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Financing the Transition of Previously Centrally Planned Economies:
Macroeconomic Effects on Western Europe

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Abstract

Under alternative assumptions on the likely developments in external financing of PCPE transition, and based on a multi-country, forward-looking model that includes a simplified PCPE block, we simulate the response of PCPEs to a transfer of capital from the industrial countries, and assess the potential implications for Western Europe over the next ten years. Real interest rates in Western Europe are likely to experience only mild upward pressure, and most macroeconomic aggregates are likely to change by substantially smaller magnitudes than typical over the business cycle.

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Summary

This paper takes a new look at the macroeconomic implications of the financing of Previously Centrally Planned Economies' (PCPEs') transition, based on a multicountry macroeconomic model extended to include a very stylized PCPE block, and allowing for different assumptions on the sources and uses of the capital flows. Under alternative assumptions of the likely developments in external financing of PCPE transition, the study simulates the response of PCPEs to a transfer of capital from the industrial countries, and assesses the potential implications for Western Europe over the next ten years.

Western European capital markets are likely to experience only a mild squeeze from concerted efforts to provide external financing to PCPEs, and most macroeconomic aggregates are likely to suffer shocks significantly smaller than would be expected from a typical business cycle. The results of the simulation suggest that industrial countries could well afford a significant (perhaps 20-fold) increase in financial assistance to PCPEs, before the impact on their capital markets could induce effects of business-cycle magnitude on economic activity and consumption.

Several reasons underlie these conclusions. First, the flow of capital forthcoming from industrial countries to the economies in transition is likely to be modest compared to industrial countries' saving and investment, even when the most generous estimates of *likely* flows are adjusted upwards toward estimates of *needed* flows. Second, projected outflows must be viewed from an intertemporal perspective, an approach that is more likely to capture other potentially beneficial effects that any flow of capital from the West to the East is likely to generate.



I. Introduction

There is little doubt that the opening-up of the formerly centrally planned economies to the industrial world, and their transformation toward a market-oriented structure, will ultimately have a profound impact on the economies of Western Europe and of the rest of the industrialized world. Large investment opportunities in the East, large flows of world saving into this region, the development of a new market for Western products, the normalization of the flow of primary products (mainly, energy) from the East to the West, and ultimately the emergence of a west-bound flow of manufactured products and saving, are some of the channels through which the transformation of Previously Centrally Planned Economies (PCPEs) may affect the industrial countries.

Despite broadly optimistic views on the long-run effects of the integration of PCPEs into the industrial world, there is a greater diversity of opinions on the potential impact of developments in PCPEs on the industrial countries in the medium term. This diversity, of course, largely reflects uncertainty about the immediate direction and strength of the reform in PCPEs, and in the Former Soviet Union (FSU) in particular. In our view, however, it also reflects the limited effort made to provide a systematic assessment of the impact of that transformation on the economies of Western Europe. 1/

One of the main channels through which reform of PCPEs is likely to affect Western Europe over the medium term--the financing of the transition process--provides a good example of an important issue that has received little systematic treatment. Clearly, the impact of the financing of the transition is likely to depend not only on the size and the duration of the flow, but also--among other things--on whether the flow takes the form of a unilateral transfer or of a loan, and on whether it is expected to finance mainly consumption or investment.

In this paper we take a new look at the macroeconomic implications of the financing of PCPEs' transition, based on a multi-country macroeconomic model extended to include a very stylized PCPE block, and under different assumptions on the sources and uses of the capital flows. Most previous studies of the financing of PCPEs' transition that conjecture a possible shortage of capital in Western Europe have been based on static investment and savings regressions, and back-of-the-envelope measurement of the interest rate impact of a potential capital outflow. These partial equilibrium calculations are likely to miss important transmission mechanisms and intertemporal feedback effects which can only be captured within a unified macroeconomic framework.

Our findings can be summarized by the view that under reasonable (yet, necessarily, imprecise) assumptions on the likely developments in PCPEs over

1/ Giustiniani, Papadia, and Porciani (1992), and IMF (1991, Chapter II) are notable exceptions.

the next ten years, Western European capital markets are likely to experience only a mild squeeze from concerted effort to provide external financing to PCPEs, and most macroeconomic aggregates are likely to change by significantly smaller amounts than would be expected from a typical business cycle. Our results suggest that industrial countries could well afford a significant (perhaps twenty-fold) increase in financial assistance to PCPEs, before the impact on their capital markets could induce effects of business-cycle magnitude on economic activity and consumption.

Several reasons underlie our conclusions. First, the flow of capital forthcoming from industrial countries to PCPEs is likely to be modest compared to industrial countries' saving and investment, even when the most generous estimates of *likely* flows are adjusted upwards toward estimates of *needed* flows. Second, projected outflows must be viewed from an inter-temporal perspective, an approach that is more likely to capture other beneficial effects that east-bound capital flows are likely to generate. For example, if capital flows take the form of loans, the anticipation of the subsequent loan servicing (and, possibly, its restitution) will tend to mitigate its impact on industrial countries' capital markets. On the other hand, if capital flows take the form of grants, the wealth transfer from the West to the East can be expected to trigger a stronger demand feedback for industrial countries' output, which would also mitigate the contractionary effects in industrial countries, at least over the short and medium term. Similarly, to the extent that PCPEs use industrial countries' financing to rebuild their capital stock, these countries are more likely, in time, to repay their loans and possibly become net lenders on world capital markets. The worst possible scenario for industrial countries would be one in which a transfer of funds to PCPEs in the form of grants would be channelled into these countries' higher consumption. Even under these circumstances, we show that the likely impact on the performance of industrial countries and, specifically, of Western Europe, would be well short of dramatic.

II. Financing the Transition of PCPEs: Estimates of Potential Flows

The planned assistance of PCPE modernization by means of increasing capital flows from the industrial world has been one of the crucial policy issues in recent analysis of PCPEs' transition to market economies. The rationale for policies aimed at channelling capital flows toward PCPEs is that despite potentially high average rates of return in these economies, the presence of credit constraints--presumably due to moral hazard and adverse selection problems--limits these countries' access to international capital markets, and therefore their ability to self-finance the transition.

Our analysis does not aim at providing a new set of projections of likely or needed capital flows beyond the numerous estimates already available. Rather, we take stock of the large uncertainty surrounding the ongoing process of reform in PCPEs, and use available estimates to develop scenarios and analyze the consequences of these shocks using a multi-country general equilibrium macro-model, with particular focus on the likely effects on Western Europe. If industrial countries' governments and international

organizations can monitor more efficiently the recipients and their use of this financial flow than individual investors, then there is scope for increasing official external financing of PCPEs without displacing a corresponding amount of private investment.

The investment needs of Eastern Europe have been evaluated in a number of recent studies, using a variety of methodologies. Not surprisingly, the range of estimates varies greatly, not only because of uncertainty on the value of the existing capital stock, the projected pace of reform, and the speed of economic recovery, but also because of differences in the basic approach to projecting capital flows. Two main approaches have been taken in the literature: a *need-based* approach, and a *source-based* approach. 1/

Need-based estimates of capital flows to PCPEs are usually derived in a two-step procedure. First, estimates of the existing capital stock in transition economies are formed, often based on estimates of investment flows in recent years, corrected by a one-time depreciation charge that reflects the poor quality of the capital stock inherited from the pre-reform regime. Then, based either on assumed rates of catch-up of these countries' capital/labor ratios to those prevailing in industrial countries, or on assumed paths for income growth (and on the implied capital requirements), need-based estimates of capital flows to PCPEs have been obtained by subtracting estimates of existing capital stocks and of domestic saving from the target path of the capital stock. 2/ In general, need-based estimates tend to lie at the highest end of the spectrum of projected capital inflows, and tend to produce implausibly large forecasts of investment rates over GDP (often estimated to be as large as 40 percent). Typically, this is due to the assumptions that most of the region's investment must be financed externally and that the catch-up with the production structure prevailing in the West will be relatively rapid. 3/

An alternative approach has been based on determining possible *sources* of financial flows over the short and medium term, including international institutions, governments, and private financial institutions. These estimates account, to a certain extent, for differences in the degree of

1/ See Collins and Rodrik (1991) for further discussion.

