

German Unification and its Impact on Net Savings*

Professor Horst Siebert

1. German unification can be interpreted as an economic shock to post-war Germany. In the long run, the factor endowment has changed. Qualified labor and land were added to the west German economy, but at the same time eastern Germany brought into the marriage an obsolete capital stock. Thus, the east German capital stock has to be rebuilt. This will take time. In the short run, the change in the relative factor endowment implies an excess demand for capital being derived from the investment opportunities in eastern Germany. There also is an excess supply of labor which amounts to 5.6 million unemployed people in mid-1993 if those who are supported by labor market policies are included. In addition, transfers to eastern Germany are needed not only for investment purposes, but for creating a new organizational and administrative structure in eastern Germany and for social purposes (Siebert 1993a). The short-run and medium-run change in relative factor supplies and the reallocation of public spending in favor of eastern Germany have an impact on net savings that Germany can supply to or withdraw from the world market.

I. Capital Demand

2. Obsolete capital stock. In any transformation process with a rapid change of the price vector, a large part of the existing capital becomes obsolete. In the case of eastern Germany, the appreciation of the East German mark and the wage shock aggravated the destruction of the existing capital. Like dinosaurs, the huge "Kombinate" were exposed to a cosmic change in their economic conditions (Long and Siebert, 1991). The transition problem can be analyzed as a change in the firms' constraints: a sudden drop in the producer's price, a shift from monopoly to competition, the emergence of product quality as a key factor, a modification in the system of subsidies and of external protection, and competition for new capital in place of the former "soft budget constraint." As demand fell abruptly, the existing capital stock became largely obsolete. In some respects the transition can be compared to a huge oil shock, one that affects not just the price of one input but changes the most important constraints. Besides these economic aspects, the capital stock of eastern Germany was old. According to estimates, 76 percent of the equipment in industry was older than 5 years and 54.9 percent older than 10 years.

3. Capital requirements to rebuild the capital stock in eastern Germany.

* Paper presented at the Progress Foundation's Conference "International Savings Flows and Capital Availability in the 1990s and Beyond," September 28, 1993, in Zurich.

I appreciate comments from Michael Heise and Alfred Boss who prepared Tables 2, 3 and 4.

Assuming that eastern Germany will have the same capital stock per capita as western Germany after the transformation process has ended, the capital stock of the enterprise sector would be 1,300 billion DM¹ (Table 1). This is a back-of-the-envelope calculation for accumulated investment assuming that the existing capital stock is completely obsolete. Infrastructure capital in western Germany amounted to 2,179 billion DM in 1991. This figure includes public buildings and equipment, roads, rail, postal and communication infrastructure and waterways. Using the infrastructure of western Germany as a frame of reference, infrastructure capital in eastern Germany should amount to 545 billion DM. Assuming that one-third of the capital stock is usable, and considering a 10-year period of adjustment, a rough calculation shows that private investment of 90 billion DM and public investment of 40 billion DM per year, i.e., 130 billion

¹ The total west German capital stock was 12,687 billion DM in 1991, that of the enterprise sector 5,201 billion DM.

Table 1
Capital Stock and Investment in eastern and western Germany
(in billion DM)

	Western Germany 1991	Eastern Germany 1988	Eastern German capital stock after adjustment ^f
1. Gross domestic product — Total	999.78	200 ^b	
Enterprises (without housing)	570	95	
Goods-producing sectors (mining, manufacturing, construction, electricity, gas and water)	367	68	
Housing	142	46	
	137	12 ^c	
2. Gross investment — Total	12,687 ^d	1,635 ^d	3,172
Enterprises (without housing)	5,201 ^d	1,300 ^e	1,300
Goods-producing sectors	2,205 ^d	780 ^d	551
Housing	5,067 ^d	—	1,267
Public infrastructure (not included in total)	2,179 ^f	—	545
4. Capital-output ratio — Total	5.0	5.2	
Enterprises (without housing)	2.5	—	
Goods-producing sectors	2.2	3.9	

^a Calculated as 25 percent of the West German capital stock in 1991. ^b Including goods-producing crafts. ^c New construction and modernization. ^d Evaluated at replacement costs, yearly averages, excluding roads, waterways and civil engineering, including rail and postal service. ^e Capital stock at 1986 prices. ^f Including roads, waterways, sewage systems, as well as rail and telecommunications systems; for 1988.
Source: Statistisches Bundesamt (Hrsg.): Staatliche Zentralverwaltung [1989]; Statistisches Jahrbuch 1992 für die Bundesrepublik Deutschland, Wiesbaden 1992, pp. 655-661, own estimates.

DM per year, would be needed.² In contrast to this rough calculation it can be expected that investment will follow a bell-shaped curve over time with investment cumulating in the years 1993-1995 or 1996 and falling afterwards. Capital demand will increase at first, and then be lower.

4. Relocation of investment. Part of the investment being undertaken in eastern Germany might have taken place in western Germany if Germany were not yet united. Thus, part of the eastern German investment may just have been shifted from western Germany. Such a reallocation of the capital stock should be expected as a normal process, but so far we do not have any indication of the magnitude of the effect. Eventually, investment in western Germany may also be stimulated once a growth process in eastern Germany comes about.

5. Governmental transfers and inherited debt. In addition to the increased demand for private capital, there is the need to finance governmental transfers to eastern Germany which are running at 150 billion DM per year. Moreover, German fiscal policy has to finance the interest payments on the additional debt burden which can be calculated as roughly 30 billion DM (Stiebert 1993).³ All in all, Germany will have to finance 180 billion DM per year (6 percent of GNP).

It is estimated that the Treuhand* will accumulate a debt of 270 billion DM by 1994. The Credit Processing Fund (Kreditabwicklungsfonds), which manages the liabilities of the former GDR and covers the differential conversion rates for the debt of socialist firms and for individual savings, will have to be taken over by the federal government. It is estimated that a debt of 140 billion DM will have been accumulated by the fund. The German Unity Fund, financed by the federal government and the Länder, will have accumulated 100 billion DM at the end of 1994. The debt of the public housing sector in eastern Germany is 50 billion DM.

6. Budget deficit. The debt of the public sector, which amounted to 929 billion DM in 1989, will have reached 1.95 trillion DM by 1994. Thus, public debt will have doubled within 5 years. In relative terms, the ratio of public debt to GNP will rise from 41 percent in 1989 to 58 percent in 1994. Public expenditures relative to GNP will rise from 45 percent in 1989 to over 52 percent in 1994.

The overall German government budget deficit, including the federal,

² Calculations for public investment do not include environmental protection.

³ Note that part of the interest payment on the so-called "inherited debt" is already included in the calculation of the transfers.

