

**IMF WORKING PAPER**

©1990 International Monetary Fund

This is a working paper and the author would welcome any comments on the present text. Citations should refer to an unpublished manuscript, mentioning the author and the date of issuance by the International Monetary Fund. The views expressed are those of the author and do not necessarily represent those of the Fund.

WP/90/24

INTERNATIONAL MONETARY FUND

Research Department

Fiscal Policy Independence in a European Monetary Union

Prepared by Paul Masson and Jacques Melitz \*

March 1990

Abstract

The issue of whether constraints should be placed on fiscal policies when moving to European monetary union is examined in the context of the use of fiscal policy for macroeconomic stabilization purposes. Examples of shocks hitting French and German economies are considered: an appreciation of their joint exchange rate against other currencies, an inflation shock, and an oil price increase. Except in the third case, flexible use of fiscal policies in the two countries is likely to give better outcomes than a system with constraints on their use. For the oil price shock, there seems to be a good case for policy coordination, not for ceilings on fiscal deficits.

JEL Classification Numbers:

321, 431, 432

---

\* Jacques Melitz is in the Research Department of INSEE (Paris), Professor at HEC and a CEPR fellow. The latter would like to thank the Ford Foundation and the Alfred P. Sloan Foundation for support. This paper was done in large part while he was a consultant for the Fund. The authors are grateful to Lans Bovenberg, Bill Branson, Hugh Bredenkamp, Matt Canzoneri, Michael Deppler, Morris Goldstein, and Klaus Riechel for helpful discussion.

<u>Contents</u>	<u>Page</u>
I. Introduction	1
II. The Simulation Analysis	4
1. Long-run simulations: Joint current account balance relative to the rest of the world	4
2. Medium-run simulation 1: French resistance to a current account deficit resulting from an appreciation of the écu	8
3. Medium-run simulation 2: German resistance to inflation resulting from monetary policy	11
4. Medium-run simulation 3: Contractionary responses by both France and Germany to an oil shock	14
III. Some Theoretical Analysis of Current Accounts in the EMU	14
IV. Concluding Remarks	17
Text Tables	
1. France and The Federal Republic of Germany in a European Monetary Union: Long-Run Scenarios	5
2. French Fiscal Targeting of Current Balance in Response to Appreciation	9-10
3. German Fiscal Targeting of Zero Inflation in Response to European Money Growth Shocks	12-13
References	20

## I. Introduction

Further progress toward monetary union in Europe is likely to involve loss of monetary independence on the part of member countries; this paper considers the issue of possible limits on fiscal policy independence as well. There is a concern that fiscal policy independence might bring conflicts in the European Monetary Union (EMU), leading to proposals for deficit ceilings, for policy coordination, and for a community-wide system of taxes and transfers. Would individual governments borrow too much on the assumption that their debt would be monetized by a European central bank? Would member governments independently attempt to reduce the relative prices of their goods through contractionary fiscal policy in order to gain competitiveness; or alternatively, would they use expansionary fiscal policy to improve their terms of trade? The fear of looser fiscal policy in the EMU has led the authors of the Delors Report (1989) to advocate a statutory ceiling on deficit spending. But deficit ceilings would not even address the problem of the competitive use of contractionary fiscal policy. The varying dangers have induced some academic opinion to support fiscal policy coordination (see Portes and Viñals, eds., (1989) and van der Ploeg (1989)). In a recent paper, Sachs and Sala-i-Martin (1989) go further, and argue that a joint fiscal policy may be required for the survival of an EMU, since in the absence of a major Community-wide mechanism of transfers a member hit by an adverse country-specific blow might be tempted to move out of a monetary union and devalue. Social transfers to afflicted regions through national fiscal systems exist in many countries on a scale that far exceeds the current level of such transfers in the Community.

One way to treat the previous questions is to consider optimal macro-economic management in the context of monetary union. As a rule, fixed exchange rate regimes are successful in handling shocks hitting all of the members similarly as they avoid opposing efforts to move the exchange rate. Asymmetric shocks, on the other hand, tend to require flexibility of real exchange rates. Cohen and Wyplosz (1989) bring out another relevant aspect: the duration of the shocks. In the face of stickiness of wages and prices, fixed-rate and common-currency systems do not easily achieve adjustment to transitory shocks. Thus, a combination of temporary and asymmetric shocks, as opposed to permanent and general shocks, would be the most difficult for an EMU to handle without the active use of other policy instruments.

Our approach to these questions in this paper will be to examine the consequences of an independent use of government spending to influence aggregate demand. We focus on this case not because demand management is the only--or even primary--objective of fiscal policy, but because it is in this context that conflicts may arise when countries are faced with temporary, asymmetric shocks. We will not consider the possibility of debt monetization, nor the question of policies with respect to taxes and transfers. <sup>1/</sup> Our procedure will be to do some simulation analysis of alternative fiscal policy responses to various shocks. This will enable us

---

<sup>1/</sup> On these matters, see Padoa-Schioppa (1990).

to take the current situation as a point of departure, to study some cases of interest, and to base our results on standard models with plausible empirical values of the fundamental parameters. But the drawback will be an analysis rooted in certain scenarios, therefore lacking generality. We shall need to keep this limitation in mind in discussing the results.

Our focus will be on France and the Federal Republic of Germany, which will thus represent for us the EMU. We shall simulate the French and German economies together using the IMF's multi-regional model, MULTIMOD, 1/ while treating the rest of the world (ROW) as exogenous except for the ROW current account, which will perforce be the negative of the joint French and German one. Implicitly, we may be said to consider France and Germany combined, therefore, as a small open economy. In all of the simulations, the growth rate of money will be set for France and Germany jointly (i.e., for the EMU), and the two countries will be supposed to have a common nominal interest rate and a common exchange rate relative to the ROW. 2/

Our first set of simulations assumes a sufficient appreciation of the currency of the EMU to drive down its joint current account balance, which is now positive, to zero. This will enable us to show the extent to which the capital flows between France and Germany (which can only be expected to become more elastic in a monetary union) will be conditioned by the distribution of the adjustment of home absorption between the two countries. The distribution of the adjustment can in principle vary from all or nothing by either country depending on the mutual settings of their fiscal policy instruments. This first set of simulations will all concern the long run.

Our remaining simulations will focus on the medium-term adjustment from year to year over five years. In order to highlight the possibility of conflict, we will assume different preference functions on the part of French and German authorities. In particular, we shall suppose that the Germans place more emphasis on price level stability, while the French emphasize current account balance, in the short run. A few things should be said here about this essential assumption.

