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## The dynamics of public spending

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**WZAB**

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## **The Dynamics of Public Spending**

by

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## **ABSTRACT**

This paper provides a model-based account of the forces shaping the dynamics of government spending in the industrialized democracies over the past few decades. The principle argument is that both short-term and long-term forces have been at work in the evolution of government spending in these countries. Emphasized here is the important role that the prevailing center of political gravity within the polity as well as the constraints that recent movements toward the integration of national capital markets into the international economic system have played in bringing about changes in government spending levels. Incorporated in the model are the hypothesized effects, in both the short and long run, of a set of cointegrated independent variables, as well as a set of other terms with impacts that are likely to be short run. The hypotheses surrounding this formulation are systematically tested and then a more encompassing model that includes the effects of domestic politics and international economic conditions is then presented and evaluated.

## **ZUSAMMENFASSUNG**

Dieser Beitrag bietet anhand von Modellen einen Überblick über die Kräfte, die der Dynamik der öffentlichen Ausgaben in den industrialisierten Demokratien in den vergangenen Jahrzehnten zugrundeliegen. Die Hauptthese ist, daß sowohl langfristige wie auch kurzfristige Einflüsse die Entwicklung der Regierungsausgaben in diesen Ländern bestimmt haben. Zwei Einflüsse haben eine besondere Rolle bei der Veränderung der Struktur der öffentlichen Ausgaben gespielt: die in den politischen Gemeinschaften jeweils dominierende Mitte und in jüngster Zeit der eingeschränkte Spielraum auf Grund der zunehmenden Integration der nationalen Kapitalmärkte in das internationale ökonomische System. Das Modell umfaßt angenommene kurz- und langfristige Auswirkungen in Form eines Satzes kointegrierter unabhängiger Variablen sowie einen Satz anderer Variablen mit angenommenen kurzfristigen Auswirkungen. Die zugrundeliegenden Hypothesen werden systematisch getestet; dann wird ein umfangreicheres Modell, das die Auswirkungen von Innenpolitik und internationalen Wirtschaftsbedingungen einbezieht, vorgestellt und ausgewertet.

## Introduction

This paper provides a model-based account of the forces shaping the dynamics of government spending in the industrialized democracies over the past few decades. The principle argument is that both short term and long term forces have been at work in the evolution of government spending in these countries. In particular, we stress the important role that the prevailing center of political gravity within the polity as well as the constraints that recent movements toward the integration of national capital markets into the international economic system have played in bringing about changes in government spending levels.

The initial hypothesis to be examined is that both many of the determinants of government spending and government spending itself, for the period and countries under study, are non-stationary, trend-like series. In formal terms, they possess unit roots or are integrated in the first order,  $I(1)$ . A related hypothesis is that these series are cointegrated, i.e., "they move together in the long-run" (Granger, 1986). Both of these hypotheses are then tested. The validity of the second presupposes the validity of the first. As indeed it would appear that one cannot reject these hypotheses, we are then in a position to entertain a model that captures the effects of these long term as well as short term factors when we undertake individual country analyses. The results of these analyses are encouraging. Given, however, that some of the factors that are hypothesized as playing a central role have far greater variation across rather than within countries, we go on to employ results from earlier stages of analysis in a pooled cross section time series estimation meant to capture the full effects of a broader specification.

The paper proceeds as follows. First, a general model of the principal determinants of the short and long term dynamics of government spending is presented. Incorporated into this model are the hypothesized effects, in both the short and long run, of the cointegrated independent variables, as well as a set of other terms with impacts that are likely to be short run. Second, the hypotheses surrounding this formulation are systematically tested. Third, a more encompassing model that includes the effects of domestic politics and international economic conditions is then presented and evaluated. The final section draws together the results of the paper and discusses some of their implications.

## **A Model of Government Spending Dynamics**

The number of explanations for the growth in the size of government that has occurred within the industrialized democracies in the post World War II era have expanded at a pace that has perhaps outstripped the phenomena being explained (cf., Larkey, et al., 1981, Hood, 1991, Lybeck, 1986). Clearly certain shortcomings in the way analysts have gone about providing empirical evaluations of these explanations contributed to this proliferation and attendant lack of integrative cumulativeness.

For example, one of the dominant approaches to explaining the growth in government has been centered on long term considerations, usually associated with trends in the social or economic sphere. Examples include the openness of the economy to international trade (Cameron, 1978), the growing wealth of society (Wagner, 1883), long term changes in labor market conditions (Kau and Rubin, 1981), and the changing position of the median voter in terms of the distribution of income (Meltzer and Richard, 1981, 1983). In the same tradition, but with a slant toward the supply side, others focus on the nature of political institutions and structures. Examples of this genre include the fiscal illusion (Wagner, 1975), the centralization of the political system and fiscal policy making (Marlow, 1988), or the frequency of elections (Saunders and Klau, 1985).

Frequently tests of such arguments are conducted on the basis of very limited and static cross sectional designs. This takes advantage of the variance one generally encounters in such a context. At the same time, such tests are based implicitly on assumptions about the cross sectional units being in equilibrium and following similar historical trajectories. In recent times many analysts have attempted to avoid the problems associated with such cross sectional designs. The tendency has become to conduct tests of models over medium to long term periods for one or a small number of countries. While thus coming closer to the possibility of capturing the dynamic forces at work in shaping the size of the public sector, a number of problems are connected with much of this work.

The most salient feature of this literature is the explosion of explanations that has taken place. The effect has been one of developing a model (or more than one) for each country. Even where similar models have been applied to a range of countries, little effort has gone in to comparing the results and attempting to account for why some results are similar and others different. Some significant studies in this area have attempted to undertake truly comparative analysis. This has been particularly the case with political business cycle models (Frey, 1978). Here, however, as Kirchgessner and Pommerehne (1988) point out, they have done so at the expense of ignoring long term effects to the exclusive concentration on short term responses. Even where long term considerations have been given emphasis, some significant problems have arisen and

frequently ignored. In particular is the fact that the historical experiences being studied are often characterized by significant trends in both the dependent and independent variables included in the models being evaluated. Quite frequently, this series non-stationarity is ignored to the detriment of the quality of the findings.

The approach taken below is an effort to move in the direction of remedying some of these problems. Thus, an emphasis is placed on formulating and testing a model that captures both long run and short run influences on the development of government spending. Additionally, the initial model is tested against a fairly large range of national experiences (15 OECD countries) over a significant portion of the post World War II era.<sup>1</sup> Finally, in an effort to capture the widest range of influences of the development of government spending, the model is extended and evaluated using a pooled design.

We start with the general argument that the trend upward in public spending that has marked the experience of all of the OECD countries in the post World War II era has been determined by the parallel secular trends in the wealth of these countries, the increasing burden of population groups with claims on financial support by government, and the general tendency of labor intensive sectors, such as government, to lag behind in productivity improvements and thereby to suffer increasing costs which are reflected in a growing share of the national product being employed for purposes of financing government activity.

To give a sense of the secular trends that have marked not only spending but the putative determinants of spending just alluded to, a series of graphs plotting all of these series are provided in Figure 1. Plotted in each country-graph is an aggregate measure of government spending, an income term, a demographic burden variable, and a relative

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<sup>1</sup> The fifteen countries included in this study are (in the order provided by the Russett-Singer-Small Country Code Scheme): the United States (2), Canada (20), the United Kingdom (200), the Netherlands (210), Belgium (211), France (220), the Federal Republic of Germany (260), Austria (305), Italy (325), Finland (375), Sweden (380), Norway (385), Denmark (390), Japan (740), and Australia (900). Data for most of these countries are available from 1950 through 1988. In some cases data are available for a much more limited time frame (usually, 1960 through 1988).

price term.<sup>2</sup> Given the different units in which these series are measured, standardized values (country specific) of the variables under consideration are charted. As one can readily observe, there is evidence of stochastic trends in all of these series. There is, then, good reason to suggest that these series are indeed cointegrated. Before going into the details and implications of this, a brief characterization of each of the three leading hypotheses is provided.

--- Figure 1 about here ---

The wealth argument follows in the tradition that has developed around "Wagner's Law." In effect, here it is hypothesized that economic development sets in train a variety of societal demands for greater government intervention in the economy. On the one side, there are various market failures that need to be dealt with and the public sector is the only institution capable of correcting these failures. On the other side, the effect of economic development is to generate an increase in demands for greater social amenities as well as to heighten the desire for various merit goods. Both of these are increasingly demanded because the satisfaction of more basic desires that comes with economic progress shifts people's demands toward other spheres. The role of the public sector in the economy, and the resources of the economy that would come under its control, will thereby increase with the level of well-being brought about by economic development.<sup>3</sup>

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## 2 Definitions, methods, and sources are detailed below:

The government spending variable is general government total spending, less interest and military expenditures, expressed as a percentage of GDP. For sources and methods see Cusack (1991).

The income variable is GDP per capita in real 1980 US dollars (expressed in units of 10 thousand). The GDP and price deflator series are derived from OECD (1984, 1987, and 1990a). Exchange rates are drawn from IMF (1986)

The demographic clientele variable is defined as the sum of (1) the population 65 and over and (2) the number of unemployed together expressed as a percentage of the total population. Sources for these data are from Maddison (1982) and the OECD (1970, 1973, 1983, 1987b, 1990b and 1990c).

Relative prices are defined as the government consumption deflator divided by GDP deflator. The GDP and government consumption deflators (base year, 1980=100.0) are drawn from (OECD 1984, 1987, and 1990c).

**3** The inclusion of this term in models of public sector size and expansion is relatively widespread though somewhat contentious. See Bird (1971) and Musgrave (1969) for discussions of "Wagner's Law." Henrekson (1990) provides a sophisticated empirical analysis of its validity in his study of the development of Swedish public finance.

The demographic clientele argument rests on a structural feature of the states being studied. The idea here is that the advanced industrialized democracies have as one of the principal structural elements regulating their fiscal policy the commitment on the part of the state to deal with problems generated in the labor market. The central focus has been on the loss of an individual's ability to continue in an employed relationship and the need to provide an income flow to replace the loss in the ability to earn. The two major groups covered, those of retirement age and the unemployed, universally among these countries constitute the largest and most significant demographic groupings for whom these states have implemented and maintained a variety of income transfer programs.<sup>4</sup> Over time, the scope and coverage of these programs have broadened, particularly in the post World War II era, and together have come to represent, in most cases, the largest component of government spending. Simultaneously, with the increasing wealth of these societies and the concomitant improvement in life styles, working conditions, and health provision, and also in part because of the generosity of these programs themselves, the size of the former group, the pension age population, has increased significantly relative to the entire population.