* Refers to the Treuhandanstalt, the government trustee agency to which the rights to publicly owned East German firms were transferred under the terms of the MESU of 1990. The Treuhand's primary task is to privatize East German firms. — Ed.

state and municipal levels as well as the social security system, amounted to 140 billion DM in 1992; this is 4.7 percent of GNP. These data include the Treuhand deficit of 30 billion DM for 1992. If the governmental telecommunication and mail services and the railroads are included, the public sector capital demand will amount to roughly 170 billion DM in 1992. Figure 1 shows the development of public debt and the budget deficit up to 1994.

7. One potential issue is whether unification has had an impact on savings behavior of households. With respect to net household savings, this is not the case. The savings ratio, *i.e.*, net household savings as a percentage of disposable income has remained relatively stable reaching the same values as in the eighties.⁴ East Germans have a similar savings ratio as west Germans.

II. The swing in the current account

8. The accounting identity. The impact of Germany's increased demand for capital can be seen by the change in Germany's net capital export as measured by the balance in the current account. Let X denote exports, M imports, Tr international transfers, S savings of the private sector, I investment of the private sector and T - G the budget surplus with T taxes and other government revenues and G expenditures. Then the macroeconomic accounting identity

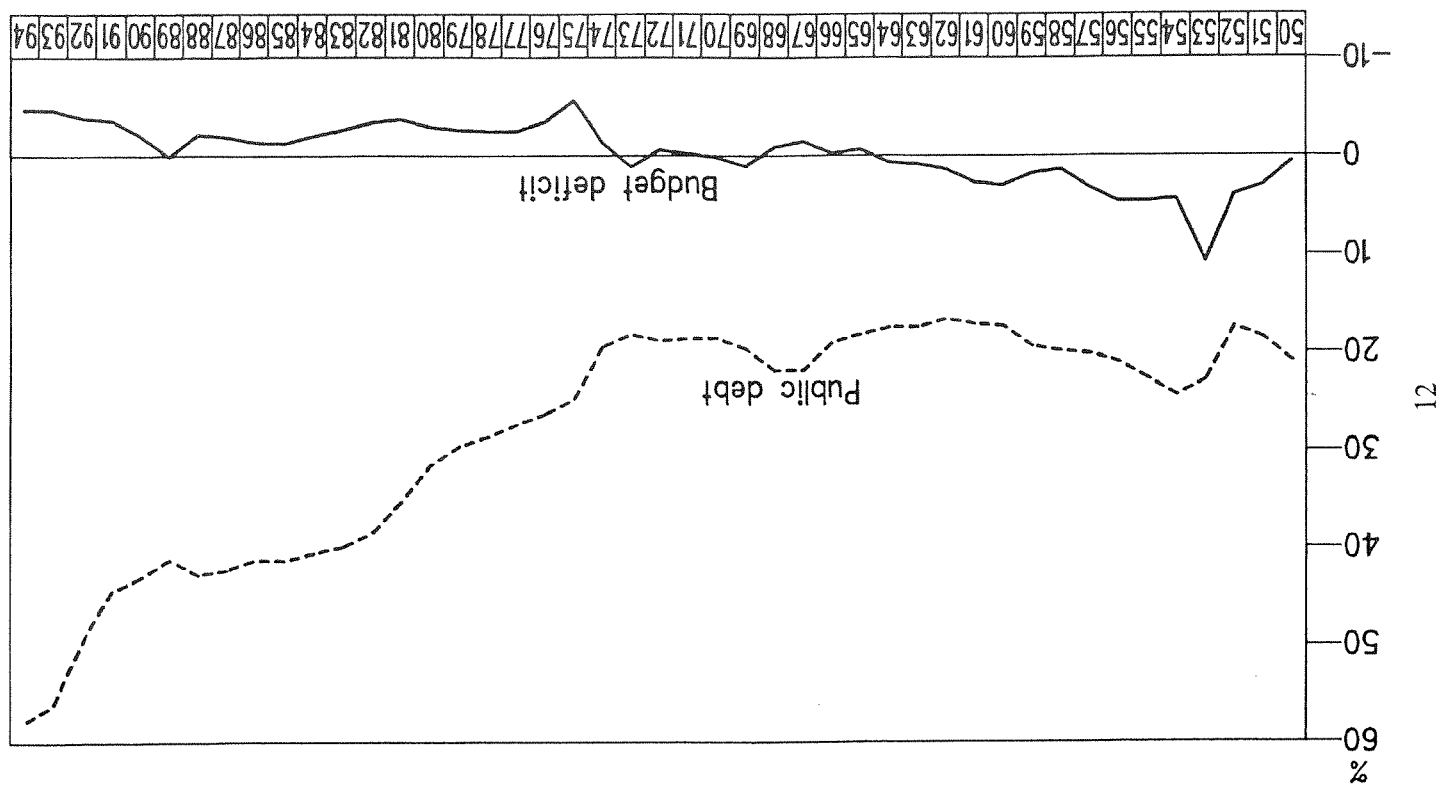
$$(S - I) + (T - G) = X - M + Tr$$

indicates that the balance in the current account corresponds to an excess supply of or an excess demand for savings. A positive current account is equivalent to an excess supply of savings. The country does not completely absorb its production and exports capital abroad. A negative current account implies an excess demand for savings. A country's savings are not sufficient to finance private investment and the budget deficit of the government. A country absorbs more than its production. It imports capital.

9. Different concepts of the budget deficit. Some conceptual and statistical difficulties arise in calculating the different components of the accounting identity for post-wall Germany. The issue is to what extent a narrow concept of the governmental budget including the federal, regional and local government and the social security system can be used or whether the shadow budget of Treuhand, the Kreditabwicklungsfonds and the mortgages on housing must be included. In an economic interpretation the wider concept must be applied. One reason is that the wider concept is relevant for capital market implications. The other reason is that any debt outside the

⁴ The net household savings ratio with 12.6 in 1991 and 1992 for total Germany was similar to the average of 12.3 in 1980-89 (OECD 1993a, Table R12).

Figure 1 — Public Debt and Budget Deficit



official budget eventually must become part of the official budget. Thus, a long-run view requires the integration of debt into the budget.

10. Statistical problems. One possible approach is to integrate debt into the budget right away. Such an approach, however, meets severe data problems. With respect to the shadow budgets, debt taken over as of July 1, 1990 and the increase in debt since that date should be distinguished. In 1990 eastern Germans exchanged their East-mark against the D-mark at the rate 1:1. This conversion rate represented a wealth transfer and affected east German savings positively. Debt of firms was converted at a rate of 2:1. In order to reach consistency between both sides of the account of the east German banking sector, *i.e.*, of the previous Staatsbank, a credit processing fund took over the difference between the converted old savings and the converted old debt (30 billion DM). Note, however, that the exact figure for old debt only became known when the opening balance for GDR-firms was eventually established. In addition, the credit processing fund took over the debt of the previous eastern German government (27.6 billion DM). This increase in debt of roughly 58 billion DM has to be added to the overall budget deficit of the government in the year 1990. If it were not added, the increased savings of eastern Germans due to the wealth transfer would represent a distorted picture of German savings.

