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INTERNATIONALISTS, REGIONALISTS, OR EUROCENTRISTS

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Abstract. The paper classifies small open economies in Europe into three categories. First, countries moving primarily in line with international fluctuations. Second, countries responding mainly to shocks at the EU level, and third, countries where fluctuations can be attributed essentially to domestic shocks. A variance decomposition of residuals from a Structural Vector Autoregression model is used for this classification. The results allow an assessment of the degree of real integration in Europe and of the benefits and costs from further steps of integration.

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1. INTRODUCTION

More and more countries join regional or international economic institutions fostering international trade. Most prominent are the 'European Economic Area' and the 'North American Free Trade Area'. Besides the more long term oriented issue of free trade and its consequences for domestic economic variables, there is another more short and medium term related source of interdependence among economies: international business cycle fluctuations and the associated problems of macroeconomic policy coordination among leading industrial economies. These co-movements can be attributed to two different sources:

(1) common shocks affecting all members of an integrated area at the same time. Well known examples are the oil shocks of the 70's and 80's, or the break down of the Bretton Woods agreement.

(2) interdependence of economies due to trade patterns, capital transactions, or common economic policy regimes. In this case a shock in one country has an impact on economic variables of another country through some kind of transmission mechanism. Of course the magnitude of interdependence is determined by the size of the country and its degree of openness.

Whereas much work deals with the cyclical behavior of national output data, particularly in the USA, or with common factors in the cyclical variation among the world's leading economies, little empirical work has been carried out in the field of international business cycles and small open economies. Within the tradition of real business cycle models Christodoulakis et al. (1995) correlate residuals from Hodrick-Prescott filtered series for members of the European Union as of 1960-1990. They conclude that the auto- and cross-correlations between macroeconomic variables are quite similar and differences among countries are mostly attributable to economic policy oriented variables. Another example is provided by Canova and Dellas (1993) who concentrate on interdependence through the transmission channel in a larger set of countries, including small open economies like Austria and Sweden. The authors conclude that contributions from trade interdependence to a common cycle were greater before 1973 as compared to more recent years. This result is attributed to common shocks like the change in the international monetary system and several oil shocks in the second half of the data set.

Some other work by Bayoumi (1992) and Bayoumi and Eichengreen (1992a,b) is related to the literature on optimal currency areas, and uses the idea of permanent and transitory fluctuations in output brought forward by Blanchard and Quah (1989). In bivariate Vector Autoregressive (VAR) models an individual country's output series is decomposed into transitory and permanent shocks. After estimating correlations between these shocks in European countries, Bayoumi and Eichengreen conclude that Europe is not very well fitted for a common currency union, because countries are mainly exposed to asymmetric shocks. Although this bivariate approach is appealing, it ignores a very distinct feature of European economies, namely the high degree of openness and dynamic interdependence. Although shocks across European regions might be asymmetric, dynamic interdependence may create a common business cycle. Moreover, by ignoring international economic variables, Bayoumi and Eichengreen leave out a major source for common factors.

In a study by Norrbin and Schlagenhauf (1990) international fluctuations are explicitly included into the model for decomposing fluctuations of industrial output for several European countries into international, industry specific, and national shocks. The main result of their study is that national disturbances are by far the most important source of influence. Formby, Norrbin and Sakano (1992) extend this analysis to output data from five EU members, Canada, Japan, and the USA, and arrive at the result, that at least Belgium, the Netherlands, Germany, the United Kingdom, and since 1973, France appear to be more responsive to international and industry specific fluctuations as compared to non-EU members.

The aim of this paper is to integrate the idea of international economic fluctuations and the approach of decomposing domestic fluctuations into permanent and transitory components for small open economies in Europe. In this sense the paper is in the same tradition as Ahmed et al. (1993) but restricts the number of identified shocks to four. The introduction of short and long run restrictions makes it possible to identify two kinds of real foreign shocks as well as one transitory and one permanent domestic shock for each country. Foreign shocks will be associated either with unexpected changes in OECD-output or with unexpected fluctuations in EU-output. Variance decompositions then allow for an assessment whether domestic, OECD- or EU-fluctuations dominate the cyclical behavior of a particular country over different stages of the business cycle. According to the dominance of a specific type of shock in the transmission mechanism, a grouping of small open economies in Europe can be established: Internationalists are those countries most strongly reacting to shocks at the OECD level, Eurocentrists are mainly responding to shocks at the European level, and finally Regionalists are dominated by local shocks.

Specifically the project of a European Monetary Union raises several questions about the economic costs of a single common monetary policy for otherwise substantially different countries. Moreover, it is interesting to find out whether the new EU-members: Austria, Finland, and Sweden show a high degree of integration at the macroeconomic level. The results also have direct implications for the conduct of stabilization policy in Europe. The more integrated a country is at the EU-level, the more it will benefit from European policy coordination based on a more equal distribution of decision power. On the other hand, if the main origin of real disturbances is local, an independent national economic policy is preferable. Although the European Economic Area facilitates consumption smoothing by spilling over expansions and contractions to other member countries, the restrictions from a common monetary policy might turn out to be costly.

The paper is organized as follows. First, I will present a model for a small open economy with nominal rigidities which provides a simple propagation mechanism for exogenous variables and allows for a distinction of shocks according to their long run impact and to their origin. Section 3 provides the identification for the structural VAR system and sections 4 and 5 contain a description of the estimation procedure and the empirical results, respectively. The paper ends with conclusions on the extent of real economic integration and its consequences for economic policy decision making.

2. THE MODEL

The following model is a straightforward extension of Fischer (1977) and Blanchard and Quah (1989) to a small open economy (SOE) framework and motivates the choice of variables included in the VAR model and the identification of underlying structural shocks. It is a traditional Keynesian model allowing for short term deviations in output from potential, due to wage rigidities. The integration of the economy into international markets is achieved by adding foreign absorption and a variable indicating international competitiveness to the demand function as well as external price factors to the pricing rule. SOEs are defined by their one-sided dependence on international macroeconomic conditions like output, interest rate, or price fluctuations. This characteristic makes foreign variables exogenous to domestic activities and facilitates modeling. The following model reflects this reasoning:

$$Y_t^d = M_t - P_t + a\theta_t + bY_t^* + d(E_t + P_t^* - P_t) \tag{2.1}$$

$$Y_t^s = N_t + \theta_t \tag{2.2}$$

$$P_t = W_t - \theta_t + g(E_t + P_T^*) \tag{2.3}$$

$$W_t = W| \left[N_t^e = \bar{N} \right] . \tag{2.4}$$

The first equation relates the log of real aggregate demand Y_t^d to a mixture of domestic and international variables. The log of real money balances $(M_t - P_t)$, the level of productivity θ_t, the log of foreign output Y_t^*, and the real exchange rate $(E_t + P_t^* - P_t)$. An intuitive interpretation would combine a Clower constraint and a relation for net exports, depending on foreign absorption and the relative price of foreign to domestic goods. Positive changes in any of the arguments of the aggregate demand function are associated with an increase in output. For example a devaluation of the domestic currency $(\Delta E_t > 0)$ will improve international competitiveness and therefore also net exports $(d > 0)$. A rise in foreign income generates a demand pull and results in higher demand for domestic products $(b > 0)$. The direct effect of productivity on aggregate demand can be motivated either by investment spending, reacting positively on improved marginal productivity, or by consumption spending responding to an increase in permanent income perspectives

$(a > 0)$.

Equation (2.2) is a simple production function relating aggregate supply Y_t^s to labor input N_t, the only production factor, through a constant returns to scale technology. The development of labor productivity over time is specified by an independent process for technology θ_t which is also present in the demand function.

The price setting behavior is described in equation (2.3) and follows an approach suggested by Dornbusch (1987). Even in SOEs some goods must be regarded as nontradable. Therefore the aggregate price level P_t is determined by a combination of domestic and international factors. Domestic wages W_t, corrected for changes in productivity θ_t, form the basis of the price setting decision. The responsiveness of domestic prices to international competition is given by the parameter g which can be interpreted as the share of tradables in output. According to the law of one price, domestic prices of tradables should be tied to the foreign price level P_t^* and the nominal exchange rate E_t.