2/ See, for instance, CEPR (1990) and U.S. Congressional Budget Office (1990) for examples (and criticism) of this methodology. The estimates are crude not only because of the lack of reliable information on past investment and on its productivity, and of the arbitrariness of the assumed catch-up process, but also because they are not independent of variables (such as output and interest rates) which are endogenous to the transfer.

3/ To be fair, few of the studies that have constructed need-based estimates of projected capital flows to PCPEs interpret such estimates as projections of likely flows. Rather, these studies are usually aimed at highlighting a difficult trade-off, whereby the exceedingly high capital flow needed to assure rapid convergence of PCPEs to an industrial production structure cannot possibly be accommodated within industrial countries' capital markets.

creditworthiness of various destination countries, and sometimes incorporate direct surveys of private investors (see, for instance, Collins and Rodrik (1991)). In a similar vein, likely flows of capital to PCPEs have also been estimated by comparison with other episodes of international assistance, such as the "Marshall Plan" of the Post-World War II period. That calculation is based on the assumption of similar absolute flows to those recorded after World War II (after adjusting for inflation), or similar ratios of grants to donors' or recipients' GDP, etc. (see, for instance, Collins and Rodrik (1991)).

Table 1 provides a summary of estimates of annual capital flows to PCPEs over the next few years, obtained using the two basic methodologies discussed above. Some of these estimates were formulated in the early stages of the transition, and probably did not recognize the significant progress achieved by countries such as Poland and the Czech Republic, but likely incorporated a more optimistic projection of progress in the FSU.

Table 1 reveals the significant difference between need-based estimates and source-based estimates of capital flows to PCPEs. Source-based estimates typically fall between zero and \$70 billion a year (for all PCPEs), while need-based estimates typically range from a few hundred billion dollars to more than \$1 trillion each year. In our simulations, we shall consider two alternatives: in one scenario, we project a flow of \$70 billion a year for ten years from industrial countries to PCPEs, beginning in 1994; in another scenario, we project a flow of \$250 billion a year for the same period. The first figure corresponds to the highest source-based estimate available in the literature surveyed in Table 1, and is equivalent to about 0.3 percent of OECD GDP in 1993; the second figure ranks in the low range of need-based estimates, and is equivalent to about 1 percent of OECD GDP in 1993. We (and most observers) would regard both figures (especially the latter) as exceedingly high estimates of forthcoming flows of external (exogenous) financing to PCPEs, obtained by correcting *likely* flows upward with a measure of *needed* flows. To place these figure in perspective, consider that IMF (1994) estimates that lending, debt relief and other financial assistance from international financial institutions, OECD governments, and other private sources has averaged \$10 billion per annum to Central European and Baltic countries in 1991-1993, and \$30 billion per annum to Russia in 1992-93. Similarly, publicly-financed costs of German unification are estimated to have averaged 4 to 5 percent of Germany's GDP (roughly \$70 billion to \$90 billion) since 1991. Nevertheless, at least at first glance, \$250 billion appears to be a rather small amount, when compared to the share of saving in GDP in OECD countries, or to the size of the fiscal correction that would be necessary, for instance, for European countries to meet the Maastricht targets. 1/ Several authors (most notably Collins and Rodrik (1991)), however, have

1/ Naturally, these figures represent a much larger fraction of PCPEs' GDP, approximately 6 percent for the \$250 billion figure. Thus, as discussed later in the paper, it is not surprising that the impact on PCPEs may be much stronger than on OECD countries.

Table 1. Projected Capital Flows to Previously Centrally Planned Economies
(In billions of U.S. dollars per year)

Study	Eastern Europe	Former Soviet Union	PCPEs' Total
Collins-Rodrik (1991) <u>1/</u>	344 - 421	571 - 1164	915 - 1585
Collins-Rodrik (1991) <u>2/</u>	5 - 14	12 - 34	16 - 48 (136)
Collins-Rodrik (1991) <u>3/</u>	12 - 24	-4 - 2	8 - 30
Debs-Shapiro-Taylor (1991) <u>4/</u>	12 - 15	--	--
CEPR (1990) <u>5/</u>	130 - 290	--	--
Solomon (1991) <u>6/</u>	14	--	--
McKibbin (1991) <u>7/</u>	20 - 40	30	50 - 70
Allen-Vines (1991)/WEO (1991) <u>8/</u>	--	--	33
WEO (1994) <u>9/</u>	--	--	20
Holzmann-Thimann-Petz (1993) <u>10/</u>	23 - 599	--	--
Giustiniani-Papadia-Porciani (1992) <u>11/</u>	59	84	143
Boote (1992) <u>12/</u>	259 - 628	--	--

- 1/ Need-based estimate. Catch-up in ten years.
2/ Source-based estimate (parametrized by Marshall Plan figures). Average over four years.
3/ Source-based estimate.
4/ Source-based estimate.
5/ Need-based estimate. Catch-up in ten years.
6/ Source-based estimate.
7/ Source-based estimate. Estimates based on Bosworth's (1990) and a rule-of-thumb of foreign investment flows of 5 percent of GDP. Average over five years, phased-out over the next five years.
8/ Source-based estimate. Average over five years.
9/ Source-based estimate. Projected net external financing in 1994 and 1995 (yearly average).
10/ Need-based estimate. Average over ten years.
11/ Need-based estimate. Average over the first ten years of the projection.
12/ Need-based estimate. Average over ten years.

argued that even a financing effort smaller than \$70 billion each year may have quite a dramatic impact on OECD financial markets, raising interest rates by more than 200 basis points. The fear, often expressed in policy circles, is that a shock of this size may have a strong negative impact on industrial countries and on Western Europe in particular. In the next sections, however, we present a series of scenarios showing that under reasonable circumstances the impact on the performance of Western European economies in the next ten years is likely to be small. While the development of a more satisfactory model of transition economies remains an important task for future research, the conclusion of this paper seems unlikely to be reversed as better data and knowledge on the working of these economies becomes available.

III. Modeling Issues

The framework used for our simulations is provided by the IMF's macroeconometric model, MULTIMOD. ^{1/} MULTIMOD is a dynamic multi-country model with rational expectations, which treats cross-country linkages mainly through changes in traded goods' prices and volumes and exchange and interest rates (all of which are endogenous in the model). The model is estimated from annual data from 1965 to 1991, largely with pooled time series/cross-sectional techniques, and can be used to simulate the effects of exogenous and policy changes around a baseline forecast. ^{2/}

In the *industrial country* block of the model, consumption and investment are derived from intertemporal utility and profit maximization. Exports and imports of manufactured goods depend on relative prices and economic activity at home and abroad as in a model of imperfectly substitutable goods. Export prices follow domestic output prices in the long run, but respond to price movements in export markets in the short run. Import prices are defined as a weighted average of partner countries' export prices. Production and export of oil by the industrial countries are treated as exogenous, while their consumption of oil is endogenous. Net oil exports by the developing countries are treated as residuals to clear the world market of oil. Non-oil primary commodities (treated as a homogeneous composite good) are produced by the developing countries and sold at market-clearing prices. Demand for primary commodities by industrial countries is

^{1/} A complete description of the model, including its theoretical underpinnings and estimation details, can be found in Masson, Symansky, and Meredith (1990).

^{2/} The baseline forecast is based on country-specific information provided by country economists at the IMF, aggregated and updated on a six-month frequency as part of the IMF's World Economic Outlook exercise. The baseline used in this paper is based on historical data through end-1993 and projected data thereafter. The long-run data is assumed to converge to a steady state defined by conditions that include the equality of each country's real growth rate and interest rate, and zero primary fiscal and trade balances.

sluggish in the short run, but fully responds to relative price changes in the long run. Real government spending is treated as exogenous. In the short run, tax rates are exogenous and deficits are financed through endogenous changes in public debt. Over the medium to long run, the government's intertemporal budget constraint is enforced by adjusting taxes and transfers. The target supply of base money is exogenous in free-floating exchange rate countries, but is endogenous in countries that target their exchange rate (in order to maintain a constant open interest premium). Financial assets of the industrial countries are assumed to be perfect substitutes.

The *developing countries* are divided into two regions: capital-exporting (mainly oil-exporting) and capital-importing countries. Both regions are the residual suppliers of oil and face import demand functions. The latter group is also assumed to produce and export manufacturing goods and primary commodities. The capital-importing countries face a supply schedule for foreign loans based on a forward-looking assessment of their debt-servicing capacity; given the stock of debt (which defines a flow of debt service, at the going interest rate) and their exports (determined endogenously as import demand from the rest of the world), imports are residually determined, and are both consumed and invested. This region is supply-constrained in the short run: output can rise only through an increase in the capital stock. Investment adjusts endogenously, responding one-for-one to changes in domestic and foreign saving.