A very significant feature of these spending programs is the government's general lack of discretion in controlling them. Thus, it is both rare and difficult for government to engage in serious reshaping of these programs. More often than not, strong legal and political barriers surround them. In effect, they become entitlements, and given the political misfortunes associated with efforts to deprive large voting blocs of entitlements, the discretionary control that is politically feasible is most frequently on the side of expanding rather than contracting the financial resources available for such programs.

The third element in this formulation rests on the recognition of the general tendency for the costs of providing public goods and services to rise in excess of those in most other spheres of the economy. This is the relative price effect. Drawing on Baumol's [1976] exposition of the impact of differential rates of technological progress across sectors in modern societies, a number of scholars have pointed to the impact of "Baumol's Disease" on the size of the public economy.<sup>5</sup> As a sector primarily engaged

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<sup>4</sup> Both variables have been shown to have an important role in shaping the size of the public economies of the industrialized democracies in the post World War II era. For a sampling of cross-national studies generally supportive of this argument, see Wilensky [1975], Saunders and Klau [1985], Rice [1986], Cusack [1988], Pampel and Williamson [1989].

<sup>5</sup> Generally successful evaluations of this argument can be seen in a large number of studies; some major examples include Beck [1981], Berry and Lowery [1984], and Neck and Schneider [1988]. Heller [1981] provides a critique of some of the methods employed in studies such as these, but does find merit in the theoretical argument.



in service functions, the labor-intensive character of government is much greater than that of the rest of the economy. Given the tendency for wages across the economy to generally move together, the relative costs of production in a laggard sector such as government will persistently increase. The resistance toward cuts in the provision of public services fosters the need for greater resources to be pumped into the public sector in order to maintain output levels relative to those generated in more progressive sectors. The consequence of these divergent movements and the resistance to cuts, both on the part of those supplying and receiving public services, is for the public sector to expand relative to the size of the overall economy as cost inflation in government outstrips that occurring in the private sector.

Now, following Hendry, et al., a dynamic model based on factors such as these can most fruitfully and generally be specified in the following way:

$$y_t = \alpha_1 y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + \varepsilon_t \quad [1]$$

A reformulation into the following, i.e., error correction model, is possible:

$$\Delta y_t = (a_1 - 1)y_{t-1} + \beta_0 \Delta x_t + (\beta_1 + \beta_0)x_{t-1} + \varepsilon_t \quad [2]$$

or

$$\Delta y_t = \beta_0 \Delta x_t + (a_1 - 1)(y_{t-1} - Kx_{t-1}) + \varepsilon_t \quad [3]$$

An error correction mechanism (ECM) model and its parameters lend themselves to ready interpretation. Thus,  $\beta_0$  corresponds to the impact effect or short term response to change in the independent variable. The term  $(1 - a_1)$  represents the feedback effect, or correction to the dependent variable in light of divergences between its actual level and its target level in the previous period. The ratio  $(\beta_0 + \beta_1)/(1 - a_1)$  captures the long run response, or  $K$ , of the dependent variable to levels of the independent variable.

As Engle and Granger (1987) have shown, should, as we suspect, the independent variables and the dependent variable be cointegrated, a model such as this (i.e., eq. 3) can be estimated by a simple two-step procedure whereby the long term relationship (see eq. 4 below) between the dependent and independent variables is first estimated using OLS. Should the result of this estimation provide a relatively good fit and at the same time should the residuals of such an estimated equation be  $I(0)$ , i.e., the series does not contain a unit root, then the residuals from this first estimation step can be viewed and used as the deviations from the long term target portrayed in the equation 3, immediately above. In other words, the term  $z_t$  in equation 4 below represents the disequilibrium between the actual and target values.

Given the set of leading hypotheses presented earlier, the vector of variables setting the long term developmental path of public spending is captured in:

$$G_t = \gamma + \delta_1 Y_t + \delta_2 DC_t + \delta_3 RP_t + z_t \quad [4]$$

where:

$G_t$  = total government spending less military spending and interest payments;

$Y_t$  = real per capita income in 1980 US dollars;

$DC_t$  = transfer program clientele, i.e., the sum of both retirement age population and the unemployed expressed as a percentage of the total population;

$RP_t$  = relative prices, i.e., the ratio of government price series to the private sector consumption price series;

$z_t$  = the error term,

where the disequilibrium between the actual and target is embodied in  $z_t$ . Note that  $z_{t-1}$  is equivalent to  $(y_{t-1} - Kx_{t-1})$  in equation 3.

Following Engle and Granger (1987), the lag in the estimate of this last term, i.e.,  $\hat{z}$ , can then be substituted into the ECM formulation. This then facilitates the complete estimation of the three effects, impact, long term response, and feedback, of the independent variables on the change in the dependent variable. This equation, too, can be estimated with OLS. The equation below, captures these terms in the present substantive case:

$$\Delta G_t = \alpha + \beta_1 \Delta Y_t + \beta_2 \Delta DC_t + \beta_3 \Delta RP_t + \beta_4 \hat{z}_{t-1} + \beta_5 IP_t + \beta_6 UP_t + \varepsilon_t \quad [5]$$

In this ECM formulation two further terms have been added. These,  $IP_t$  and  $UP_t$ , represent, respectively, the response to fiscal pressures represented by the share of GDP required to finance the public debt, and the effects of unanticipated economic performance on public spending. Since neither of these two terms contain a significant trend nor are likely to be cointegrated with the dependent variable, they need only be included in this second and final stage of the estimation. In effect, neither will generally provide the basis for a long term target of public spending but will affect short term changes in public spending levels.

The first of these two,  $IP_t$ , represents the public debt management costs, or interest payments (as a percentage of GDP), confronting the government sector. The expectation is that these should act as a constraint on spending by government for normal civilian purposes. This expectation rests on the argument that some budgetary constraint is in operation. While not modeling this constraint directly, the introduction of interest payment considerations allows one to tap a very significant dimension of fiscal stress, particularly as this has manifested itself in the 1980s. With the relatively

strong taxpayer opposition to further expansion of government revenue extractions during the 1970s and 1980s, and with active efforts on the part of governments to provide more micro-economically "rational" tax codes over the last decade, many OECD countries have been hampered by severe restrictions on their ability to finance the further expansion of the public sector. Where spending and revenues have been persistently out of line, the effect has been to dramatically increase the relative size of the debt burden. In combination with high interest rates, this has expanded the financial magnitude of the debt management problem in many countries (see Table 1) and confronted fiscal policy makers with the need to shift spending away from traditional categories to the purpose of paying for previous imbalances.

--- Table 1 about here ---

The second of these additional terms,  $UP_t$ , captures unexpected performance within the economy. Using the same operationalization as Roubini and Sachs (1989), i.e., unexpected performance equals the lag of a three year moving average of the GDP growth rate minus the GDP growth rate in the present period, the expectation is that this would be positively associated with changes in government spending. The reasoning for this expectation is two-fold. First, this postulated effect captures the impact of the tendency for government spending decisions to be fixed significantly prior to their implementation. Thus, short term movements of the economy in a direction away from recent performance might see government spending as a share of GDP rising when the economy suddenly suffers a downturn. The opposite, that is a decline in the relative weight of public spending, would occur when the economy undergoes a spurt of growth in excess of recent performance. Second, this effect could come about through a rapid response on the part of government when the economy actually takes a dip or surge as government officials attempt to manage the level of demand within the economy.

This section has presented a relatively straightforward model of government spending dynamics in the advanced industrialized democracies. The next section is intended to provide some empirical underpinning for the hypotheses framing this model. This is done by conducting a set of single country analyses with the purpose of evaluating the general utility of this framework. Since there are good reasons to believe that other elements also need to be taken into consideration, in particular, the effects of domestic politics and international economics, and since these latter elements can probably best be examined when taking into account both temporal and cross-unit variation, the

section following the next will build on the latter's results, introduce these other two elements, and evaluate the entire formulation in the context of a pooled cross section time series design.

## Unit Roots, Cointegration and ECM Model Estimation

Before estimating the ECM model (i.e., eq. 5) laid out in the last section it is necessary to go through a series of prior test and estimation stages.<sup>6</sup> The first stage focuses on establishing whether or not the series, both in terms of the dependent and independent variables in the long term equation specified above, do indeed have unit roots. If that can be established, one proceeds to the stage where the cointegration or long term equation is estimated. The results of this equation are then examined in terms of the quality of fit as well as the character of the estimated residuals. With respect to the former, this obviously should be relatively good. With respect to the latter the hypothesis is that this is indeed a cointegrated system and tests of the estimated residuals should show that they do not possess a unit root. Success at this stage permits one to go on to estimate the ECM equation where the disequilibrium term is explicitly modeled within the equation.

Turning first to the question of whether these series do have unit roots, one estimates the standard Dickey-Fuller and Augmented Dickey-Fuller regressions and evaluate the t-statistics derived from these estimations. The Augmented Dickey-Fuller equation is as follows:

$$\Delta x_t = \beta x_{t-1} + \sum_{j=1}^p \gamma \Delta x_{t-j} + e_t \quad [6]$$

where p is chosen to assure that the residual is white noise. Note that the Dickey-Fuller equation is the same as above but with the right-hand-side summation not included.

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<sup>6</sup> This approach was developed by Engle and Grange (1987). A helpful range of papers on cointegration and ECM models is to be found in a special issue of the 1986 *Oxford Bulletin of Economics and Statistics*. Hendry's and Granger's papers provide the background to the approach. Hall's paper serves as useful example of its application.

Rajmaira and Ward (1990) and Ward and Rajmaira (1992) are two interesting applications of this approach to the study of political science questions. For some general considerations of this entire approach, especially useful are Gilbert (1986, 1989), Hendry and Mizon (1978), Hendry, Pagan, and Sargan (1984), and Hendry and Richard (1982). The ECM modeling approach has its roots in Phillips' earlier writings (see, e.g., Phillips, 1954).

The t-statistic for  $\hat{\beta}$  is tested against a set of critical values with the null hypothesis being that  $x_t \sim I(1)$ , i.e., integrated of order 1. This hypothesis of a unit root is rejected if  $\hat{\beta}$  is negative and statistically significant from zero.

The test statistics for all four series for each of the fifteen countries in this studied are provided in Table 2. In the 120 tests reported, there are only two, the ADF statistics for RP in the cases of Sweden and Australia, where a negative value is obtained. In neither of the two cases with negative t-statistics, using the critical values provided in Fuller (1976) or Engle and Granger (1987), can one reject the null hypothesis of a unit root.

