.39	0.04*	1.88	-0.02	-1.21								
Countries	19	20	19	20	19	20	19	20	19	20	19	20	19	20	19	20								
Observations	349	258	316	258	315	288	315	258	288	315	258	288	288	258	288	258								

**Table 4 (continued)**

	Investment							
	FGLS		2SLS		FGLS		2SLS	
	Before 1990		After 1990		Before 1990		After 1990	
	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>	Coeff.	<i>t</i>
Growth in trade	-0.13	-1.57	-0.37***	-3.40	0.01	0.11	-0.47***	-3.03
Growth in GDP per capita	0.09	0.34	0.72***	2.56	0.17	0.46	-0.003	-0.01
Real GDP	5.43·10 <sup>-15</sup>	1.46	-2.80·10 <sup>-15</sup>	1.09	-8.13·10 <sup>-15</sup>	-0.25	2.04·10 <sup>-15</sup>	0.08
Unemployment	0.0006	0.36	-0.0008	-0.49	-0.007	-1.19	0.002	0.35
Growth in unemployment	0.02	0.76	0.005	0.12	0.04	1.15	-0.10	-1.54
Dependency ratio	0.002	0.93	-0.002	-1.09	-0.008	-0.99	-0.02	-1.71
Left-party legislative seats	-0.00002	-0.17	-0.0001	-0.51	0.0001	0.59	-6.63·10 <sup>-6</sup>	-0.04
Election year	0.01	1.21	-0.03***	-2.91	0.01	0.83	-0.02	-1.59
European Union membership	-0.009	-1.18	-0.01	-1.15	-0.03	-0.68	-0.08	-2.55
Countries	19		20		19		20	
Observations	348		258		316		258	

Note: FGLS = feasible generalized least squares; 2SLS = two-stage least squares. Year dummies included but not reported.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.



**Table 5 (continued)**

Single Member Districts				Decentralization				EMU			
FGLS		2SLS		FGLS		2SLS		FGLS		2SLS	
Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t
-0.001	-0.66	-0.002	-0.82	-0.0001	-1.42	-0.0001	-0.82	0.0002	0.04	-0.0008	-0.13
-0.004	-1.12	-0.004	-1.04	0.0001	1.19	0.0008***	3.06	0.002	0.32	0.04	0.43
-0.003	-0.54	0.002	0.22	0.0002	0.91	-0.0009	-1.54	-0.003	-0.14	-0.005	-0.24

Note: EMU = Economic and Monetary Union; FGLS = feasible generalized least squares; 2SLS = two-stage least squares.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

& Tabellini, 1999, 2004). In addition, we include a dummy reflecting whether representation is proportional, modified proportional, or single member and a dummy reflecting whether the constitutional structure can be described as strong, weak, or no federalism. The results are unchanged by the additional control variables. The only additional control variable that is statistically significant is presidential system, which positively influences the change in government consumption, a possible explanation being that presidential systems tend to have smaller governments (Persson & Tabellini, 1999) and therefore have a tendency to catch up.

We also include a control variable measuring the degree of decentralization, namely the amount of resources subnational governments receive from the central government.<sup>5</sup> The reason for including this variable is that the size of public spending is generally thought to be affected by the degree of decentralization; the higher it is, the smaller the government. If the degree of decentralization affects the size of public spending, it may also affect the change in public spending. The results are unaffected by the inclusion of this variable, however. In one specification, the degree of decentralization positively affects public spending, namely the change in transfers.

Last, to test whether countries are fiscally constrained by the constraints imposed by the Maastricht Treaty and the Growth and Stability Pact, we replace the EU dummy with a dummy for membership in the Economic and Monetary Union (EMU), as this may relate more closely to the fiscal constraints imposed by the Maastricht Treaty and the Growth and Stability Pact.<sup>6</sup> The EMU dummy has no impact on public spending and does not change the results, however.

## Conclusions

In this article, we estimate the effects of integration on the structure of public spending. Although there are a number of studies investigating the effect of integration on overall public spending or social protection expenditures, studies analyzing the overall *structure* of public spending are rare. We try to fill this void by empirically estimating the impact of integration on government consumption, transfers, and investment using panel data from 1970 to 2002 on a sample of OECD countries. How integration affects these components is theoretically unclear. One line of thought is that integration will force governments to become more efficient and, hence, increase productive spending while decreasing unproductive spending in attempts to

attract mobile production factors. We would then expect increases in public investment and decreases in transfers. It is harder to predict how government consumption is affected by integration because government consumption is a very heterogeneous spending component that incorporates productive spending (e.g., expenditures on education and judicial system) and less productive spending (e.g., expenditures on recreation and bureaucracy).