The last equation (2.4) introduces nominal rigidities into the model. Nominal wages W_t are set one period in advance such that expected employment N_t^e is equal to full employment $\bar{N}$. The model is closed by assuming that the processes determining exogenous variables follow random walks:

$$M_t = M_{t-1} + \epsilon_t^m \tag{2.5}$$

$$\theta_t = \theta_{t-1} + \epsilon_t^\theta \tag{2.6}$$

$$(E_t + P_t^*) = (E_{t-1} + P_{t-1}^*) + \epsilon_t^r \tag{2.7}$$

$$Y_t^* = Y_{t-1}^* + \epsilon_t^* \quad , \tag{2.8}$$

where $\epsilon_t^m, \epsilon_t^\theta, \epsilon_t^r$, and ϵ_t^* are serially uncorrelated orthogonal shocks. These underlying structural disturbances form the base for the reduced form solution for output growth ΔY_t and inflation ΔP_t:

$$\Delta Y_t = \Delta\epsilon_t^m + (d - g - dg)\Delta\epsilon_t^r + b\Delta\epsilon_t^* + (a + d)\Delta\epsilon_t^\theta + \epsilon_t^\theta \tag{2.9}$$

$$\Delta P_t = \frac{1}{1+d}\left(\epsilon_{t-1}^m + (g + dg)\Delta\epsilon_t^r + d\epsilon_{t-1}^r\right) - \frac{a+d}{1+d}\Delta\epsilon_t^\theta - \frac{1-a}{1+d}\epsilon_t^\theta + \frac{b}{1+d}\epsilon_t^* \quad . \tag{2.10}$$

Provided that the price effect of foreign nominal shocks is sufficiently small relative to quantity effects, i.e. g is small relative to d, the reduced form reflects the positive relation of output growth to all of the underlying shocks. The ambiguous sign for foreign nominal shocks is a well known fact already put forward in favor of optimum currency areas by McKinnon (1963). Figure 1 provides an illustration of the reduced form coefficient for varying values of d and g. For SOEs with a high share of tradable goods, a devaluation will have a negative effect on the real purchasing power of households which might outweigh the positive effect on aggregate demand resulting from improved international competitiveness. In the model the reduction of real balances through increasing prices incorporates this transmission mechanism.

Inflation, on the other hand, increases with positive real foreign shocks, unexpected improvements in competitiveness, and money surprises. Positive domestic productivity shocks will have a dampening effect on inflation. The long term solution of the system shows that only domestic productivity shocks have a permanent effect on the level of output, all other shocks cancel within the next period due to the adjustment in wages to the level compatible with full employment[1]. The price level

[1]It would be possible to achieve permanent effects from transitory shocks if the

on the other hand is permanently affected by all of the shocks in the system, although domestic money shocks have a delayed effect on the inflation rate.

Another interesting relation can be derived when solving the model for the unemployment rate $U = \bar{N} - N_t$:

$$U_t = -\epsilon_t^m - (d - g - dg)\Delta\epsilon_t^r - (a + d)\epsilon_t^\theta - b\epsilon_t^*,$$

which reacts negatively to all shocks, provided the price effect of a devaluation is sufficiently small. For the following empirical analysis the reduced form for output growth and inflation will be used because European unemployment rates show strong hysteresis symptoms and therefore do not provide the stationary cyclical indicator needed for a successful application of the Blanchard and Quah decomposition. In the following section we will use the long run implication of transitory and permanent shocks along with exogeneity assumptions to impose a set of short and long run restrictions in a structural VAR.

3. Identification

In the model (2.1-2.4) output fluctuations in SOEs are attributed to domestic changes of total factor productivity, to unexpected changes in money supply, foreign prices denominated in domestic currency, and to variations in foreign absorption. This reasoning suggests that the

production function were to include capital. In this sense (2.2) represents a short run supply curve with fixed capital stock. There is no relation between real foreign shocks ϵ_t^* and investment spending. Introducing such a link would create export led growth because the transitory shock would have an impact on a stock variable. Moreover, since foreign productivity follows a random walk process, the foreign output level is nonstationary and thereby generates a permanent demand pull. The following results do not depend on the reliance on the short term supply function. More complicated dynamics in the reduced form can be achieved by longer duration of wage contracts, e.g. Taylor (1980).

output series of a specific country is composed of a deterministic part which specifies the transmission mechanism and a stochastic part that comprises permanent as well as transitory shocks.

The discussion in the previous section offers a reduced form for the SOE including two variables: domestic output growth and inflation. Particularly interesting for the analysis of international business cycle relations are indicators measuring the development of foreign absorption. Because the focus of interest is, whether SOEs in Europe are more integrated globally relative to the EU level, it is necessary to split foreign absorption into EU and the rest of the OECD output. To avoid any problems from multicollinearity the analyzed country will always be removed from the corresponding international aggregate. The rest of the OECD comprises big economies like Australia, Japan, and the USA. Under these assumptions the vector of endogenous variables, x_t, includes growth rates in the rest of the OECD output, y_t^o, EU output, y_t^e, and domestic output y_t. The last equation of the system determines the domestic inflation rate p_t. The remainder of this section will discuss identifying assumptions for the structural VAR. As Cooley and Leroy (1985) emphasized, the step from reduced form analysis to economic interpretation in terms of underlying disturbances needs identifying structural assumptions.

A VAR system can be thought of as linear approximation to the true data generating process, containing lagged information of all the variables included into the vector of endogenous variables. The dimension m of x_t is the number of variables in the system, and in our model x_t is a (4×1) vector. The values of x_t are completely determined by lagged values x_{t-i}, associated coefficient matrices Φ_i of dimension (4×4), and a (4×1) vector of errors u_t:

$$x_t = \Phi_1 x_{t-1} + \ldots \Phi_p x_{t-p} + u_t$$
$$= \sum_{i=1}^{p} \Phi_i x_{t-i} + u_t \qquad (3.1)$$

where p indicates the order of the autoregressive process. The error vector u_t is assumed to be a mean-zero, serially uncorrelated, unobservable vector of random variables with covariance matrix $E(u_t u_t') = \Sigma_u$, in general not diagonal. Associated with the reduced form (3.1) is a structural form with uncorrelated structural innovations $\epsilon_t = Au_t$

$$Ax_t = A \sum_{i=1}^{p} \Phi_i x_{t-i} + \epsilon_t \quad , \qquad (3.2)$$

where A is a $(m \times m)$ matrix of structural coefficients. The matrix A is a decomposition of the covariance matrix $A^{-1}A^{-1'} = \Sigma_u$ such that the covariance matrix of the structural innovations Σ_ϵ is diagonalized. Thus the disturbances ϵ_t in (3.2) are serially, and more importantly contemporaneously uncorrelated and represent orthogonalized innovations. To facilitate the interpretation of these disturbances the matrix A must be a unique decomposition of the covariance matrix of the errors from (3.1). The covariance matrix contains $m(m+1)/2$ distinct elements and because the diagonal of Σ_ϵ already contains m unknown elements, one can only estimate $m(m-1)/2 = 6$ unknown structural parameters in A. The rest of the elements must be restricted a priori, by assuming ones on the diagonal and imposing zero or other restrictions on off diagonal elements.

Because all countries in the sample are SOEs it is natural to assume that there will be no contemporaneous effect running from domestic output and price movements to OECD or EU output. Therefore zero restrictions are imposed on the coefficient matrices Φ_i in the VAR and the corresponding elements in the structural matrix A. This results in a recursive ordering of the variables where foreign output variables are at the top and domestic variables at the bottom of x_t.

Both domestic variables are assumed to depend on fluctuations in OECD and EU output. Given the remaining information from (2.9) and (2.10), we know that domestic variables can be decomposed into transitory innovations ϵ_t^m, and permanent innovations ϵ_t^θ. To identify these innovations the decomposition technique suggested by Blanchard and Quah (1989) is applied, and a long run restriction on the matrix A is imposed. If a shock to the economy is transitory, its effect on output must vanish in the long run, i.e. the sum of dynamic multipliers must converge to zero as the forecast horizon approaches infinity. A more formal description uses the Wold-decomposition or Moving Average representation for x_t. Assuming that x_t follows a stationary process it is possible to rewrite (3.2) as

$$\begin{aligned} x_t &= \Psi_1 \epsilon_{t-1} + \Psi_2 \epsilon_{t-2} + \dots \\ &= \sum_{i=1}^{\infty} \Psi_i \epsilon_{t-i} \quad . \end{aligned} \tag{3.3}$$

where Ψ_i are structural moving average coefficient matrices or, equivalently, the dynamic multipliers. The implication of a zero long run effect on domestic output is then:

$$\sum_{i=0}^{\infty} \psi_i = 0 \quad . \tag{3.4}$$

where ψ_i is the respective element of the structural moving average matrix Ψ_i. Condition (3.4) imposes a restriction on the accumulated effect of a transitory shock on the level of domestic output: it cancels out in the long run. This type of restriction was first used by Blanchard and Quah (1989) to identify supply and demand shocks for US output. Their variables were the change in log output and the level of the unemployment rate. Subsequent work by King et al. (1991), Bayoumi and Eichengreen (1992a.b), Bayoumi (1992), and Ahmed (1993) also employed this type of long run restriction.