The old debt of firms as of July 1, 1990 can be interpreted as negative savings in the period when debt is taken over, *i.e.*, in 1990. But again, it only became known later with the opening balance for all Treuhand firms how high debt was and to what extent debt was officially taken over by Treuhand and by government.

In addition to the stock variable of debt taken over, there was an increase in debt after July 1, 1990. Thus, Treuhand made an annual deficit of 4 billion DM in 1990, 20 billion DM in 1991, and 30 billion DM in 1992. The deficit of Treuhand per period means that investment in Treuhand firms was financed or that Treuhand firms made a loss, *i.e.*, they had negative savings. Similarly, debt increased in the Credit Processing Fund and in the public housing sector.

11. Ignoring debt temporarily. The alternative procedure is to neglect the debt in the shadow budget, both the level and the annual increase, temporarily and to integrate in one way or another the level of debt at some future date into the overall budget. This procedure is followed in practice. The level of debt (consisting of debt taken over as of July 1, 1990 and accumulated debt up to December 31, 1994) will be made explicit in the "burden inherited fund" (Erblastentilgungsfond), from January 1995 on.

⁵ Formally, 20 billion DM for the housing sector will have been integrated into the federal budget before 1994, 45 billion DM for Treuhand will be integrated in 1994.

The level of debt is estimated at 466 billion DM.⁵ It is realistic to expect a larger figure. The annuity of debt of roughly 40 billion DM will increase the annual budget deficit.

12. Narrow concept of budget deficit. Official statistics follow the narrow concept of the state budget deficit excluding Treuhand and other shadow budgets. Thus, it is difficult to establish the real budget deficit per period. In Table 2 this narrow concept of the budget deficit is followed. In this approach, the share of the state budget deficit is -3.3 for 1991 and -2.8 for 1992, which is not overwhelming. Note, however, that S - I only accounts for 1-2 percent of GNP. This is not surprising. In this approach, the deficit of Treuhand is part of private sector savings and reduces S - I.

13. Broad concept of budget deficit. Table 2 shows the development of debt in the shadow budgets taking into account the date in which year the debt materializes. We use this information to establish the broader concept

Table 2
Savings, Investment and External Balance
(in billion DM and percent of GNP)

	S		I		S - I		T - G		Current Account	
	bil. DM	% GNP	bil. DM	% GNP	bil. DM	% GNP	bil. DM	% GNP	bil. DM	% GNP
1960	46.6	-1.4	50.9	1.4	-4.3	-1.4	9.1	3.0	4.8	1.6
1970	93.6	3.4	90.2	2.5	3.4	0.5	1.4	0.2	4.7	0.7
1980	139.5	14.2	125.3	10.0	14.2	1.0	-42.7	-2.9	-28.5	-1.9
1981	135.7	13.5	90.9	6.6	44.8	2.9	-56.6	-3.7	-11.7	-0.8
1982	133.0	12.8	69.8	5.1	63.2	4.0	-52.7	-3.3	10.5	0.7
1983	148.7	14.1	94.3	6.9	54.4	3.2	-42.6	-2.5	11.8	0.7
1984	155.7	14.8	100.1	7.4	55.6	3.2	-34.0	-1.9	21.6	1.2
1985	154.1	14.5	91.9	6.6	62.2	3.4	-21.1	-1.2	41.1	2.2
1986	204.0	19.1	99.0	7.4	105.0	5.4	-25.4	-1.3	79.6	4.1
1987	216.6	20.3	99.0	7.4	117.6	5.9	-37.8	-1.9	79.8	4.0
1988	254.5	24.1	122.9	11.7	131.6	6.2	-45.2	-2.1	86.3	4.1
1989	256.6	24.4	155.7	14.7	100.9	4.5	4.3	0.2	105.1	4.7
1990	318.8	29.8	188.6	17.7	130.2	5.1	-60.5	-2.4	69.8	2.7
1991	286.6	27.1	234.4	21.8	52.2	1.8	-93.6	-3.3	-41.4	-1.5
1992	293.3	27.8	255.3	23.3	38.0	1.3	-83.7	-2.8	-45.6	-1.5
1993	310.0	29.1	240.0	21.8	70.0	2.3	-125.0	-4.0	-55.0	-1.8
1994	334.0	31.3	274.0	24.8	60.0	1.9	-115.0	-3.5	-55.0	-1.7
1995	355.0	33.3	300.0	27.5	55.0	1.6	-100.0	-2.9	-45.0	-1.3

S = savings of private households and firms; I = private investment; T - G = budget deficit (-) or surplus. For 1980-89: West Germany; from July 1, 1990: United Germany (intra-German transactions eliminated).

Source: German Council of Economic Advisors, Annual Report 1992/93, Table 45; Deutsche Bundesbank, Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung der Deutschen Bundesbank 1982 bis 1991, Ergänzungslieferung, Sonderdrucke der Deutschen Bundesbank, Nr. 4, August 1992; Deutsche Bundesbank, Monatsberichte, May 1993; National Income and Product Accounting Data.

of government debt in which shadow budgets of Treuhand (including annual operating deficits and debt taken over in the privatization process, debt of the Credit Processing Fund and debt of the state housing sector) are included (Table 4). Note that the data on debt based on Bundesbank calculations are on the low end.

It is interesting to see that the inclusion of the shadow budget implies that the overall state budget deficit increases (219.3 billion DM in 1992 instead of 83.7 billion DM) to 7.3 percent of GNP. While the data for investment remain unchanged, data for savings of the private sector increase considerably (428.9 billion DM instead of 293.3 billion DM). This is due to the fact that savings of the private sector include savings of the business sector. Thus, capital transfers to the firms, for instance the reduction of debt or the infusion of new capital by Treuhand,⁶ are part of savings. The difference of 135.6 billion DM between the larger concept of savings in Tables 4 and 2 is explained by the increase of debt in 1992 of Treuhand (67.4 billion DM), the Credit Processing Fund (64.2 billion DM) and public housing (4 billion DM). Thus, the figure for savings is blown up artificially.

14. Graphical illustration. Figure 2 shows how Germany's external balance has changed after unification. Most impressive is the swing in the current account between 1989 and 1992, from a surplus of roughly 110 billion DM to 40 billion DM or from 4.8 percent of GNP to -1.5 percent of GNP (1992). The narrow concept of the budget deficit illustrates the impact of German unification in the low net saving of roughly 1-2 percent (curve n in Figure 2). In the narrow concept of the budget deficit, the

⁶ Note that the counterposition is represented by increased debt in the shadow budget.