Of course, national preferences could evolve in the context of a monetary union, and indeed we will examine in a later section (III) whether current account targets still retain a role in this context. However, not only is it reasonable to suppose some persistence of different French and German preferences at the outset of the union, but there are really no grounds to think that French and German objectives must eventually converge in the union. The fact that both countries must accept a common long-run rate of inflation does not remove the need for adjustments to the terms of

---

1/ See Paul Masson, Steven Symansky, Richard Haas, and Michael Dooley (1988).

2/ We assume that the equations of the model would not be affected by the move to monetary union, even though we recognize that there are good reasons to expect a change in some relationships, for instance, the demand for money, trade equations, and wage/price flexibility.

trade between them, and this requires short-run deviations from price level stability for one or the other. Therefore, differences in their ranking of inflation relative to other objectives will remain relevant.

Since 1987, the French rate of inflation has dropped to the German level, around 3 percent. This equivalent price performance is the fruit of an intense effort in France to gain monetary discipline and a solid reputation for it. Nevertheless, if we take the 1950-88 period as a whole, the average French rate of inflation, measured by the change in the GNP deflator, was 7.1 percent, as compared with 4.0 percent in Germany. If we look at the experience of France and Germany regarding current account balance, we find an equally marked contrast, and this is true whether we focus on the last few years or a longer period. In the years since 1986, the current account was virtually balanced for France, but in large surplus for Germany, attaining levels of around 4 percent of GNP. Over the longer 1963-88 period, the average imbalance was -0.4 percent of GNP for France +1.2 percent of GNP for Germany. As regards the absolute values of these imbalances without regard to sign for 1963-88, the corresponding values are 0.8 percent for France and 1.5 for Germany. Thus, the idea that France put relatively more emphasis on current account balance and Germany on price level stability looks very plausible as a description of historical experience.

The first of our three medium-term scenarios, based on the previous hypothesis about French and German priorities, supposes a 10 percent appreciation of the EMU currency which gives rise to a French attempt to use contractionary fiscal policy in order to maintain current account balance. In the second medium-term scenario, the joint monetary authority of the EMU allows a growth rate of money one percent higher than it was previously (as a weighted average in France and Germany), thereby prompting the Germans to adopt tighter fiscal policy to bring inflation down to earlier levels. Our third and last scenario starts off with a doubling of the price of oil: France fights the current-account implications while Germany opposes the inflationary ones.

In Section III, as already mentioned, we take a closer look at the idea that France would continue to place some emphasis on current account balance. Our hypothesis that current-account objectives would be retained by some countries in the EMU is a fairly common one. It has been used by others to show that fiscal policy independence may result in externalities that call for cooperation (see Cohen and Wyplosz (1989) and Krugman (1989)). Yet in a monetary union, the significance of current account imbalances clearly alters. Such imbalances can no longer yield exchange rate changes or balance-of-payments crises. They do, nonetheless, continue to affect the international distribution of wealth and the geographical location of economic activity. We conclude, based on our general examination of the issue, that there are reasons for believing that differences in country preferences within an EMU may persist, and that flexibility of fiscal policy would help in achieving those different objectives. A final section offers some remarks on a different issue: namely, the need for a system of taxes and transfers at the community level to make an EMU viable.

## II. The Simulation Analysis

In doing the simulations with MULTIMOD, we use as a reference scenario, or baseline, the projections of the IMF's World Economic Outlook, extrapolated, where necessary, further into the future (IMF (1989)). The starting year, taken to be 1990, has a large current account surplus for the Federal Republic of Germany (about 4 percent of GNP), and a small deficit for France (about 0.2 percent of GNP). If monetary union were to begin in that year, and at current nominal exchange rates between the French franc and the deutsche mark (and between both of them and third currencies), then it is likely that the current account imbalances would persist into the medium term, given stickiness of inflation rates, which are about equal in the two countries. Indeed, monetary union would probably yield larger current account deficits for France, at least initially, by lowering French interest rates to the German level, since the elimination of the expectation or the risk of a devaluation associated with the franc would equalize nominal interest rates in the two countries (presumably at a level close to the prevailing one in Germany). French short-term interest rates are currently (December 1989) about 10 percent, while German rates are a little over 8 percent. The adverse current-account effects of the reduction of French interest rates would come from the demand side, and should prevail at first; but in the long run the beneficial supply-side effects of a higher French capital stock would be expected to prevail, or at least to do so on the trade balance.

The presence of monetary union means that EMU monetary policy would set a rate of growth of the joint money stock of France and Germany. The separate demands for money in the two countries would simply determine the distribution of the increase in the money stock between them, while the sum of these two demands would decide the countries' common nominal interest rate. It is assumed that these changes from present circumstances, together with the perfect fixity of the franc/mark exchange rate, would be viewed as irrevocable by the market. We do not necessarily suppose a new common unit of account, and therefore do not presume that the benefits of a common currency would be fully reaped. In any event, these benefits, involving increased ease of calculation and lower transactions costs, cannot easily be reflected in the model. Nevertheless, where convenient, we shall refer to the écu as an alternative to saying "either francs or marks." The common variables in France and Germany are shown in bold type in the tables containing the simulations so as to set them out.

### 1. Long-run simulations: Joint current account balance relative to the rest of the world

The current account surplus of the monetary union vis-à-vis the rest of the world would be roughly 2 percent of GNP on the basis of current projections (Table 1). The current account surplus of the EC as a whole is really much smaller, the German surplus being largely offset by a deficit in the United Kingdom, and to a lesser extent, in Spain and Italy. For illustrative purposes, we look at only France and Germany, however. We suppose that a reduction of the U.S. current account deficit would involve larger U.S.

Table 1. France and The Federal Republic of Germany in a  
European Monetary Union: Long-Run Scenarios

	Baseline Value in 1990	EMU Current Balance Constrained to Zero via Changes in Exchange Rates, and by Absorption Changes in:		
		Germany only	France only	Shared equally
Current account balances <u>1/</u>				
France	-0.2	--	-3.9 <u>5/</u>	-2.1
Germany	3.9	--	4.1 <u>5/</u>	1.8
EMU <u>2/</u>	2.1	--	--	--
Real domestic absorption <u>3/</u>				
France	--	--	12.3	6.1
Germany	--	11.3	--	6.1
Output price <u>3/</u>				
France	--	-4.6	22.6	8.5
Germany	--	9.4	-6.7	1.6
Dollar exchange rate <u>3/</u>				
EMU <u>4/</u>	--	9.9	12.4	11.7

1/ As a percent of GNP.