--- Table 2 about here ---

The presence of unit roots in the individual series for these countries established, it is now possible to take the next step and estimate the cointegration equation for each country. The results of these estimations are provided in Table 3. Here there are two concerns. First, the fit of the equations ought to be quite good. This is clearly the case. Second, the series of the estimated errors for each country does not contain a unit root, i.e.,  $\hat{z}_t \sim I(0)$ . The most frequently employed tests here are (1) the Cointegration Regression Durbin Watson (CRDW) test, which is simply the Durbin Watson statistic based on the estimated residuals for the equation, (2) the Dickey-Fuller (DF) and (3) Augmented Dickey-Fuller (ADF) tests, as above. These test statistics are reported in the last three columns of Table 2. With the null hypothesis being the dependent and independent variables are not cointegrated, one can reject the null and accept the alternative (of cointegration) when the CRDW is significantly greater than zero and the Dickey-Fuller t-statistics are negative and significant (Granger, 1986).

--- Table 3 about here ---

Although some of the CRDW statistics are rather low, using the critical values provided by Engle and Granger (1987), they are all at a level to allow one to reject the null hypothesis (at the .10 level) that the set of independent and dependent variables is not cointegrated. In terms of the DF and ADF tests, the evidence is a bit mixed. In the case of the DF test, one can see that there are seven countries (i.e., the United Kingdom, France, Austria, Finland, Sweden, Norway, and Japan) where one cannot reject the null hypothesis (at the .10 level) given the size of the t-statistics. On the other hand, for all countries we can reject the null (at the .10 level) using the t-statistics derived from the Augmented Dickey-Fuller equation. Given that it was possible to reject the

null hypothesis of non-cointegration on at least two of three tests for all of the countries, it was decided to proceed with the estimation of the ECM equation using  $\hat{z}$  as the measure of the divergence between the actual and long term target spending level.

A brief word is in order on the nature of the parameter estimates for the cointegrated independent variables. In general, one sees that the income parameter frequently has a statistically significant negative sign (in ten of the fifteen cases) and in only one case, Belgium, is the effect of income positive and statistically significant. While this generally negative effect, opposite that one would expect given Wagner's Law, may be a function of multicollinearity, it is consistent with the findings of Henrekson (1990) who was able to demonstrate in his study of Swedish public finances that, when there is a relationship between income and government spending, it is indeed negative--i.e., in complete contradiction to the prediction one would make on the basis of "Wagner's Law."

In ten of fifteen cases, the estimated effect of the demographic clientele variable is positive, as expected, and significant. Only one case, Canada, has an estimated coefficient that is negative and statistically significant. Finally, the relative price variable fares the best of the three independent variables in terms of expectations. In twelve of the fifteen cases it is positive and statistically significant. In sum, then, the parameters estimated for the cointegration regression are plausible.

Attention now turns to the estimation results for the error correction model. These are reported in detail in Table 4 below. The results from these single country estimations are rather encouraging. First, with respect to the overall fit of the model, the range, in terms of  $\bar{R}^2$ , is from a low of .26 in France to a high of .79 in the case of Finland. Nine of the fifteen have goodness of fit measure at the .60 level or above -- a not unattractive performance for a first difference model.

--- Table 4 about here ---

Second, there is the question of the parameter estimates.<sup>7</sup> One sees that with respect to the short term effects of the cointegrated variables the pattern is rather similar to the long term effects. That is to say, change in income almost always registers a negative effect, although here only seven of the 15 parameter estimates are significant at the .10 level or better. Contemporaneous change in the size of the dependent

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<sup>7</sup> The government spending data series for Japan registers a major jump between 1959 and 1960. It is unclear whether there was indeed such a major increase or whether this is simply a problem of combining data from different sources. At any rate, given that this one observation contains more than half the variance in the entire series, it was decided to use a dummy variable for that year in the hope of restricting the observation's influence on the parameter estimates.

population is, when the parameter estimate is statistically significant (which occurs in seven of the fifteen cases at the .05 level), produces a positive effect on the change in the size of government. In nearly all cases (13 out of 15) change in relative prices has a positive and significant (at the .10 level or better) effect on spending changes.

Recall that the parameter,  $\beta_4$ , captures the feedback effect or short term adjustment to disequilibrium between the immediately preceding values of the long term target and the actual level of government spending. There are no cases of a positive and statistically significant estimate for this parameter, which would signal rather perverse behavior. Indeed, 14 of the 15 parameter estimates have a negative sign and ten of these are significant at the .10 level or better. With the negative sign, then, spending is moved upward when in the last period the actual level was below the target level that would exist in terms of the long term equilibrium relationship between income, clientele, and relative prices on the one hand, and spending on the other. Overshooting this target in the previous period would prompt a cutback in the present period. In effect, then, the error correction formulation seems to receive a good deal of support.

In terms of the two non-cointegrated variables, the picture is at best mixed. There are strong signs of the expected crowding out effect of current interest payments on normal civilian spending with eight of the fifteen parameter estimates negative and significant at the .10 level or better. However, in only two cases, i.e., the United States and Canada, does the unexpected economic performance variable register any statistically significant effect. In both cases the signs are as expected, i.e., positive.

Third, and finally, is the question of possible serially correlated error. In all of the cases we can reject the alternative hypothesis of serial correlation. However, in only five of the fifteen cases (i.e., Canada, Belgium, Norway, Denmark, and Japan) can we conclusively accept the null of no serial correlation. In the other ten cases, the Durbin Watson statistic is inconclusive. Note these tests were made at the .05 level of significance.

The estimation results reported in this section have been able to show for a large group of OECD countries that a set of frequently hypothesized determinants of government spending are indeed cointegrated with the latter. Extending the analysis to incorporate the short term effect of these variables, disequilibrium between the long term targets for spending implied by these variables and the actual spending level, as well as two other short term effects, a model of changes in government spending levels was estimated for each of the fifteen countries included in this study. In general, this model performs reasonably well in capturing the dynamics of spending across this range of countries. With respect to the three cointegrated independent variables, viz., income, clientele, and relative prices, a similar pattern was found to hold in terms of both their

long and short run relationships with government spending. Thus, contrary to expectations based on "Wagner's Law," income has a negative impact on spending. On the other hand, as expected from much of the literature on the determinants of welfare state spending as well as research on "Baumol's Disease," the size of the clientele for government income support programs and the relative cost of government goods and services generally have the positive effects (both in the short and long run) expected. In addition, the critically important facet of the error correction model that was estimated, i.e., the feedback relationship of the disequilibrium between target and actual levels of spending and changes in the latter was found to be a significant element in the government spending dynamics of many of these countries. Finally, indications of response to fiscal stress, in the form of the size of the debt management burden, was found to be an important component of spending dynamics in quite a few countries.



## Bringing Domestic Politics and International Economics Into the Model

The focus is now expanded to bring into view two other forces that are hypothesized to have helped shape the dynamics of government spending in the countries under study. The expanded model takes the form specified in equation 7 below. Note that the variables in this formulation have subscripts for both time, as before, as well as for the cross sectional units. Included are two new terms, *IFI* and *POL*, meant to capture the influence of international financial integration and the domestic center of political gravity on the dynamics of government spending.

$$\Delta G_{i,t} = \alpha + \beta_1 \Delta Y_{i,t} + \beta_2 \Delta DC_{i,t} + \beta_3 \Delta RP_{i,t} + \beta_4 \hat{z}_{i,t-1} + \beta_5 IP_{i,t} + \beta_6 UP_{i,t} + \beta_7 IFI_{i,t} + \beta_8 POL_{i,t} + \varepsilon_{i,t} \quad [7]$$

One of the major developments in the last two decades has been the marked increase in the flow of international capital. The implications of this are generally considered to be widespread in terms of their influence on the behavior of various economic agents. In particular, it is frequently argued that the reduction in capital controls and the expanding integration of national economies into the international capital markets have reduced the latitude available to governments to carry out policies designed to influence their own economies.

While the conventional view is that international capital integration has proceeded at a rapid pace over the last few decades, this has not remained uncontested. In particular, some scholars (Feldstein and Horioka, 1980; Feldstein, 1983) have argued that there is really little evidence to support this view. They claim that the relationship between domestic savings and domestic investment will reflect the degree of capital mobility in the international system. The extent to which the cross-country association between these two variables is weak, they argue, is the extent to which international sources are available for domestic investment. This, in turn, reflects the degree to which financial markets are integrated. The evidence Feldstein and Horioka have produced on this question would suggest that indeed domestic savings and investment are highly connected and that there is little sign of any weakening in this connection.

Bayoumi (1990) takes exception to this conclusion. He points out that a better measure of international financial integration would be the association between private (as opposed to total) savings and investment. This would reflect the fact that the totals of each, which are the sums of private and public sectors' activities, are likely to be kept aligned by government. Thus, government policy is seen to be endogenous to the process and is held to be adjusting public savings and investment to offset discrepancies in the private sector. When one examines the relationship between the private sector measures, it turns out that they are indeed less coupled than the totals. As we have

shown elsewhere (Cusack and Garrett, 1992), there is strong evidence to suggest that this relationship, unlike that between the measures based on the total aggregates, has diminished over time. This last point is important in that it corresponds with the view that international financial integration has increased in recent years.

The movements charted In Figure 2 portray this general tendency. The measure plotted there is a 15-country average of an index computing the convergence between private savings and private investment.<sup>8</sup> As is quite apparent, the 1970 saw a measurable increase in this measure of integration which, after a decline toward the end of the decade, surged upward in the 1980. As Table 5 demonstrates, however, the pattern of international financial integration, both across time and countries, is not a uniform one. Some countries, with the United States and Australia as the leading examples, have low levels of integration and have not experienced the kind of major growth that one sees in the aggregate measure charted in Figure 2. Others, such as Norway and the United Kingdom have experienced movement both up and down. And still others, such as Belgium the Netherlands, and Canada, have undergone major increases in recent years relative to earlier periods.

--- Figure 2 about here ---

--- Table 5 about here ---

The final term introduced into the equation, *POL*, is meant to capture the effects of the domestic politics on government spending policy. Based on the power resource arguments regarding the democratic class struggle (see, e.g., Korpi, 1983) the expectation here is that the political strength of organized groups, both outside and inside government, will have a powerful impact on public policy outputs, such as government spending. Treating capital and labor as the two principal class based antagonists in modern capitalist democracies, this argument focuses on the power of these two groupings in the market and polity.

