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Sectoral Disturbances, Government Policies, and Industrial Output in Seven European Countries

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ABSTRACT

for

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in Seven European Countries

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This paper investigates the source of disturbances to fluctuations in output by examining whether the fluctuations in industrial production in seven European countries over the past two decades reflects mainly disturbances that - like productivity shocks in an industry - should be common to the industry irrespective of the nations - or disturbances that - like changes in monetary policy or overall tax policy - should be shared by industries within the country but not necessarily by other countries. The paper concludes that after industry-specific disturbances (that are common across countries) are accounted for, the only significant cross-country differences in the growth of industrial production among the seven countries examined here is seasonal. There is no important nonseasonal component to industrial production growth left to be explained by differences across countries in monetary or fiscal policies. Monetary disturbances and price rigidities, fiscal policies, and other factors that differ across countries are apparently not major sources of changes in the growth rate of industrial production; the source of those changes must be sought in industry-specific events.

Sectoral Disturbances, Government Policies, and Industrial Output in Seven European Countries

I. Introduction

Much of macroeconomic analysis is concerned with the effects of changes in national economic policies - monetary, fiscal, or other policies - on aggregate output. Fluctuations in aggregate output are frequently thought to result from changes in national policies. At the same time, most open-economy analyses of the effects of changes in policies imply that the effects at home differ from the effects of the domestic policy changes on foreign countries. Monetary theories of business fluctuations, whether of the "incomplete information" type or the "sticky nominal price or wage" type typically predict that an innovation to the domestic money supply will have an expansionary effect on the domestic economy, while the effect on foreign economies will be smaller or different in character, depending on the precise theory of how money affects real variables. Fiscal policies are also alleged to have different effects at home and abroad "Real business cycle" theories are less clear on this point, since they do not (or at least need not) share a common view on the source of disturbances, except that they are "real." Disturbances that cause changes in aggregate output could include fiscal and regulatory policies of nations. or (what is more common in the models) productivity disturbances that have little to do with national boundaries but are likely to differ across industries.[1]

This paper investigates the source of disturbances to fluctuations in output by examining whether the fluctuations in industrial production in seven European countries over the past two decades reflects mainly disturbances that - like productivity shocks in an industry - should be common to the industry irrespective of the nation - or disturbances that - like changes in monetary policy or overall tax policy - should be shared by industries within the country but not necessarily by other countries. The paper concludes that after industry-specific disturbances (that are common across countries) are accounted for, the only significant cross-country differences in the growth of industrial production among the seven countries examined here is seasonal. There is no important nonseasonal component to industrial production growth left to be explained by differences across countries in monetary or fiscal policies.

Section II presents a simple general equilibrium model to aid in the interpretation of the empirical results. Those results are discussed in Section III. An appendix with all of the (extensive) estimates and the data is available on request.

II. An Interpretive Model

This section of the paper presents a simple model to aid in the interpretation of the empirical results that follow. The model incorporates some special features and is not intended to provide the only economic interpretation of the estimates presented and tests conducted in Section III. Many of the special features and assumptions of the model about to be presented could be relaxed, at the cost of additional complexity, without altering the main result to be investigated empirically.

Consider a world with N countries, indexed by n, and two goods produced by two internationally immobile factors, labor and capital. Supplies of factors are (L^n, K^n) in the n^{th} country. Constant-returns-to-scale production functions are common across countries and are subject to nonstationary multiplicative random productivity shocks that are also common across countries. Both goods are traded internationally in perfectly competitive markets without barriers or transactions costs. Letting superscripts denote countries, subscripts denote industries, and suppressing time subscripts on outputs and the productivity shocks, the production functions are

$$(1) \qquad x_i^n = h_i F_i(L_i^n, K_i^n) \,, \qquad i=1,2 \text{ and } n=1,\ldots,N.$$

In (1), L_i^n and K_i^n are the quantities of labor and capital that are used in the i^{th} industry in nation n, and h_i is the productivity shock to industry i. Implicitly, x_i^n and h_i are indexed by time, t, and (1) holds for all t. The practice of omitting time subscripts will be continued below.