2/ France and Germany combined, as a percent of their combined GNP.

3/ Deviations from baseline, in percent.

4/ A positive number indicates an appreciation of both the franc and the deutsche mark against the U.S. dollar.

5/ The reason that the French deficit is lower than the German surplus as a ratio to GNP, yet the EMU current balance is zero, is that the value of nominal GNP in France increases relative to that in Germany.

surpluses in the future relative to the EMU, and thus would imply an equal dollar depreciation relative to both the franc and the deutsche mark.

Let us assume that the dollar exchange rate of the écu adjusts to achieve a zero current account balance for the union (with the écu moving uniformly relative to all third currencies, not only to the dollar) accompanied by changes in absorption in France and Germany, as discussed below. The growth rate of the joint money stock in France and Germany follows the baseline trend and is assumed to be unaffected. Therefore, the nominal appreciation also leads to real appreciation (but not necessarily one for one because of endogenous responses in German and French output prices). However, the current account balance between France and Germany need not be zero. Indeed, as a basic consequence of monetary union, capital flows would easily finance the excess of spending over income in any region. This ease of finance is reflected in our simulations by the common interest rate in the union, implying that the flow of capital from the surplus into the deficit area is not hampered by any rise in the interest rate in the deficit area relative to the rest of the union. The responsiveness of capital flows to shocks is correspondingly higher. <sup>1/</sup>

Nonetheless, the extent of these capital flows will depend on the distribution of the rise in absorption that is needed to eliminate the 2 percent joint surplus vis-à-vis the outside world and to bring about joint balance in the French and Germany current account. This distribution, in turn, will depend not only on the appreciation of the écu (which is always sufficiently high in our simulations to balance the current account), but also on the separate fiscal stances of France and Germany. By setting their fiscal policies sufficiently far apart from one another, France and Germany can always ensure that the rise in absorption takes place entirely on one side of the Rhine or the other. For the moment we are not interested in the fiscal policy considerations themselves, but the size of the capital flows inside the monetary union.

Table 1 shows us these flows in three separate cases: full adjustment of the required rise in absorption by Germany (with absorption unchanged in France), full adjustment by France (with absorption unchanged in Germany), and equally shared adjustment. In all three cases, every coefficient in the French and Germany models is set at its cumulative value over time in order to eliminate distributed lags and the whole adjustment process. This is therefore a long-run simulation, but only in a limited sense, since we do not impose the satisfaction of all long-run equilibrium conditions, which would include, notably, the stabilization of the net capital flows between the two regions of the union based upon life-cycle considerations and differentials in growth of factors and productivity. Thus, the only long-run condition which is necessarily satisfied in these simulations is full adjustment to current account balance between the two countries and the ROW.

---

<sup>1/</sup> For an insightful theoretical and empirical discussion of capital flows in a monetary union (partly inspired by James Ingram's earlier work on Puerto Rico (1962)), see Barry Eichengreen (1989).



The case of full adjustment by Germany is the one leading to approximate balance in the separate French and German current accounts individually, since the German current account is the only one of the two to be markedly out of balance initially. This particular scenario requires an 11 percent rise in absorption by Germany. It also requires (independently of baseline growth of the EMU money stock) an appreciation of the EMU currency against the dollar of about 10 percent. In this scenario, further, German prices rise by nearly 10 percent. But in France, where some fiscal contraction is implicit (in order to explain the lack of any rise in the current account deficit despite the appreciation of the franc), prices fall by nearly 5 percent.

The case of full adjustment by France is the alternative that achieves outside adjustment entirely at the expense of greater internal imbalance. This alternative (implicitly requiring a combination of fiscal ease in France and fiscal stringency in Germany) necessitates a 12 percent appreciation of the écu. The German surplus stays the same (approximately) while France acquires a deficit larger than 4 percent of GNP. The widening of the German advantage in competitiveness relative to France is enormous: nearly 30 percent ( $22.6 + 6.7$ ). This case is clearly unrealistic, and has perverse consequences.

The final alternative, which assumes that domestic absorption increases in equal proportions in France and Germany, requires about a 6 percent rise in absorption in each country. While the German current account surplus drops in half from the baseline, this surplus remains substantial and now corresponds to a French current account deficit of about 2 percent of French output. Prices rise both in Germany and France, but do so by about 7 percent more in France than Germany.

Thus, the stakes are high in the distribution of the adjustment between the two countries. If the predominant burden of the adjustment is on Germany, inflation there increases for a time. If the adjustment is fifty-fifty--a situation which we might associate more or less with the case of a joint fiscal authority--the Germans might be happy enough (as the small inflation in their home output prices will be offset by a large deflation in their import prices), but the French would experience inflation in consumer prices together with a large current account deficit. The case of exclusive adjustment on the French side seems least favorable for France. Viewing the full range of possibilities, we can see that the presence of separate fiscal authorities in the two countries, as opposed to a single one in both of them, could lead to a better outcome for both countries, since the two are differently situated initially, and aside from this, disagree about what is best. Of course, policy coordination in principle could respond to these differences. However, a fully optimal coordinated policy is unlikely to emerge. Instead, a joint EMU fiscal policy might well lead to a convergence to identical policy settings, even though such convergence is not what is required, given the different circumstances and the different preferences in the two countries. In the next three simulations, we focus on these last

policy disagreements, and consider the dynamic sequence of adjustments over a five-year period.

2. Medium-run simulation 1: French resistance to a current account deficit resulting from an appreciation of the écu

The first of our medium-term simulations begins with an appreciation of the écu of 10 percent against the dollar (and all other currencies) as a result of pressures in exchange markets that do not depend on France and Germany, but come, for example, from a concern about the U.S. current account deficit. We model this as if it were a portfolio shift on the part of international investors. Monetary policy in the union and fiscal policies in France and Germany are assumed not to respond, but to continue along the baseline path derived from the World Economic Outlook. The appreciation of the écu yields a reduction of the German current account surplus and an increase in the French deficit (raising the latter to more than 2 percent of GNP by 1995) after the first year of the J-curve effect. No constraint being imposed on the joint current account balance of the two countries, a small joint surplus continues. We then repeat the simulation of the shock with an accompanying endogenous response of French government spending on goods and services in order to resist a current account deficit. In this case, as opposed to the preceding one, we treat the écu as endogenous. Quite specifically, following the initial 10 percent appreciation, we suppose the écu to move in accord with open interest parity as well as rational exchange rate expectations.