Table 3
Debt of Shadow Budgets
(in billion DM)

	1990	1991	1992	1993	1994	1995
Treuhand						
Change in Debt	14,1	25,3	67,4	83	40	-
Debt*	14,1	39,4	106,8	190	245†	230
Credit Processing Fund						
Change in Debt	27,6	-0,1	64,2	46,3	2	-
Debt*	27,6	27,5	91,7	138	140	140
Public Housing						
Change in Debt	38	4	4	5	0	0
Debt*	38	42	46	51	51	51
Total Change in Debt	-	29,2	135,6	-	-	-

* End of year. † 45 billion DM will be taken over by the Federal Government in 1994.
Source: Deutsche Bundesbank, Hrsg., Monatsberichte, Treuhandanstalt, Informationen, Presse- und Informationsamt der Bundesregierung, Bulletin. Own calculations and estimates.

Table 4
Savings, Investment and External Balance — Including Treuhandanstalt, Credit Processing Fund and formerly state-owned housing sector
(in billion DM and percent of GNP)

	S		I		S-I		T-G		Current Account	
	billion DM	percent of GNP	billion DM	percent of GNP	billion DM	percent of GNP	billion DM	percent of GNP	billion DM	percent of GNP
1989	256.6		155.7		100.9		0.2		105.1	
1990	370.8		188.6		182.2		-5.5		69.8	
1991	316.0		234.4		81.6		-4.4		-41.4	
1992	428.9		255.3		173.6		-7.3		-45.6	
1993	444.0		240.0		204.0		-8.4		-55.0	
1994	376.0		274.0		102.0		-4.8		-55.0	
1995	355.0		300.0		55.0		-2.9		-45.0	

S = savings of private households and firms; I = private investment; T - G = budget deficit (-) or surplus.
For 1989: West Germany; from 1990: United Germany (intra-German transactions eliminated).

Source: German Council of Economic Advisors, Annual Report 1992/93, Table 45; Deutsche Bundesbank, Ergebnisse der gesamtwirtschaftlichen Finanzrechnung der Deutschen Bundesbank 1982 bis 1991, Ergänzungslieferung, Sonderdrucke der Deutschen Bundesbank, Nr. 4, August 1992; Deutsche Bundesbank, Monatsberichte, May 1993; National Income and Product Accounting Data.

governmental budget deficit is not disturbing. In the broader concept, net savings are artificially blown up, and the budget deficit reaches 7-8 percent of GNP in the years 1992 and 1993 (curve b in Figure 2).

III. Interest rate and exchange rate effects

15. Shift in the factor-price frontier. The long-run effect of integration, new investment opportunities and the incentives of the market system make German unification look like a "new frontier" in the sense of Alvin Hansen (1955), as creative destruction in the interpretation of Schumpeter (1934) or as a positive supply shock. Clearly, the potential marginal efficiency of capital in eastern Germany has increased, and the real interest rate will be driven up from the supply side. A similar effect comes from infrastructure capital which can be expected to have a high marginal productivity in eastern Germany. The effect on the real interest rate of this supply shock can be viewed as an increase in the marginal productivity of capital or as a shift in the factor price frontier. This schedule describes the combination of maximum rewards to the factors of production, say capital

Figure 3 — The Factor Price Frontier

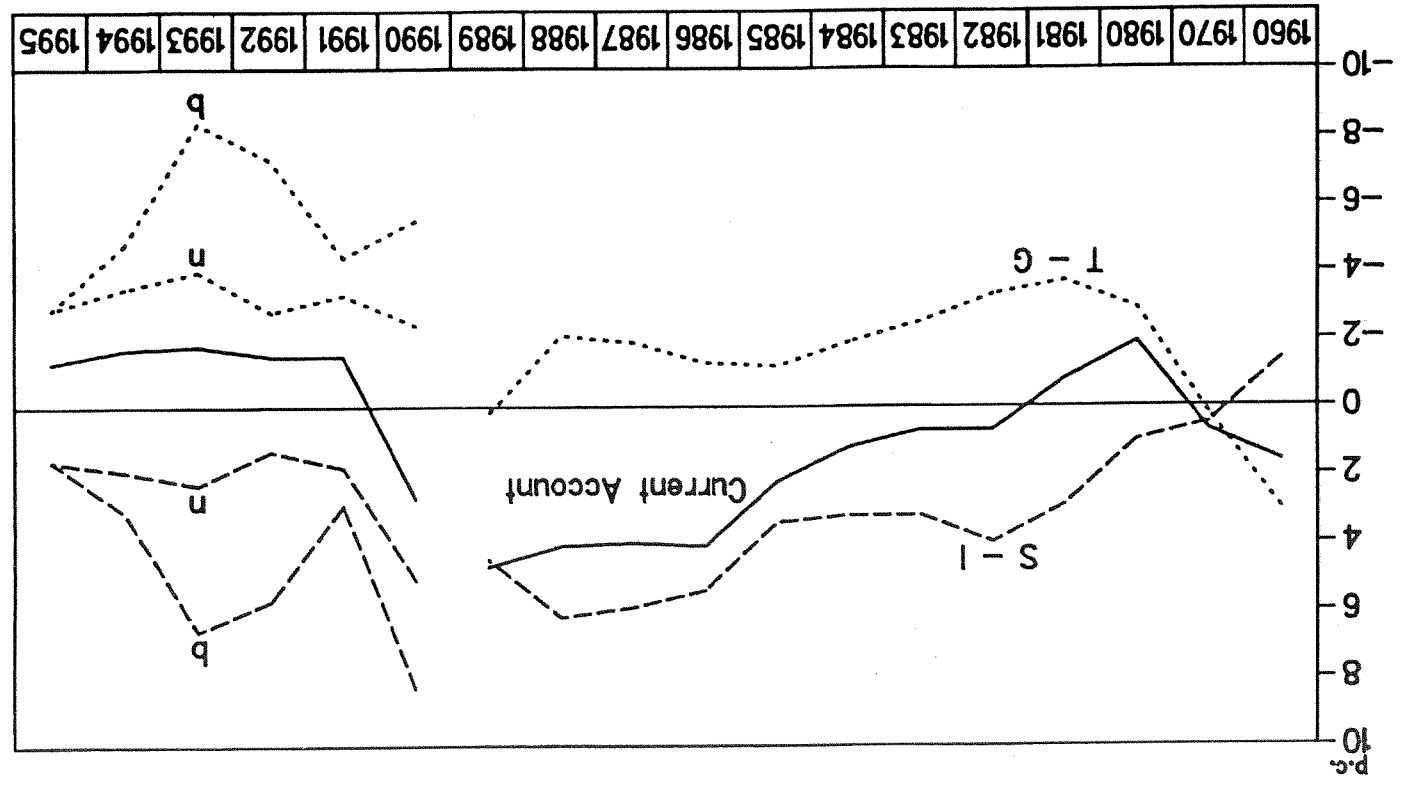
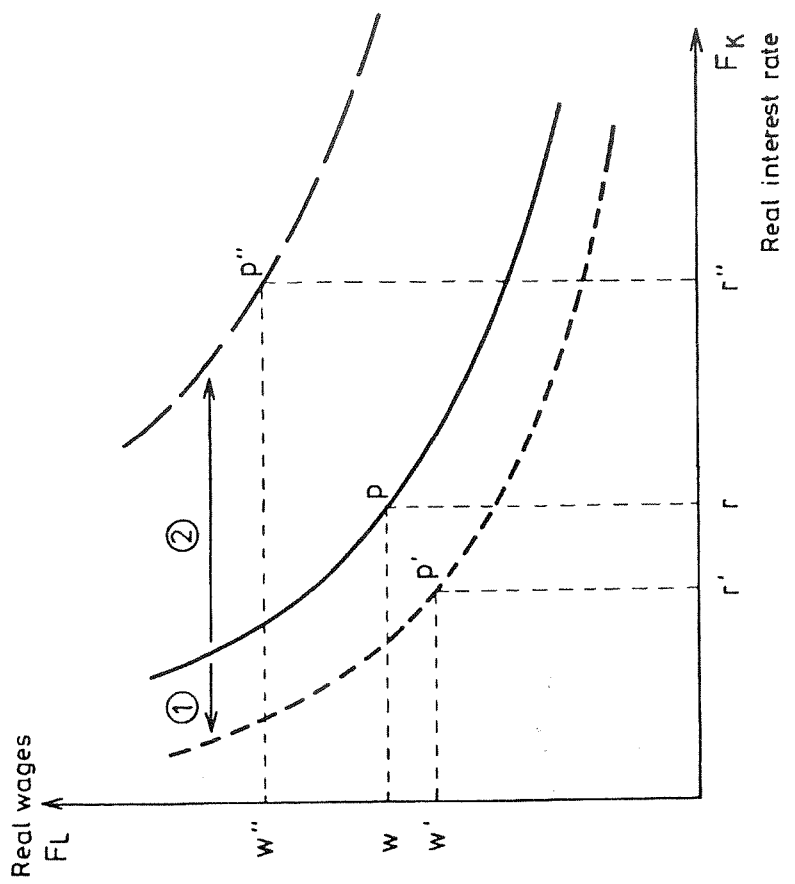