Each period, the random productivity disturbance in each industry is drawn before factors are allocated, so competition and factor mobility imply that

$$(2a) \quad w^n = p_i h_i \, dF_i(L_i^n, K_i^n)/dL_i^n ,$$

$$i=1,2 \quad \text{and} \quad n=1,\ldots,n$$

$$(2b) \quad R^n = p_i h_i \, dF_i(L_i^n, K_i^n)/dK_i^n ,$$

where w^n and R^n are the wage rate and rental rate of capital in nation n.

Labor and capital will be thought of as being fixed in supply in each country and as having three possible uses: production in industry 1, production in industry 2, or "other." The "other" category is intended to allow for the results of various government policies in each nation. In particular, full employment of factors (in a broad sense, given the interpretation about to be given to the category "other") implies that

$$(3) \quad \begin{array}{l} L_1^n + L_2^n + L_o^n(G^n) = L^n, \\ \qquad\qquad\qquad\qquad\qquad n=1,\ldots,N \\ K_1^n + K_2^n + K_o^n(G^n) = K^n, \end{array}$$

where the "other" use of labor and capital, L_o^n and K_o^n (which are nonnegative), are functions of a vector of government policies in nation n, G^n. These other uses of labor and capital may be nonproductive, as when government policies lead to inefficiencies or wasteful rent-seeking. In a simple neoKeynesian model, L_o and K_o can be positive due to insufficient aggregate demand, and government policies G affect the level of aggregate demand. In sticky nominal-wage models, government policies can affect real wages and "employment," L_1+L_2, through the price level. In models based on confusion between relative and nominal prices, L_0 may reflect extra leisure taken when perceived wealth is greater or perceived temporary opportunities are poor. The perceptions of wealth and temporary opportunities are affected by government monetary policies in those models. (The model here abstracts from the utility of leisure, as can be seen below. Adding a separable term in leisure to the utility function should not substantially affect the results.)

For each nation n, (2) and (3) form a system of six equations in w^n, P^n, $L_1{}^n$, $L_2{}^n$, $K_1{}^n$, and $K_2{}^n$. Solutions for these variables can be obtained as functions of $p_2\hbar_2/\hbar_1$, G^n, and L^n and K^n. Substitution of these solutions in (1) gives an expression for output in each industry in each country as a function of the productivity shock of that industry, and of $p_2\hbar_2/\hbar_1$, G^n, L^n and K^n,

$$(4) \quad x_i{}^n = \hbar_i \; F_i\left[L_i{}^n(p_2\hbar_2/\hbar_1, G^n, L^n, K^n), K_i{}^n(p_2\hbar_2/\hbar_1, G^n, L^n, K^n)\right], \quad i=1,2,$$

Taking first differences of logs of (4) gives (for each i and n)

$$d\ln x_i{}^n = \alpha_{1i} d\ln\hbar_i + \alpha_{2i} d\ln(p_2\hbar_2/\hbar_1) + \alpha_{3i} d\ln G^n + \alpha_{4i} d\ln L^n + \alpha_{5i} d\ln K^n.$$

Note that the α coefficients depend on the industry i. Taking means of the coefficients of the last three terms across industries, and writing each coefficient as its mean plus its industry-specific component, one obtains

$$(5)\quad d\ln x_i^n = \alpha_{1i}\, d\ln h_i + \alpha_{2i}\, d\ln(p_2 h_2/h_1) + \alpha_3\, d\ln G^n + \alpha_4\, d\ln L^n + \alpha_5\, d\ln K^n + e_{in}.$$

where $\alpha_3-\alpha_5$ are independent of industry, and e_{in} is a function of both the industry and the nation. The first term on the right hand side of (5) is specific to the industry i but common to nations, and the third, fourth, and fifth terms are specific to nation n but common across industries. The second term involves the industry price, for which demand considerations must be introduced into the model.