Table 2 compares the two simulations. Hence, it focuses on the changes resulting from the French unwillingness to accept the emergence of current account deficits. The French fiscal policy feedback rule is based on initial experiments which were designed to yield approximate balance in the current account. <sup>1/</sup> As seen from the table, this feedback rule reduces France's current account deficit by 1.7 percent relative to GNP by 1995, as compared with an alternative deficit of about 2.3 percent in that year (not shown).

The decrease in government spending lowers demand in France by more than 4 percent by 1995 and output (real GNP) by almost one third as much. French output prices also go down by almost 5 percent by 1995 (or one percent annually). The impact of the French policy actions on Germany is of special interest. The French fiscal contraction tends to increase output in Germany by depreciating the écu. Fiscal contraction in France leads to a decline in demand for French goods, requiring a real depreciation of the franc; because of sticky prices, this occurs through a nominal depreciation of the écu. Paradoxically, interest rates rise at first because depreciation pushes up German output and prices, and on balance EMU demand for money

---

<sup>1/</sup> The particular rule took the the form

$$\Delta G/GDP = 5 \text{ CAB/YGNP}$$

where G and GDP are stated in real terms, CAB (current account balance) and YGNP in nominal terms.

Table 2. French Fiscal Targeting of Current Balance in Response to Appreciation

(deviations from the scenario with no fiscal response) 1/

	1990	1991	1992	1993	1994	1995
France						
National Income						
Real GDP (percent)	-0.4	-0.9	-1.5	-1.8	-1.9	-1.7
Real GDP (annual growth rate)	-0.4	-0.6	-0.6	-0.4	-0.1	0.2
Real GNP (percent)	-0.4	-0.9	-1.4	-1.7	-1.7	-1.4
Domestic demand (percent)	-0.8	-1.9	-3.0	-3.8	-4.4	-4.6
Consumption expenditure (percent)	-0.8	-1.8	-2.5	-2.9	-2.8	-2.4
Gross private investment (percent)	-3.8	-4.5	-4.7	-4.4	-3.6	-2.4
Exports of goods and services (percent)	0.2	0.4	0.8	1.2	1.9	2.6
Imports of goods and services (percent)	-1.4	-3.3	-5.0	-6.3	-7.2	-7.8
Government						
Gen. gov't financial balance (FFb)	-31.3	-7.9	33.1	79.1	126.9	172.6
Gen. gov't financial balance/GNP (percent)	-0.5	-0.1	0.5	1.1	1.7	2.2
Government debt (FFb)	32.7	43.3	14.6	-58.9	-179.4	-345.4
Government debt/GNP	0.6	1.0	0.7	-0.0	-1.4	-3.2
Interest Rates						
Short-term interest rate	0.6	0.7	0.7	0.6	0.4	0.2
Long-term interest rate	0.6	0.5	0.4	0.2	-0.0	-0.2
Prices and Supply						
Absorption deflator (percent)	0.0	-0.1	-0.6	-1.3	-2.2	-3.3
Absorption deflator (annual inflation rate)	0.0	-0.2	-0.5	-0.8	-1.0	-1.1
GNP deflator (percent)	-0.1	-0.5	-1.1	-2.2	-3.4	-4.8
Export price deflator (percent)	0.5	0.5	0.5	0.1	-0.4	-1.2
Import price deflator (percent)	1.0	1.7	2.4	3.1	3.8	4.3
Capacity utilization rate	-0.4	-0.8	-1.3	-1.5	-1.5	-1.2
Long-term real interest rate	1.3	1.4	1.4	1.2	0.9	0.4
Real user cost of capital	1.3	1.5	1.5	1.3	1.0	0.6
International Accounts						
Trade balance (FFb)	15.5	40.5	66.8	87.5	103.0	114.5
Current account balance (FFb)	15.5	41.7	71.3	97.6	120.3	140.7
Net foreign assets (\$b)	2.6	9.9	22.7	40.5	62.7	88.9
As a percent of nominal GNP						
Trade balance	0.3	0.6	1.0	1.2	1.4	1.5
Current account balance	0.2	0.6	1.0	1.3	1.5	1.7
Net foreign assets	0.2	0.8	1.7	2.8	4.1	5.5
Nominal effective exchange rate (percent)	-1.0	-1.5	-2.0	-2.6	-3.0	-3.4
Real effective exchange rate (percent)	-0.6	-1.1	-1.9	-2.8	-3.9	-5.1

Table 2 (concluded). French Fiscal Targeting of Current Balance in Response to Appreciation

(deviations from the scenario with no fiscal response) 1/

	1990	1991	1992	1993	1994	1995
Germany, F.R.						
National Income						
Real GDP (percent)	0.4	0.5	0.6	0.6	0.6	0.6
Real GDP (annual growth rate)	0.4	0.1	0.1	0.0	-0.0	-0.0
Real GNP (percent)	0.4	0.5	0.6	0.6	0.6	0.6
Domestic demand (percent)	0.2	0.3	0.4	0.4	0.4	0.4
Consumption expenditure (percent)	0.1	0.2	0.3	0.4	0.5	0.6
Gross private investment (percent)	1.1	1.1	1.1	0.9	0.6	0.3
Exports of goods and services (percent)	0.1	0.2	0.2	0.2	0.2	0.1
Imports of goods and services (percent)	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Government						
Gen. gov't financial balance (DMb)	1.1	-0.9	-1.7	-2.1	-2.1	-2.1
Gen. gov't financial balance/GNP (percent)	0.1	-0.0	-0.1	-0.1	-0.1	-0.1
Government debt (DMb)	-1.7	-1.5	-1.0	-0.5	-0.2	0.1
Government debt/GNP	-0.2	-0.3	-0.4	-0.5	-0.6	-0.6
Interest Rates						
Short-term interest rate	0.6	0.7	0.7	0.6	0.4	0.2
Long-term interest rate	0.6	0.5	0.4	0.2	-0.0	-0.2
Prices and Supply						
Absorption deflator (percent)	0.5	1.0	1.6	2.2	2.8	3.2
Absorption deflator (annual inflation rate)	0.5	0.5	0.6	0.6	0.6	0.4
GNP deflator (percent)	0.2	0.7	1.3	2.0	2.6	3.1
Export price deflator (percent)	0.4	0.9	1.4	2.1	2.6	3.1
Import price deflator (percent)	1.2	1.7	2.4	3.1	3.6	4.0
Capacity utilization rate	0.4	0.5	0.6	0.6	0.6	0.5
Long-term real interest rate	0.1	0.0	0.0	-0.0	-0.0	-0.0
Real user cost of capital	-0.2	-0.2	-0.2	-0.1	-0.0	0.1
International Accounts						
Trade balance (DMb)	-1.7	-1.2	-1.0	-0.8	-0.6	-0.4
Current account balance (DMb)	-1.3	-0.7	-0.3	-0.1	0.1	0.2
Net foreign assets (\$b)	-2.0	-4.3	-7.0	-10.3	-14.3	-19.0
As a percent of nominal GNP						
Trade balance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
Current account balance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Net foreign assets	-0.0	-0.1	-0.3	-0.5	-0.6	-0.8
Nominal effective exchange rate (percent)	-1.1	-1.5	-2.1	-2.7	-3.2	-3.5
Real effective exchange rate (percent)	-0.8	-0.8	-0.9	-0.8	-0.7	-0.5
EMU Nominal exchange rate (percent in \$/ECU)	-1.3	-1.8	-2.5	-3.2	-3.8	-4.2