Figure 2 — Germany's External Balances

1960-1989 Western Germany.

and labor, given the state of technology (Figure 3). The transition to the market economy makes the existing capital stock obsolete, because the price vector of the economy is changed. This shifts the factor price frontier inward. Building up a new capital stock, and incorporating new technical knowledge in more recent vintages of the capital stock shifts the factor price frontier outward. Note that the initial inward move corresponds to the J-curve effect (Siebert 1991a).⁷

16. Capital demand for social consumption. The supply side effect on the marginal efficiency of capital or on the real interest rate is not the whole story. In addition there is an increased capital demand of the government. Part of this governmental capital demand arises for investive purposes, for instance for building up the physical infrastructure in eastern Germany. These capital outlays will improve productivity, and insofar as governmental capital demand has to be interpreted similarly as private investment. The factor price frontier shifts outward. But a large part of the budget deficit — according to some estimates 70 percent — is linked to a social easing of the transformation process (labor market policies, unemployment benefits, subsidies to Treuhand firms). These policies increase the demand for capital without a rise in the marginal productivity.

17. Supply of savings. The interest rate effect will be influenced by the availability of capital. In an open economy, capital inflows reduce the tendency of the interest rate to rise. If foreign savings were available at a constant price there would be no interest rate effect. (Supply curves SS in diagram Figure 4.)

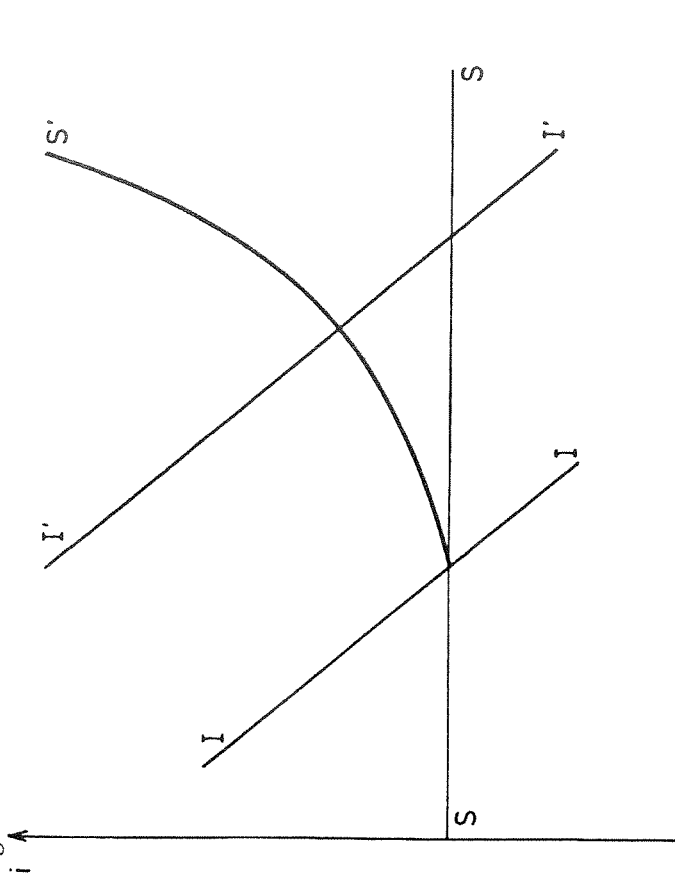
With gross savings in the world capital market being estimated to be larger than 3000 billion US-\$⁸ and the swing in the German account of less than 100 billion US-\$ (150 billion DM) representing less than 3 percent of the total supply of gross world savings, one would only expect minor changes in the German interest rate. Empirical studies, however, point out that there is a strong relationship of 0.8 and higher between the investment share and saving share in national income 1991.⁹ This indicates that international capital mobility is far from perfect and that national investment is strongly linked to national savings. If capital mobility were perfect, the coefficient would be zero (see also Eichengreen 1991).

⁷ As an aside: In the 80s we were looking for investment opportunities in the world economy since productivity in the industrialized countries was falling. Germany is an investment scenario. One should not complain about high long-term interest rates when we have an investment opportunity.

⁸ Gross domestic capital formation in the OECD countries amounted to 2.7 billion dollars in 1991 being financed by consumption of fixed capital (1.7 billion dollars) and (1.0 billion dollars) of net savings (OECD 1993, pp.16-17).

⁹ Compare for instance for the sixties and the seventies Feldstein (1983).