Consumers maximize discounted expected utility,

$$(6)\quad E \sum_{t=0}^{\infty} \beta^t\, U^h(x_{1t}^d,\ x_{2t}^d)$$

where x_i^d denotes consumption of good i and the utility function is of the HARA class,

$$(7)\quad U^h(x_1^d,\ x_2^d) = \begin{cases} \displaystyle\sum_{i=1}^{2} \frac{1}{B-1}\,(A_i^h + B\, x_i^d)^{(1-1/\beta)}, & B \neq 0,\ 1 \\ \displaystyle -\sum_{i=1}^{2} A_i^h \exp(-x_i/A_i), & B = 0.\ A_i^h \neq 0 \\ \displaystyle\sum_{i=1}^{2} \ln(A_i^h + x_i^d) & B = 1. \end{cases}$$

and where the superscripts continue to index nation variables and parameters (e.g. the taste parameters A may differ across nations). The discount factor $\beta < 1$ is constant across nations and over time. The HARA utility class, which includes quadratic, logarithmic, and exponential functions as special cases, has convenient aggregation properties that will be useful momentarily, but is not essential. Nor is separability of utility in consumption of the two goods essential.

Maximization of (6) is constrained by the sequence of budget constraints (with the nation superscript suppressed),

$$\text{(8)} \qquad \alpha_t(\delta_t + q_t) - x^d_{1t} - p_{2t}\, x^d_{2t} - \alpha_{t+1} q_t \geq 0$$

for all t, where α_t is the vector of assets the consumer holds at the beginning of period t, δ_t is the vector of dividends or interest paid by these assets at date t, and q_t is the ex-dividend asset price vector. The consumer chooses consumption of each good and an end-of-period asset vector. The relative price of good 2 is p_2.

Necessary conditions for utility maximization include

$$U^h_1(x^d_{1t}, x^d_{1t}) = \lambda^h_t$$

$$\text{(9)} \qquad U^h_2(x^d_{1t}, x^d_{2t}) = \lambda^h_t p_{2t},$$

$$\beta E[\lambda^h_{t+1}(q_{it+1} + \delta_{it+1})/q_{it}] = \lambda^h_t$$

for every state of the world and all t and n, where λ_t^n is the Lagrange multiplier on (8) at date t. With (7), these imply

$$
(10) \quad p_{2t} = \begin{cases} (A_1^n + B \ x_{1t}^n)^{1/B} / (A_2^n + B \ x_{2t}^n)^{1/B}, & B \neq 0 \\ [\exp(x_{1t}^n)]^{1/A_1^n} / [\exp(x_{2t}^n]^{1/A_2^n}, & B = 0,\ A^n \neq 0. \end{cases}
$$

Free trade without taxes or transactions costs implies that all consumers face the same relative price. Equating (10) across all consumers in the world gives

$$
(11) \quad p_{2t} = \begin{cases} (\sum_n A_1^n + B \ \sum_n x_{1t}^n)^{1/B} / (\sum_n A_2^n + B \ \sum_n x_{2t}^n)^{1/B}, & B \neq 0 \\ [\exp(\sum_n x_{1t}^n)]^{1/\sum_n A_1^n} / [\exp(\sum_n x_{2t}^n)]^{1/\sum_n A_2^n}, & B = 0,\ A^n \neq 0, \end{cases}
$$

$$
= \begin{cases} (\bar{A}_1 + B \ \bar{x}_{1t})^{1/B} / (\bar{A}_2 + B \ \bar{x}_{2t})^{1/B}, & B \neq 0 \\ [\exp(\bar{x}_{1t})]^{1/\bar{A}_1} / [\exp(\bar{x}_{2t})]^{1/\bar{A}_2}, & B = 0,\ \bar{A} \neq 0 \end{cases}
$$

where summations are over all consumers in the world, and equilibrium conditions for each good are used in obtaining the second equality, with $\bar{x}_{it}$ defined as the sum of output in industry i, x_i^n, over all nations n.