For the purpose of this study, the PCPE model was based on the basic capital-importing model outlined above. The structure of the capital-importing developing countries was duplicated and then calibrated using aggregate data from PCPEs obtained from the World Economic Outlook of the IMF. 1/ One important change was made to the PCPE model because of the nature of the scenarios in this paper. As explained above, the prototype capital-importing region is finance-constrained and only able to import if it receives new capital inflows and/or exports. Since all scenarios considered in this paper represent some form of new financing, we augmented this framework by including a debt-repayment equation, whereby this region repays some of the outstanding loans as their output rises. This repayment of debt then results in a decline of imports.

The resulting PCPE model should be regarded as only a rough approximation of the behavioral characterization of this region. For instance, labor markets may be more flexible and productive bottle-necks may be less severe in PCPEs than in developing countries, thereby allowing for a stronger response of PCPEs' output to demand shocks than allowed for in our

1/ Thus, the parameters of the behavioral equations are kept at the values estimated from developing country data, but the macroeconomic baseline is based on PCPE data. Needless to say, the reliability of the macroeconomic series used to calibrate our PCPE model is limited. The series, however, reflect official estimates, adjusted by IMF country economists' own estimates and projections.

simulations (where, recall, output can increase only in conjunction with a rise in the capital stock). Data limitations are also severe. Overall, our simulations should be viewed as providing only an approximate indication of the potential response of these countries' economies to changes in industrial countries' macroeconomic variables. However, the main reason to include a stylized model of PCPEs in our framework is to capture some of the feedback effects from PCPEs of shocks originating in OECD countries. Since the magnitude of these feedbacks can be expected to be of second-order importance with respect to the original shocks, our approximation in dealing with PCPEs seems acceptable for the purpose of this study.

IV. Alternative Reform Scenarios

1. Methodological considerations

Before describing the specific scenarios that we simulate with the model, a few methodological considerations should be clarified from the outset. First, we follow other studies in assuming that baseline trade shares remain constant at the most recent year for which data is available (1992, in our case), even with the opening-up of trade with the PCPEs. 1/2/ This is not necessarily a realistic assumption. Several recent studies of prospective PCPE geographic trade pattern, often based on variants of the so-called gravity model, have suggested that countries such as the United States might benefit disproportionately from the re-orientation of PCPE trade and, in fact, may *increase* their trade shares with PCPEs in the next few years. 3/ Given the uncertainty that surrounds these estimates, and the difficulty of addressing 'micro' issues of trade direction in a 'macro' model, we have chosen--for the time being--to make the agnostic assumption of constant trade share and side-step the issue of trade restructuring.

Second, our focus is on the effects of the financing effort on Western Europe which, in our framework, is captured by including specific models for Germany, France, Italy, the United Kingdom, and other European countries as a group. 4/ Naturally, the multi-country nature of our framework implies that the analysis cannot be conducted in isolation from developments in non-European countries and the model is simulated in its multi-country format. Results are reported, however, only for PCPEs and European countries as a group. Results for the other countries are available upon request.

1/ See, for instance, Helkie, Howard, and Marquez (1994).

2/ However, trade shares are free to adjust in response to endogenous changes in relative prices.

3/ See, for instance, the discussion in Hamilton and Winters (1992), Vavilov and Vjugin (1993), and Holzmann, Thimann, and Petz (1993).

4/ Strictly speaking, the model of the other European countries includes also Australia and New Zealand. European countries, however, account for about 90 percent of this group's output.

Finally, in order to isolate the effect of the financing effort on OECD countries, we have assumed a passive approach on the part of industrial country governments in all respects (for instance, regarding monetary policy) ^{1/}, except for their involvement in the financing effort.

2. Macroeconomic scenarios

The capital inflow scenarios considered in this paper are essentially a relaxation of the trade balance/financing constraint on PCPEs, in the form of a rightward shift in the supply schedule of foreign finance (the financing burden is distributed among industrial countries in proportion to their GDP). The relaxation of the external constraint directly allows for an increase of PCPEs' imports, which is allocated in the rest of the world in proportion to 1992 trade shares. For reference, Table 2 shows our baseline import and export shares of PCPEs with respect to the other 9 blocks of MULTIMOD.

Our scenarios are classified along three main dimensions.

a. Size of the capital flow

We consider two basic scenarios. In one case we simulate the effects of a constant financing flow of \$70 billion a year (in constant 1993 dollars) from OECD countries to PCPEs for a period of ten years, after which the flow is gradually phased out (also over ten years). In a second case, we simulate a projected flow of \$250 billion dollars a year (1 percent of OECD GDP, or about 6 percent of PCPE GDP). For convenience, we shall refer to these two cases as *low flow* and *high flow* scenarios, respectively, even though we view both scenarios as very optimistic projections of exogenous financing from industrial countries to PCPEs in the next few years.

b. Investment versus consumption shocks

To capture the effects of alternative uses of the capital flow, we consider three different scenarios. The baseline assumption is that the allocation of the capital inflow between investment and consumption is determined endogenously by the model: as the economy's disposable income is

^{1/} In our simulations, in particular, the industrial countries' monetary authorities are assumed to follow a neutral stance by targeting monetary *aggregates* at their baseline values. Alternative assumptions would have been to assume constant *inflation* targets or constant *interest rate* targets. Different assumptions about monetary policy lead to somewhat different short-run results in response to unanticipated shocks. With an inflation target, for instance, the expansionary effect of a demand shock of the type modelled here would be mitigated by contractionary monetary policy, while the opposite would be true with interest rate targets. However, to the extent that our study is concerned with the effects of *announced* (and, hence, largely *anticipated*) shocks, different assumptions on monetary policy would have minimal impact on our results.

Table 2. Nonenergy Trade Shares of the Previously Centrally Planned Economies with the Rest of the World, 1992

Region	Imports from PCPEs as a Percent of Region's Total Nonenergy Import	Exports to Region as a Percent of PCPE's Total Nonenergy Exports
United States	0.6	6.5
Japan	7.2	13.4
Germany	6.6	30.7
Canada	0.6	1.6
France	2.8	6.5
Italy	6.2	12.2
United Kingdom	1.7	4.4
Other European Industrial Countries	2.9	15.6
Other Developing Countries	3.3	9.1

Source: IMF, Direction of Trade Statistics; UN Statistical Office, COMTRADE data base; and authors' calculations.

increased by the transfer, both consumption and investment increase consistently with the model's behavioral equations. Alternatively, the whole *ex ante* capital inflow may be constrained to finance PCPEs' investment, or to finance PCPEs' consumption. (Clearly, endogenous changes in income, output, prices, etc., affect both consumption and investment in all scenarios.) When the exogenous flow of foreign capital is destined to increase the domestic capital stock, we also consider a scenario where PCPEs' production capability is enhanced by allowing for an additional growth of total factor productivity of 1 percent a year for ten years. This scenario is consistent with the often-expressed view that the initial shortage of capital in PCPEs, and the installation of new western-style capital in a relatively undeveloped production environment (but with relatively well-educated and skilled labor force), are likely to lead to stronger productivity growth than justified solely by the increase of the capital/labor ratio (see, for instance, Borensztein and Montiel (1992)). Estimates of the effects of increasing productivity by more than the assumed one percent can be obtained by suitably scaling the results presented below.

c. Loans versus grants

In all the scenarios described above, we assumed that the financing was in the form of an outright grant. In practice, the financing of PCPEs' transition is likely to involve a combination of grants, loans at market terms, and loans at concessional terms. In order to span the set of relevant alternatives, we considered a scenario that differs from the reference scenario (a \$250 billion grant to be allocated endogenously between consumption and investment) only by assuming that the exogenous external financing takes the form of a loan.

3. Results

Figures 1-6 summarize the results of our simulations for the period from 1994 to 2008. The figures present results for five indicators for PCPEs: real GDP, consumption, investment, exports, and imports (measured as a fraction of baseline GDP). The figures also include results for seven indicators for the industrial countries: real GDP, real and nominal long-term interest rates, consumption, investment, exports, and imports (measured as a fraction of baseline GDP). We present aggregate results for Western Europe, but detailed results for the other industrial countries are available upon request.