For labor, the ability to organize and control, both outside and inside the political system, will enhance its capacity to foster its aims and objectives. Chief among these is the reduction of exposure to the workings of the market system. One of the best ways to accomplish this is to promote the growth of the size of the public sector and use the latter to diminish the dependence of workers on the market. Manifestations of

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<sup>8</sup> The financial integration measure is  $\left| 1 - \frac{INV_p}{SAV_p} \right|$ , i.e., the absolute value of 1 minus the ratio of private investment to private savings.

this ability to organize and control can be seen in terms of the scope of union membership, the electoral support for left parties, as well as the involvement of the latter in governing coalitions.

In the present context, the expectation, which has often received empirical support in the past (cf., Shalev, 1983; Hicks and Swank, 1992), is that left-wing strength in the political system is conducive to the expansion of the size of the public sector while right-wing strength tends to induce restraint and cutbacks in public spending.

Using data on union support together with measures of the ideological center of gravity of electorates and cabinets, one can assemble an index for the center of political gravity for these countries.<sup>9</sup> By computing the annual average values of this index, it

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<sup>9</sup> The center of political gravity index is equal to

$$POL_{i,t} = UD_{i,t}^s - V_{i,t}^s - C_{i,t}^s$$

where  $UD^s$  is the standardized score on Union Density,  $V^s$  is the standardized Vote Center of Gravity index, and  $C^s$  is the standardized Cabinet Center of Gravity index. Standardizations based on the observed means and standard deviations of the indicators across the 15 countries (plus Switzerland) over the period 1950 through 1988.

The union density measure is the size of membership in unions expressed as a percentage of the labor force. Sources for labor force data are elsewhere. In the main, data on union membership were drawn from Bain and Price (1980), Price (1989) and Visser (1989). A large number of national statistical yearbooks as well as various issues of *The Europa Yearbook* were also drawn from. In addition, various national embassies in Bonn provided data for more recent years.

The electoral and cabinet center of gravity scores were constructed on the basis of a series of measures. First, for any year the share of votes received by each party in the most recent national (normally parliamentary) election (analogously for the cabinet measure, the share of cabinet seats held in the year) were assembled. These data were drawn from Austin (1986), Banks (various issues), *The Europa Yearbook* (various issues), Inter-Parliamentary Union (1989), Jacob (1989), Mackie and Rose ((1974, 1982-87, 1991), and Paloheimo (1984). Second, party vote (or cabinet seat) shares were then aggregated into five distinct categories representing the political orientation of the parties. The five categories include, ultra left (UL), moderate left (ML), center (C), moderate right (MR), and ultra right (UR). Placement of parties into these categories is based on classification provided by Castles and Mair (1984), plus own codings. Finally, using the vote distribution scores (analogously for the cabinet measures), ULVOTE, MLVOTE, CVOTE, MRVOTE, URVOTE, the ideological center of gravity measure was calculated. This is Gross and Sigelman's (1984) weighted mean index (see below) which is computed in the following way:

$$ICG = \sum_{i=1}^n T_i C_i,$$

where  $ICG$  is the ideological center of gravity,  $T_i$  is a party category's decimal share of the vote (or of cabinet seats), and  $C_i$  is the party category's position on a left-right ideological continuum, which ranges from 1 for ultra-left (UL) in increments of 1 to 5 for ultra-right (UR).

is possible to plot the shifting balance of political power within the industrialized democracies (see Figure 3). As one can see there, the tendency in the early phases was toward the right. This was reversed in the 1960s. The 1970s saw a major shift toward the right followed by a sharp move toward the center beginning in the late 1970s and early 1980s.

Again, as with financial integration, there are some major variations in specific country tendencies in terms of the movement of the center of political gravity (see Table 6). On the right, for example, the United States, Canada and Japan have not strayed very far toward the center. Sweden and Austria have also tended to stay relatively far out on the left. On the whole one can see that the major source variation in the center of political gravity is cross sectional and not temporal.

--- Figure 3 about here ---

--- Table 6 about here ---

Table 7 presents the results of the pooled cross section time series analysis of the model. Note that the two columns present first an initial and then a final set of statistical results. The first column reports on an OLS estimation, where in effect, the hypothesis is that there are no unit effects, no serial correlation, and no heteroscedasticity [cf., Stimson, 1985; Sayrs, 1989]. The upper part of Table 8 provides some diagnostic statistics helpful in evaluating these assumptions.

Only one of the first two hypotheses was found to be wanting. Specifically, in three cases there were clear signs of autocorrelated error. In each of these three cases, the United Kingdom, France, and Japan, the correlogram pattern conformed to a first order autoregressive process. There were no indications of unit effects which are generally signalled by significant serial correlation with relatively flat correlograms and/or radically divergent patterns in the summed residuals and residual variance ratios. GLS estimation was then undertaken. Examining the results of this second stage estimation suggested that while the UK, France, and Japan no longer presented a problem, there was an increase in the degree of serial correlation in the Belgian residual series; the increase was manifested in the appearance of a significant first order autoregressive process. The appropriate differencing of the Belgian series permitted a second GLS estimation. The results of this are reported in the second column of Table 7 and the diagnostics on this last estimation effort are provided in the bottom part of Table 8. Although not reported here, examination of the residuals against the various independent variables included within the equation provided no evidence of heteroscedasticity.

--- Table 7 about here ---

--- Table 8 about here ---

Concentrating on the final GLS estimation, one can see that the model does a good job in accounting for movements in government spending across the sample of years and countries. In terms of the specific parameter estimates the general pattern found in the individual country equations reported in the last section continues to hold. The short term response to movements in income is negative while it is positive in the case of both the demographic clientele and relative prices. The parameter capturing the adjustment to disequilibrium is negative, as it should be. The effect of the interest payments is to crowd out other spending. Unexpected economic performance has the effect of pushing up spending when there is a decline relative to recent growth and lowering spending when there is an upward surge in growth. The effect of the degree of financial integration is negative, as predicted, but the parameter estimate is significant at only the .10 level. The politics term has a parameter that takes on a significant positive value, as predicted. Thus, the further to the left the political system is in terms of its center of gravity, the greater the increase in government spending.

The results of this pooled analysis are quite supportive of the model that has been introduced in this section. They help show that not only do some of the standard public choice variables influence public spending dynamics but that the latter are appreciably influenced by domestic political and international economic conditions.

## **Discussion and Conclusion**

The growth in the relative size of the public sectors in the industrialized democracies is one of the most dramatic developments in the last half of the twentieth century. An extensive literature has grown up around this theme. Nevertheless, there is to date little in the way of cumulative knowledge regarding this phenomenon that could qualify as integrative. While clearly the wide diversity of single factor explanations that have been advanced helps to account for this situation, it is also certainly true that the methodological designs and techniques that analysts have employed have also played a significant role.

Some of the methodological problems that have been noted here include (a) an excessive reliance on static cross sectional designs; (b) very limited or restricted (in terms of country coverage and comparison) analysis when employing designs covering medium and long term periods; (c) the tendency to restrict the focus on short term

effects when conducting multi-system comparisons of models covering medium and long term temporal domains; and (4) the tendency to ignore the implications of non-stationarity in longitudinal designs.

The study reported here has attempted to rectify these problems. Focused on a relatively large set of countries and covering a relatively large time frame, it has put forward and evaluated a model based on some widely used theoretical propositions about the causes of government spending dynamics. This model is capable of handling both long and short term influences and at the same time is able to take into account the problems of non-stationarity.

A number of findings emerge from the analysis conducted. For example, three leading hypotheses from the public choice literature on the dynamics of government spending, i.e., "Wagner's Law," the demographic burden argument, and Baumol's relative price effect, need to be treated more cautiously than is usually the case. This arises because, at least in the present context (and this is likely to be so in many others), the variables that go into these relationships are cointegrated. The findings that emerge with respect to these three putative relationships are mixed. While a good deal of support for the demographic argument and Baumol's hypothesis was found, the evidence that has been produced on "Wagner's Law" is contrary to what we predicted. In effect then, while increasing demographic burdens and government cost inflation affect government spending in both the long and short term in a positive way, the effect of income was found to be negative in terms of the long term target of spending as well as short term changes in spending.

A fair amount of support was found for the argument that the burden of financing the public debt tends to crowd out spending for normal civilian functions by government. This was often the case in the single country analyses and was found again to be so in the pooled analysis conducted with the larger model. Evidence on the effects of unanticipated economic performance was mixed. In only a couple of country cases did the effect manifest itself, although it did emerge as a significant influence in the pooled analysis.

One of the central working hypotheses that the dynamics of public spending are affected by both long and short term considerations and that divergences between long term targets and actual spending levels have a negative feedback effect on later spending received strong support in both the single country and pooled analyses. This result lends credence to the idea that dynamic models of public spending can be fruitfully cast in terms of an error correction mechanism.

Two other leading arguments with respect to the forces shaping the dynamics of public spending in these countries were also evaluated and support for both accrue. First, it was found that the degree to which an economy is integrated into international financial markets does seem to have the expected negative impact on spending. The argument itself rests on the notion that a reduction in policy latitude has occurred in recent decades through the increasing integration of national economies into international markets. Second, the argument that the constellation of political forces within the political system have an impact on public policy spheres such as government spending was evaluated. Strong support for the argument in the form that the domestic political system's ideological center of gravity on the left-right dimension contributes to the dynamics of public spending was found. Specifically, it was shown that the further to the left the system is in terms of its political orientation, the greater the tendency to increase the size of the public household.

The question of whether the size of the public sector will continue to expand is clearly an important one. As Peltzman (1980), contrary to the views of many others, pointed out nearly a decade ago, there were good reasons to expect that it would not. In this regard, the decade of the 1980s has, for many, though not all, countries, been one of stabilizing the size of government (Cusack, 1991). Four of the factors examined here likely have played a significant role in this development and will probably continue to do so. First, the tendency for prices in the public sector to increase at a faster pace than those in the private sector has diminished in many countries. In part, this clearly resulted from governmental efforts at increasing efficiency and holding down wage increases for public sector workers. This change may also reflect the shifting character of both production and consumption in the private sector, where services have taken on an increasingly important role in terms of both employment and household purchases. Second, the spiraling debt burdens of many of these public sectors has begun to seriously cut into normal spending programs forcing cutbacks and delaying or cancelling projects. The effect here has been particularly noticeable in the significant reduction in government sector investment for infrastructure. Third, the latitude available to public authorities to set fiscal policy seemingly has diminished somewhat with the increasing integration of national economies into international financial markets. Present plans in Europe to develop common monetary policies and institutions with a variety of constraints on public sector finances, as a condition for participation, may lead to an even more diminished degree of flexibility for national authorities. Finally, the generally greater political success of the right over the last decade has shifted the political center of gravity in many countries and has played a role in cutting back spending by government.