Equation (11) can be substituted into (5), which is a system of 2N equations (one for each industry output in each nation) and solved for each output in each nation as a function of productivity shocks and government policies. It is clear that, in general, output in each industry in each nation is a function of productivity shocks in all industries and policies in all nations. But with N sufficiently large and with G^n distributed independently across nations and independently of productivity shocks, (11) and (5) show that the effect of government policy in any one nation on the relative price and on industry outputs in other nations is small. Even if N is small and/or the changes in government policies are correlated across nations, the effect of a change in G^n has a different effect in nation n than in other nations because it operates directly through factor employments as well through the price. In the case with a negligible effect of any one nation's government policies on the price, the second term in (5) becomes independent of the nation and dependent only on the industry i. IN the case in which government policies in one nation are correlated with price changes, either because N is not sufficiently large or because government policies are correlated across nations, the second term in (5) includes an indiosyncratic component that depends on both the industry and the nation; this component can be added to the last term in (5), $e_i{}^n$ at each time t. The growth in output in each industry in each nation then consists of an industry component, a nation component, and an idiosyncratic component.

Empirical Results

Quarterly data on indexes of industrial production in ISIC industries 20, 31-38, and 40 (mining; food, beverages, and tobacco; textiles and clothing; wood and wood products; paper and paper products; chemicals and allied products; non-metallic mineral products; basic metals; metal products, machinery and equipment; and utilities) were collected for the period 1964:1 through 1985:2 for seven European countries: Germany, France, Italy, Belgium, the Netherlands, the United Kingdom, and Switzerland. The first difference of the natural log of industrial production, seasonally unadjusted, forms the basic data series examined here. Not all of the data, on all industries for all countries and time periods, were available. Data are from the OECD (supplements to Main Economic Indicators and Indicators of Industrial Activity) supplemented in some places by data from national publications.

The basic equation estimated was

$$\text{(12)} \qquad dlnx(i,n,t) = f(i,t) + g(n,t) + s(n,t) + u(i,n,t)$$

where $x(i,n,t)$ is the output of industry i in nation n at time t. The term $f(i,t)$ is the interaction of a fixed effect (in variance-components terminology) for industry i and a (fixed) time effect; that is, $f(i,t)$ is specific to industry i and time t but common to all nations. $f(i,t)$ is intended to represent disturbances to production functions or to demand that would affect production in all nations. The term $g(n,t)$ is the interaction of a fixed effect for nation n with the time effect; it is intended to represent the effects of nation-specific disturbances such as monetary or fiscal policies that influence output differently in that nation and other nations, or other aggregate disturbances that differ across nations. The term s(n,t) is a fixed seasonal effect (set of seasonal dummmies) that is permitted to differ across nations (a seasonal that differs across industries is unnecessary because of the f(i,t) term). Finally, u(i,n,t) is an idiosyncratic disturbance to industry i in nation n at time t. Estimation of (12) was performed with SAS Proc GLM.

Because of the large number of parameters to be estimated, I was unable to perform all of the estimation simultaneously. The main parameters of interest are the g(n,t) terms, conditional on the other terms. So I first estimated f(i,t) and s(n,t), and used the residuals from that equation to estimate g(n,t). The standard errors reported here have not been corrected for the two-step process, which should overstate the statistical significance of the g(n,t) terms. There are a total of 3865 usable observations after differencing and excluding missing values. There are 85 quarterly observations on 10 industries in 7 countries, which, because of some empty cells (such as no Swiss data on mining), means that there are 1104 parameters to be estimated, leaving 2761 degrees of freedom. Of these parameters, 594 are f(i,t)s or s(i,n)s, and 510 are g(n,t)s. These numbers reflect the fact that 85 of the g(n,t) parameters are linearly dependent with the f(i,t)s. But, with the computer available, I was unable to estimate all 510 of the g(n,t)s at once; the sample had to be divided and estimation performed for part of the sample at a time. This meant that the linear dependency was not exact, so in fact 595 rather than 510 g(n,t) terms were estimated, leaving 2676 degrees of freedom in total.