Figure 4



There are some arguments pointing to a differentiation in the long-term interest rates between countries in case of a major asymmetric shock. One explanation is that sizable real capital flows need large changes in the current account representing shifts in the trade of goods and services. Such large shifts do not occur abruptly. Moreover, sustained net capital inflows between 2-4 percent of GDP are rather unusual (Bosworth 1993, p. 26). Net real capital flows are different from portfolio flows. Another explanation is that capital markets are segmented. In addition, the interest rate may reflect a risk premium that is required by the international capital market. This risk premium depends on expectations relating to the success of economic policy and the country's ability to pay back the loan. Last not least the interest rate effect will also depend on such aspects as the way of financing the infrastructure, for instance whether it is financed privately, by bonds or by taxation. Thus, it seems realistic to consider a supply curve SS' for new capital.

18. Increase in the German interest rate. The nominal long-term German interest rate (on Government bonds) has increased in Germany from below 7 percent in the middle of 1989 to around 9 percent after the announcement of the monetary union on 7 February 1990. It has come down in 1993 to

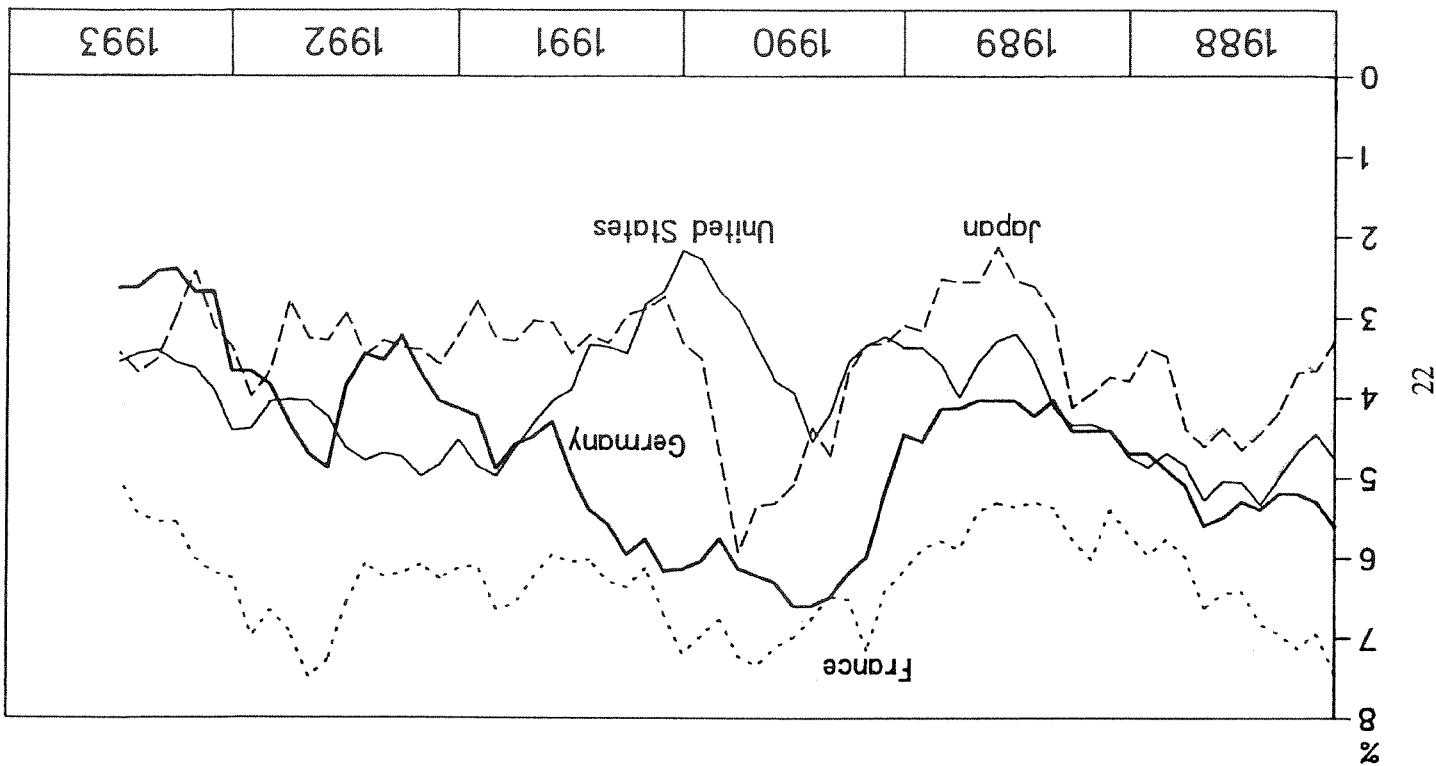


Figure 6 — Long-Term Real Interest Rates

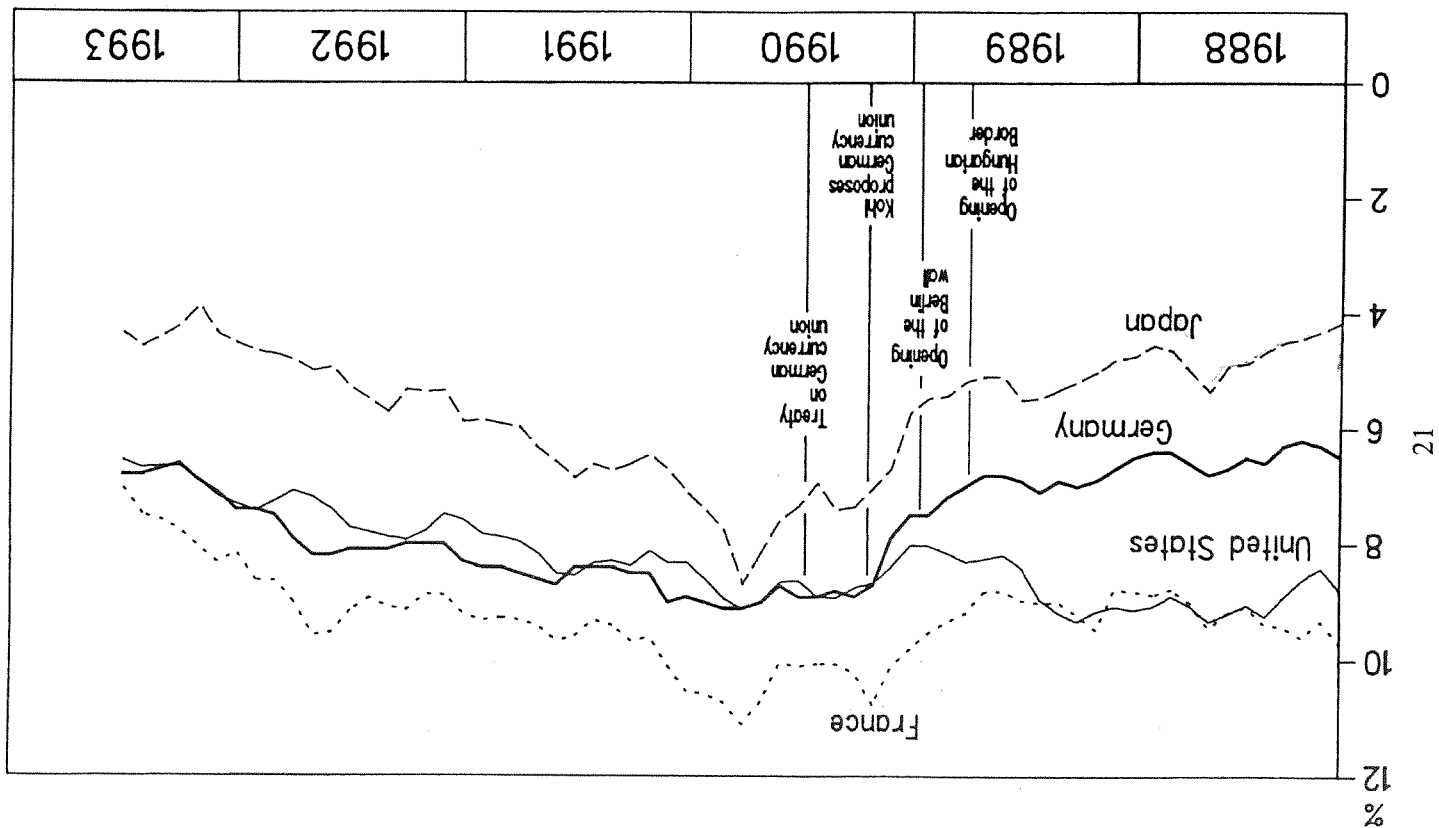


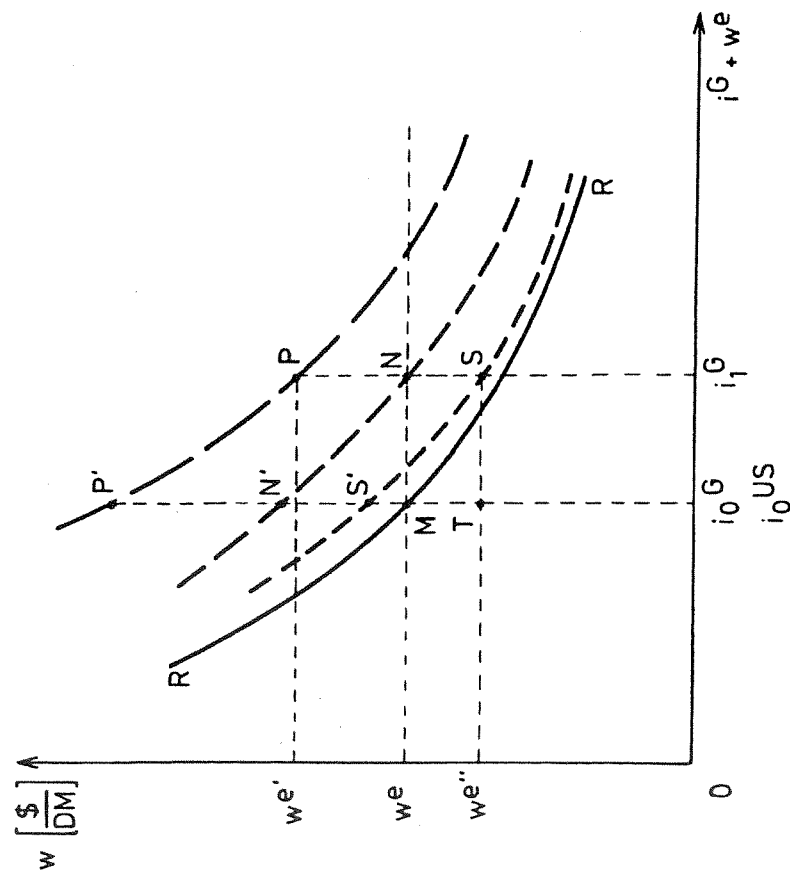
Figure 5 — Long-Term Interest Rates

