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Domestic and international macroeconomic effects of German economic and monetary union

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Diskussionspapiere
Discussion Papers

Diskussionspapier 26

**Domestic and International Macroeconomic
Effects of German Economic and
Monetary Union**

von

G. A. Horn, W. Scheremet und R. Zwiener

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Diskussionspapier 26

**Domestic and International Macroeconomic
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Berlin, im Juni 1991

1 Introduction

The following paper deals with the impacts of German Economic and Monetary Union (GEMU) on trade relationship between West Germany and the rest of the world. To capture the quantitative shocks imposed on the world economy by GEMU we use the multi-country model QUEST to run the respective simulations.¹ We will not present a detailed analysis of developments within East Germany. These can be found in numerous publications of DIW and other institutions.²

Nevertheless, to get a first impression of the main effects we start with a short description of the economic development in East Germany. Special consideration will be given to the effects caused by the conversion of the Mark of the former GDR into Deutsche Mark at a rate of one to one. This is considered as a massive appreciation whose consequences will be discussed shortly in the first section. In the second section we explain the assumptions on which our simulations are based.

¹*The QUEST-Model has been developed by a research group at the EC Commission. We would like to thank Heiner Flassbeck and Reinhard Pohl for helpfull comments. However all errors and misunderstandings committed in this paper are those of the authors.*

²*See Akerlof, G.A. and A.K. Rose, J.L. Yellen, H. Hesseinius, East Germany In From the Cold: The Economic Aftermath of Currency Union, Paper presented at the Conference of the Brooking Panel on Economic Activity, Washington D.C., 1991.*

Lippschütz, L. and D. McDonald (eds.), German Unification; Economic Issues, International Monetary Fund, Occasional Paper, 75, Washington D.C., 1990.

Deutsches Institut für Wirtschaftsforschung, Institut für Weltwirtschaft, Micro- and Macroeconomic Adjustment Processes in East Germany. Economic Bulletin, Vol. 28, No. 4, Juni 1991.

The World Economy and the German Economy in the Spring of 1991. Economic Bulletin, Vol. 28, No. 5, July 1991.

Broader room is given to interest rates and exchange rate movements, which are a major transmission channel of GEMU shocks to foreign economies. These will be dealt with in the fourth section. Since the QUEST model does not incorporate a sophisticated capital market, model assumptions on the respective impacts of GEMU have to be derived.

The shocks will be fed into the QUEST model to derive their impact on international trade. To capture differences as well as uncertainties in judgement about nature and intensity of the shocks several sets of simulations with different sets of assumptions are run. The period under consideration begins with GEMU in July 1990. Hence all consecutive annual periods start at this month and annual growth rates have to be interpreted as reaching from July to July. The simulation results will be presented in section V to VII. The paper ends with a conclusion.

II Transition in East Germany

The economic and political unification of Germany is formally completed. Due to enormous financial transfers from West to East, the conditions of living slightly begin to converge. However, a deep gap still prevails. Even if there remains a long distance to equal conditions between both parts of Germany, West Germany can make a contribution to cut it short.

The unification of the two contrary political, economic and social systems shed light on the deep gap of competitiveness between them. On one hand this results from

the system of the former GDR in which neither the structure of the produced goods nor the allocation of capital and labour was based on relative prices. Furthermore the political system created an illusion of wealth which could only be financed to the debit of net-investment into capital equipment, infra-structure and environment. In addition to this system-made lack of competitiveness, the monetary union at a conversion rate of one to one between the two currencies led to a revaluation of the East German Mark of about 300 p.c. Besides insufficient quality of the East German products the exchange rate shock induced a dramatic fall of international competitiveness of East German firms due to high production costs. But not only price effects caused the loss of domestic demand. After forty years of a rationed demand the East German consumers had a strong preference for western products. Hence firms lost their domestic customers almost completely. Additionally, the change from the Transfer Rubel into a convertible currency and the transition problems in Eastern Europe made East German producers loose most of their former export markets, too.