The estimates of f(i,t) and s(n,t) are given in Table A.1 of the Appendix. The f and s vectors (consisting of all the f(i,t) and the s(i,t)) are each statistically significant at the .0001 level. Table 1 presents F statistics for testing the null hypothesis that f is a zero vector for each of the subsamples estimated. The subsamples consist of (1) the first 1600 observations, (2) the second 1600 observations, and (3) the last 695 observations.

The importance of the f(i,t) component is not surprising. Technical innovations and changes in world demand for each group of products imply changes in the growth rates of output in each industry over time, and the industries differ in their behavior over time. The importance of seasonals that differ across nations is more surprising, given the set of nations studied here. Yet the hypothesis that the seasonal effects differ across countries can be rejected at better than the .0001 level. The seasonals for Germany and Belgium are nearly identical, but this is the only pair of countries with similar seasonal effects, as can be seen from the estimates in Table A.1 of the Appendix. The growth in industrial production falls in all of the countries in the second and third quarters, with particularly strong decreases in France and the Netherlands (which also have particularly strong increases that follow in the fourth quarter). The differences in seasonal patterns across countries may reflect genuine differences in the timing and magnitude of plant closings for vacations or in other differences across countries due to differences in tax and regulatory policies that make it advantageous to alter the timing of production, or differences in the composition of goods within the 2-digit (or in two cases, one-digit) ISIC industries studied here. With a different composition of goods across countries and differences in seasonals for each component, the aggregate seasonals for each 2-digit industry will differ across countries. It is also possible that the differences in seasonals reflect some differences in reporting across countries on the timing of production.

The 510 nation-time interactions, the g(n,t), could not all be estimated at one time. So several methods of splitting the sample were employed. First, Table A.2 in the Appendix reports the results of limiting the form of g(n,t). Rather than estimating a term that is different for each quarter of each year for each country, g was limited to the interaction of (fixed) year effects and nation effects. In other words, $g(n,t_0) = g(n,t_1)$ if t_0 and t_1 are two quarters of the same year. This form of the g(n,t) should differ significantly across nations if annual growth rates of industrial production differ across nations in a way that changes over time because of differences in national policies and in (nonseasonal) nation-specific disturbances. In fact, the estimates in Table A.2 show that the null hypothesis that this limited form of g is zero cannot be rejected at any reasonable significance level: the F statistic (with 154 and 3711 degress of freedom) is only 0.33. Few of the individual coefficients have t-statistics greater than one, and only one (Britain in 1980) has a coefficient with a t-statistic greater than 2. This strongly suggests that country-specific monetary or fiscal policies, or other disturbances, have played little role in fluctuations in the growth of industrial production over 1964-85 in this set of countries.

This conclusion is strengthened by the results in Table 2. The sample was split into four subsamples (observations 1-1000, 1001-2000, 2001-3000, and 3001-3865) for estimation of g(n,t). In each subsample, the hypothesis that there are time-varying (nonseasonal) nation-specific components of the growth of industrial production is rejected at any reasonable significance level.

Out of all the 595 coefficients estimated in the results summarized in Table 2, only 14 had t-statistics greater than 2. Two of these were associated with the fall in output in France in Spring 1968, with the uprising and general strike, and a subsequent rise in output in the third quarter of that year. Six are associated with Italy, in 1965:3, 1969:4, 1970:1, 1973:3, 1980:3, and 1983:3. Five were associated with the UK, where output fell in the first quarters of 1972 and 1974 and rose again in the second quarters of those years, and fell in 1980:1. Finally, one was associated with the Netherlands, in 1980:3.