1/ Deviations are for the level of the variable relative to its value in the corresponding year for the scenario with no fiscal response.

risers. 1/ The German current account surplus drops, ever so slightly. Two points are manifest. The first is the "negative transmission" of fiscal policy that is characteristic of a currency union under flexible exchange rates relative to the rest of the world in a Mundell-Fleming model: contraction in one member country of the union leads to expansion in the other (and vice versa). The second is the importance of the rest of the world in diminishing the interaction between the two members of the union. Virtually the entire improvement in France's current account balance comes at the expense of the ROW. Of course, this point would carry less weight if we included the other members of the EC in the EMU, but it would still remain significant.

We see more clearly, in this light, the possible advantage of freedom to use government expenditure flexibly within the EMU. France is able virtually to neutralize a 2 percent current account deficit relative to GNP over a five-year horizon by taking action benefiting Germany slightly in terms of real output and costing it about half of one percent of extra annual inflation. Since the shock to which France responds lowers German output and prices independently, the impact on Germany is even better than it might otherwise seem. Even if the result were not entirely to German liking because of the net inflationary consequences of France's action, the outcome could easily be to lighten the cost for France a lot without much disturbing Germany. If so, any German fiscal reaction to the initial impulse and France's response to it would only be small and not alter the result substantially.

3. Medium-run simulation 2: German resistance to inflation resulting from monetary policy

The next simulation begins with the assumption that the EMU monetary authorities let the total money stock grow by one percent more annually than previously (how this rise is divided up as between French and German portfolios is assumed to be endogenous). All other exogenous values follow along the baseline trend. We then repeat the simulation while supposing that Germany responds by contracting its fiscal policy in order to cut back inflation. Table 3 compares the two results. By depreciating the écu, the tight fiscal policy in Germany at first promotes inflation. But inflation has already come down as of the second year (1991). By 1995, the German fiscal program has offset 40 percent of the extra inflation. 2/

The cumulative fall in aggregate demand is substantial in Germany (9.3 percent by 1995), though GNP growth drops only in the initial year and

---

1/ If demands for money were formulated in terms of the output deflators rather than absorption deflators, a fall in interest rates would likely occur instead.

2/ The feedback rule for Germany in this case is

$$\Delta G/GDP = -2\pi$$

where  $\pi$  is the rate of change of the absorption deflator and G and GDP are as defined above.

Table 3. German Fiscal Targeting of Zero Inflation in Response to European Money Growth Shocks

(deviations from the scenario with no fiscal response) 1/

	1990	1991	1992	1993	1994	1995
France						
National Income						
Real GDP (percent)	0.1	0.5	0.6	0.6	0.3	0.1
Real GDP (annual growth rate)	0.1	0.4	0.2	-0.1	-0.2	-0.3
Real GNP (percent)	0.1	0.4	0.6	0.5	0.2	0.0
Domestic demand (percent)	0.2	0.3	0.2	-0.0	-0.3	-0.5
Consumption expenditure (percent)	-0.0	0.0	0.0	-0.1	-0.4	-0.6
Gross private investment (percent)	1.4	1.4	0.9	0.2	-0.5	-1.0
Exports of goods and services (percent)	-0.6	0.2	0.5	0.4	0.1	-0.1
Imports of goods and services (percent)	0.1	-0.5	-1.2	-1.7	-2.0	-2.1
Government						
Gen. gov't financial balance (FFb)	-6.8	-13.0	-14.9	-23.0	-32.4	-38.3
Gen. gov't financial balance/GNP (percent)	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3
Government debt (FFb)	5.8	16.4	27.2	45.5	73.5	107.9
Government debt/GNP	0.0	-0.0	-0.1	-0.1	0.1	0.3
Interest Rates						
Short-term interest rate	1.0	0.5	0.4	0.5	0.6	0.4
Long-term interest rate	0.6	0.5	0.3	0.1	-0.2	-0.6
Prices and Supply						
Absorption deflator (percent)	0.8	1.4	2.2	3.1	3.9	4.5
Absorption deflator (annual inflation rate)	0.8	0.7	0.8	0.9	0.8	0.5
GNP deflator (percent)	0.3	0.9	1.8	2.7	3.6	4.1
Export price deflator (percent)	2.0	2.4	2.8	3.2	3.7	4.0
Import price deflator (percent)	3.7	4.5	4.7	4.8	5.0	5.2
Capacity utilization rate	0.1	0.4	0.6	0.5	0.2	-0.0
Long-term real interest rate	-0.2	-0.2	-0.1	0.1	0.1	0.1
Real user cost of capital	-0.5	-0.4	-0.2	0.0	0.3	0.4
International Accounts						
Trade balance (FFb)	-37.9	-20.5	-0.4	15.8	24.3	25.7
Current account balance (FFb)	-37.8	-24.2	-6.6	8.6	17.1	19.2
Net foreign assets (\$b)	-6.1	-10.2	-11.7	-10.9	-8.9	-6.6
As a percent of nominal GNP						
Trade balance	-0.6	-0.3	-0.0	0.2	0.2	0.2
Current account balance	-0.6	-0.3	-0.1	0.1	0.2	0.2
Net foreign assets	-0.7	-1.0	-1.1	-0.9	-0.7	-0.6
Nominal effective exchange rate (percent)	-3.6	-4.3	-4.6	-4.8	-5.1	-5.4
Real effective exchange rate (percent)	-1.8	-1.9	-1.8	-1.5	-1.2	-1.0

Table 3 (concluded). German Fiscal Targeting of Zero Inflation in Response to European Money Growth Shocks