The relation between OECD and EU output requires some comment. Presumably there is an interdependence between both blocks but it cannot be estimated because the information contained in the covariance matrix has already been exhausted by the triangular structure of the decomposition matrix. Therefore an additional restriction must be used to determine coefficients. Outside information is available from a comparative study of twelve international macroeconometric models. Bryant et al. (1988) calculate the average response of the US economy to a one percent fiscal expansion in the rest of the OECD. Because the USA counts for more than 50% of the rest of OECD output, it is reasonable to approximate the rest of the OECD-response to a one percent shock in EU output by the average value of 0.22 published in Bryant et al. (1988) table G of the supplement volume. The response of EU output to a shock in the rest of the OECD will be estimated with no restriction.

The previous discussion gives rise to an almost triangular system with six estimated parameters, four elements in A restricted to zero, one taken from Bryant et al. (1988), and another implied by the long run restriction for transitory shocks:

$$\begin{bmatrix} u^{yo} \\ u^{ye} \\ u^{y} \\ u^{p} \end{bmatrix} = \begin{bmatrix} 1 & 0.22 & 0 & 0 \\ a_{21} & 1 & 0 & 0 \\ a_{31} & a_{32} & 1 & (\sum \psi = 0) \\ a_{41} & a_{42} & a_{43} & 1 \end{bmatrix} \cdot \begin{bmatrix} \epsilon^{o} \\ \epsilon^{e} \\ \epsilon^{\theta} \\ \epsilon^{m} \end{bmatrix}$$

Thus the first entry in the vector of innovations ϵ_t represents innovations to the OECD growth rate, ϵ_t^o, and the second refers to innovations in EU growth rates, ϵ_t^e. The identifying assumptions allow for a unique decomposition of the residuals from the VAR. The residuals from the first and second equation of the VAR are a combination of OECD and EU innovations. The remaining estimated errors u^y and u^p are composed of OECD and EU innovations as well as of domestic permanent, ϵ_t^θ, and transitory, ϵ_t^m, innovations.

4. ESTIMATION

The data used in estimation is annual gross domestic product expressed in 1990 prices and US-Dollars and the corresponding GDP-deflators. The source is OECD National Accounts, Volume 1 and a detailed description of source codes is given in the appendix. The period of estimation is 1961 to 1994. To avoid problems of multicollinearity, EU output is subtracted from total OECD output. Similarly, each individual country's output is subtracted from the corresponding aggregate. To abbreviate notation, henceforth the remainder of OECD and EU output will be referred to as OECD and EU output.

The statistical properties of the data are presented in Table 1 and confirm the presumed order of integration. Two different tests on the long run behavior of all output and price series are conducted. First, the discussion on the productivity slow down in industrialized countries after the first oil shock suggests a search for common deterministic structural breaks. This is done using a Goldfeld and Quandt (1973) test. For the OECD and EU output series a deterministic break in 1974 cannot be rejected at the 5% level. For most of the individual countries' series the structural break happens also to be in 1974. However, some of the small countries experienced a lag of one year[2]. Sweden has a significant break in 1971, and Norway in 1981. By assuming the same break date for all countries in 1974, a large common shock to all countries is removed from the original time series. Deviating breaking dates for individual countries will therefore be interpreted as a domestic shock. In the price series three countries show a deterministic structural break. These are Greece and Portugal in 1973 and 1974 respectively. Both years coincide with the removal of military dictatorship. The third country is Denmark, where a structural break in the price series in 1984 cannot be rejected. This is about one year after a successful stabilization program had been started by the Danish government.

The second series of tests on the nature of long run growth looks for unit roots in the series. Because a deterministic structural break is already established for a part of the series, tests of unit roots should take into account this feature. A procedure developed by Perron (1989) allows for a unit root test under the presence of structural breaks. The results are presented in Table 1 of the appendix. For none of the series the null hypothesis of a unit root can be rejected at the 5% level.

There is one more problem associated with VAR estimation in first differences. If any of the included variables are cointegrated in the sense of Engle and Granger (1987), information about the long run relationship among the variables is lost by taking first differences and misspecification will occur when ignoring the cointegrating term. Given the weak power of cointegration tests in small samples, here a more theoretical approach is employed to argue in favor of lack of cointegration. If e.g. OECD and EU output would be cointegrated, then the long run average share of EU- in OECD-output has to be constant. The same should

[2] In particular Austria, Belgium, and the Netherlands.

hold for the ratios of individual countries' output to OECD and EU totals. For this to be true, two necessary conditions must be fulfilled: all countries must belong to the same regional convergence club and all countries must already be at their steady state output level[3], i.e. all convergence processes among countries must be completed. However, since there was a significant catch up in terms of converging per capita income levels across European regions and countries (Barro and Sala-i-Martin (1995)), the relative position of countries shifted over time and thus output levels cannot be cointegrated. Moreover, long run neutrality of money implies independence between real output and price levels.

Due to the significance of a structural break, pre and post 1974 averages are subtracted from first differences of all output series. This procedure is also applied to the three price series where significant structural breaks have been detected. In line with the small country assumption the coefficients on lagged national income and price variables in the equations for OECD- and EU-output are restricted to zero and the system is estimated using Seemingly Unrelated Regression (SUR), and annual data from 1961 to 1994. The order of the VAR is chosen to be 1, according to both the Akaike and the Hannan and Quinn information criteria. For five countries CUSUM and CUSUM2 tests indicate problems with structural stability of the reduced form equations. These are Norway's, Switzerland's, and Luxembourg's output series and Sweden's and Finland's price deflators. In the case of Norway and Sweden increasing the number of lags to two solved the instability problem but for the remaining countries, shifts in output or price levels, respectively, during the oil shock 1974-75 suggest the use of impulse dummies for growth rates. After introducing such dummies for Luxembourg and Switzerland in 1975

[3]See Durlauf and Johnson (1992) on the concept of regional convergence.

and Finland in 1974 structural stability cannot be rejected at the 5% level.

5. Dynamic Effects of Structural Shocks

In this section the dynamic response of national output series will be characterized by means of variance decomposition. This method allows for assessing the importance of each of the four identified sources of fluctuations in the domestic transmission process. A variance decomposition gives the contribution of each source of innovations to the variance of the h-years ahead forecast error for each variable. Thus it provides an insight into the way how shocks are processed within the economic system, i.e. which type of shock turns out to be an important source of unexpected domestic fluctuations over a period of several years. Since the share of variance explained by a shock is itself a random variable. it is subject to standard errors of estimation. This should be kept in mind when interpreting the results. In the following I will concentrate on the reaction of output in SOEs and Tables 2 to 5 provide the fraction of unexplained variance in domestic output series due to each underlying shock. In order to present an easy overview on the vast amount of numbers, Figures 2 to 9 distinguish between EFTA members as of 1994, and other EU-members, respectively.

OECD shocks are of minor importance for explaining short run fluctuations in both the EU and the EFTA groups. Over forecast horizons of one to four years the contribution of OECD shocks to forecast errors lies between zero and 25%. EU countries are more or less uniformly distributed over this range with Greece and Luxembourg showing the highest shares. Among the EFTA group Sweden shows the biggest reaction to OECD innovations, although the contribution is zero in the first year. In the long run OECD innovations have their biggest impact in Luxembourg and Sweden (23%). Austria, Belgium, and Norway are almost independent of economic fluctuations outside Europe. This picture changes dramatically if the structural break in 1974 in output is not removed from the data. For example short run unexpected output fluctuations in Belgium will then be explained by about 25% by OECD shocks. In the long run approximately 44% of output fluctuations will be explained by OECD shocks. In general the contribution of OECD shocks increases primarily at the expense of domestic permanent shocks and only modestly at that of EU innovations.