Figures 1 and 2 present results for two scenarios in which PCPEs' import constraint is relaxed by an amount of \$250 billion (labelled as *high-flow grant*) and \$70 billion (labelled as *low-flow grant*) each year, respectively, for a period of ten years. The inflow of goods is endogenously allocated by PCPEs between consumption and investment. In both cases, the transfer implicit in the relaxation of the import constraint is assumed to be in the form of a grant.

Two features are immediately apparent from these two scenarios. First, the results from the *high flow* scenario are, approximately, a proportional

blow-up (by a factor of about 3 1/2) of the results from the *low flow* scenario. This is an intuitive feature, which reflects partly the linearity of most of the model's behavioral equations, and partly the small magnitude of the simulated shocks, particularly with respect to the size of Western European economies. Based on this premise, the scenario presented in Figure 1 will be used as a reference case in the rest of the discussion; alternative scenarios can be derived by proportional rescaling.

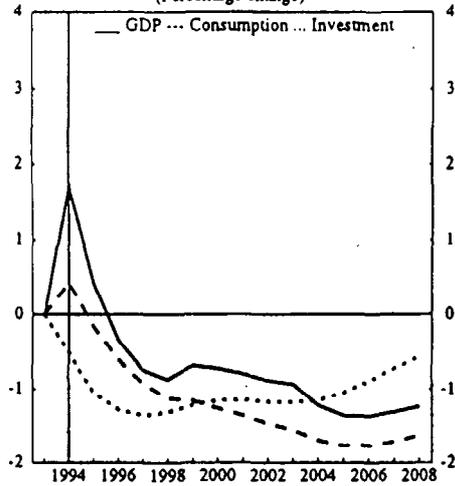
The second feature that is apparent from these scenarios is that despite the large impact on the performance of PCPEs, the simulated shocks have a moderate impact on Western European economies; in the *high-flow* scenario Western Europe's real output increases by less than 2 percent in the short run, and subsequently declines by about 1.5 percent below its baseline. The *low-flow* scenario projects a proportionally smaller response. This limited response, particularly over longer horizons, is due to two factors. First, even in the high flow case, the projected capital flow amounts to only one percent of OECD gross domestic product, clearly a modest shock. Secondly, there are feedback effects from PCPEs onto Western Europe (mainly, greater demand for Western Europe's output--see the discussion below) that mitigate the negative medium-term effect on Western Europe's domestic output that arises from higher interest rates. Broadly speaking, the simulations suggest that flows in the order of half-trillion dollars per year (some ten-to-twenty times those currently discussed in policy circles) would produce fluctuations that are roughly of business-cycle magnitude on Western-European economies.

The qualitative results of our simulations are rather intuitive. The relaxation of the financing constraint facing the PCPEs allows them to increase imports, partly in the form of higher consumption and partly in the form of higher investment. Domestic output is roughly unchanged in the short run because domestic production is constrained by the existing capital stock. The capital stock increases gradually, and the rate of investment is sufficient to raise output by a maximum of 4.5 percentage points. The large trade deficit initially matches the relaxation of the import constraint, but subsequently falls slightly, as PCPEs' external liabilities are reduced as output increases. However, in this reference scenario, the PCPEs are not estimated to become net lenders on international capital markets.

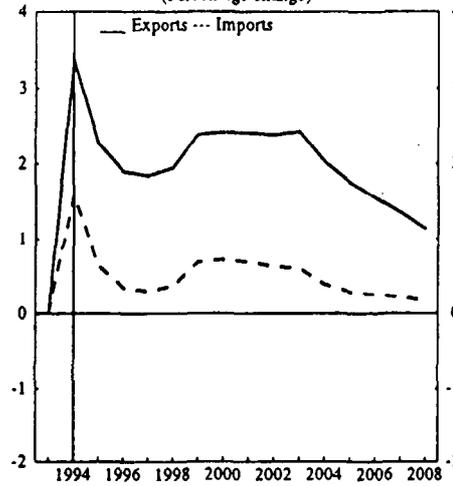
In contrast with the uniformly positive response of PCPEs' output to the assumed shock, the short-run and medium-run effects of industrial countries' output have opposite signs: the transfer to PCPEs leads to a small expansion of industrial countries' output in the short run, but to a broad recession over longer horizons, as the increase in demand for industrial country exports raises interest rates and crowds out investment. The relaxation of PCPEs' import constraint effectively shifts world demand from investment to consumption, similar to what would happen in the case of a bond-financed increase in government consumption. Thus, while world output increases on impact, it declines in the long run: the increase in total world demand, which is manifested in an increase of real long term interest rates of up to 160 basis points, crowds out investment, thereby reducing the capital stock and consumption below their baseline.

Figure 1
High Flow Grant Scenario

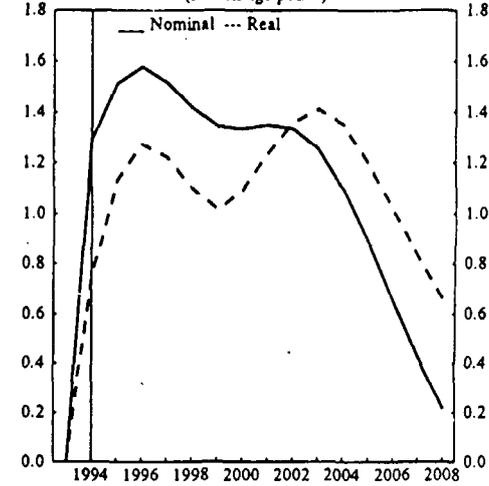
Western Europe
Real GDP, Consumption, and Investment
(Percentage change)



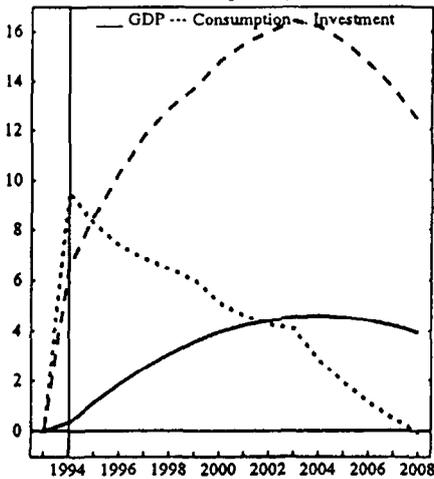
Western Europe
Real Exports and Imports
(Percentage change)



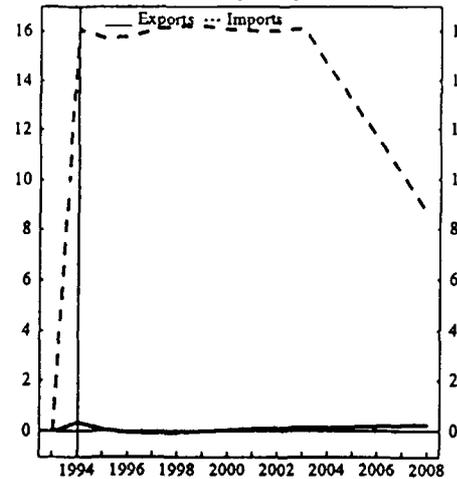
Western Europe
Real and Nominal Long-Term Interest Rates
(Percentage points)



PCPEs
Real GDP, Consumption, and Investment
(Percentage change)



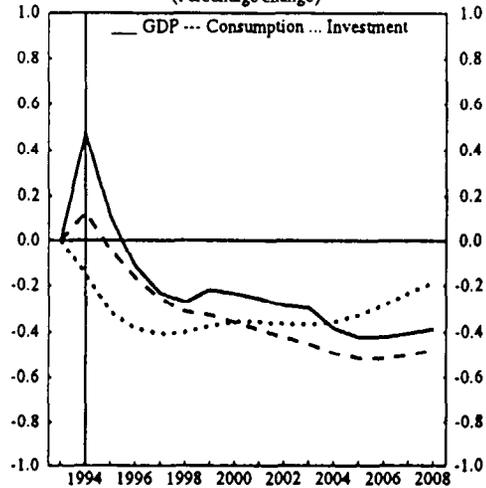
PCPEs
Real Exports and Imports
(Percentage change)