(deviations from the scenario with no fiscal response) 1/

	1990	1991	1992	1993	1994	1995
Germany, F.R.						
National Income						
Real GDP (percent)	-2.2	-1.9	-1.6	-1.7	-1.9	-1.9
Real GDP (annual growth rate)	-2.3	0.4	0.3	-0.1	-0.3	0.0
Real GNP (percent)	-2.2	-1.7	-1.2	-1.1	-1.2	-0.8
Domestic demand (percent)	-5.2	-5.6	-6.0	-7.0	-8.3	-9.3
Consumption expenditure (percent)	-1.9	-1.4	-0.9	-0.5	-0.1	0.6
Gross private investment (percent)	-3.4	-3.6	-3.8	-3.7	-3.4	-2.5
Exports of goods and services (percent)	0.7	2.0	2.9	3.7	4.4	5.2
Imports of goods and services (percent)	-7.8	-8.4	-9.1	-10.5	-12.3	-13.9
Government						
Gen. gov't financial balance (DMb)	57.7	64.4	72.5	91.5	122.0	152.8
Gen. gov't financial balance/GNP (percent)	2.5	2.6	2.8	3.4	4.3	5.1
Government debt (DMb)	-57.7	-120.9	-192.3	-282.6	-403.3	-554.8
Government debt/GNP	-2.0	-4.4	-6.9	-9.8	-13.4	-17.7
Interest Rates						
Short-term interest rate	1.0	0.5	0.4	0.5	0.6	0.4
Long-term interest rate	0.6	0.5	0.3	0.1	-0.2	-0.6
Prices and Supply						
Absorption deflator (percent)	1.0	0.9	0.6	0.4	0.2	-0.2
Absorption deflator (annual inflation rate)	1.0	-0.1	-0.2	-0.2	-0.2	-0.4
GNP deflator (percent)	-0.2	-0.8	-1.5	-2.3	-3.1	-4.2
Export price deflator (percent)	0.5	0.1	-0.4	-1.1	-1.8	-2.7
Import price deflator (percent)	4.2	5.0	5.6	5.9	6.4	6.8
Capacity utilization rate	-2.2	-1.8	-1.5	-1.5	-1.7	-1.6
Long-term real interest rate	0.8	0.8	0.8	0.8	0.6	0.3
Real user cost of capital	0.7	0.9	1.0	1.0	0.9	0.7
International Accounts						
Trade balance (DMb)	37.4	46.4	55.7	70.2	89.3	107.3
Current account balance (DMb)	39.2	51.7	64.8	84.2	109.5	135.8
Net foreign assets (\$b)	16.5	38.6	67.2	105.9	157.9	223.1
As a percent of nominal GNP						
Trade balance	1.7	2.0	2.3	2.8	3.4	3.9
Current account balance	1.8	2.2	2.6	3.2	4.0	4.7
Net foreign assets	3.0	5.0	7.2	10.0	13.5	17.6
Nominal effective exchange rate (percent)	-3.7	-4.4	-4.8	-5.0	-5.3	-5.7
Real effective exchange rate (percent)	-3.6	-4.8	-5.8	-6.7	-7.7	-9.0
EMU Nominal exchange rate (percent in \$/ECU)	-4.5	-5.3	-5.7	-6.0	-6.4	-6.8

1/ Deviations are for the level of the variable relative to its value in the corresponding year for the scenario with no fiscal response.

thereafter GNP grows faster than in the same situation without German fiscal tightening. As this implies, the current account balance swings sharply into surplus. Such is the rise in this surplus--both because of the fall in absorption and the induced depreciation of the écu--that there might be little room for further tightening of fiscal policy to combat inflation. On the French side, real output is slightly higher, inflation goes up by less than one percent annually, and the current account worsens a little. French net foreign assets are lower by about half of a percent of GNP by 1995. All in all, the story is much the same as previously. Mundell-Fleming is confirmed. But the confirmation is attenuated by a tendency for the improvement of the current account in the contracting country to come mostly at the expense of the outside world. Once again, the possibility that fiscal policy independence yields a reasonable outcome for both countries is not remote.

4. Medium-run simulation 3: Contractionary responses by both France and Germany to an oil shock

In a final simulation, we consider the possibility of fiscal responses to an oil shock. This shock has stagflationary effects on output and prices in both countries. Moreover, it tends to lower their current account surpluses (or, in the case of France, to increase the deficit). France wants to adopt contractionary fiscal policy to combat the current account deficit. Germany wants to do the same to fight inflation.

We had no difficulty simulating the French response without a German reaction, or simulating the German response without a French one, but we could not simulate the two simultaneously. The simulations would not converge. This could obviously be a reflection of our French and German models. But it could be also the result of genuine instability, since each country's fiscal contraction reinforces the other's contractionary tendency. The French reaction improves the French current account, but does so partly by depreciating the écu, thereby worsening the inflationary problem for Germany. The German reaction attenuates inflation at home (after a lag), but yields a French current account deficit in the short run (because of a J-curve effect of the depreciation of the écu). Moreover, unlike the two previous simulations, both of the countries seem about as much affected by the shock initially and therefore would be as much impelled to respond. Even if we dismiss the possibility of genuine instability, there is prima facie evidence of notable room for improvement through fiscal policy cooperation. Such cooperation would remove the conflicting attempts of France to reduce its output prices relative to German ones, thus contributing to a depreciation of the écu, and of Germany to resist a rise in inflation, which becomes all the harder as the écu falls.

III. Some Theoretical Analysis of Current Accounts in the EMU

Up to now the discussion assumes persisting French concern with current account balance. But, as mentioned above, current account deficits no longer have the same implications in a monetary union: they can be easily



financed and do not portend reserve losses, possible balance-of-payments crises, and devaluations, as they did for France most of the time in recent decades. Do current account targets still make sense in an EMU? In order to get some insights into the question, let us return to the scenario in which the monetary union as a whole has a balanced current account, but France has a deficit and Germany a surplus. To keep the focus on the important issues, let us further assume that the French deficit (German surplus) is not warranted by structural differences regarding productivity, time preference, or demography. Therefore, the current account imbalances are not sustainable and the policy question is the optimal path toward equilibrium.