EU shocks have a strong but varying impact on the SOEs. Belgium is clearly the most dependent country in the short as well as in the long run. Already in the first year more than 60% of the forecast error is explained by EU innovations. This share increases for the 10 years horizon to more than 70%. Despite the fact that Austria was not an EU-member over the sample period, 40-50% of its unexpected output fluctuations are explained by shocks originating in the EU. Luxembourg, Netherlands, Portugal and Switzerland have about 30 to 40% of their short run forecast errors explained by EU shocks. The Nordic countries, with the exception of Norway, have one fifth of the short term variation explained by EU-shocks; with extended forecast horizon this share declines.

Surprisingly, *transitory shocks* play a negligible role in the determination of output fluctuations. Only for one country, Switzerland, a larger part of unexpected short run output fluctuations is explained by transitory shocks (30%). Notably in Sweden transitory shocks contribute more than 10% to unexpected output variations over the business cycle horizon. For all the other countries this source contributes less than 10%

to the forecast error.

With the exception of Belgium and Switzerland domestic *permanent shocks* are the major source of fluctuations in all countries. Figures 8 and 9 indicate two more groups of countries according to their sensitivity to domestic permanent shocks. The second group is over all forecast horizons highly affected by permanent shocks and comprises Denmark, Greece, Ireland, and Portugal of the EU, as well as Finland and Norway of the EFTA. All of the EU members among this group joined the EU during the first or second round of enlargement. For the longer term horizons Luxembourg joins this group. Specifically Ireland and Norway attract attention with their high dependence on domestic fluctuations. Austria, the Netherlands, and Sweden form the third group with permanent shocks explaining around 50-70% of short run fluctuations, with slightly declining long run importance.

Between 1960 and 1994 three different exchange rate regimes existed in Europe. Up to 1973 the Bretton Woods agreement provided a frame for fixed exchange rates based on the US-Dollar. Between 1973 and 1978 many countries tried to minimize exchange rate fluctuations inside the European Snake and since 1979 the European Monetary System (EMS) provided a more or less successful environment for stable nominal exchange rates. Although CUSUM and CUSUM2 tests indicate structural stability of the estimated equations throughout the sample period, an interesting question with respect to the development after 1979 is: can a tighter integration among participating EU members be discerned after 1979? This question can be answered by splitting the sample into a pre and post 1979.

Results from a variance decomposition of the system for both estimation periods are given in Tables 6 to 13. There are several interesting differences between these two periods. In the period after 1979. *OECD-shocks* tend to explain larger fractions in output variation for Greece. Finland. the Netherlands. and Switzerland (around 20-30 percentage points). In the Danish case OECD-shocks lost their previous importance almost completely and for Sweden the previous dependence declined substantially. Many countries like Austria. Greece. Denmark. Luxembourg, Sweden and particularly Portugal show an increased responsiveness to EU-shocks after 1979 (up by 20-70 percentage points). In contrast to this increased integration into Europe, Finland and Norway appear as the only countries where disintegration from Europe took place in the period after 1979.

The dependence on transitory shocks changes remarkably. Finland and Norway show a distinct decline in the importance of transitory shocks; the same holds for Greece. On the other hand Belgium. Ireland. and Portugal are since 1979 more prone to domestic transitory shocks.

On average the share of *permanent shocks* in forecast errors decreased in all countries. Particularly big reductions are estimated for Denmark, Greece, Luxembourg, the Netherlands, Norway, and Portugal.

5. Conclusions

The integration of small European economies into international business cycle fluctuations can be attributed either to the exposure of countries to the same international shock or to links generated by trade in goods and factors which spill over national disturbances into a trading partner's economy. The results from variance decompositions of structural VAR systems allow for an estimation of the second type of business cycle interdependence. Specifically the decomposition indicates whether a small open economy strongly propagates international developments or whether it is mainly reacting to domestic developments. Furthermore, in light of accelerated European integration it might be of interest to see whether international shocks are originating from within Europe or whether they are coming from the rest of the industrialized countries. Yet another interesting aspect, especially in the context of economic policy, is the exposure to domestic driving forces which can be distinguished according to their long term impact on output.

The results of this study allow for a general assessment of the exposure of small European economies and are in line with previous research. For many countries domestic shocks dominate short and long term unexpected variations in output. Over the business cycle horizon as well as in the long run, countries propagate predominantly domestic shocks of a permanent character. This result could also be attributed to a heavy persistence of inflation and unemployment rates all over Europe, which makes it difficult to disentangle transitory and permanent shocks in the short run.

The results also provide a framework for a classification of countries into Internationalists, Eurocentrists, and Regionalists according to the regional diversity of shocks. Countries with a big share of their unexpected output variation explained by domestic permanent shocks can be classified as Regionalists. These are Denmark, Finland, Greece, Ireland, Norway, and Portugal. Luxembourg and Sweden form an ambiguous pair with the share of permanent shocks varying over time. Whereas in Sweden the share is falling when extending the forecast horizon, it is rising in the case of Luxembourg. Only Belgium and Switzerland respond primarily to foreign disturbances as compared to national shocks and for both countries shocks originating in the European Union are the predominant source of short and long run output variations. Of the remaining countries Austria and the Netherlands show a similarly strong response to European output fluctuations and may therefore be added to the group of Eurocentrists. The impact of output variations outside the European Union is limited to a ratio below 20% for all small economies in Europe. This result leads to the conclusion that Internationalists cannot be identified among small European economies.

Although the estimated models do not show significant structural breaks, a split of the sample into the period before and after the introduction of the European Monetary system in 1979 reveals signs of integration within Europe. Only two countries show a declining proportion of unexpected output variations explained by shocks coming from the European Union area. The Finnish experience after 1979 reflects probably the specific emergence and the break down of trade with the former Soviet Union and in the case of Norway exploitation of oil fields contributed to the diverging development. Another peculiarity of the European economic development in the 90s was the German reunification and the break up of Eastern Europe. Exclusion of the years from 1992 through 1994 from the sample results in a reduction in the amount of European integration for most countries but also eliminates the disintegration of the Finnish economy.

The main conclusion from these findings is that most of the SOEs will benefit greatly from the European Economic Area project because it allows for a more direct transmission of domestic shocks into other member countries. Since domestic permanent shocks are prevalent, higher integration into Europe can reduce the forecast error variance due to domestic shocks. The free movement of goods, services, capital, and labor will facilitate national production and consumption smoothing.

On the other hand Regionalists will face adjustment costs when forced into the constraints of a common monetary policy inside the European Monetary Union. By loosing a policy instrument for quick adjustments to permanent shocks the whole adjustment process must rely on fast responses in real wages and relative prices. Otherwise employment would be acting as the immediate accommodating mechanism. Thus the problem of costs associated with giving up the exchange rate as a policy instrument arises mainly from either a high frequency or a strong propagation of permanent shocks in combination with sticky real wages and relative prices. At least the countries identified as Regionalists must be aware that one of these conditions holds for them.

Another important implication of the grouping arises for diversification strategies of investment portfolios. One may conclude that the single European market project should bring about substantial gains in risk reduction for national investment funds. European diversification strategies are feasible because for many countries domestic permanent shocks form an important part of unexpected output fluctuations. On the other hand restrictions on investment opportunities within the European Economic Area will be most costly for funds located in the Regionalist's group. For investment funds based in Eurocentric countries, the reduction in risk associated with a European portfolio might be outweighed by the additional cost of information collection in European capital markets.