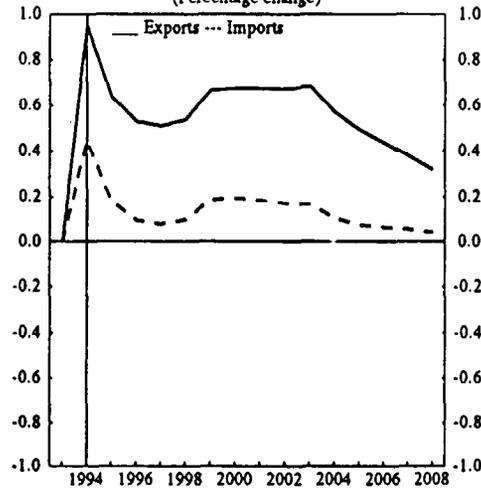
Note: Consumption, investment, exports, and imports, are relative to baseline GDP

Figure 2
Low Flow Grant Scenario

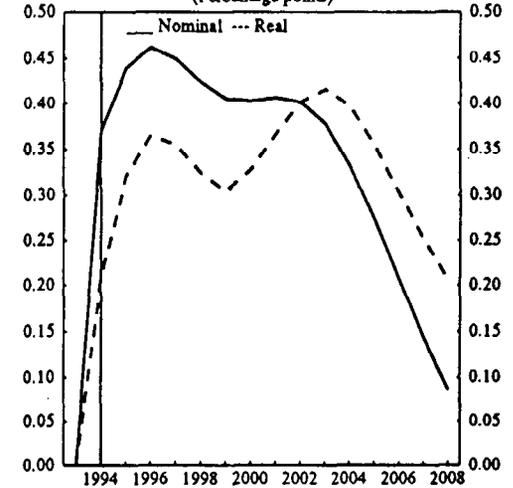
Western Europe
Real GDP, Consumption, and Investment
(Percentage change)



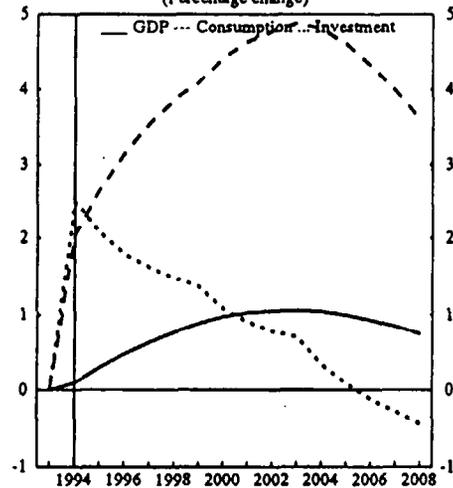
Western Europe
Real Exports and Imports
(Percentage change)



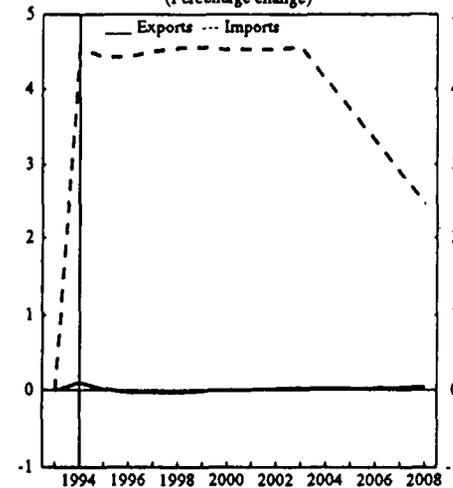
Western Europe
Real and Nominal Long-Term Interest Rates
(Percentage points)



PCPEs
Real GDP, Consumption, and Investment
(Percentage change)



PCPEs
Real Exports and Imports
(Percentage change)

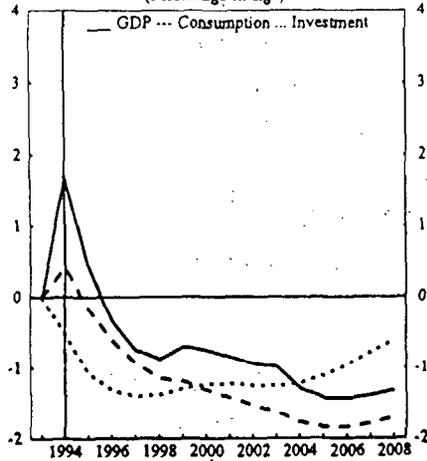


Note: Consumption, investment, exports, and imports, are relative to baseline GDP

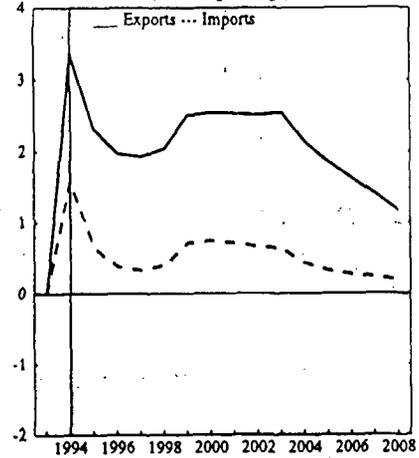
Figure 3

High Flow Grant Scenario: Grant Used for Consumption

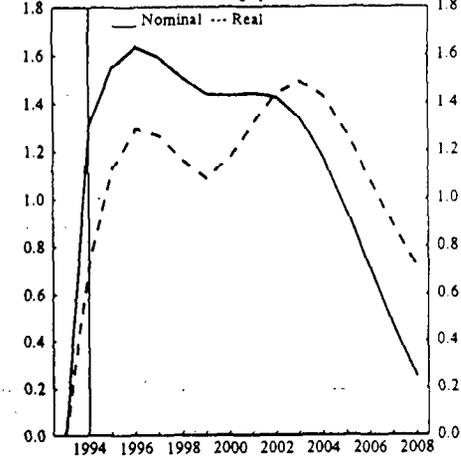
Western Europe
Real GDP, Consumption, and Investment
(Percentage change)



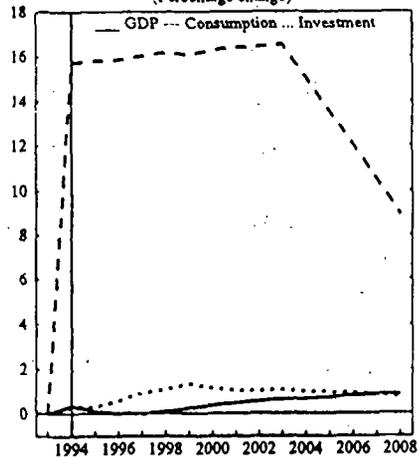
Western Europe
Real Exports and Imports
(Percentage change)



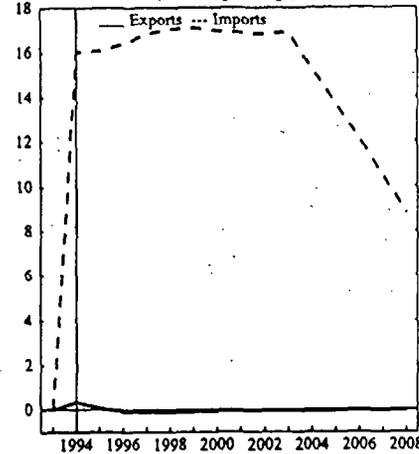
Western Europe
Real and Nominal Long-Term Interest Rates
(Percentage points)



PCPEs
Real GDP, Consumption, and Investment
(Percentage change)



PCPEs
Real Exports and Imports
(Percentage change)

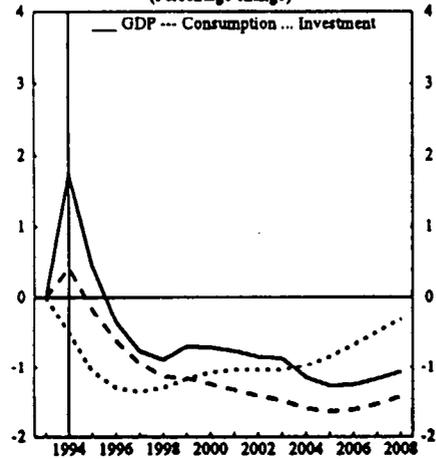


Note: Consumption, investment, exports, and imports, are relative to baseline GDP