## References

- Austin, Erik W. 1986. *Political Facts of the United States Since 1789*. New York: Columbia University Press.
- Bain, George Sayers and Robert Price. 1980. *Profiles of Union Growth: A Comparative Statistical Portrait of Eight Countries*. Oxford: Basil Blackwell.
- Banks, Arthur S. (various issues) *Political Handbook of the World. Governments, Regional Issues and Intergovernmental Organizations*. New York: McGraw Hill.
- Baumol, William J. 1967. "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis." *American Economic Review* 57:415-427
- Bayoumi, Tamim. 1990. Saving-Investment Correlations: Immobile Capital, Government Policy, or Endogenous Behavior? *International Monetary Fund Staff Papers* 37/2: 360-397.
- Beck, Morris. 1981. *Government Spending: Trends and Issues*. New York: Praeger.
- Berry, William D., and David Lowery. 1984. "The Growing Cost of Government: A Test of Two Explanations." *Social Science Quarterly* 65:735-749.
- Bird, Richard 1971. "Wagner's 'Law' of Expanding State Activity." *Public Finance* :1-25.
- Cameron, David R. 1978. "The Expansion of the Public Economy: A Comparative Analysis." *American Political Science Review* 72:1243-1261.
- Castles, Francis G. and Robert D. McKinlay. 1979. "Does Politics Matter: An Analysis of the Public Welfare Commitments in Advanced Democratic States." *European Journal of Political Science* 7: 169-186.
- Castles, Francis G. and Peter Mair. 1984. "Left-Right Political Scales: Some 'Expert' Judgements." *European Journal of Political Research*. 12
- Cusack, Thomas R. 1988. "Public Expenditure Decision-Making: A Comparative Analysis." in *Explaining the Growth of Government*, ed. Johan A. Lybeck and Magnus Henrekson. Amsterdam: North Holland.
- Cusack, Thomas R. 1990. The Changing Contours of Government. Discussion Paper (P91-304), Forschungsgruppe Internationale Beziehungen, Wissenschaftszentrum Berlin für Sozialforschung
- Cusack, Thomas R. and Geoffrey Garrett. 1992. "The Expansion of the Public Economy, Revisited: The Politics of Government Spending, 1960-1988." (P92-303), Forschungsgruppe Internationale Beziehungen, Wissenschaftszentrum Berlin für Sozialforschung.
- Engle, Robert F. and C.W.J. Granger. 1987. "Co-Integration and Error Correction: Representation, Estimation, and Testing." *Econometrica* 55:251-276.
- Europa Yearbook*. (various issues). London: Europa Publications Limited.
- Feldstein, Martin. 1983. "Domestic Saving and International Capital Movements in the Long Run and in the Short Run." *European Economic Review* 21:129-151.
- Feldstein, Martin, and Charles Horioka. 1980. Domestic Savings and International Capital Flows *The Economic Journal* 90:314-329.
- Frey, Bruno S. 1978. *Modern Political Economy*. Oxford: Martin Robinson.
- Fuller, Wayne A. 1976. *Introduction to Statistical Time Series*. New York: Wiley.
- Garrett, Geoffrey and Peter Lange. 1991. "Political Responses to Interdependence: What's 'Left' for the Left?" *International Organization* 45:539-564.
- Gilbert, Christopher L. 1986. "Practitioners' Corner: Professor Hendry's Econometric Methodology" *Oxford Bulletin of Economics and Statistics* 48/3:283-307.



- Gilbert, Christopher L. 1989. "LSE and the British Approach to Time Series Econometrics" *Oxford Economic Papers* 41:108-128.
- Gould, Frank. 1983. "The Development of Public Expenditures in Western Industrialized Countries: A Comparative Analysis." *Public Finance* 38: 38-70.
- Granger, C.W.J. 1986. "Developments in the Study of Cointegrated Economic Variables." *Oxford Bulletin of Economics and Statistics* 48:213-228.
- Granger, C.W.J. and P. Newbold. 1974. "Spurious Regressions in Econometrics" *Journal of Econometrics* 2:111-120.
- Gross, Donald A. and Lee Sigelman. 1984. "Comparing Party Systems: A Multidimensional Approach." *Comparative Politics* 16:463-479.
- Hall, S.G. 1986. "An Application of the Granger & Engle Two-Step Estimation Procedure to United Kingdom Aggregate Wage Data." *Oxford Bulletin of Economics and Statistics* 48:229-239.
- Heller, Peter S. 1981 "Diverging Trends in the Shares of Nominal and Real Government Expenditure: Implications for Policy." *National Tax Journal* 34:61-74.
- Hendry, David F. 1986. "Econometric Modelling with Cointegrated Variables: An Overview." *Oxford Bulletin of Economics and Statistics* 48:201-212.
- Hendry, David F. and Grayham E. Mizon. 1978. "Serial Correlation as a Convenient Simplification, Not a Nuisance: A Comment on a Study of the Demand for Money by the Bank of England." *The Economic Journal* 88:549-563.
- Hendry, David F., Adrian R. Pagan and J. Denis Sargan. 1984. "Dynamic Specification" In: Zvi Griliches and Michael D. Intriligator (eds) *Handbook of Econometrics*, Volume II. Amsterdam: North-Holland.
- Hendry, David F. and Jean-Francois Richard. 1982. "On the Formulation of Empirical Models in Dynamic Econometrics" *Journal of Econometrics* 20:3-33.
- Henrekson, Magnus. 1990. *An Economic Analysis of Swedish Government Expenditure*. Stockholm: Trade Union Institute for Economic Research.
- Hicks, Alexander M. and Duane H. Swank. 1992. "Politics, Institutions, and Welfare Spending in Industrialized Democracies, 1960-1982." *American Political Science Review*, forthcoming.
- Hood, Christopher. 1991. "Stabilization and Cutbacks: A Catastrophe for Government Growth Theory?" *Journal of Theoretical Politics* 3:37-65.
- International Monetary Fund. 1980. *International Financial Statistics Yearbook, 1979*. Washington, D.C.: International Monetary Fund.
- International Monetary Fund. 1981. *International Financial Statistics, Supplement on Price Statistics, Supplement Series #2*. Washington, D.C.: International Monetary Fund.
- International Monetary Fund. 1987. *International Financial Statistics Yearbook, 1986*. Washington, D.C.: International Monetary Fund.
- International Monetary Fund. 1990. *International Financial Statistics Yearbook, 1989*. Washington, D.C.: International Monetary Fund.
- Inter-Parliamentary Union. 1987. *Chronicle of Parliamentary Elections and Developments, Vol. XXI*. Geneva: Inter-Parliamentary Union.
- Jacob, Francis, ed. 1989. *Western European Political Parties: A Comprehensive Guide*. Harlow: Longman.
- Kau, J.B. and P.H. Rubin. 1981. "The Size of Government." *Public Choice* 37:261-274.

- Kirchgässner, Gebhard, and Werner W. Pommerehne. 1988. "Government Spending in Federal Systems: A Comparison between Switzerland and Germany." In Lybeck, Johan A., and Magnus Henrekson, eds. *Explaining the Growth of Government*. Amsterdam: North Holland.
- Korpi, Walter. 1983. *The Democratic Class Struggle*. London: Routledge and Keagan Paul.
- Larkey, Patrick D., C. Stolp and Mark Winer. 1981. "Theorizing About the Growth of Government: A Research Assessment." *Journal of Public Policy* 1: 157-220.
- Lybeck, Johan A. 1986. *The Growth of Government in the Developed Economies*. Aldershot: Gower.
- Mackie, Thomas T., and Richard Rose. 1974, 1982, 1991. *The International Almanac of Electoral History*. (1st, 2nd, and 3rd eds.) Free Press, New York
- Mackie, Thomas T., and Richard Rose. 1983. "General Elections in Western Nations during 1982." *European Journal of Political Research*. 11:345-349.
- Mackie, Thomas T., and Richard Rose. 1984. "General Elections in Western Nations during 1983." *European Journal of Political Research* 12: 335-342.
- Mackie, Thomas T., and Richard Rose. 1985. "General Elections in Western Nations during 1984." *European Journal of Political Research* 13: 335-339.
- Mackie, Thomas T. 1986. "General Elections in Western Nations during 1985." *European Journal of Political Research* 14: 695-697.
- Mackie, Thomas T. 1987. "General Elections in Western Nations during 1986." *European Journal of Political Research* 15: 717-722.
- Maddison, Angus. 1982. *Phases of Capitalist Development*. Oxford: Oxford University Press.
- Marlow, M.L. 1988. "Fiscal Decentralization and Government Size." *Public Choice* 56:259-269.
- Meltzer, A.H. and S.F. Richard. 1981. "A Rational Theory of the Size of Government." *Journal of Political Economy* 89:914-927.
- Meltzer, A.H. and S.F. Richard. 1983. "Tests of a Rational Theory of the Size of Government." *Public Choice* 41:403-418.
- Musgrave, Richard A. 1969. *Fiscal Systems*. New Haven: Yale University Press.
- Neck, Reinhard, and Friedrich Schneider. 1988. "The Growth of the Public Sector in Austria: An Exploratory Analysis." in *Explaining the Growth of Government*, ed. Johan A. Lybeck and Magnus Henrekson. Amsterdam: North Holland.
- Organization for Economic Cooperation and Development. 1970. *Labour Force Statistics, 1957-1968*. Paris: Organization for Economic Cooperation and Development.
- Organization for Economic Cooperation and Development. 1973. *Labour Force Statistics, 1960-1971*. Paris: Organization for Economic Cooperation and Development.
- Organization for Economic Cooperation and Development. 1980. *National Accounts Statistics, 1950-1978: Vol.1, Main Aggregates*. Paris: Organization for Economic Cooperation and Development.
- Organization for Economic Cooperation and Development. 1984. National Accounts and Labour Force Data Tape, 1984.
- Organization for Economic Cooperation and Development. 1987a. *Labour Force Statistics*. Paris: Organization for Economic Cooperation and Development.