There are two mechanisms that operate, even if the nominal exchange rate is fixed, to bring about an adjustment in the current account balances and therefore a rise in Germany's absorption relative to output and a fall in France's. First, continuing German surpluses lead to transfers of wealth from France to Germany. These wealth changes will lower consumption in France and raise it in Germany. Second, and equally important, insofar as French current account deficits correspond to higher investment in France--due to initially lower capital intensity and higher marginal productivity of investment--the deficits will be associated with an outward shift of the French productivity frontier relative to the German one. This shift will increase the marginal product of French labor relative to German labor over time, hence result in an increase in the competitiveness of France relative to Germany.

The second mechanism allows a real exchange rate adjustment to occur without either a rise in German prices or a recession-induced fall in French real wages. Indeed, French real wages would rise. The basic reason for considering this second mechanism to be important is that the past decade has seen insufficient investment in France. One cause has been restrictive aggregate demand policies. But another cause--more significant from our viewpoint--is that French real interest rates have been high and have even risen since the mid-eighties relative to the German level. The special significance of this last factor stems from its link to the past operation of the EMS and its relationship to the move toward monetary union.

In the early years of operation of the EMS, realignments compensated for differentials in inflation. As French inflation has declined to the German level, however, adjustments in exchange rates have become smaller than inflation differentials, and French relative prices have risen. French nominal interest rates have also failed to decline correspondingly, because a premium has developed on the franc based on the expectation or the risk of a downward realignment which would offset past increases in French relative prices. The result has been a rise in real interest rates in France, which has led to lower capital accumulation and to a higher marginal product of capital in France.

Because of the need for faster capital accumulation, therefore, were the EMU to be formed today, France would have less cause to resist current

account deficits than it had in the past. 1/ The country therefore has several good reasons to resist these deficits less, since as we indicated before, the deficits will also become easier to finance and less troublesome in general in an EMU. Hence, it is plausible to suppose that the French emphasis on targeting current account balance will decrease.

Let us suppose next that the German fiscal authorities interfere with the appreciation in the real exchange rate of German output in the EMU by restraining the rise in German prices. This would sustain current account deficits in France. On the assumptions of the earlier sections, the conflict with French objectives would be marked. But on present assumptions, the conflict would be lessened since higher current account deficits would be more acceptable to France. Moreover, the German policy would not unambiguously interfere with the process of international adjustment; while hindering this adjustment through shifts in relative demand, it would assist the adjustment through shifts in relative supply. More precisely, by encouraging the financing of investment in France, the German policy would promote an equilibrating rise in capital intensity in France. 2/ Is the French current account deficit, therefore, no longer the source of any legitimate concern?

Current account deficits correspond to accumulation of net indebtedness. If the deficit finances productive investment and the rate of return on investment is greater than the borrowing cost, then the indebtedness should be self liquidating. If, however, there are distortions that make the private return on investment higher than the social return, it is not so clear that deficits are benign. Further, current account deficits may correspond to increased consumption; while it may be optimal to smooth temporary consumption shocks, the persistence of high consumption in the face of reduced income may be cause for concern. 3/ Therefore, the existence of current account deficits may signal inappropriately stimulative policies, and accumulation of indebtedness that is not self liquidating. In these circumstances, if accumulated indebtedness by France needs to be reversed later, or at least stabilized as a ratio to GNP (and the economy's rate of interest is above the growth rate of output), then French prices will have to decline relative to foreign prices since the higher interest payments on the debt will need to be offset by a larger trade surplus. Indeed, if the debt is to be repaid, then the ratio of French to German output prices will need to undershoot its long-run equilibrium value at some stage in the adjustment process. 4/ The period of undershooting is clearly a

---

1/ This is also the conclusion of Bredenkamp and Deppler (1989).

2/ France might also do the same, in particular, by lowering taxes on capital income. Discussion of the effect of tax policies on the location of investment and capital may be found in Dooley and Isard (1989), Isard (1989), and Tanzi and Bovenberg (1990).

3/ See Jacob Frenkel, Morris Goldstein, and Paul Masson (1989).

4/ William Branson may be cited as the source of a number of clear expositions of the dynamics of the adjustment process. For a recent example in a policy context, see Branson (1988).

disadvantage to French consumers since it means higher relative prices of imports. From this perspective, therefore, it is not the case that perfectly elastic capital flows in the EMU would make the current account balance a matter of indifference.

It is therefore still reasonable to suppose that German anti-inflation policy could lead to French current account deficits that are not desired by France. But is there any cause to modify our earlier emphasis on the benefits of fiscal policy independence? We think not. We see little reason to deviate from our earlier assessment in the case of overpriced French goods that fiscal policy independence is a good bet to yield better results than would come about without it. If France and Germany begin from different initial positions or if their preferences differ, the ability of the French and German authorities to wield a separate instrument adds a desirable element of flexibility. At the opposite extreme, a joint fiscal authority might well force convergence to a policy that would represent some mix of French and German preferences. But if Germans place greater emphasis on price level stability than the French, while the French place more weight, say, on output smoothing, there is a real possibility that both countries would be better off with some difference in fiscal policies, made possible by retaining fiscal policy flexibility. The answer to fiscal policy conflicts over aggregate demand policies, therefore, is not to adopt measures interfering with the ability of fiscal policies to differ within the EMU, like ceilings on fiscal deficits, but to add an element of fiscal policy cooperation. Failing such cooperation, it would be desirable to design the constraints on national fiscal policies in a way that kept a degree of flexibility.

#### IV. Concluding Remarks

In sum, our analysis serves to highlight the increased possibility of financing current account deficits in a monetary union and the value of fiscal policy independence in that context. <sup>1/</sup> Our simulations have illustrated cases in which there would be clear value to retention of fiscal flexibility, because of different initial conditions (or asymmetric shocks) and different preferences. How much fiscal policy cooperation would be desirable in order to cope with fiscal policy conflicts remains largely a moot point in our discussion, we admit. We presented one example--that of an oil shock--where the French and German fiscal authorities seem to be locked in a conflict implying notable room for improvement through cooperation. Indeed cooperation could even be essential in this example. But in light of our central concern with showing the value of fiscal policy independence, the benefits of cooperation have been left mostly in the

---

<sup>1/</sup> For a highly complementary analysis, see Tommaso Padoa-Schioppa (1990).

background. 1/ Also left in the background is the issue of possible incentives governments may have to run excessive fiscal deficits in a monetary union, and the role of deficit ceilings in limiting this possibility.

Obviously, our medium-term baseline projections might be radically altered by developments in Eastern Europe, and in particular, by unification of the Federal Republic of Germany with the German Democratic Republic. Though we do not discuss German unification here, it could be analyzed as a shock that would likely affect France and Germany quite differently. We would argue that in these circumstances fiscal flexibility would be all the more desirable, and deficit ceilings all the more unproductive.