The consequence of these shocks was a decline of the nominal value of industrial production in the second half of 1990 of about 50 p.c. In the same period real GNP was already nearly 25 p.c. below its level of the previous year.

This economic collapse, the worst economic crisis Germany ever faced, affected the labour market dramatically. Total employment has been reduced by an amount of about 1.3 million or 14 p.c. in one year and unemployment rose up to 840 000 until the end of May. The corresponding unemployment rate was 9.5 p.c. But the whole

extend to which employment has been reduced can only be detected if the number and the development of the specific East German short time working is included. Besides the 840 000 unemployed people at the end of May there were additionally 2 million short time workers. On average their working time is reduced by more than 50 p.c.. The adjusted unemployment rate which takes into consideration the 50 p.c. working time reduction of short time working, then would reach 22 p.c. at the end of May.

The sharp decline in the production of goods and services in East Germany did not result in a corresponding decline of domestic demand. The real consumer demand increased after GEMU and was mainly financed by the massive financial transfers from the Federal Government and to some extent by the reduction of previously accumulated savings.

The development during the last months has shown that the East German economy is not able to solve the problems in course of the structural change without outside assistance. The old capital stock will have to be depreciated to a great extent and replaced by new equipment. As long as the domestic accumulation of capital in East Germany is insufficient, the construction of a new capital stock has to be financed by investors from Western industrialized countries. In the course of the investment process into new capital equipment there will be a rise of imported investment goods in addition to increased imports of consumption goods.

III Impacts for West Germany

Almost a year ago DIW presented its first estimate of the macroeconomic effects of GEMU on the Federal Republic of Germany.³ At that time there existed no experience with the conversion of a central planned economy into a market economy. Forecasts had to be made facing a historically unprecedented event. Looking back, most of the problems which occurred, were underestimated. Not enough attention was paid to the problems related to property rights, the inefficiency of the administration and the total lack of competitiveness.

This report is an attempt to quantify the macroeconomic consequences of the monetary union and the unification for West Germany and some of the major industrialized countries. As we already expected one year ago, the GEMU would show particularly significant and direct impacts on the following areas: government budgets (including the social insurance system), exports of investment and consumer goods to East Germany, the labour market (due to the increased supply of labour) and the money, capital and foreign exchange rate markets.

The benchmarks for our calculations are provided by a five years status-quo simulation by which economic developments on West Germany are described without the effects of the unification of the two German states. Alternative simulations are run to estimate the consequences of GEMU. These require a

³Pohl, R. and D. Vesper, R. Zwiener, *Macroeconomic Effects of German Monetary, Economic and Social Union on the Federal Republic of Germany. Economic Bulletin, Vol. 27, No.6, August 1990.*

Table 1

**Basic assumption for GEMU simulation
- Difference to baseline in billions DM -**

Variable	Amount p.a.*
Exports to East Germany	+ 110
Imports (pass through of goods)	+ 18
Public Transfers to East Germany	+ 110
Taxes and social insurance contributions**	+ 50
Cuts in government consumption	- 10
Supply of labour (persons)	+ 500 000 first year + 240 000 each add. year
population (person)	+ 360 000 first year + 170 000 each add. year

* Deviation from baseline in nominal terms

** This consists of a VAT increase by 2 pc points, other indirect taxes and an increase in social insurance contributions.

number of assumptions on exogenous variables. A survey is presented in table 1.

After one year experience with GEMU, we have to admit that the statistical data are not of high quality. This is mainly due to the fact that it becomes more and more difficult to distinguish between the eastern and the western part of the German economy. This concerns especially the public budget and the foreign trade sector.

Our assumptions are based on a quarterly national account statistics for East and West Germany which is regularly provided by the DIW.⁴ Recent figures indicate, that the amount of public transfers from West to East Germany will be DM 110 billion during the first year. Our first guess was about DM 50 billion. This amount of transfer payments of at least DM 100 billion p.a. will be necessary for several years. Therefore tax increases became unavoidable. So the German economy is faced with direct and indirect tax increases as well as higher social insurance contributions. This will sum up to more than DM 50 billion p.a.⁵ A further assumption is that fiscal policy-makers will attempt to reduce spending. The potential cuts, particularly in defence and state subsidies, amount to an estimated DM 10 billion p.a..