- Organization for Economic Cooperation and Development. 1987b. *Yearbook of National Accounts Statistics, 1974-1986*. Paris: Organization for Economic Cooperation and Development.
- Organization for Economic Cooperation and Development. 1990a. *Labour Force Statistics*. Paris: Organization for Economic Cooperation and Development.
- Organization for Economic Cooperation and Development. 1990b. *OECD Historical Statistics, 1960-1988*. Paris: Organization for Economic Cooperation and Development.
- Organization for Economic Cooperation and Development. 1990c. *Yearbook of National Accounts Statistics, 1976-1988*. Paris: Organization for Economic Cooperation and Development.
- Organization for Economic Cooperation and Development. 1991. *National Accounts Statistics, 1960-1989: Vol. 1, Main Aggregates*. Paris: Organization for Economic Cooperation and Development.
- Paloheimo, Heikki. 1984. *Governments in Democratic Capitalist States, 1950-1983: A Data Handbook*. University of Turku, Department of Sociology and Political Science.
- Pampel, Fred C. and John B. Williamson (1989) *Age, Class, Politics, and the Welfare State*. Cambridge: Cambridge University Press.
- Phillips, A.W. 1954. "Stabilization Policy in a Closed Economy" *Economic Journal* 64:290-323.
- Price, Robert. 1989. Trade Union Membership, in R. Bean, ed, *International Labour Statistics: A Handbook, Guide, and Recent Trends*. London: Routledge.
- Rajmaira, Sheen and Michael D. Ward (1992) "Evolving Foreign Policy Norms: Reciprocity in the Superpower Triad." *International Studies Quarterly* 34:457-475.
- Rice, Tom W. 1985. "The Determinants of Western European Government Growth, 1950-1980." *Comparative Political Studies* 19:233-257.
- Roubini, Nouriel and Jeffrey Sachs (1989) "Fiscal Policy." *Economic Policy* 9:99-132.
- Saunders, Peter, and Friedrich Klau. 1985. *The Role of the Public Sector: Causes and Consequences of the Growth of Government*. Paris: OECD.
- Sayrs, Lois W. 1989. *Pooled Time Series Analysis*. London: Sage.
- Shalev, Michael. 1983. "Class Politics and the Western Welfare State." In Shimon E. Spiro and E. Yuchtman-Yaar, eds. *Evaluating the Welfare State: Social and Political Perspectives*. New York: Academic Press.
- Stimson, James A. 1985. "Regression in Space and Time: A Statistical Essay." *American Journal of Political Science* 29:914-947.
- Visser, Jelle. 1989. *European Trade Unions in Figures*. Deventer: Kluwer Law and Taxation Publishers.
- Wagner, A. 1883. *Finanzwissenschaft*. Leipzig: C.F. Winter.
- Ward, Michael D. and Sheen Rajmaira. 1992. "Reciprocity and Norms in U.S. - Soviet Foreign Policy." *Journal of Conflict Resolution* 36: 342-368.
- Wilensky, Harold L. 1975. *The Welfare State and Equality: Structural and Ideological Roots of Public Expenditures*. Berkeley: University of California Press.

## Tables and Figures

**Table 1**

**Government Interest Payments as a Percentage of GDP:  
Country-Period Averages**

	1950-59	1960-69	1970-79	1980-88
United States	1.45	1.97	2.43	4.47
Canada	2.50	3.07	4.14	7.58
United Kingdom	3.93	3.93	4.01	4.67
Netherlands	2.82	2.66	3.46	6.71
Belgium	2.20	3.03	3.84	9.49
France	1.14	1.20	1.10	2.51
Fed. Rep. Germany	0.71	0.80	1.28	2.68
Austria	0.41	0.87	1.45	3.31
Italy	1.81	1.45	3.70	7.60
Finland	0.64	0.82	0.78	1.47
Sweden	1.44	1.51	2.27	6.68
Norway	1.00	1.46	2.41	4.20
Denmark	1.29	0.99	1.73	7.55
Japan	0.63	0.44	1.35	4.15
Australia	2.57	2.69	2.12	3.09
Average	1.64	1.79	2.41	5.08

**Table 2**  
**Dickey-Fuller and Augmented Dickey-Fuller Tests for Unit Roots**

	<i>G</i>		<i>DC</i>		<i>Y</i>		<i>E</i>	
	DF	ADF	DF	ADF	DF	ADF	DF	ADF
United States	1.20	1.43	1.06	1.40	2.21	2.48	2.78	1.77
Canada	1.17	1.19	1.50	1.35	2.74	1.69	1.94	2.65
United Kingdom	0.90	1.18	1.80	0.65	2.51	2.68	2.31	2.61
Netherlands	1.76	0.95	2.44	3.26	2.53	1.78	2.65	-0.02
Belgium	1.54	0.51	0.94	0.62	3.71	1.18	1.36	0.43
France	1.91	2.48	3.12	1.76	5.40	0.18	2.30	0.96
Fed. Rep. Germany	1.49	1.09	2.32	0.85	3.71	0.59	2.68	0.67
Austria	1.60	1.29	1.99	2.14	4.89	1.03	2.80	1.13
Italy	1.38	2.69	2.31	1.38	2.99	1.00	2.52	3.10
Finland	1.17	0.97	2.06	1.25	2.99	1.55	1.49	2.30
Sweden	1.82	0.24	1.65	1.20	3.51	1.83	2.36	-0.19
Norway	2.02	1.92	2.28	4.15	2.30	2.54	1.05	0.95
Denmark	1.89	1.34	1.19	1.29	2.61	1.15	2.07	1.58
Japan	1.52	1.12	2.47	1.77	5.50	0.07	2.94	1.16
Australia	0.99	0.97	1.29	1.34	2.52	1.45	1.17	-0.31

**Table 3**  
**Cointegration Regressions**

$$G_t = \gamma + \delta_1 Y_t + \delta_2 DC_t + \delta_3 RP_t + z_t$$

	$\delta_1$	$\delta_2$	$\delta_3$	$\gamma$	$\bar{R}^2$	<i>obs.</i>	<i>CRDW</i>	<i>DF</i>	<i>ADF</i>
United States	-1.22 (-5.28)	.434 (2.66)	.643 (12.8)	-30.73 (-11.4)	.960	35	.981	-3.14	-5.96
Canada	-1.81 (-3.56)	-1.13 (-5.01)	.809 (8.58)	-12.89 (-4.77)	.963	35	1.04	-3.41	-4.34
United Kingdom	-2.64 (-4.20)	-.141 (-0.62)	.823 (8.65)	-19.75 (-7.00)	.951	35	.621	-1.72	-2.85
Netherlands	-2.15 (-3.03)	2.14 (7.46)	.520 (7.85)	-9.28 (-5.16)	.975	35	.663	-3.11	-4.80
Belgium	1.78 (5.79)	-2.17 (4.06)	.786 (5.50)	-18.25 (-3.17)	.945	35	.725	-2.48	-3.44
France	.141 (0.24)	2.23 (4.24)	.075 (0.70)	-5.63 (-0.90)	.940	35	.360	-1.85	-3.06
Fed. Rep. Germany	-.701 (-3.00)	.514 (3.13)	.479 (8.75)	-6.89 (-2.85)	.967	35	.813	-3.08	-5.35
Austria	.847 (1.36)	3.92 (3.29)	-.013 (-0.13)	-26.70 (-2.22)	.952	35	.550	-1.99	-3.09
Italy	.142 (1.61)	.382 (1.45)	.101 (1.07)	9.20 (1.60)	.928	35	.980	-3.14	-3.39
Finland	-1.20 (-5.60)	1.41 (10.19)	.418 (8.10)	-14.11 (-4.06)	.980	29	.878	-2.78	-4.35
Sweden	-.952 (-2.79)	2.82 (7.53)	.661 (14.15)	-46.81 (-19.2)	.990	29	.794	-2.47	-4.30
Norway	-1.17 (-2.52)	3.96 (5.21)	.531 (11.26)	-58.36 (-9.23)	.966	35	.922	-2.76	-4.14
Denmark	.100 (0.34)	1.79 (12.50)	.609 (11.05)	-45.16 (-14.7)	.987	35	1.13	-3.48	-5.25
Japan	-1.13 (-1.89)	.903 (1.79)	.323 (5.17)	-4.28 (-1.42)	.929	35	.430	-2.00	-3.99
Australia	-.735 (-3.21)	1.49 (9.96)	.400 (10.04)	-22.826 (-9.55)	.974	29	1.04	-3.19	-7.11

**Table 4**  
**Error Correction Model**  
**Individual Country Analyses**

$$\Delta G_t = \alpha + \beta_1 \Delta Y_t + \beta_2 \Delta DC_t + \beta_3 \Delta RP_t + \beta_4 \hat{z}_{t-1} + \beta_5 IP_t + \beta_6 UP_t + \varepsilon_t$$

	$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$	$\beta_5$	$\beta_6$	$\alpha$	$\bar{R}^2$	obs.	DW
United States	-.025 (-0.21)	.805 (2.00)	.263 (2.20)	-.363 (-2.61)	-.149 (-1.80)	.148 (7.00)	.505 (0.34)	.757	34	1.85
Canada	-.056 (-0.49)	.528 (1.20)	.337 (2.61)	-.247 (-2.06)	-.168 (-2.65)	.144 (1.78)	.874 (1.76)	.664	34	1.95
United Kingdom	-.539 (-2.14)	.345 (0.73)	.513 (3.92)	-.053 (-0.39)	-.710 (-1.55)	-.288 (-1.44)	3.71 (1.68)	.516	34	1.34
Netherlands	-.267 (-1.47)	1.35 (2.57)	.199 (1.70)	-.407 (-2.80)	-.357 (-2.39)	-.036 (-.03)	2.25 (2.25)	.569	34	1.81
Belgium	-.245 (-2.36)	.576 (1.96)	.381 (4.28)	-.041 (-0.53)	-.202 (-4.52)	-.056 (-0.53)	2.00 (4.32)	.758	34	2.04
France	-.481 (-1.68)	-.078 (-0.09)	.305 (2.29)	.075 (0.48)	-.339 (-0.58)	-.205 (-1.06)	2.37 (1.24)	.260	34	1.53
Fed. Rep. Germany	-.051 (-0.42)	1.22 (2.40)	-.008 (-0.09)	-.461 (-4.30)	-.584 (-2.55)	.040 (0.50)	1.20 (1.49)	.744	34	1.54
Austria	-.266 (-1.53)	1.23 (1.12)	.136 (1.14)	-.201 (-1.54)	-.359 (-1.45)	.035 (0.25)	1.74 (1.65)	.448	34	1.74
Italy	-.341 (-3.47)	-.429 (-1.19)	.254 (4.02)	-.250 (-2.04)	-.049 (-0.76)	-.069 (-0.80)	1.77 (3.15)	.583	34	2.37
Finland	-.184 (-1.66)	1.14 (2.84)	.470 (6.70)	-.528 (-2.58)	-.365 (-.98)	.001 (0.13)	.655 (0.85)	.791	28	2.24
Sweden	-.481 (-2.48)	-.076 (-.07)	.503 (2.66)	-.329 (-2.07)	-.178 (-1.46)	-.138 (-0.97)	2.29 (2.09)	.698	28	2.40
Norway	-.027 (-0.11)	1.56 (1.46)	.309 (5.11)	-.380 (-2.82)	-.108 (-0.74)	-.037 (-0.25)	.549 (0.86)	.500	34	1.89
Denmark	-.174 (-1.11)	.507 (1.54)	.385 (4.37)	-.249 (-1.82)	-.118 (-2.08)	.103 (0.87)	1.22 (2.23)	.735	34	2.07
Japan (1960 dummy: b=5.73)	-.227 (-3.50)	1.04 (2.95)	.129 (1.91)	-.035 (-0.37)	-.293 (-2.87)	-.001 (-0.01)	1.66 (3.25)	.756	34	1.92
Australia	.001 (0.11)	.991 (2.56)	.239 (2.22)	-.466 (-2.56)	-.613 (-1.75)	.119 (1.00)	1.59 (1.73)	.615	28	1.44