Another basic question that we have not considered is the possible use of regional transfers to alleviate undesirable consequences of monetary union. No doubt such transfers might be an advantageous means of putting bounds on the redistributions associated with fiscal policy independence. But as indicated in the introduction, strong views have been expressed about the importance of engaging in such transfers, some going so far as to suggest that a fully integrated fiscal system may even be essential for a monetary union to work. Having emphasized the value of retaining some fiscal policy independence in a European Monetary Union, it behooves us to return to this strong form of the argument for fiscal integration. 2/ Though we do not pretend to do justice to the whole issue, we would like to raise a few skeptical observations about the critical need for a system of taxes and transfers in order to compensate for unfavorable country-specific shocks.

There is a considerable question, at the start, about how far the preceding argument for an integrated fiscal system really concerns the viability of a monetary union rather than an independent question of distributive justice. The most important fiscal mechanisms in the automatic transfer of resources to adversely hit areas--including the income tax system above all--essentially arrived late: only in the course of this century, in many countries mostly since the Second World War. Yet the earlier meagerness of transfers to depressed areas rarely gave rise to calls for monetary independence in particular regions. Politically speaking, depressed areas tend to call for aid, not for monetary independence. This might be different, of course, in the instance of newcomers in a monetary

---

1/ Bredenkamp and Deppler (1989) concluded that the problems from noncooperative fiscal policies might in fact be weaker in a monetary union than in a flexible exchange rate regime. Insofar as cooperative adjustment to shocks nonetheless remains desirable, and insofar as monetary policy is not independent of fiscal policy, there may be an argument for limiting fiscal policy flexibility in order to gain credibility for monetary policy. See Matthew Canzoneri (1985).

2/ The classic reference on this matter is Peter Kenen (1969), a work discussing Robert Mundell's important early contribution to the subject of optimal currency areas, Mundell (1961).

union. But how many prospective entrants in the EMU could look back to an earlier time when monetary independence was an effective means of responding to adverse shocks?

There is another set of major questions. The sort of system of transfers that advocates of fiscal integration have in mind would operate automatically. What would therefore prevent the system from coming into operation because of problems that a country brought upon itself and that aroused no sympathy elsewhere in the union? To what extent would residents of one country be prepared to make transfer payments to that of another because of an enormous wage settlement in the latter? To what extent would they be prepared to compensate others for high unemployment in some industrial sectors that resulted from very tight fiscal policy? But is there any way to set up an automatic system of transfers at the Community level that would draw distinctions of this sort? And if not, is there scope for devising a fiscal system in a monetary union to correct regional problems that would otherwise have been solved through exchange rate changes? As these questions indicate, a basic tension exists between the notion of independent states wishing to preserve their national identities and any major system of taxes and transfer payments between them. Whereas such a system might very well be acceptable as a way of funneling aid to poorer members, it might not be acceptable if it were a means of providing collective insurance for everyone.

### References

- Branson, William, "International Adjustment and the Dollar: Policy Illusions and Economic Constraints," in Wilfrid Guth, moderator, Economic Policy Coordination (IMF and HWWA-Hamburg, 1988).
- Bredenkamp, Hugh, and Michael Deppler, "Fiscal Constraints of a Fixed Exchange Rate Regime," IMF Working Paper No. WP/89/107 (Washington: International Monetary Fund, December 1989).
- Canzoneri, Matthew, "Monetary Policy Games and the Role of Private Information," American Economic Review, Vol. 75 (December 1985), pp. 1056-70.
- Cohen, Daniel, and Charles Wyplosz, "The European Monetary Union: An Agnostic Evaluation," CEPR Discussion Paper No. 306 (April 1989).
- Delors Report, "Report on Economic and Monetary Union in the European Community," European Community (April 1989).
- Dooley, Michael and Peter Isard, "A Note on Fiscal Policy, Locational Decisions, and Exchange Rates," IMF Research Department, September 8, 1989.
- Eichengreen, Barry, "One Money for Europe? Conceptual Issues and Lessons from the U.S. Currency Union," prepared for Economic Policy (September 1989).
- Frenkel, Jacob A., Morris Goldstein, and Paul Masson, "International Dimensions of Monetary Policy: Coordination Versus Autonomy," paper prepared for a symposium Monetary Policy Issues in the 1990's, Jackson Hole, Wyoming, August 30-September 1, 1989 (Federal Reserve Bank of Kansas City, forthcoming).
- International Monetary Fund, World Economic Outlook (Washington: International Monetary Fund, October 1989).
- Ingram, James, Regional Payments Mechanisms: The Case of Puerto Rico (University of North Carolina Press, 1962).
- Isard, Peter, "Corporate Tax Harmonization and European Monetary Integration," IMF Research Department, September 8, 1989.
- Kenen, Peter, "The Theory of Optimum Currency Areas: An Eclectic View," in Robert Mundell and Alexander Swoboda, eds., Monetary Problems of the International Economy (University of Chicago Press, 1969).
- Krugman, Paul, "Policy Problems of a Monetary Union," prepared for Bank of Greece and CEPR conference on "The EMS in the 1990s," (August 1989).

- Masson, Paul, Steven Symansky, Richard Haas, and Michael Dooley,  
"MULTIMOD--A Multi-Region Econometric Model," Staff Studies for the  
World Economic Outlook (Washington: International Monetary Fund, July  
1988) pp. 50-104.
- Mundell, Robert, "A Theory of Optimum Currency Areas," American Economic  
Review, Vol. 51 (September 1961), pp. 657-65.
- van der Ploeg, Frederick, "Fiscal Aspects of Monetary Integration in  
Europe," CEPR Discussion Paper No. 340 (August 1989).
- Padoa-Schioppa, Tommaso, "Fiscal Prerequisites of a European Monetary  
Union," prepared for Bank of Israel and David Horowitz Institute  
conference on "Aspects of Central Bank Policy" (January 1990).
- Portes, Richard and Jose Viñals, eds., The European Monetary System in  
Transition, a CEPR Report (September 1989).
- Sachs, Jeffrey and Xavier Sala-i-Martin, "Federal Fiscal Policy and Optimum  
Currency Areas," (mimeographed, Cambridge, Massachusetts: Harvard  
University, 1989).
- Tanzi, Vito and Lans Bovenberg, "Is There a Need for Harmonizing Capital  
Income Taxes within EC Countries?" in H. Seidel, ed., Reforming Capital  
Income Taxation (Kiel Institute of World Economics, forthcoming, 1990).