Since GEMU West German "exports" of goods and services to East Germany

⁴*The national account statistics of East Germany are available on request.*

⁵*Teichmann, D. and R. Zwiener, Steuerentlastung 1986/90 und Steuerbelastung 1991: Umverteilung der Einkommen von unten nach oben. Wochenbericht des DIW, 58. Jg., Nr. 14/1991.*

exploded. Since the 1. July 1990 they increased to DM 130 billion during the first 12 month of GEMU. During the whole year 1989 the corresponding figure was DM 18 billion. Hence the same amount of transfer payments to East Germany almost completely flows back to West Germany as increased revenues from exports of goods and services. To capture higher import needs caused by the higher exports to East Germany we incorporated a specific import shock into the model by adding DM 18 billion exogenously to the "normally" determined imports.

It is difficult to forecast whether West German exports to the eastern part will increase or decrease in the future. This depends on the magnitude and speed of economic stabilization in East Germany. Because of this uncertainty the amount of additional exports during the next years is assumed to be a constant DM 110 billion p.a..

Considering East German trade with the rest of the world, a huge drop in imports from the former CMEA has already happened last year. Exports into these countries will be reduced further. Imports from and exports to western industrialized countries play only a minor role.

During the first 12 month of GEMU the estimated figure of East Germans who have settled in West Germany was around 360 000. The trend during the next years is uncertain. It will largely depend on the economic perspectives, and in particular on income and employment opportunities in East Germany. An important factor is the capacity of the West German labour market to absorb further supplies of

labour. If the employment opportunities in the west rise, the incentives to leave the east will increase. In addition to the flow of migrants the number of "cross-border commuters", who choose to live in the east but prefer to work in the west will rise substantially. For the purpose of our analysis it is assumed that, due to the inflow of migrants and crossborder commuters, the supply of labour increases by 500 000 persons and will continue at a rate of 240 000 persons p.a.. This will change conditions on the labour market to large extend. One has to keep in mind, that immigrants from Eastern European countries are not included.

It is rather difficult to assess the impact of unification on West German private investment. On one hand subsidies and tax exemptions may lead West German firms to invest in east Germany by substituting their investment in the West. On the other hand they may also react by expanding their capacities in the West in order to produce those goods to be delivered to the East. The last behaviour reflects the still insufficient infrastructure in the East which provides not enough incentives to attract Western investment. Since no reliable data are available we assume that both effects mutually offset. Hence investment in the West will develop as predicted by the "normal" investment function.