**Table 5**  
**International Financial Integration Measure:**  
**Country-Period Averages**

	1950-59	1960-69	1970-79	1980-88
United States	0.12	0.06	0.10	0.11
Canada	0.07	0.09	0.12	0.41
United Kingdom	0.31	0.08	0.20	0.26
Netherlands	0.16	0.04	0.18	0.47
Belgium	0.10	0.09	0.24	0.76
France	0.06	0.05	0.08	0.17
Fed. Rep. Germany	0.06	0.09	0.18	0.27
Austria	0.11	0.12	0.11	0.16
Italy	0.07	0.18	0.13	0.53
Finland	---	0.15	0.17	0.10
Sweden	---	0.18	0.15	0.25
Norway	0.24	0.13	0.20	0.14
Denmark	0.09	0.10	0.17	0.35
Japan	---	0.06	0.13	0.19
Australia	---	0.09	0.09	0.07
Average	0.13	0.10	0.15	0.28



**Table 6**  
**Center of Political Gravity Index:**  
**Country Period Averages**

	1950-59	1960-69	1970-79	1980-88
United States	-3.71	-2.93	-3.86	-4.39
Canada	-2.13	-2.01	-1.37	-2.13
United Kingdom	-0.95	0.44	0.50	-1.56
Netherlands	0.79	0.16	0.30	-0.71
Belgium	1.94	1.81	1.28	0.96
France	-3.10	-3.48	-2.52	-1.23
Fed. Rep. Germany	-3.07	-1.58	0.52	-1.45
Austria	2.32	2.51	3.83	3.21
Italy	-0.54	-0.23	0.67	1.05
Finland	0.54	0.95	2.50	2.88
Sweden	3.59	4.35	4.56	5.41
Norway	2.92	2.27	3.24	2.40
Denmark	0.91	1.59	2.19	1.93
Japan	-3.10	-2.64	-2.22	-2.55
Australia	-0.71	-0.86	-0.40	0.63
Average	-0.29	0.02	0.61	0.30

**Table 7**

**Error Correction Model With  
Domestic Politics and International Financial Integration  
Pooled Cross Section Time Series Estimation  
15 OECD Countries, 1961-1988**

$$\Delta G_{i,t} = \alpha + \beta_1 \Delta Y_{i,t} + \beta_2 \Delta DC_{i,t} + \beta_3 \Delta RP_{i,t} + \beta_4 \hat{z}_{i,t-1} + \beta_5 IP_{i,t} + \beta_6 UP_{i,t} + \beta_7 IFI_{i,t} + \beta_8 POL_{i,t} + \varepsilon_{i,t}$$

Estimation:	OLS	GLS
Parameters:		
$\beta_1$	-.157 (-5.84)	-.158 (-4.98)
$\beta_2$	.726 (6.14)	.755 (6.40)
$\beta_3$	.282 (12.31)	.290 (12.55)
$\beta_4$	-.168 (-4.99)	-.234 (-6.28)
$\beta_5$	-.075 (-2.95)	-.058 (-2.34)
$\beta_6$	.058 (2.42)	.061 (2.28)
$\beta_7$	-.591 (-1.86)	-.622 (-1.89)
$\beta_8$	.060 (3.74)	.079 (5.12)
$\alpha$	.561 (3.40)	.339 (2.65)
$\overline{R}^2$	.594	.608
obs.	420	405

**Table 8**  
**Cross Sectional Diagnostics**

**OLS Results**

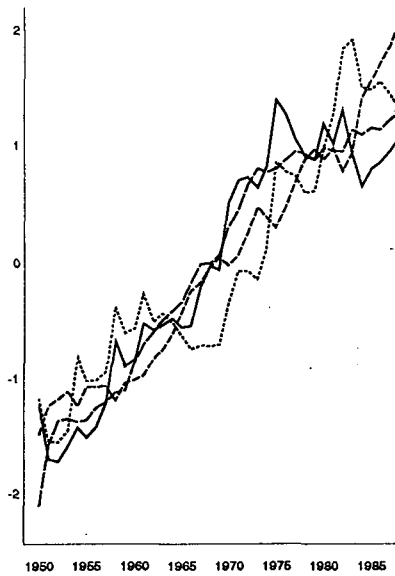
	Summed Residuals	Residual Variance Ratio	Auto- correlation Lag1	Pattern
United States	-0.61	0.51	0.16	decay
Canada	2.31	0.83	0.19	none
United Kingdom	-5.55	1.44	0.44	decay
Netherlands	2.69	0.88	0.03	none
Belgium	11.53	0.39	0.26	decay
France	3.75	0.89	0.47	decay
Fed. Rep. Germany	-7.09	0.65	0.03	none
Austria	-8.94	1.10	0.07	none
Italy	-0.35	1.18	-0.05	none
Finland	-9.81	0.55	-0.12	none
Sweden	3.54	1.13	0.04	none
Norway	3.33	1.69	-0.11	none
Denmark	7.71	1.13	-0.11	none
Japan	1.13	0.71	0.43	decay
Austria	-3.65	0.86	0.31	decay

**GLS Results**

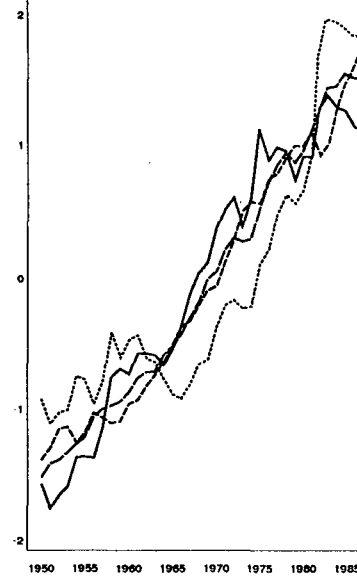
	Summed Residuals	Residual Variance Ratio	Auto- correlation Lag1	Pattern
United States	2.75	0.53	0.18	decay
Canada	3.67	0.90	0.20	none
United Kingdom	-7.97	1.19	0.21	decay
Netherlands	4.60	0.88	0.05	none
Belgium	6.48	0.47	0.10	none
France	-0.63	0.77	0.12	none
Fed. Rep. Germany	-3.98	0.69	0.06	none
Austria	-8.70	1.17	0.08	none
Italy	0.85	1.25	-0.01	none
Finland	-7.82	0.59	-0.19	none
Sweden	2.74	1.24	0.12	none
Norway	4.23	1.78	-0.05	none
Denmark	7.55	1.18	-0.07	none
Japan	-2.33	0.59	0.03	none
Austria	-1.45	0.88	0.30	decay

**Figure 1: Trends in Spending, Income, Clientele, and Relative Prices**

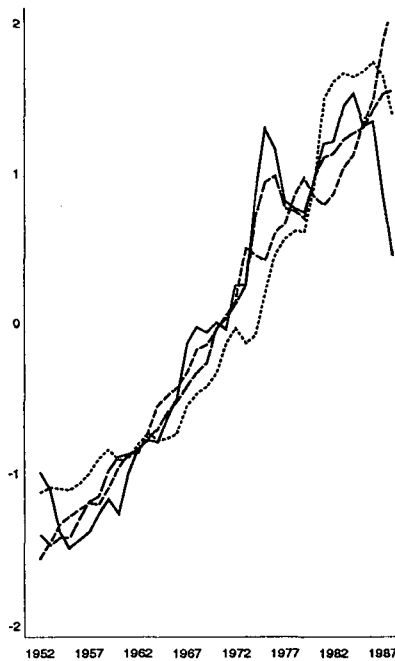
**United States**



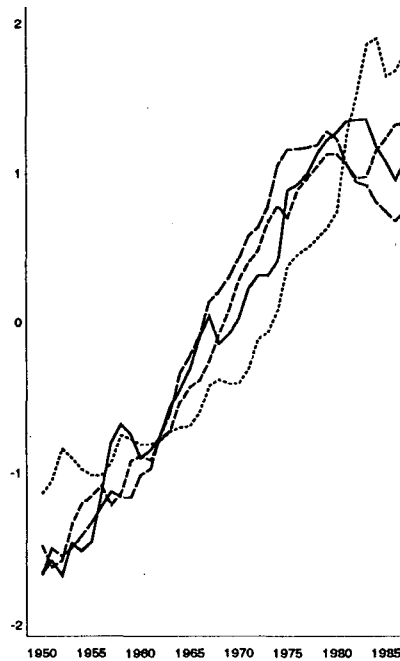
**Canada**



**United Kingdom**



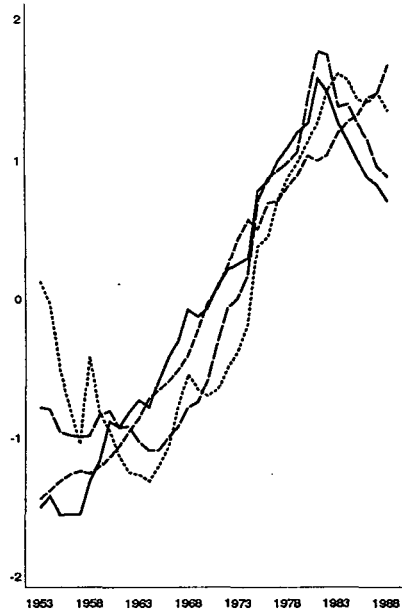
**Netherlands**



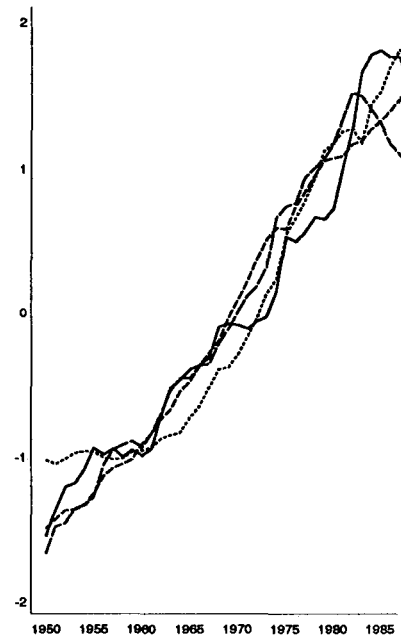
**Key:**

- Government spending
- - - Income per capita
- ... Clientele
- . - Relative prices