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Appendix

Data Source Codes

output series	OECD National Account Vol. I.
BEL	NA1:BEL"DOLL3GDPE
DNK	NA1:DNK"DOLL3GDPE
GRC	NA1:GRC"DOLL3GDPE
IRL	NA1:IRL"DOLL3GDPE
LUX	NA1:LUX"DOLL3GDPE
NLD	NA1:NLD"DOLL3GDPE
PRT	NA1:PRT"DOLL3GDPE
AUT	NA1:AUT"DOLL3GDPE
CHE	NA1:CHE"DOLL3GDPE
FIN	NA1:FIN"DOLL3GDPE
NOR	NA1:NOR"DOLL3GDPE
SWE	NA1:SWE"DOLL3GDPE
OECD	NA1:TOT"DOLL3GDPE
EU	NA1:EUR"DOLL3GDPE

price series	OECD National Account Vol. I.
BEL	NA1:BEL"IDXPRIGDPE
DNK	NA1:DNK"IDXPRIGDPE
GRC	NA1:GRC"IDXPRIGDPE
IRL	NA1:IRL"IDXPRIGDPE
LUX	NA1:LUX"IDXPRIGDPE
NLD	NA1:NLD"IDXPRIGDPE
PRT	NA1:PRT"IDXPRIGDPE
AUT	NA1:AUT"IDXPRIGDPE
CHE	NA1:CHE"IDXPRIGDPE
FIN	NA1:FIN"IDXPRIGDPE
NOR	NA1:NOR"IDXPRIGDPE
SWE	NA1:SWE"IDXPRIGDPE
OECD	NA1:TOT"IDXPRIGDPE
EU	NA1:EUR"IDXPRIGDPE

TABLE 1

Augmented Dickey-Fuller tests of Unit Roots

for series with a deterministic trend break*

series	$\tilde{\alpha}^{c)}$	$T(\tilde{\alpha}-1)$	$t_{\tilde{\alpha}}$
YO	0.8828	-3.87	-1.88
YE	0.9413	-1.94	-1.09
YAUT	0.9808	-0.63	-0.31
YCHE	0.8598	-4.63	-2.15
YFIN	0.8259	-5.74	-1.34
YNOR	0.7968	-6.70	-1.72
YSWE	0.8897	-3.64	-1.71
YBEL	0.9426	-1.90	-0.93
YDNK	0.8556	-4.77	-1.67
YGRC	1.0215	0.71	0.42
YIRL	0.7709	-7.56	-1.86
YLUX	0.6841	-10.42	-2.58
YNLD	0.9100	-2.97	-1.97
YPRT	0.9229	-2.54	-1.00

series	$\tilde{\alpha}^{c)}$	$T(\tilde{\alpha}-1)$	$t_{\tilde{\alpha}}$
PAUT [b]	0.9259	-2.45	-1.73
PCHE [b]	0.8792	-3.99	-1.90
PFIN [b]	0.9493	-1.67	-1.00
PNOR [b]	0.9496	-1.66	-0.75
PSWE [b]	0.9219	-2.58	-1.87
PBEL [b]	0.9252	-2.47	-1.75
PDNK [a]	0.8776	-4.04	-1.12
PGRC	0.9843	-0.52	-0.77
PIRL [b]	0.9621	-1.25	-0.90
PLUX [b]	0.7535	-8.13	-2.00
PNLD [b]	0.9725	-0.91	-1.06
PPRT	0.9498	-1.66	-2.68

a) $\lambda = .7$

b) no break

c) $\tilde{\alpha}$ is the estimated coefficient on lagged level
T is the sample size

*The model includes constant, trend, dummy, and one lagged correction term. The dummy simulates a changing slope in the trend function. Critical values depend on the ratio of pre-break sample size to total sample size $\lambda = 0.4$ and can be found in Tables V.A and V.B for model B in Perron (1989). The null of a unit root cannot be rejected at the 5% level for all models.

Table 2 - Variance decomposition of output fluctuations: h-step forecast error due to OECD-shocks (Estimation period 1961-94)

step	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	POR
1	0.01	0.01	0.00	0.00	0.00	0.01	0.12	0.09	0.02	0.06	0.04	0.00
2	0.01	0.02	0.07	0.00	0.04	0.01	0.20	0.16	0.05	0.17	0.10	0.06
3	0.01	0.07	0.11	0.00	0.12	0.03	0.19	0.19	0.08	0.20	0.13	0.11
4	0.01	0.11	0.12	0.01	0.18	0.03	0.18	0.20	0.09	0.22	0.15	0.13
5	0.01	0.13	0.13	0.02	0.20	0.04	0.17	0.21	0.10	0.22	0.15	0.14
6	0.02	0.14	0.14	0.02	0.20	0.04	0.17	0.21	0.10	0.23	0.16	0.14
7	0.02	0.15	0.14	0.02	0.20	0.04	0.16	0.21	0.11	0.23	0.16	0.15
8	0.02	0.15	0.14	0.02	0.21	0.05	0.16	0.22	0.11	0.23	0.16	0.15
9	0.02	0.16	0.14	0.02	0.22	0.05	0.16	0.22	0.11	0.23	0.17	0.15
10	0.02	0.16	0.14	0.03	0.23	0.05	0.16	0.22	0.11	0.23	0.17	0.15

Table 3 - Variance decomposition of output fluctuations: h-step forecast error due to EC-shocks (Estimation period 1961-94)

step	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	POR
1	0.41	0.35	0.14	0.02	0.24	0.63	0.21	0.06	0.00	0.42	0.37	0.27
2	0.47	0.51	0.10	0.01	0.21	0.72	0.11	0.06	0.00	0.33	0.40	0.28
3	0.48	0.51	0.07	0.02	0.20	0.72	0.08	0.06	0.00	0.28	0.39	0.27
4	0.48	0.49	0.06	0.02	0.19	0.73	0.07	0.06	0.00	0.25	0.38	0.26
5	0.49	0.47	0.05	0.02	0.18	0.73	0.06	0.06	0.00	0.24	0.38	0.25
6	0.49	0.45	0.04	0.01	0.18	0.73	0.05	0.06	0.00	0.23	0.38	0.25
7	0.49	0.44	0.03	0.01	0.17	0.73	0.04	0.06	0.00	0.22	0.38	0.25
8	0.49	0.43	0.03	0.01	0.17	0.73	0.04	0.06	0.00	0.22	0.38	0.25
9	0.49	0.43	0.03	0.01	0.17	0.73	0.03	0.06	0.00	0.21	0.37	0.24
10	0.49	0.42	0.03	0.01	0.16	0.74	0.03	0.06	0.00	0.21	0.37	0.24

Table 4 - Variance decomposition of output fluctuations: h-step forecast error due to transitory shocks (Estimation period 1961-94)

step	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	POR
1	0.00	0.33	0.03	0.09	0.07	0.03	0.05	0.09	0.01	0.00	0.00	0.01
2	0.00	0.17	0.02	0.08	0.15	0.02	0.04	0.06	0.00	0.00	0.00	0.00
3	0.00	0.10	0.01	0.06	0.15	0.02	0.04	0.04	0.00	0.00	0.00	0.00
4	0.00	0.07	0.01	0.05	0.13	0.01	0.03	0.03	0.00	0.00	0.00	0.00
5	0.00	0.06	0.01	0.04	0.11	0.01	0.03	0.02	0.00	0.00	0.00	0.00
6	0.00	0.05	0.01	0.03	0.10	0.01	0.03	0.02	0.00	0.00	0.00	0.00
7	0.00	0.04	0.01	0.03	0.09	0.01	0.02	0.02	0.00	0.00	0.00	0.00
8	0.00	0.04	0.00	0.02	0.08	0.01	0.02	0.02	0.00	0.00	0.00	0.00
9	0.00	0.03	0.00	0.02	0.07	0.01	0.02	0.01	0.00	0.00	0.00	0.00
10	0.00	0.03	0.00	0.02	0.07	0.01	0.02	0.01	0.00	0.00	0.00	0.00

Table 5 - Variance decomposition of output fluctuations: h-step forecast error due to permanent shocks (Estimation period 1961-94)

step	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	POR
1	0.57	0.31	0.83	0.89	0.69	0.32	0.62	0.76	0.97	0.49	0.58	0.72
2	0.52	0.31	0.81	0.91	0.60	0.25	0.64	0.72	0.94	0.54	0.50	0.65
3	0.51	0.32	0.81	0.91	0.54	0.24	0.68	0.71	0.92	0.58	0.48	0.62
4	0.50	0.33	0.81	0.92	0.51	0.23	0.72	0.71	0.91	0.61	0.47	0.61
5	0.50	0.35	0.82	0.93	0.51	0.22	0.74	0.71	0.90	0.63	0.46	0.61
6	0.50	0.36	0.82	0.93	0.53	0.22	0.76	0.71	0.89	0.64	0.46	0.61
7	0.49	0.37	0.82	0.94	0.54	0.21	0.77	0.71	0.89	0.65	0.46	0.60
8	0.49	0.38	0.82	0.94	0.54	0.21	0.78	0.71	0.89	0.65	0.46	0.60
9	0.49	0.39	0.83	0.95	0.54	0.21	0.79	0.71	0.89	0.66	0.46	0.60
10	0.49	0.39	0.83	0.95	0.54	0.21	0.80	0.71	0.88	0.66	0.46	0.60