IV Impacts on Capital Markets and the Exchange Rates

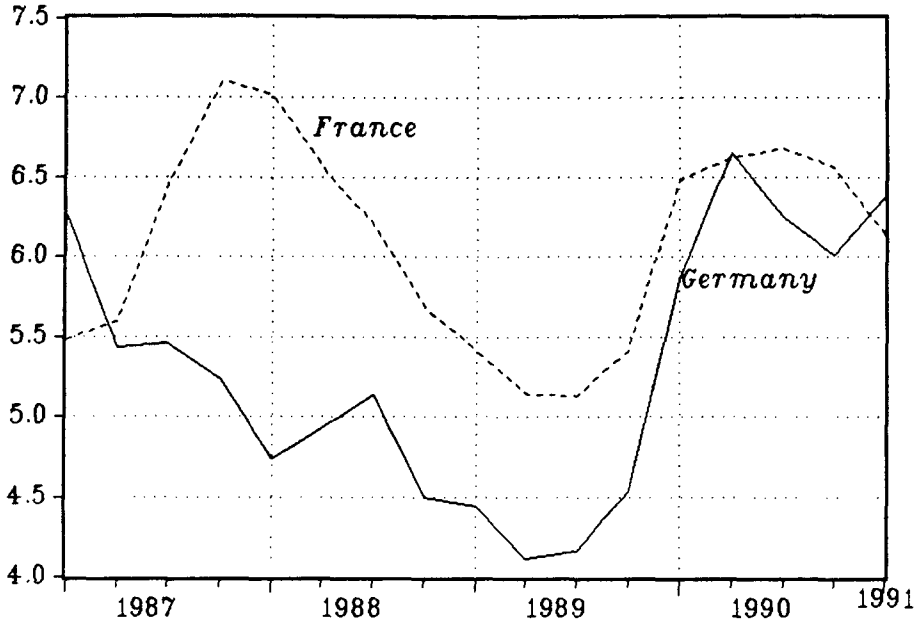
As an other study has shown, the economic impacts of GEMU on foreign economies seems to depend to a fairly large extend on interest rates movements.⁶ Hence it is a crucial question whether and to what extend unification leads to higher interest rates in Germany. The simulations which will be outlined in the following sections differ from the baseline only by the effects which can be attributed to unification. A positive interest rate shock which may be induced by GEMU will occur only if public or private demand rises to a larger extent than usually at the prevailing state of the cycle.

To get the impact of GEMU on capital markets caused by additional financial needs, some calculations are required. As mentioned in the previous sections we assume that public transfers will amount to DM 110 billion. In addition to these payments the public deficit of East German State of about DM 30 billion has to be added. Furthermore it is necessary to consider the deficits of the Treuhand institution which do not appear in any state budget. According to our calculations Treuhand needs about DM 50 billion p.a. to continue subsidising firms in the East. Hence additional public demand for capital amounts to about DM 190 billion. Tax increase may yield another DM 50 billion. Other budget cuts e.g. for defence should save DM 10 billion. Taking this into account, the additional public demand

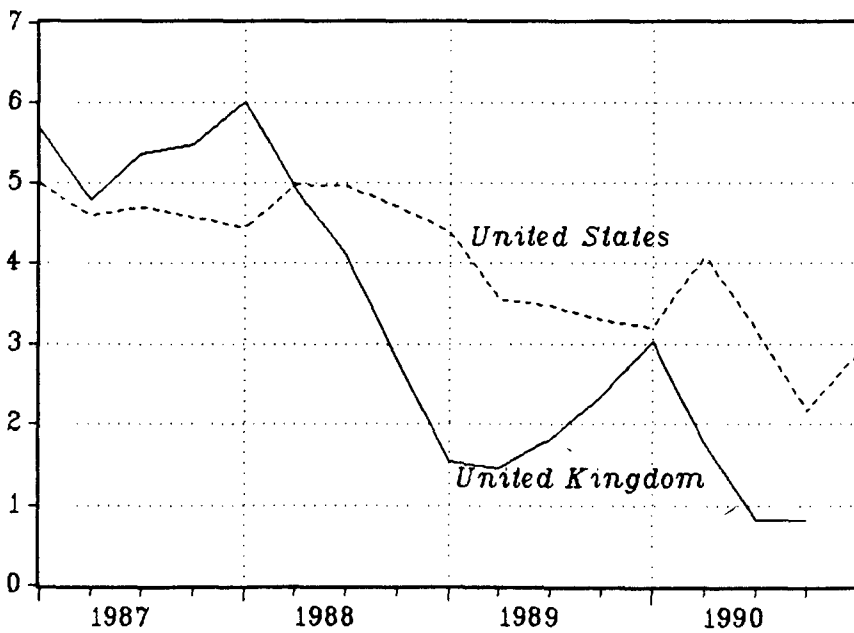
⁶ See Masson, P.R. and Guy Meredith, *Domestic and International Macroeconomic Consequences of German Unification*, in: Lipschitz, L. and D. McDonald (eds.), *German Unification; Economic Issues*, International Monetary Fund, Occasional Papers, No. 75, Washington D.C., 1990.

figure 1

Real Long-Term Interest Rates
France and Germany



Real Long-Term Interest Rates
United States and United Kingdom



on capital market should be about DM 130 billion. The total impact on world capital market will be less than 100 bill. Dollars.