The nation-time interaction effects were also estimated for samples of consisting of each quarter of the year, with all years included. The results are summarized in Table 3. With one exception, the results strongly support the hypothesis that (outside of seasonals) time-varying nation effects are unimportant for industrial production growth rates in this sample. That exception is the sample of third quarters. There, the hypothesis that the coefficients of the nation-time interaction effect are jointly zero can be rejected at the .031 level. These results mainly reflect eleven data points. These are Italy in 1966, 1973, and the five years 1980-4, France in 1968 (the year of the general strike) and 1980, and Britain in 1968 and 1982. Omitting all eleven of these data points from the sample gives an F statistic (for testing the hypothesis that g=0) of .76, which is in the lower 3% tail of the F(122,662) distribution. The null hypothesis is also not rejected at any reasonable significance level if only Italian data are omitted, or if only the four observations of France in 1968 and 1980, and Britain in 1968 and 1982, are omitted. The point is that any evidence in favor of time-varying nation effects is very sensitive to a few observations, one being a clearly identifiable effect (the French events of May 1968). The large and statistically significant coefficients for Italy in the third quarters of all years starting in 1980, combined with the absence of evidence of large or significant coefficients for Italy in other quarters (and the absence of significant effects for Italy in the Table A.2 results) suggests that the seasonal pattern of production in Italy may have changed over time. Overall, the evidence indicates that, conditional on time-varying industry effects and on seasonal dummies that differ across nations, time-varying nation effects that are common across industries are small and insignificantly different from zero. Once seasonal factors and terms capturing industry-specific disturbances such as productivity shocks are accounted for, there has been practically no difference in industrial production growth rates across nations.

IV. Conclusions

A simple general equilibrium model leads to the result that many aggregate economic policies should have different effects on domestic output than on foreign output. The potential importance of these policies in explaining observed changes in industrial production of seven countries from 1964 through 1985 has been examined with a fixed-effects variance components model that allows interactions between industry effects and time effects, and between nation effects and time effects. The only nation effects that have explanatory power are seasonal dummies that differ across nations. Unless the monetary and fiscal policies of the seven nations involved have been very well coordinated over the past two decades - contrary to the views of most analysts[2] - this evidence indicates that monetary and fiscal policies have played little role in fluctuations in the growth of industrial production. On the other hand, the evidence indicates that there have been significant changes in the growth rates of output in different industries that have been common across countries. Monetary disturbances and price rigidities, fiscal policies, and other factors that differ across countries are apparently not major sources of changes in growth rates of industrial production; the sources of those changes must be sought in industry-specific events.

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TABLE 1

Tests of Industry-Time Interaction Effects: f(i,t)

	observations 1-1600	observations 1601-3200	observations 3201-3865
F statistic to test $H_0: f=0$	3.33	4.28	4.23
d.f. num/den	235/1359	230/1346	101/594
prob > F	.0001	.0001	.0001
R^2	.36	.42	.42

****

TABLE 2

Tests of Nation-Year-Quarter Interaction Effects. g(n,t)

	F-stat for $H_0: g=0$	d.f. num/den	prob > F	R^2
observations 1-1000	0.81	196/798	.9653	.17
observations 1001-2000	0.60	177/817	1.0000	.11
observations 2001-3000	0.71	126/982	.9917	.09
observations 3001-3865	0.54	112/783	1.0000	.07

****

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TABLE 3

Tests of Nation-Year Interactions for Each Quarter

	F statistic for g(n,t)	d.f num/den	prob > F	R^2
sample of first quarters	0.91	147/818	.91	.14
sample of second quarters	0.65	154/835	.65	.11
sample of third quarters	1.26	147/805	.031	.19
sample of fourth quarters	0.58	147/812	.58	.09