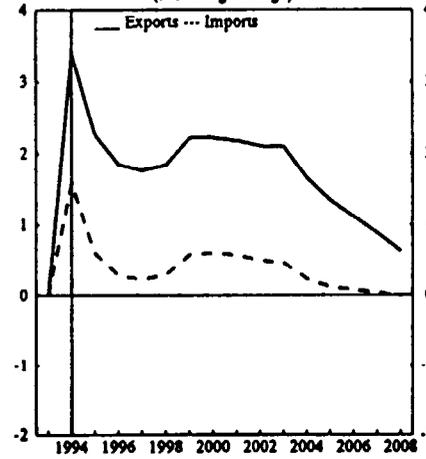
Figure 4

High Flow Grant Scenario: Grant Used for Investment

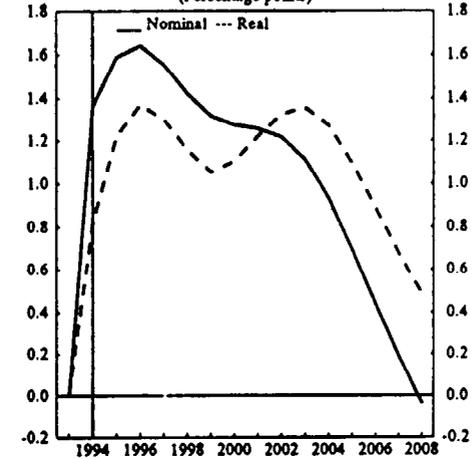
Western Europe
Real GDP, Consumption, and Investment
(Percentage change)



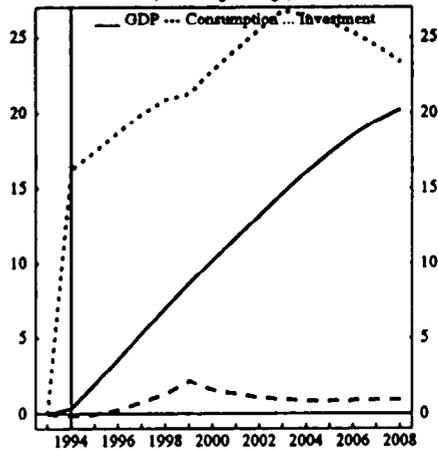
Western Europe
Real Exports and Imports
(Percentage change)



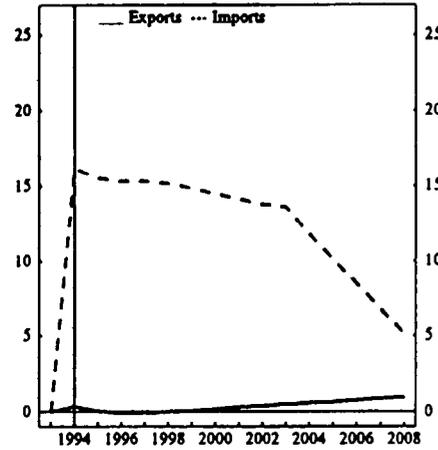
Western Europe
Real and Nominal Long-Term Interest Rates
(Percentage points)



PCPEs
Real GDP, Consumption, and Investment
(Percentage change)



PCPEs
Real Exports and Imports
(Percentage change)

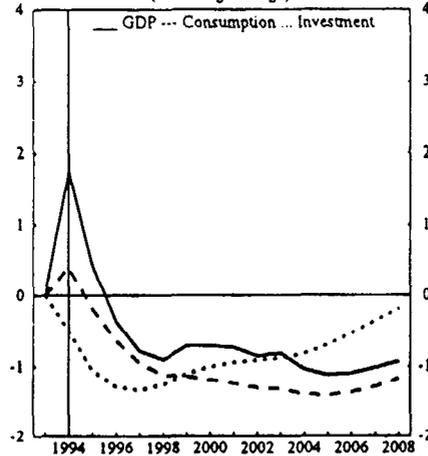


Note: Consumption, investment, exports, and imports, are relative to baseline GDP

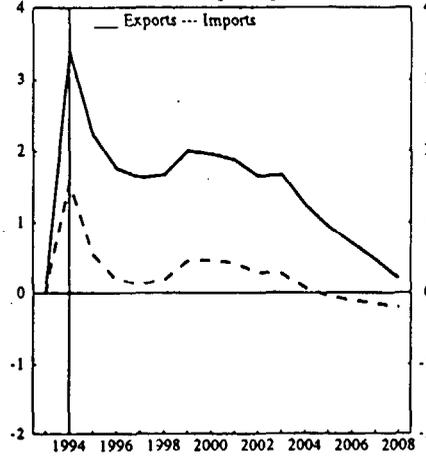
Figure 5

High Flow Grant Scenario: Grant used for Investment plus 1% Growth in Productivity

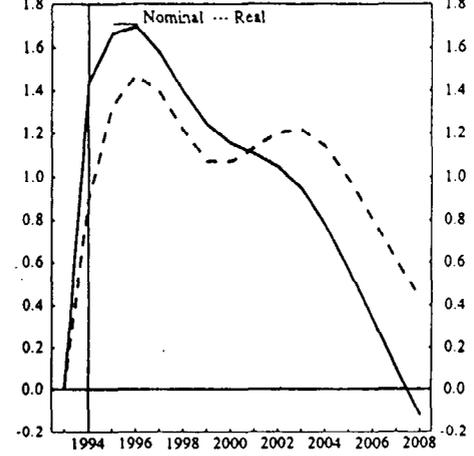
Western Europe
Real GDP, Consumption, and Investment
(Percentage change)



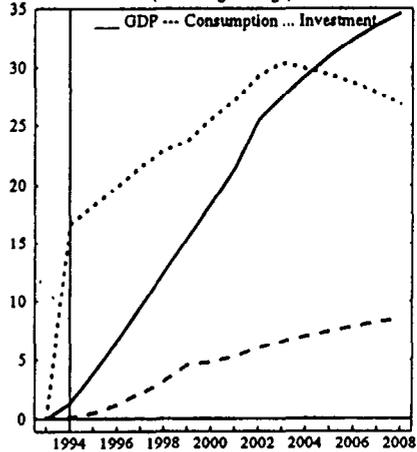
Western Europe
Real Exports and Imports
(Percentage change)



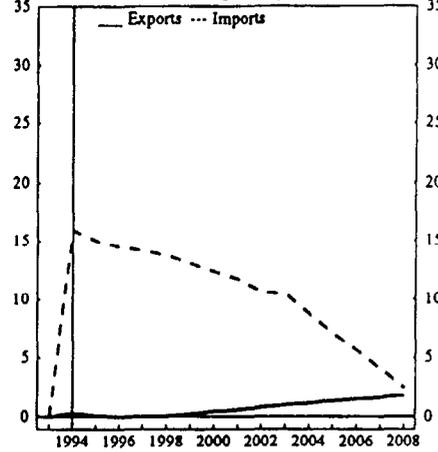
Western Europe
Real and Nominal Long-Term Interest Rates
(Percentage points)



PCPEs
Real GDP, Consumption, and Investment
(Percentage change)



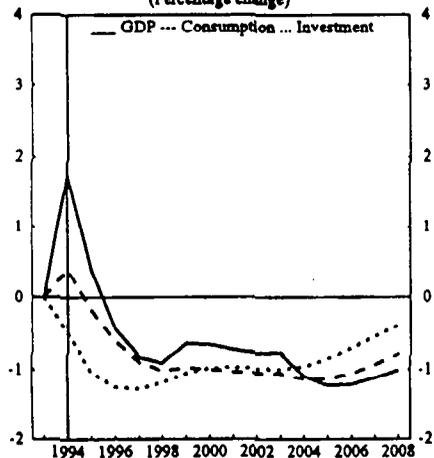
PCPEs
Real Exports and Imports
(Percentage change)



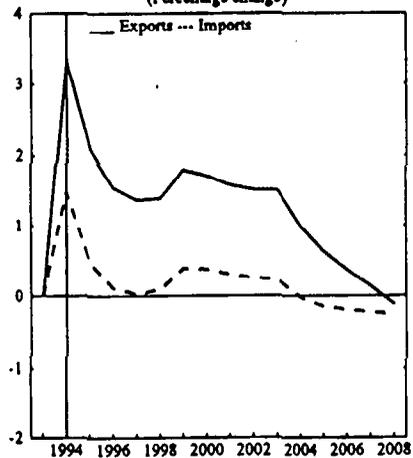
Note: Consumption, investment, exports, and imports, are relative to baseline GDP