Since the QUEST model does not incorporate an appropriately sophisticated capital market section determining interest rates, some further considerations are necessary. Assuming that expectations on capital markets are forward looking it seems reasonable to check the interest rates movements which directly occurred after the announcement of the West German government to proceed on its way to unity by an economic and monetary union. The respective policy goal was announced on 7th February 1990. On capital markets, agents immediately reacted by anticipating higher capital needs:⁷ Nominal interest rates rose by one percentage point.

In a world of almost completely flexible capital movements and relative high elasticity of capital supply the additional demand of financial resources should be easily provided out of international capital flows. Thus an increased demand does not necessarily lead to such a strong reaction of interest rates. At least the increase should not prevail for long. This is particularly true if the required amount of about DM 130 billion is quite small compared to world private savings.⁸

However a short signalling induced by higher interest rates in Germany should

⁷ *Die Lage der Weltwirtschaft und der westdeutschen Wirtschaft im Frühjahr 1990, Wochenbericht des DIW, 56. Jg., Nr. 15/1990.*

⁸ *The IMF estimates that 1989 private world savings amount to 4194 bill. dollars. See Lipschitz, L. and D. McDonald (eds.), German Unification, Economic Issues, International Monetary Fund, Occasional Papers, No. 75, Washington D.C., 1990.*

attract the necessary influx of capital. Then expected profits of German assets rise. This process will be accompanied by an appreciation of the DM which will continue until the expected profits of German assets equal again those on international markets. As long as capital market agents suppose that no additional risks are involved with GEMU a new equilibrium on German capital will shortly establish with higher interest rates and an appreciated DM.

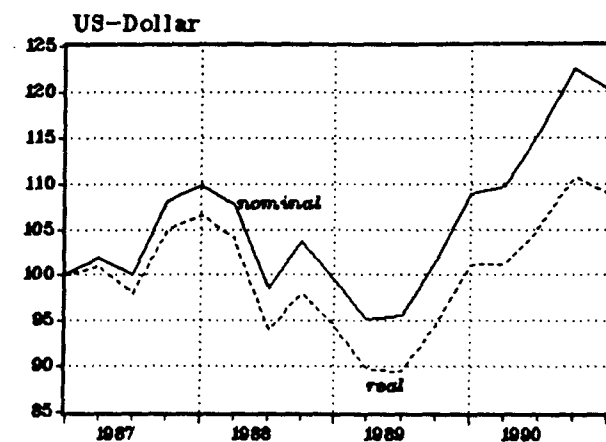
If GEMU is perceived as risk increasing, expected profits on German markets may not rise proportionally in line with interest rates due to e.g. possible future losses of German firms. In this case the whole process of finding a new equilibrium on capital markets will not be accompanied by an appreciation of the currency. At least it will happen only to a smaller extent because otherwise the expected profits fall again below its equilibrium value on capital markets and induce financial flows to seek for more profitable assets.

For a different set of simulations it will be assumed that only German interest rates rise due to higher risk there whereas for the other EMS countries only a temporary increase would occur. In this case they succeed, unification risks will concentrate on the German market.

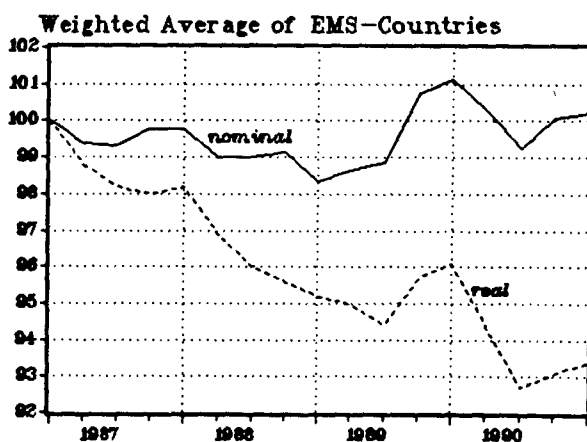
In the light of these considerations, our simulations will be based on the assumption that real interest rates in Germany rise by one percentage point due