Table 6 - Variance decomposition of output fluctuations: h-step forecast error due to OECD-shocks (Estimation period 1961-78)

	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.04	0.02	0.04	0.03	0.49	0.09	0.28	0.13	0.01	0.09	0.01	0.08
2	0.04	0.01	0.03	0.23	0.44	0.07	0.36	0.15	0.04	0.14	0.02	0.19
3	0.04	0.07	0.02	0.19	0.34	0.06	0.38	0.14	0.06	0.17	0.03	0.24
4	0.03	0.11	0.02	0.19	0.25	0.05	0.40	0.15	0.07	0.16	0.04	0.27
5	0.03	0.13	0.01	0.21	0.20	0.05	0.41	0.15	0.07	0.16	0.04	0.29
6	0.03	0.14	0.01	0.20	0.17	0.04	0.42	0.15	0.07	0.15	0.05	0.30
7	0.03	0.16	0.01	0.19	0.15	0.04	0.43	0.15	0.07	0.15	0.05	0.30
8	0.03	0.17	0.01	0.19	0.14	0.04	0.43	0.15	0.07	0.14	0.06	0.31
9	0.03	0.17	0.01	0.19	0.14	0.04	0.44	0.15	0.07	0.14	0.06	0.31
10	0.03	0.18	0.01	0.19	0.13	0.04	0.44	0.15	0.07	0.14	0.06	0.32

Table 7 - Variance decomposition of output fluctuations: h-step forecast error due to EC-shocks (Estimation period 1961-78)

step	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.33	0.55	0.28	0.21	0.22	0.79	0.35	0.03	0.12	0.58	0.45	0.19
2	0.36	0.76	0.37	0.34	0.29	0.82	0.26	0.06	0.10	0.43	0.43	0.12
3	0.36	0.73	0.31	0.37	0.34	0.83	0.23	0.04	0.11	0.33	0.41	0.09
4	0.36	0.70	0.28	0.34	0.33	0.84	0.21	0.04	0.12	0.28	0.40	0.07
5	0.36	0.68	0.26	0.34	0.32	0.84	0.20	0.04	0.12	0.24	0.39	0.06
6	0.36	0.67	0.24	0.36	0.34	0.84	0.18	0.03	0.12	0.22	0.38	0.05
7	0.36	0.66	0.23	0.35	0.36	0.85	0.17	0.03	0.13	0.21	0.37	0.05
8	0.36	0.65	0.22	0.35	0.35	0.85	0.17	0.03	0.13	0.20	0.36	0.04
9	0.36	0.65	0.22	0.35	0.36	0.85	0.16	0.03	0.13	0.19	0.36	0.04
10	0.36	0.64	0.21	0.35	0.36	0.85	0.15	0.03	0.13	0.18	0.36	0.04

Table 8 - Variance decomposition of output fluctuations: h-step forecast error due to transitory shocks (Estimation period 1961-78)

	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.00	0.12	0.16	0.21	0.01	0.00	0.06	0.51	0.00	0.03	0.03	0.03
2	0.00	0.05	0.08	0.12	0.04	0.00	0.05	0.40	0.00	0.01	0.02	0.02
3	0.00	0.03	0.05	0.10	0.05	0.00	0.05	0.32	0.00	0.01	0.02	0.01
4	0.00	0.03	0.04	0.09	0.03	0.00	0.04	0.27	0.00	0.01	0.01	0.01
5	0.00	0.02	0.03	0.08	0.02	0.00	0.03	0.22	0.00	0.00	0.01	0.01
6	0.00	0.02	0.03	0.07	0.02	0.00	0.03	0.19	0.00	0.00	0.01	0.00
7	0.00	0.02	0.02	0.06	0.02	0.00	0.03	0.16	0.00	0.00	0.01	0.00
8	0.00	0.01	0.02	0.06	0.02	0.00	0.02	0.14	0.00	0.00	0.01	0.00
9	0.00	0.01	0.02	0.05	0.01	0.00	0.02	0.13	0.00	0.00	0.01	0.00
10	0.00	0.01	0.02	0.05	0.01	0.00	0.02	0.12	0.00	0.00	0.01	0.00

Table 9 - Variance decomposition of output fluctuations: h-step forecast error due to permanent shocks (Estimation period 1961-78)

	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.62	0.31	0.51	0.55	0.29	0.12	0.31	0.33	0.87	0.30	0.51	0.70
2	0.60	0.18	0.52	0.31	0.23	0.11	0.32	0.40	0.86	0.41	0.53	0.67
3	0.60	0.17	0.61	0.33	0.27	0.11	0.34	0.49	0.83	0.50	0.54	0.66
4	0.60	0.17	0.66	0.37	0.38	0.11	0.35	0.55	0.81	0.55	0.55	0.65
5	0.60	0.17	0.69	0.37	0.45	0.11	0.36	0.59	0.81	0.59	0.56	0.65
6	0.60	0.17	0.72	0.38	0.46	0.11	0.37	0.63	0.80	0.62	0.56	0.65
7	0.60	0.17	0.73	0.39	0.48	0.11	0.37	0.66	0.80	0.64	0.57	0.65
8	0.60	0.17	0.74	0.40	0.49	0.11	0.38	0.68	0.80	0.66	0.57	0.64
9	0.60	0.17	0.75	0.41	0.49	0.11	0.38	0.69	0.80	0.67	0.57	0.64
10	0.60	0.17	0.76	0.41	0.49	0.11	0.38	0.71	0.80	0.68	0.57	0.64

Table 10 - Variance decomposition of output fluctuations: h-step forecast error due to OECD-shocks (Estimation period 1979-94)

	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.02	0.21	0.15	0.07	0.18	0.00	0.03	0.06	0.04	0.15	0.19	0.12
2	0.01	0.31	0.27	0.05	0.28	0.03	0.27	0.32	0.09	0.23	0.23	0.05
3	0.01	0.34	0.29	0.03	0.28	0.03	0.23	0.35	0.11	0.27	0.25	0.08
4	0.01	0.35	0.29	0.02	0.28	0.04	0.18	0.39	0.12	0.28	0.27	0.11
5	0.02	0.35	0.29	0.02	0.28	0.05	0.14	0.40	0.12	0.29	0.28	0.13
6	0.02	0.35	0.29	0.03	0.28	0.05	0.12	0.42	0.12	0.30	0.29	0.15
7	0.02	0.35	0.29	0.03	0.27	0.06	0.10	0.42	0.13	0.31	0.30	0.15
8	0.02	0.36	0.28	0.04	0.27	0.06	0.09	0.43	0.13	0.31	0.30	0.16
9	0.03	0.36	0.28	0.04	0.27	0.06	0.08	0.43	0.13	0.31	0.31	0.16
10	0.03	0.36	0.28	0.04	0.27	0.06	0.07	0.43	0.13	0.31	0.31	0.16

Table 11 - Variance decomposition of output fluctuations: h-step forecast error due to EC-shocks (Estimation period 1979-94)

	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.56	0.41	0.21	0.09	0.60	0.67	0.11	0.09	0.01	0.52	0.49	0.41
2	0.52	0.50	0.10	0.03	0.50	0.74	0.09	0.21	0.02	0.59	0.49	0.55
3	0.50	0.54	0.06	0.02	0.49	0.78	0.19	0.28	0.03	0.60	0.48	0.62
4	0.50	0.56	0.04	0.03	0.47	0.80	0.28	0.31	0.05	0.60	0.47	0.65
5	0.50	0.57	0.03	0.04	0.46	0.81	0.35	0.32	0.06	0.60	0.47	0.66
6	0.51	0.58	0.02	0.05	0.46	0.81	0.40	0.34	0.06	0.60	0.46	0.68
7	0.51	0.58	0.02	0.06	0.45	0.82	0.44	0.34	0.07	0.60	0.46	0.69
8	0.52	0.58	0.02	0.07	0.45	0.82	0.47	0.35	0.08	0.60	0.45	0.70
9	0.53	0.58	0.02	0.08	0.44	0.82	0.49	0.35	0.08	0.60	0.45	0.71
10	0.54	0.59	0.01	0.08	0.44	0.82	0.50	0.36	0.08	0.60	0.45	0.71