We find evidence that integration negatively affects government consumption. This result is fairly robust across different estimation techniques and specifications. This negative effect of increased integration on government consumption seems to have emerged since 1990. Another result that is robust across different estimations is that transfers seem to be unaffected by integration. These results clearly add to the findings in newer studies and show that it is important to consider different components of public expenditures. It is also noteworthy that of these two components—government consumption and transfers—it is the less productive component that has not decreased with integration, thus providing no support to the efficiency view. Also, we find no evidence that integration increased government investment. On the contrary, investment appears to be negatively associated with integration, especially after 1990. A possible explanation for this negative correlation may be that when governments, for example, are forced to reduce spending because of declining tax revenues or want to increase spending on other components, cuts in public investment are politically easier to undertake than are cuts in transfers. Although this could be politically attractive in the short run, it could also have negative effects on growth and welfare in the long run.

In future work, it may be worthwhile to disaggregate government spending; in particular, government consumption could be divided into subcategories by productivity to see if there is any systematic difference between more and less productive government consumption spending. Disentangling transfers can also be fruitful to determine whether transfers to “integration losers” have increased or whether transfer payments to the median voter have risen, in addition to determining if there has been any shift from involuntary to voluntary transfers.

## Appendix Data Description

Variable	Definition	Source	<i>M</i>	<i>SD</i>
Government consumption growth	Annual change in government consumption as share of GDP	OECD Economic Outlook	0.01	0.05
Government investment growth	Annual change in fixed investment as a share of GDP	OECD Economic Outlook	-0.008	0.09
Government transfers growth	Annual change in government transfers as a share of GDP	OECD Economic Outlook	0.02	0.06
Trade growth	Annual change in the sum of exports and imports as a share of GDP	OECD Economic Outlook	0.01	0.07
FDI growth	Annual change in the sum of FDI inflows and outflows as share of GDP	UNCTAD	0.10	0.90
Change in capital liberalization	Annual change in qualitative index of capital account restrictions	Quinn (1997)	2.71	1.03
Real GDP	Real GDP in U.S. dollars, PPP adjusted	OECD Economic Outlook	764 billion	1,430 billion
GDP per capita growth	Annual change in real GDP per capita, PPP adjusted	OECD Economic Outlook	0.02	0.02
Unemployment	Unemployment in percentage of the labor force	OECD Economic Outlook	5.25	3.65
Unemployment growth	Annual change in unemployment rates	OECD Economic Outlook	0.04	0.27
Left-party legislative seats	Social-Democratic and other left parties in percentage of total cabinet posts	Armingeon, Leimgruber, Beyeler, and Menegale (2004)	32.15	36.88
Dependency ratio	Number of people younger than 15 or older than 65 in percentage of the total population	Armingeon et al. (2004)	34.73	3.72

## Simple Correlation Matrix

	Trade Growth	FDI Growth	GDP per Capita Growth	Real GDP	Unemployment	Unemployment Growth	Dependency Ratio	Left- Party Seats	Election Year
FDI growth	0.10								
GDP per capita growth	0.10	0.17							
Real GDP	-0.05	-0.001	-0.05						
Unemployment	0.09	0.04	-0.03	-0.04					
Unemployment growth	-0.14	-0.24	-0.60	0.01	-0.06				
Dependency ratio	0.04	-0.01	0.09	-0.28	0.01	0.13			
Left-party seats	-0.03	-0.004	-0.04	-0.23	-0.20	0.03	0.001		
Election year	-0.001	0.04	0.07	-0.04	-0.01	0.02	0.003	0.03	
European Union membership	0.03	0.05	0.07	0.11	0.35	-0.07	0.08	-0.04	-0.02

Note: OECD = Organisation for Economic Co-operation and Development; FDI = foreign direct investment; UNCTAD = United Nations Conference on Trade and Development; PPP = purchasing power parity. Our sample of 20 OECD countries consists of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom, and the United States. We use data from 1970 to 2002, but as the panel is unbalanced because of restrictions in data availability, the samples included in the various regressions somewhat vary.

## Notes

1. A similar approach is taken by Adserà and Boix (2002), who examine the relationship between integration and size of the public sector from a trade perspective.
2. Similar results are obtained when capital account liberalization is used as our measure of integration (not reported).
3. We also used the lagged value of three time periods as an instrument, which did not noticeably alter the results.
4. The constitutional variables come from Huber, Ragin, Stephens, Brady, and Beckfield (2004).
5. The data come from IMF's Government Finance Statistics.
6. We are thankful to an anonymous referee for this valuable point.

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