figure 2

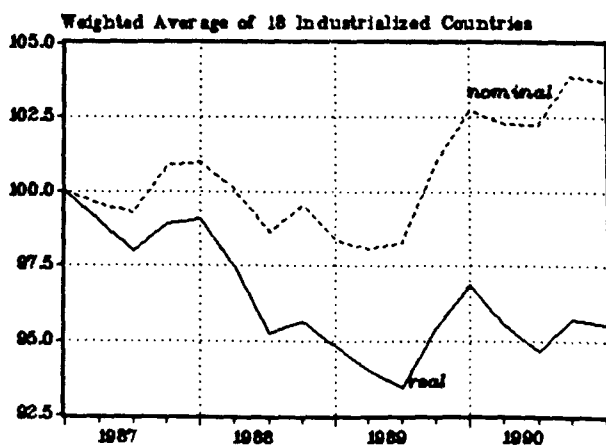
Nominal and Real Exchange Rates*



* Foreign currency against D-Mark



* Foreign currency against D-Mark — AWEWS - - - AWEWE



* Foreign Currency against D-Mark

to GEMU.⁹ During the first simulation period, nominal rates behave equally. Later on, they differ according to the induced movement of the inflation rate. It has to be decided whether the perception of GEMU as risk increasing process is correct or if a more optimistic outlook is appropriate. In the latter case either interest rates should reduce to a level they usually reach at this stage of the business cycle or an appreciation of the DM should occur. We will grasp these differences by doing sensitivity tests running different sets of simulations.

An essential point to be analysed is the impact of German on foreign interest rates. It seems reasonable to distinguish between effects on those countries which are members of the EMS and the rest of the world.¹⁰ Former are bound by quasi fixed exchange rates with respect to the DM. Since the increase of German interest rates induces downward pressure on other EMS currencies, central banks have to tighten their monetary policy to keep exchange rates within the agreed boundaries. Thus compliance to EMS rules leads to an upward move on interest rates of the EMS members. Hence it is assumed for some simulation runs that real interest rates for EMS countries also rise by one percentage point.

An alternative approach could be made by allowing other EMS members to depreciate their currencies such that a new equilibrium on the capital market can establish without higher domestic rates. However, this realignment scenario

⁹ *In fact real rates rose by even more than 1 percentage point during the first quarter 1990 (see table 1). But this is due to a declining inflation rate which cannot be attributed to GEMU.*

¹⁰ *Since the United Kingdom was no member of the EWS at time of GEMU announcement it is treated in the following in the same manner as the rest of the world countries.*

immediately raises doubts on credibility with respect to future exchange rate reactions. Furthermore especially those countries like France whose trade links to Germany are quite close, risk an inflationary shock due to higher import prices. This effect then also will exhibit some pressure towards higher interest rates. These considerations will be analysed running a realignment scenario in which EMS exchange rates will adjust to set off pressure on the domestic interest rates. However, data on interest rates and exchange rates rather support the former scenarios. Real interest rates tend to increase whereas during the first quarters of 1990 only minor exchange rate movements can be observed.

The other countries among them USA, United Kingdom and Japan also face the impacts of higher German interest rates albeit to a much lower degree. The most important difference to EMS countries consists in central banks allowing exchange rates to depreciate in relation to the German Mark. Doing this, their domestic interest rates are hardly affected by GEMU. Observing the respective data, this notion is confirmed. Real interest rates are either almost unchanged (USA) or even tend to decline (UK) during the first months of 1990. Hence all simulations are based on the assumption that real interest rates in all rest of world countries remain unaffected by GEMU. However, it is also assumed for some simulation runs that there is a depreciation of the respective currencies towards the DM.