Table 12 - Variance decomposition of output fluctuations: h-step forecast error due to transitory shocks (Estimation period 1979-94)

	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.11	0.05	0.01	0.09	0.03	0.25	0.00	0.38	0.19	0.00	0.06	0.39
2	0.10	0.02	0.01	0.06	0.01	0.11	0.00	0.16	0.14	0.00	0.04	0.34
3	0.08	0.01	0.01	0.04	0.01	0.06	0.00	0.10	0.11	0.00	0.02	0.26
4	0.06	0.01	0.00	0.03	0.00	0.04	0.00	0.06	0.08	0.00	0.02	0.21
5	0.05	0.00	0.00	0.02	0.00	0.03	0.00	0.05	0.07	0.00	0.01	0.18
6	0.04	0.00	0.00	0.02	0.00	0.02	0.00	0.04	0.06	0.00	0.01	0.16
7	0.04	0.00	0.00	0.01	0.00	0.02	0.00	0.03	0.05	0.00	0.01	0.15
8	0.04	0.00	0.00	0.01	0.00	0.01	0.00	0.03	0.04	0.00	0.01	0.14
9	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.04	0.00	0.00	0.13
10	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.03	0.00	0.00	0.12

Table 13 - Variance decomposition of output fluctuations: h-step forecast error due to permanent shocks (Estimation period 1979-94)

	AUT	CHE	FIN	NOR	SWE	BEL	DNK	GRC	IRL	LUX	NLD	PRT
1	0.31	0.33	0.63	0.75	0.18	0.07	0.85	0.46	0.76	0.33	0.25	0.07
2	0.37	0.18	0.63	0.86	0.20	0.12	0.64	0.30	0.75	0.18	0.25	0.06
3	0.41	0.12	0.65	0.91	0.23	0.13	0.58	0.27	0.75	0.14	0.24	0.04
4	0.43	0.09	0.66	0.92	0.24	0.13	0.54	0.24	0.75	0.12	0.24	0.03
5	0.43	0.08	0.68	0.92	0.25	0.12	0.50	0.22	0.75	0.10	0.24	0.02
6	0.43	0.07	0.69	0.91	0.26	0.12	0.48	0.21	0.75	0.10	0.24	0.01
7	0.43	0.06	0.69	0.89	0.27	0.11	0.46	0.21	0.76	0.09	0.24	0.01
8	0.42	0.06	0.70	0.88	0.28	0.11	0.45	0.20	0.76	0.09	0.24	0.01
9	0.41	0.06	0.70	0.87	0.28	0.11	0.44	0.20	0.76	0.08	0.24	0.01
10	0.40	0.06	0.70	0.86	0.29	0.11	0.43	0.19	0.76	0.08	0.24	0.01

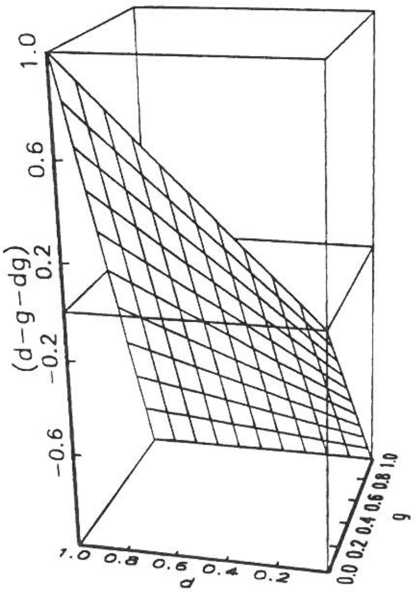

Fig. 1 - Effect of an exchange rate shock on aggregate output for different values of demand (d) and price (g) elasticities

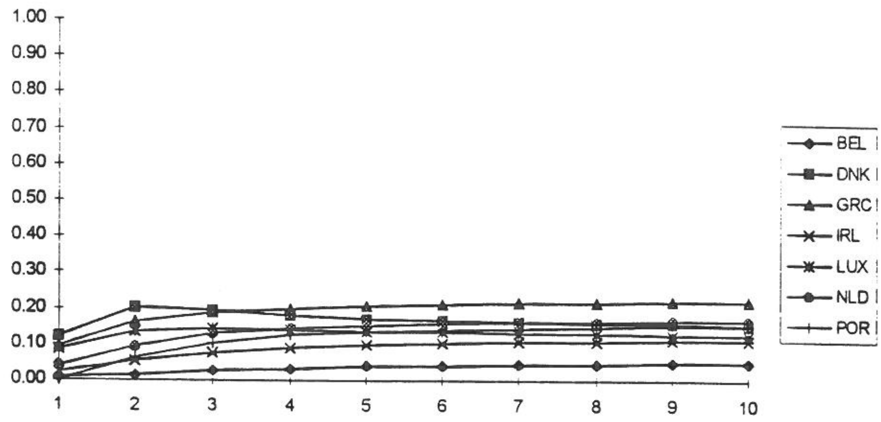

Fig. 2 - EU countries: Variance of output fluctuations explained by OECD-shocks

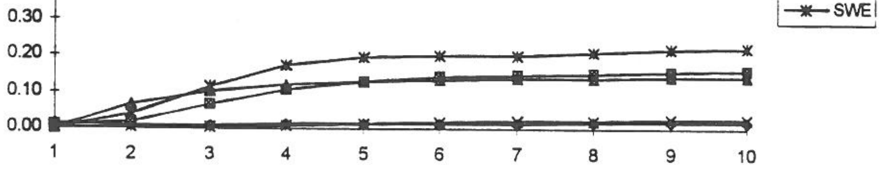

Fig. 3 - EFTA countries: Variance of output fluctuations explained by OECD-shocks