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TABLE A.1

Estimates of Industry-Time Interactions Effects, f(i,t)

and Seasonal Dummies that Differ Across Nations, s(n,t)

	variable*		coeff	t-stat
Q	1		-0.042	-4.46
	2		0.064	6.89
	3		-0.031	-3.24
	4		0.032	3.40
Q*NAT	1	1	0.023	1.82
	1	2	0.051	3.97
	1	3	0.051	3.95
	1	4	0.025	1.93
	1	5	0.044	3.38
	1	6	0.045	3.52
	1	7	0.000	.
	2	1	-0.057	-4.50
	2	2	-0.091	-7.13
	2	3	-0.070	-5.50
	2	4	-0.060	-4.71
	2	5	-0.114	-8.94
	2	6	-0.104	-8.16
	2	7	0.000	.
	3	1	-0.062	-4.77
	3	2	-0.148	-11.33
	3	3	-0.067	-5.15
	3	4	-0.061	-4.71
	3	5	-0.096	-7.33
	3	6	-0.045	-3.43
	3	7	0.000	.
	4	1	0.091	7.02
	4	2	0.183	14.04
	4	3	0.089	6.83
	4	4	0.086	6.62
	4	5	0.179	13.73
	4	6	0.089	6.84
	4	7	0.000	.

* Q is quarter, NAT is nation, where Germany = 1, France = 2, Italy = 3, Belgium = 4, the Netherlands = 5, U.K. = 6, and Switzerland = 7.

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TABLE A.2

see notes at end of table

Estimates of Nation-Year Interaction Effects: g(n,t)

YR*NAT				YR*NAT			
64	1	0.0144	0.49	72	1	0.0114	0.53
64	2	-0.0118	-0.40	72	2	0.0116	0.54
64	3	-0.0027	-0.09	72	3	0.0138	0.64
64	4	0.0037	0.13	72	4	0.0092	0.43
64	5	0.0057	0.20	72	5	0.0156	0.72
64	6	-0.0004	-0.01	72	6	0.0072	0.33
64	7	-0.0055	-0.18	72	7	0.0082	0.35
65	1	0.0041	0.17	73	1	0.0002	0.01
65	2	0.0074	0.31	73	2	-0.0004	-0.02
65	3	0.0029	0.12	73	3	0.0120	0.55
65	4	0.0036	0.16	73	4	-0.0002	-0.01
65	5	0.0137	0.58	73	5	0.0079	0.37
65	6	0.0029	0.13	73	6	-0.0012	-0.06
65	7	0.0004	0.02	73	7	0.0068	0.29
66	1	-0.0063	-0.27	74	1	-0.0078	-0.36
66	2	0.0055	0.23	74	2	-0.0130	-0.60
66	3	0.0161	0.68	74	3	-0.0185	-0.86
66	4	-0.0047	-0.20	74	4	-0.0112	-0.52
66	5	0.0093	0.39	74	5	-0.0212	-0.98
66	6	-0.0035	-0.15	74	6	-0.0001	-0.01
66	7	0.0085	0.32	74	7	-0.0167	-0.70
67	1	0.0060	0.26	75	1	-0.0073	-0.34
67	2	0.0055	0.23	75	2	-0.0061	-0.29
67	3	0.0091	0.38	75	3	-0.0065	-0.30
67	4	0.0022	0.09	75	4	-0.0099	-0.46
67	5	0.0163	0.69	75	5	-0.0076	-0.35
67	6	0.0035	0.15	75	6	-0.0093	-0.43
67	7	-0.0014	-0.05	75	7	-0.0046	-0.19
68	1	0.0243	1.02	76	1	0.0079	0.36
68	2	0.0207	0.88	76	2	0.0087	0.40
68	3	0.0103	0.43	76	3	0.0215	0.97
68	4	0.0063	0.27	76	4	0.0086	0.39
68	5	0.0320	1.35	76	5	0.0046	0.21
68	6	0.0063	0.27	76	6	0.0094	0.43
68	7	0.0162	0.61	76	7	-0.0017	-0.07
69	1	0.0218	0.99	77	1	-0.0049	-0.24
69	2	0.0042	0.19	77	2	-0.0099	-0.48
69	3	-0.0116	-0.53	77	3	-0.0245	-1.20
69	4	0.0203	0.92	77	4	-0.0148	-0.73
69	5	0.0244	1.11	77	5	-0.0188	-0.92
69	6	0.0063	0.29	77	6	-0.0147	-0.72
69	7	0.0135	0.56	77	7	0.0051	0.23
70	1	0.0002	0.01	78	1	0.0041	0.21
70	2	0.0078	0.36	78	2	0.0056	0.28
70	3	0.0265	1.22	78	3	0.0129	0.64
70	4	0.0027	0.13	78	4	0.0203	1.02
70	5	0.0115	0.53	78	5	0.0022	0.11
70	6	0.0028	0.13	78	6	0.0106	0.53
70	7	0.0133	0.56	78	7	-0.0093	-0.43
71	1	0.0023	0.11	79	1	0.0034	0.18
71	2	0.0125	0.58	79	2	0.0069	0.35
71	3	-0.0129	-0.60	79	3	0.0079	0.40
71	4	0.0069	0.32	79	4	-0.0046	-0.23
71	5	0.0106	0.49	79	5	-0.0068	-0.35
71	6	0.0039	0.18	79	6	0.0147	0.75
71	7	-0.0053	-0.23	79	7	0.0189	0.89