below 6.5 percent (Figure 5, p. 21). There is also a temporary increase in the real long-term interest rate defined as the nominal interest rate adjusted for the consumer price level to above 5 percent; in mid-1993, the real interest rate is down to 2 percent (Figure 6, p. 22).

19. Impact on the world interest rate. One should expect that the impact of the reduced supply of German savings on the world interest rate should be negligible. Reduced net German excess savings of less than 100 billion US-\$ in a world capital market of gross savings with more than 3,000 billion US-\$ should not have a major impact on the world interest rate.

20. Appreciation of the D-mark. From the supply side, an appreciation of the D-mark of post-war Germany was to be expected. This appreciation can be motivated both from the capital account and the current account. From the capital account, the appreciation of the D-mark is due to a higher marginal efficiency of capital, *i.e.*, higher rates of return in eastern Germany prompting a larger capital inflow (reduced capital outflow out of the D-mark area) and consequently raising demand for the D-mark. From the trade

Figure 7



account, the appreciation is a vehicle to bring about a reduction in the overall German trade surplus. This reduction was necessary because eastern Germany has a trade deficit thus reducing the overall German trade surplus.

21. Asset market equilibrium and appreciation. Consider an asset market equilibrium with interest rate parity where i^{US} represents the international interest rate and i^G the German interest rate, $w : \$/DM$ is the actual exchange rate and w^e the expected exchange rate. Asset market equilibrium requires