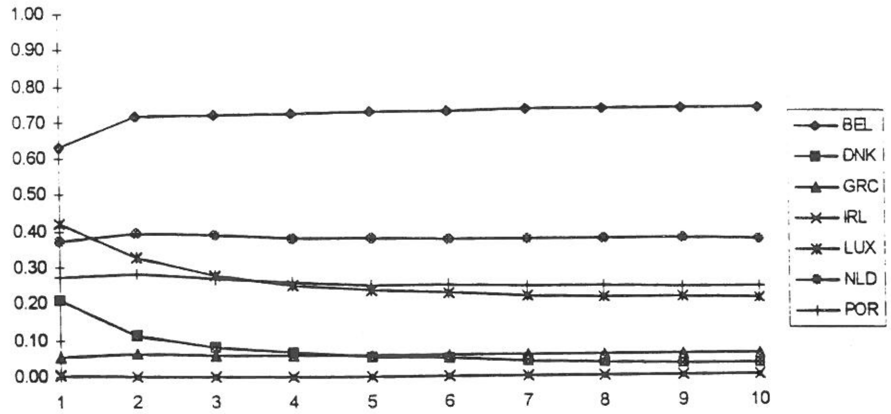

Fig. 4 - EU countries: Variance of output fluctuations explained by EU-shocks

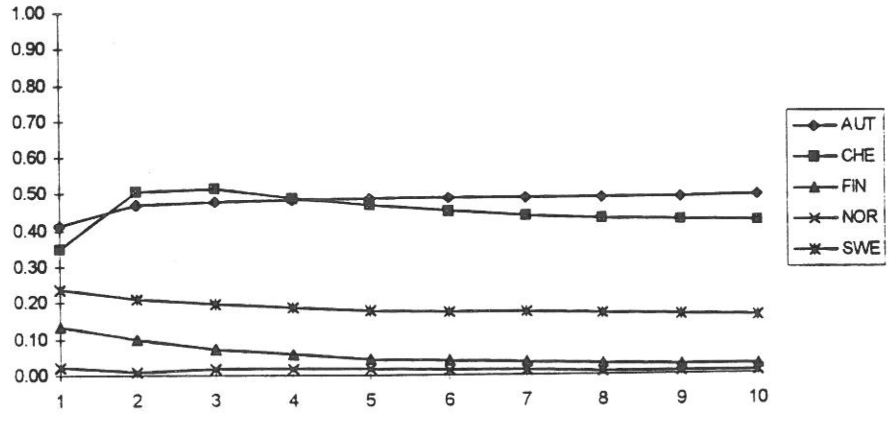

Fig. 5 - EFTA countries: Variance of output fluctuations explained by EU-shocks

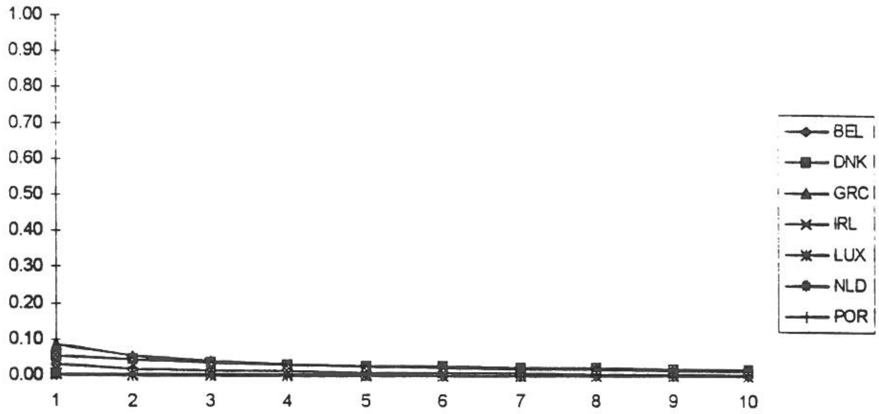

Fig. 6 - EU countries: Variance of output fluctuations explained by transitory shocks

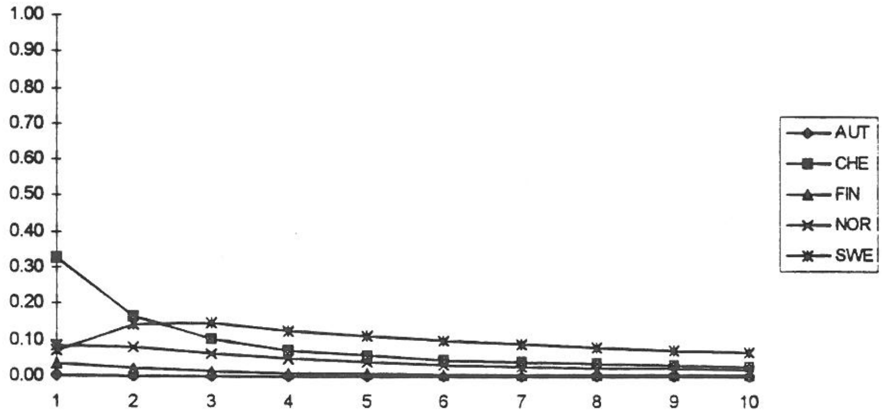

Fig. 7 - EFTA countries: Variance of output fluctuations explained by transitory shocks

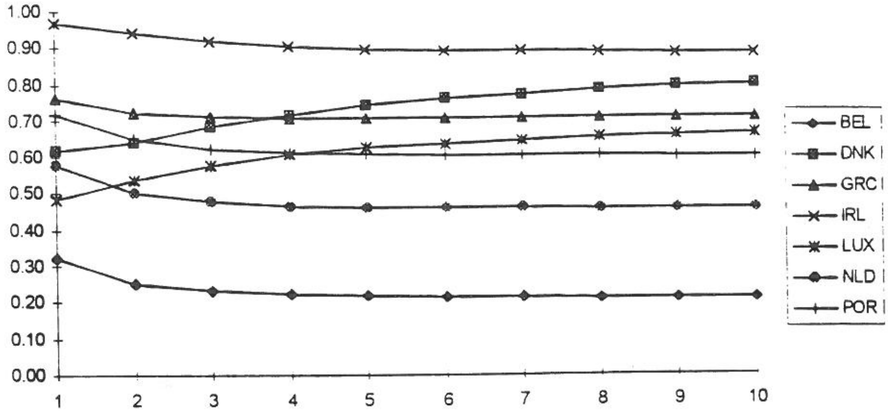

Fig. 8 - EU countries: Variance of output fluctuations explained by permanent shocks

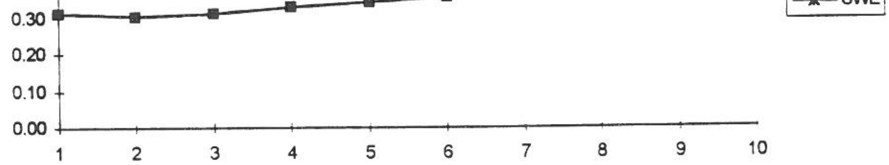

Fig. 9 - EFTA countries: Variance of output fluctuations explained by permanent shocks

INTERNATIONALISTER, REGIONALISTER OCH EUROCENTRIKER

Som en biprodukt av den tilltagande integrationen av de europeiska ekonomierna borde ett större beroende uppkomma mellan de enskilda ländernas fluktuationer. Speciellt kunde man vänta sig att de små öppna ekonomierna blev mer utsatta för internationella konjunktursvängningar. Samvariationen kan då antingen bero på gemensamma chocker som träffar samtliga ekonomier samtidigt eller på kopplingar som framkallats av allt starkare inbördes handelsrelationer, som har som resultat att nationella störningar spiller över till andra länder.

Denna studie estimerar vektorautoregressiva modeller för små öppna ekonomier i Europa. Resultaten av en variansdekomponering av den estimerade modellen mäter ifall en liten öppen ekonomi reagerar starkast på den internationella utvecklingen eller mest bara på inhemska impulser. Vidare kan det var intressant att veta om den accelererande europeiska integrationen medfört att de utifrån kommande chockerna mest är av europeiskt ursprung eller om de kommer från andra industrialiserade ekonomier. Ytterligare en intressant aspekt, särskilt med tanke på den ekonomiska politiken är om de inhemska reaktionsmönstren tyder på långvarig inverkan på produktionen.

För de flesta europeiska små öppna ekonomierna är de inhemska chockerna viktigast i förklaringen av oväntade fluktuationer. Såväl över konjunkturcykeln som på längre sikt reagerar ekonomierna mest på inhemska chocker av permanent karaktär. Sådana länder kunde klassificeras som regionalister. Till den gruppen hör Danmark, Finland, Grekland, Irland, Norge och Portugal. Luxemburg och Sverige bildar ett oklart par, med en stor andel permanenta chocker, men styrkan varierar över tid. Andelen faller för Sveriges del, men ökar för Luxenburgs.

Endast Belgien och Schweiz reagerar mer på utländska impulser än på nationella och för bägge kommer chockerna främst från den Europeiska Unionen, och detta gäller både korta och långfristiga variationer i produktionen. Av de återstående länderna uppvisar också Österrike och Nederländerna starka reaktioner på europeiska impulser och kunde därför även de hänföras till gruppen eurocentriker. Mindre än 20 % av variationerna i de små ländernas produktion kommer från ekonomier utanför den Europeiska Unionen. Konklusionen är att man inte kan hitta internationalister bland de små europeiska ekonomierna.

Det viktigaste resultatet av studien är att de små öppna ekonomierna i Europa kan dra stor nytta av projektet med en europeisk ekonomisk sfär, eftersom en sådan medger mer direkt överföring av inhemska chocker till andra medlemsländer. Eftersom varaktiga inhemska chocker dominerar kan större integration inom Europa minska prognosfel som beror på inhemska chocker. Fri rörlighet då det gäller varor, tjänster, kapital och arbete kommer att underlätta en utjämning av den nationella produktionen och konsumtionen.

Regionalister kommer emellertid att ställas inför anpassningskostnader när de underställs EMU:s penningspolitik, då länderna måste ge upp ett politiskt instrument för snabba åtgärder riktade mot permanenta chocker. Hela anpassningsprocessen måste ju då vila på förändringar i reallöner och -priser, med sysselsättngen som den första adaptorn. Kostnaden för att uppge växelkursen som politikinstrument uppkommer alltså främst som ett resultat antingen av täta eller av starka permanenta chocker i kombination med tröga löner och priser. Regionalisterna måste åtminstone vara medvetna om att minst ett av dessa orsakssamband gäller för deras land.

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