Figure 6
High Flow Loan Scenario

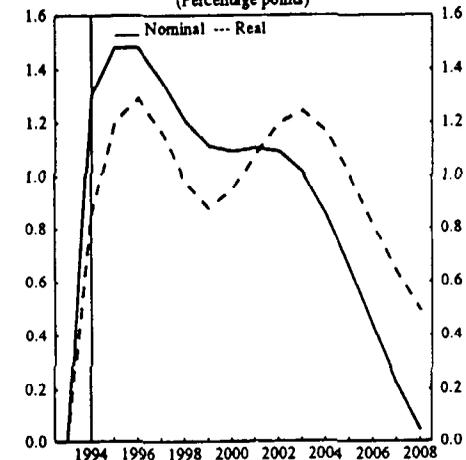
Western Europe
Real GDP, Consumption, and Investment
(Percentage change)



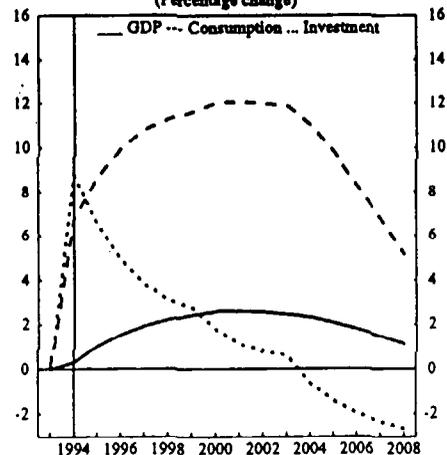
Western Europe
Real Exports and Imports
(Percentage change)



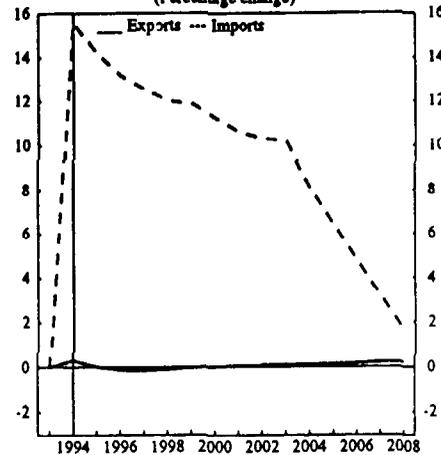
Western Europe
Real and Nominal Long-Term Interest Rates
(Percentage points)



PCPEs
Real GDP, Consumption, and Investment
(Percentage change)



PCPEs
Real Exports and Imports
(Percentage change)



Note: Consumption, investment, exports, and imports, are relative to baseline GDP

Nevertheless, the loss of industrial countries' output and consumption by the tenth year of the experiment is projected to remain in the order of 1-2 percent.

Among all industrial countries, the resource shift from investment to consumption would be strongest in Europe, due to the larger share of European exports to PCPEs. Thus the effects on Western Europe would tend to exceed that of its industrial partners. By the same token, Germany and Italy display a stronger response (detailed results are available from the authors), both in the short and in the long run, than their European partners. Reflecting their greater exposure to PCPEs' import shock, Italy and Germany would also exhibit some real appreciation and a relatively larger increase in real interest rates.

Figures 3 and 4 present two scenarios where the grants for \$250 billion each year (for ten years) that are used to relax PCPEs' import constraint are earmarked for consumption or investment, respectively. The *high-flow investment* scenario is complemented by an additional scenario (Figure 5), which allows for an increase in PCPEs' total factor productivity of 1 percent a year for ten years (see Section 4.2.b for a discussion). In all these scenarios the funds transferred from industrial countries to PCPEs are assumed to be in the form of grants.

The most noticeable feature of these three scenarios is that while the constraints on the use of resources have important implications for PCPEs, they have negligible differential effects on Western Europe. This feature reflects the marginal extent to which a constraint on the allocation of resources affects the main link between Western Europe and PCPEs, the trade balance and its national saving/investment relation counterpart.

In the *high-flow consumption scenario*, PCPEs' output is essentially identical to its baseline value throughout the whole horizon, as the capital inflow is used almost entirely to increase PCPEs' consumption of imported goods. As the external financing flow begins to be phased-out after ten years, consumption, the trade balance, and the other economic aggregates tend to return to their baseline paths. ^{1/} In the *investment scenario*, on the other hand, the faster growth in PCPEs' output due to the increase in the capital stock enables these countries to begin to pay off past debt. This repayment reduces import spending below the consumption scenario, but correspondingly increases the amount of world savings. Although output is higher, the repayment of loans imposes a burden on PCPEs, so that after 10 years imports are 3 percent of GDP less than in the consumption scenario. The impact on industrial countries' external sector is small, however, and there are only very small differential effects on the industrial countries between these two scenarios. These effects become somewhat more visible in

^{1/} Somewhat surprisingly, GDP in the PCPEs rises over longer horizons. The increase in investment that contributes to higher PCPEs' output largely reflects the decline in the real value of their (nominal) foreign liabilities resulting from lower world prices.

the scenario that allows for an additional increase in productivity growth, illustrated in Figure 5, as PCPEs' output increases sufficiently to allow these countries to repay more of their net liabilities over the medium run.

As noted above, constraining PCPEs' use of industrial countries' credit has little impact on lenders' economic performance. In both the consumption and the investment scenarios, the relaxation of PCPEs' import constraint leads to an initial increase in final demand for industrial countries' output quantitatively similar to the reference case. Differences with respect to the reference scenario emerge over longer horizons, where the consumption scenario contributes to a greater worldwide reallocation of resources from investment to consumption, while the converse is true in the investment scenario. In the latter case, interest rates increase marginally less, investment declines somewhat less, and output increases slightly more than in the reference scenario. In steady state (results are available upon request) the investment scenario leads to a marginal increase in Western Europe's and other industrial countries' output above their baseline, a result that is strengthened when allowance is made for a further increase in PCPEs' productivity. In fact, the smaller PCPEs' current account deficit, and the corresponding contribution of these countries to world savings (and thus to Western European growth), would have been even stronger, had not a worsening of PCPEs' terms of trade been required in order to increase their export shares in world markets.

To assess the effects of different contractual specifications of the financing flow, Figure 6 presents results of a scenario where the capital flow takes the form of a loan at market terms (instead of a grant, as in the reference case). Broadly speaking, the main effect of channelling funds to PCPEs in the form of a loan, rather than as a grant, is to reduce somewhat the medium- and long-run quantitative impact of the shock--without altering its qualitative implications, except for the profile of factor service payments. PCPEs would experience a somewhat weaker medium-run expansion in imports, consumption, and investment, while their GNP (not shown) would be lower in the loan scenario than in the grant scenario.

Partly because of the offsetting effects of lower interest rates and lower exports, and partly because the differences between this and the reference scenarios are modest even for PCPEs, the difference between the loan and the grant scenario is negligible in Western Europe. This is particularly true in the short run, whereas in the medium and long run the cumulated impact of a slightly higher rate of investment induces a marginal gain of Western European output and consumption with respect to the reference case. Western European GNP (not shown), however would be higher in the loan scenario by 50 to 100 basis point with respect to the grant scenario. Indeed, the important welfare implications of different contractual specifications of the financing flow should not be underestimated: higher Western European GNP in the loan scenario allows this region to sustain, by 2008, consumption at a rate almost 1 percent higher than in the grant scenario. Correspondingly, by the year 2008, Eastern European consumption is lower by 7 percent in the loan scenario than in the grant scenario. While the focus of this paper is mainly on the

output effects of alternative assumptions on PCPEs' financing, ultimately alternative financing options are likely to be evaluated by the extent that they affect welfare in industrial countries and PCPEs.

Despite the similarity between this case and the reference case, one interesting feature of this scenario is the observation that a loan at market terms from industrial countries to PCPEs has indeed some real effect on economic activity. In an efficient market with forward-looking consumers, a loan at market terms would not change either PCPE or industrial country consumers' wealth. However, full Ricardian equivalence is hardly a feature of industrial economies, much less of PCPEs. As liquid assets flow from industrial countries to PCPEs, demand falls in industrial countries and rises (proportionally more, because of tighter liquidity constraints) in PCPEs. In fact, one implication of the presence of liquidity constraints on consumption is that consumers will behave myopically (relatively more so in PCPEs), as if they ignored--*in the short run*--the different wealth implications that a transfer may have when it is specified as a loan rather than as a grant.