$$i^{US} = i^G + \hat{w}$$

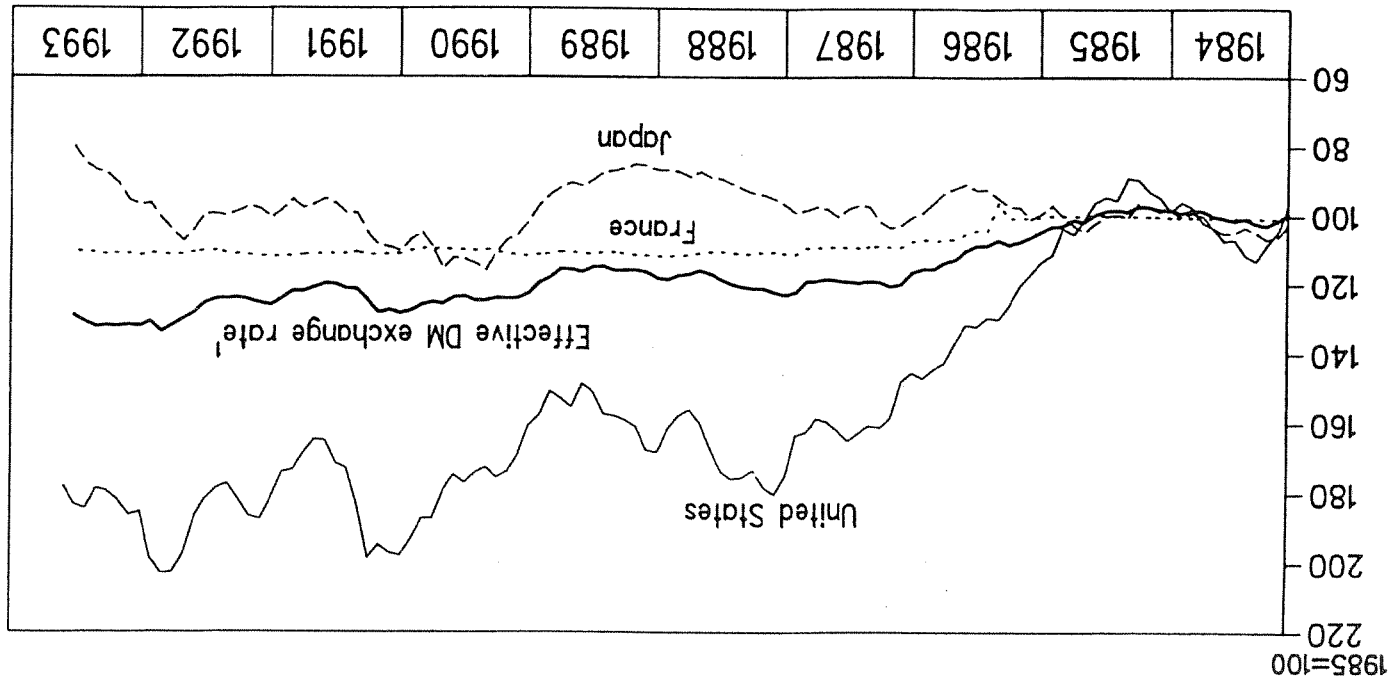
with $\hat{w} = (w^e - w)/w$. An increase in the exchange rate, *i.e.*, $\hat{w} > 0$, is an appreciation of the D-mark and $\hat{w} < 0$ represents a depreciation. Let the initial equilibrium be given at M with i_0^{US} and i_0^G being equal for simplicity. The curve RR denotes the rate of return of investing in Germany (Figure 7).

A positive supply shock in Germany means that the rate of return increases (movement from M to N). If the U.S. interest rate i_0^{US} remains fixed, the D-mark will appreciate (point N'). If in addition an appreciation of the D-mark is expected, *i.e.*, w^e instead of w^e , there is another upward shift of the RR-curve (point P). A new equilibrium will be at point P' for a given U.S. interest rate.

22. Intertemporal mechanics of debt. A somewhat different story on exchange rate expectations is told by the intertemporal mechanics of debt. According to this scenario, investment in eastern Germany will be financed through capital inflows, and Germany will accumulate foreign debt as stressed by Wyplosz (1991); in the long run, a current account surplus is required to repay the debt; this necessitates a real exchange rate depreciation. According to this scenario, Germany would repeat the story of the United States in the 1980s, with an investment boom financed by foreign debt, and a transitional appreciation which is corrected later on. The intertemporal mechanism of stocks is operating even if no foreign debt is accumulated: a reduced current account means a smaller stock of direct and of portfolio investment abroad which weakens the tendency toward appreciation. In such a context, a depreciation of the DM is expected in the long run (w^e instead of w^e in Figure 7); this is a counterforce to the interest rate effect pulling the RR-curve towards point S for given i_0^G or to the new equilibrium-point S'. If the expectation of a depreciation is large enough, the new equilibrium can be located below point M.

23. Positive productivity effects from integration. The prediction of a depreciation of the D-mark, however, crucially depends on the assumption that western German productivity will simply be extended to a united Germany. It neglects the integration gains and the effect of new technology through investment in eastern Germany. This might well change Germany's productivity (see Baldwin, 1989; Romer, 1986). Indeed, eastern Germany

Figure 8 — Exchange-Rates



¹ Against 17 industrial countries (United States, Canada, Japan, France, Italy, United Kingdom, Spain, Netherlands, Belgium, Denmark, Portugal, Ireland, Switzerland, Sweden, Austria, Finland, Norway), weighted with West Germany export shares (1984-1986).

has a chance to incorporate more modern technology than western Germany and can thus enjoy the advantage of a late comer. Moreover, economic integration can increase product variety and quality and thus stimulate exports, preventing a worsening in the terms of trade. Such a dynamic supply-side effect could, over time, counterbalance the effect of reduced German capital accumulation abroad and prevent a long-run depreciation.

24. Negative exchange rate expectations due to policy failure. Policy may change the outcome. If subsidies to firms in eastern Germany dominate the adjustment process, old inefficiencies will be perpetuated, limiting the rise in capital efficiency in eastern Germany. Another aspect is that policy may not succeed in scaling down social transfers. Subsidies and social transfers burden the budget deficit and increase debt, or taxes have to be raised. Then the expectation of depreciation may dominate, and a depreciation of the D-mark or a higher German interest rate may be required.

25. The actual picture. The D-mark has appreciated against the US-\$ since 1989; the D-mark has appreciated against the Yen only in 1989, depreciating afterwards. Against 17 currencies of other industrial countries, the D-mark has appreciated.¹⁰

26. The asymmetric shock to the EMS. German unification has represented a country-specific shock to the EMS mechanism. There is no doubt that higher interest rates in Germany negatively affect investment elsewhere. An asymmetric shock is the typical case where flexible exchange rates are desirable, or where a realignment is necessary. Thus, a long-run tendency for the D-mark to appreciate has put the EMS under pressure. Without realignment, the other EMS countries have experienced an increase in their interest rate, *i.e.*, they moved in the direction of MN in Figure 7. The appreciation of DM has pulled up other European currencies against the U.S. dollar and the Yen, thereby reducing the competitiveness of the ECU-area vis-à-vis the rest of the world. The problem must be solved by a realignment as has been shown by the turbulence in September 1992 and by the widening of the band in 1993.

Mezzogiorno or New Frontier?

27. The impact of German unification on net savings will depend decisively on whether a process of economic growth will come about in eastern Germany. In the worst case, the inefficiency of the eastern German economy carries on and production in the tradeable sector does not pick up. Then, subsidies will be required and will represent a severe drain on Germany's resources affecting the maneuvering space of fiscal policy in the future.

¹⁰ Of course, the appreciation of the D-Mark is not explained only by German unification. Other factors, for instance in the United States, might also imply an appreciation of the DM, and political instability in the CIS a depreciation.

This is the scenario of the Mezzogiorno. In the alternative scenario the positive effects of German unification prevail after the bottlenecks have been overcome. Unification then represents a New Frontier, an investment opportunity or in Schumpeter's (1934) terms a case of "creative destruction." Integration gains, the new economic system and capital accumulation will all play their role. Economic policy will decide which scenario will eventually materialize. If German economic policy does not make serious mistakes, the long-run positive effects will dominate. It is like in the Hicksian theory of the business cycle where the lower turning point will come about by "autonomous investment hammering in the basement." Capital accumulation in eastern Germany is likely to play a similar role.

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