80	1	-0.0168	-1.00
80	2	-0.0143	-0.86
80	3	-0.0050	-0.30
80	4	-0.0164	-0.98
80	5	-0.0239	-1.41
80	6	-0.0352	-2.10
80	7	-0.0066	-0.38
81	1	-0.0095	-0.56
81	2	0.0008	0.05
81	3	-0.0071	-0.42
81	4	-0.0007	-0.04
81	5	-0.0067	-0.39
81	6	0.0029	0.17
81	7	-0.0023	-0.13
82	1	-0.0232	-1.31
82	2	-0.0146	-0.83
82	3	-0.0245	-1.39
82	4	-0.0111	-0.63
82	5	-0.0284	-1.61
82	6	-0.0015	-0.09
82	7	-0.0233	-1.25
83	1	0.0113	0.64
83	2	-0.0000	-0.00
83	3	0.0021	0.12
83	4	0.0029	0.17
83	5	0.0107	0.61
83	6	0.0083	0.47
83	7	-0.0006	-0.04
84	1	-0.0031	-0.17
84	2	-0.0033	-0.18
84	3	-0.0056	-0.30
84	4	0.0041	0.22
84	5	0.0005	0.03
84	6	-0.0054	-0.29
84	7	0.0078	0.39
85	1	0.0044	0.16
85	2	-0.0095	-0.35
85	3	0.0153	0.56
85	4	0.0006	0.02
85	5	-0.0085	-0.31
85	6	0.0183	0.67
85	7	-0.0053	-0.18

The first columns give the year and the nation, NAT, where Germany = 1, France = 2, Italy = 3, Belgium = 4, the Netherlands = 5, U.K. = 6, and Switzerland = 7. The second column gives the estimated coefficient g(n,t), and the third column gives the associated t-statistic (for testing H_0: g(n,t)=0).

Footnotes

1. The differences between the domestic and foreign effects of changes in government policies occupies a substantial literature. Some of the results are summarized in the papers by Frenkel and Mussa and by Marston in the Handbook of International Economics. Frenkel and Razin (1986) have recently argued that fiscal policies have different domestic and foreign effects.

2. There is a large literature on policy analysis and, more recently, on international policy coordination. A sample of policy analysis that frequently discusses major differences in policies among the seven countries examined here can be found in the annual, World Economic Outlook published by the World Bank. The April 1985 issue, for example, emphasizes major differences in fiscal policy between Germany and the UK on the one hand, and France and Italy on the other hand, over the 1980-85 period.

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