In summary, our simulations suggest that neither significant changes in the size of currently discussed financial assistance to PCPEs' transition, nor changes in the contractual specification of the flow, or in its final use, are likely to have a large impact on the performance of Western European economies in the short and medium run, although some differences may emerge over longer horizons (and different contractual specifications would have, obviously, an impact on the allocation of welfare between OECD countries and PCPEs). As we noted, these conclusions reflect both the limited size of the planned financial flows, market imperfections leading to the prevalence of "liquidity" effects over short horizons, and the offsetting nature of some of the feedback effects from PCPEs to industrial countries.

It is worth observing that some of these conclusions contrast with predictions presented in related studies of PCPE transition, most notably on the possible dramatic impact that the financing effort would have on Western Europe's interest rates. Based on a reduced-form estimation of savings and investment equations from industrial country data, for instance, Collins and Rodrik (1991) have estimated that if resource transfers were to average \$90 billion a year, the impact on real interest rates would be nearly 300 basis points. Model simulations performed by Giustiniani, Papadia, and Porciani (1992) suggest that an average flow of about \$200 billion a year (including capital flows to East Germany) would raise real interest rates by up to 300 basis points.

The difference between these results and those presented in our study reflect differences in the projected size of the financing flow, its distribution among countries, and the methodology used to assess its impact. Collins and Rodrik's projections, for instance, mainly reflect their unusually low estimate of the interest-rate sensitivity of both saving and investment (in fact, Collins and Rodrik estimate saving to *decline* in response to a rise in interest rates, although the response coefficient is

estimated insignificantly different from zero). A sharp rise in interest rates is then required to induce a modest increase in developed countries' net saving. In contrast, the econometric model used here uses a structural approach to interest rate determination, whereby investment and consumption respond to current as well as future changes in interest rates. The resulting saving and investment equation predict little response to temporary interest rate changes, but significant response to persistent (or long-term) interest rate changes.

The results of Giustiniani, Papadia, and Porciani (1992) lie between Collins and Rodrik's and ours. Their study employs a similar analytical framework as we do (INTERMOD, an earlier version of the IMF's multi-country model MULTIMOD), but does not account for feedbacks between the industrial and PCPE blocks, due to the fact that it does not include a PCPE model. This model difference, different parameter estimates, and Giustiniani, Papadia, and Porciani's greater concentration of the financing effort on Western European countries, is likely to explain the difference in the interest rate response. In any case, their projected impact on industrial countries' output is very similar to ours.

V. Concluding Remarks

An important ingredient of the recent debate on the transition of Eastern Europe and the Former Soviet Union to a market economy has been the ability of industrial countries--and Europe in particular--to generate a sufficient amount of savings to meet profitable or socially-desirable investment opportunities in reform countries. The debate has particularly attracted policymakers, in light of perceived market failures that prevent reform countries from gaining access to international capital markets to the same extent, for instance, that Germany enjoyed in its financing of the reconstruction of East Germany. Governments of industrial countries and international organizations have viewed themselves as potential intermediaries (as well as monitors) of the financing of the transition of PCPEs to market economies, a role that has led to questions on the ability of international capital markets to withstand a potentially unprecedentedly large financial effort. Indeed, case studies and debates in policy circles have often advanced the view that even a marginal increase of currently planned financial assistance to PCPEs may have a destabilizing role in international capital markets, leading to an *ex ante* excess demand for Western saving, to be eliminated by a significant rise in interest rates.

This paper has tried to provide a crude quantitative assessment of some of the issues faced by industrial countries (and European countries in particular) engaged in a concerted effort to channel financial support to PCPEs' transition. Our analysis remains, by all accounts, highly stylized, and its descriptive content limited. Our focus has been exclusively on the effects on industrial countries--and Western Europe in particular--of the possible effort to finance the transition of PCPEs to a market economy, and has ignored the potential benefits to be derived in both regions from increasing specialization, greater trade between the two regions, etc.

Despite these limitations, we feel that the analysis of this paper does provide a few tentative conclusions. In general, our findings indicate that at least over horizons that are relevant for current policy considerations, Western Europe is unlikely to suffer more than marginally from the currently projected flow of financial assistance to PCPEs. This financing can be expected to stimulate demand for Western European output in the short run, but raise interest rates and cause some loss of output over the medium term. However, financial assistance to PCPEs' transition is unlikely to provide a dramatic shock for the functioning of industrial countries' capital markets over the medium term. The long-run impact of this transformation, and its political implications, are of course another story.

References

- Allen, C., and D. Vines (1992), "Some Key Global Adjustment Scenarios and Their Effects on Major Developing Country Regions: A Report to the United Nations" (New York: United Nations).
- Aslund, A., and R. Layard, eds. (1993), Changing the Economic System in Russia (New York: St. Martin's Press).
- Baldwin, R.E. (1993), The Potential for Trade Between the Countries of EFTA and Central and Eastern Europe, EFTA Occasional Paper No. 44.
- Blanchard, O.J., K.A. Froot, and J.D. Sachs, eds. (1994), The Transition in Eastern Europe (Chicago: University of Chicago Press).
- Boote, A. (1992), "Assessing Eastern Europe's Capital Need," IMF Working Paper No. WP/12/92 (Washington: International Monetary Fund).
- Borensztein, E., and P.M. Montiel (1992), "Savings, Investment and Growth in Eastern Europe," IMF and Austrian National Bank, ed., Central and Eastern Europe, Roads to Growth (Washington), pp. 153-204.
- Bosworth, B. (1990), "Managing Current Account Imbalances," Tokyo Club Papers, Vol. 4:1, pp. 31-44.
- CEPR (1990), Monitoring European Integration--The Impact of Eastern Europe (London: CEPR).
- Collins, S.M., and D. Rodrik (1991), Eastern Europe and the Soviet Union in the World Economy (Washington: Institute for International Economics).
- Debs, R.A., H. Shapiro, and C. Taylor (1991), Financing Eastern Europe: A Study Group Report (Washington: Group of Thirty).
- Dooley, M., and S.A. Symansky (1993), "International Savings and Investment Balances," IMF, mimeo.
- Giustiniani, A., F. Papadia, and D. Porciani (1992), "Growth and Catch-Up in Central and Eastern Europe: Macroeconomic Effects on Western Countries," Essays in International Finance No. 186 (Princeton, New Jersey: Department of Economics).
- Hamilton, C.B., and A.L. Winters (1992), "Opening Up International Trade With Eastern Europe," Economic Policy, Vol. 14, pp. 77-116.
- Helkie, W.L., D.H. Howard, and J. Marquez (1994), "International Economic Implications of the End of the Soviet Union," Board of Governors of the Federal Reserve System, International Finance Discussion Papers No. 470.

Holzmann, R., C. Thimann, and A. Petz (1993), "Pressure to Adjust: Consequences for the OECD Countries from Reforms in Eastern Europe," University of Saarland, Research Paper No. 9301.

International Monetary Fund (1991), World Economic Outlook (Washington: International Monetary Fund).

_____ (1993), World Economic Outlook (Washington: International Monetary Fund).

_____ (1994), World Economic Outlook, (Washington: International Monetary Fund).

Masson, P., S. Symansky, and G. Meredith (1990), MULTIMOD Mark II: A Revised and Extended Model, IMF Occasional Paper, No. 71 (Washington: International Monetary Fund).

McKibbin, W.J. (1991), "The New Europe and Its Economic Implications for the World Economy," Brookings Discussion Paper in International Economics No. 89.

Solomon, R. (1991), "Do We Face a Global Shortage of Capital?" Brookings Discussion Paper in International Economics No. 91.

U.S. Congressional Budget Office (1990), How the Economic Transformations in Europe Will Affect the United States (Washington: Government Printing Office).

Vavilov, A., and O. Vjugin (1993), "Trade Patterns After Integration into the World Economy," John Williamson, ed., Economic Consequences of Soviet Disintegration (Washington: Institute for International Economics), pp. 99-174.

Winters, L.A., and Z.K. Wang (1994), Eastern Europe's International Trade, (Manchester, United Kingdom: Manchester University Press).