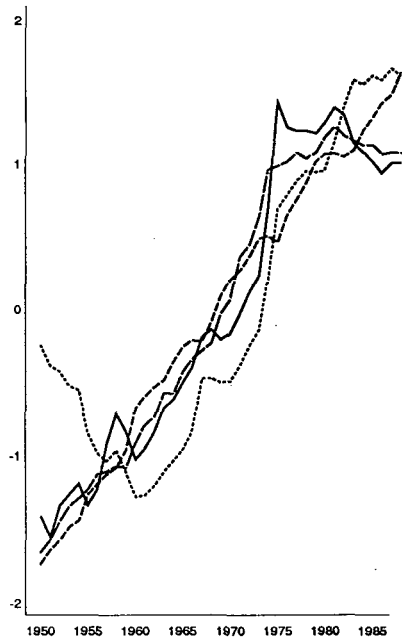
Belgium



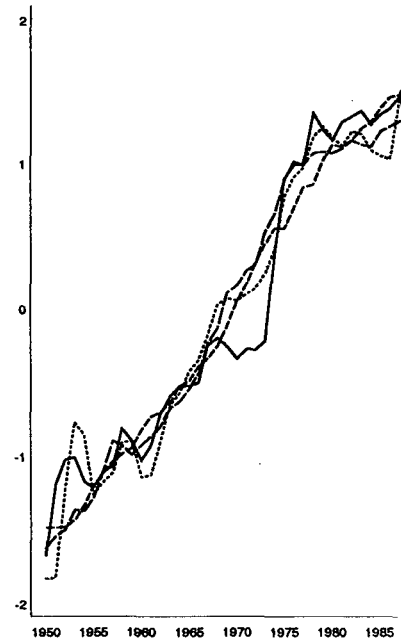
France



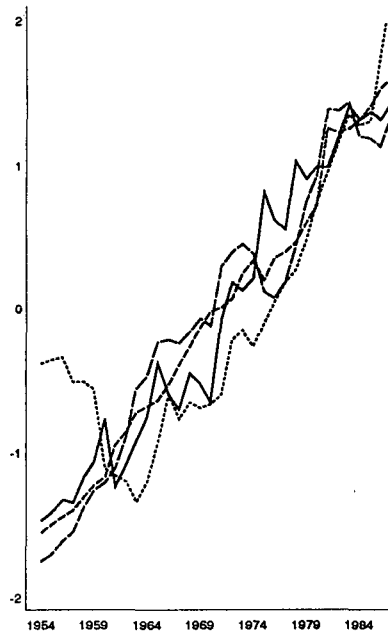
Germany



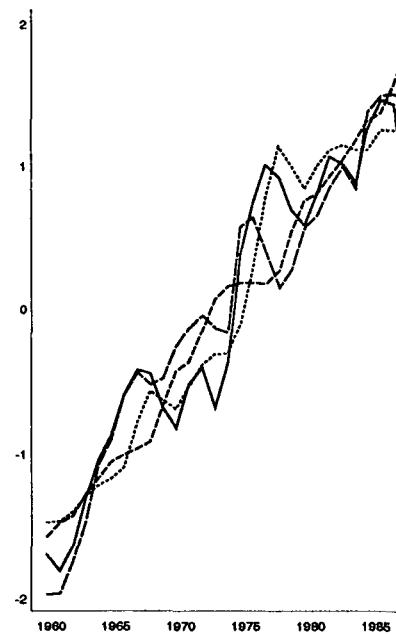
Austria



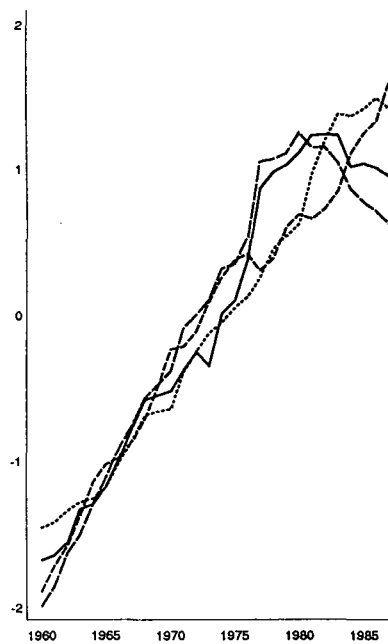
Italy



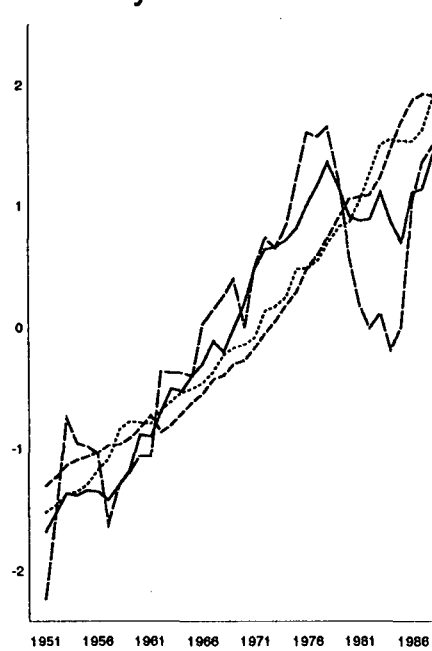
Finland



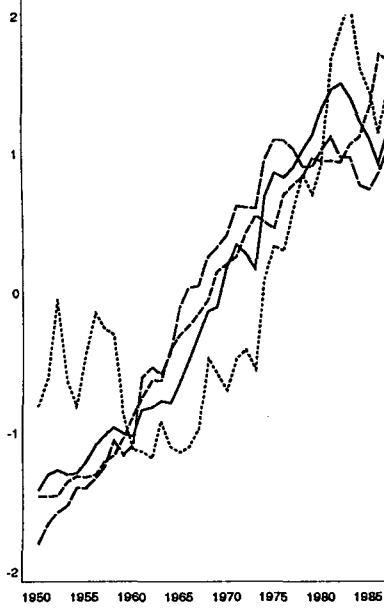
Sweden



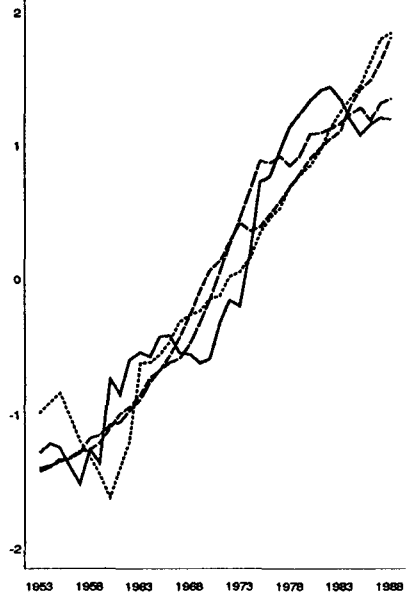
Norway



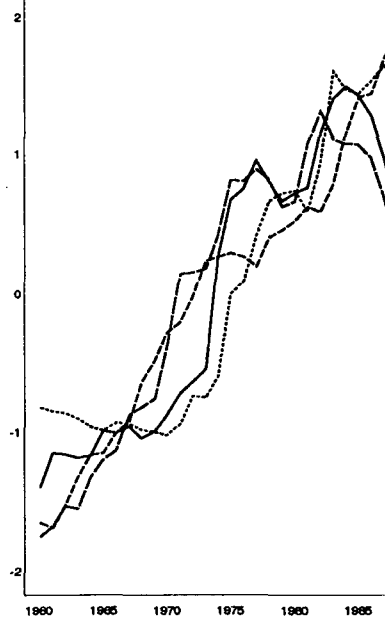
Denmark



Japan

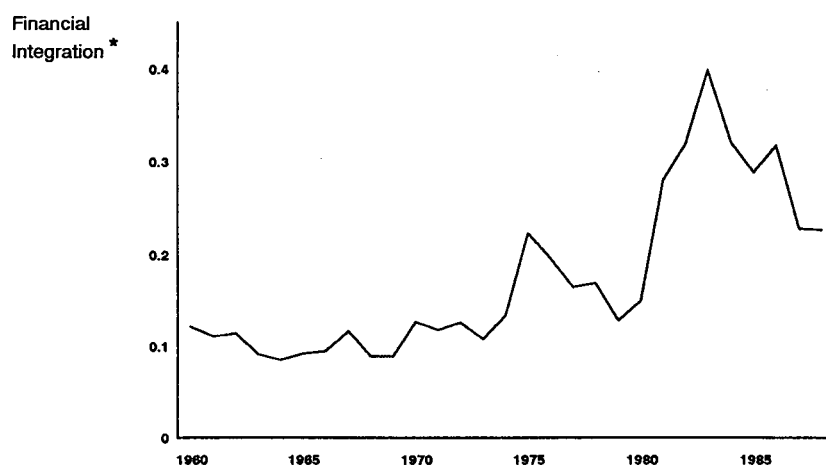


Australia



**Figure 2**

**The Growth in the Level of  
International Financial Integration**



\* -- Financial integration measure is based on the divergence between private domestic savings and private domestic investment.  
Average annual values for 15 countries.



Figure 3

# The Shifting Center of Political Gravity \*