V Simulation Scenarios

The shocks defined in the previous sections will be fed into the QUEST model. In order to capture differences in judgment and uncertainties we run a set of different simulations. All of them are based on the shocks as defined as in table 1. Since we were forced to run ex post simulations (from 1st quarter 1983 until 4th quarter 1987), the size of the effects had to be adjusted for the simulation period. Additionally nominal terms were deflated if necessary.

In reality the size of the shocks will not be constant over five years. For example additional nominal exports to East Germany (or the new laender) may vary throughout the five years of the simulation period. However, since the exact development is unknown shocks are assumed to be of constant value. A similiar problem occurs concerning the exact timing of shocks. Tax increases did not start at the beginning of German unification but will be introduced step by step beginning one year after GEMU. To avoid a kind of "overloading" of the simulation exercises, we start all shocks and policy measures simultaneously at the same time. For the first simulation runs we are not so much interested to find out what happened exactly in 1990. We are more interested to asses the overall effects of German unification on the rest of the world. Those simplifications make it easier to interpret the results.

The set of simulations focuses on the role of the European Monetary System (EMS) for capital and exchange rate markets. Different types of exchange rate

Table 2
Survey on Simulation Sets
- Difference to baseline -

Simulations Assumptions	A Higher in- terest rates; Permanent EMS appreciation	B Higher in- terest rates no EMS appreciation	C Temporary higher interest rates and EMS appreciation	D EMS Realignment	E Compound scena- rio; higher German capital risk
German real interest rates, pc.p.	+1	+1	+1 only first year	+1	+1
EMS real interest rates, pc. p.	+1	+1	+1 only first year	0	+1 only first year
\$/DM exchange rate, pc.	+5,5	0	+1 only first year	+5,5	+5,5 only first year
\$/EMS exchange rate, pc.	+5,5	0	+1 only first year	0	+5,5 only first year
Tax increase from start on	yes	yes	yes	yes	after one year
Import push, DM billions	18	18	18	18	36

rules within the EMS (realignment, no realignment) are combined with the duration of the real interest rate increase and appreciation (temporary, permanent) and the question of an additional capital risk (no risk, only in Germany, whole EMS). Out of these possible combinations we selected four scenarios which are of major interest for our analysis (see table 2). In a final simulation we combine those assumptions which seems to be close to reality. Special attention is given to the sequence of shocks.

Simulation A:

Permanent higher real interest rates within the EMS countries and a permanent appreciation against all other countries (tables 3 to 8)

Supposing that there are "permanent" higher capital needs for Germany (at least for 5 years) which require higher real interest rates to attract capital flows, the other EMS countries will be faced with almost the same interest rates increases because of constant exchange rates within the EMS. The European capital and exchange rate markets behave as if there would be only a single currency. As a consequence all EMS currencies appreciate against the US-Dollar by the same percentage rate. As long as there is no additional capital risk involved with the German unification, the appreciation of the EMS countries follows the uncovered interest parity, which yields a "permanent" revaluation of about 5.5 pc.. This is based on the assumption of an average term structure of 6 years for capital assets.

Table 3

GERMANY		UNIFICATION SIMULATION AS FMS PERM.				APPRECIATION		
		YEAR: 1	2	3	4	5	6	
:								
:								
:								
:	NOMINAL GNP	P	0.00	3.93	3.27	3.21	3.53	3.62
:	REAL GNP	P	0.00	1.42	0.28	0.14	1.29	2.26
:	GNP DEFLATOR	D	0.00	2.54	0.50	0.08	-0.85	-0.87
:	CONSUMERS EXPENDITURE DEFLATOR	D	0.00	1.73	0.43	0.15	-0.56	-0.70
:	COMPENSATION PER EMPLOYEE	P	0.00	2.17	1.95	0.82	0.34	-0.36
:	EMPLOYMENT	P	0.00	0.55	0.73	0.79	1.26	1.93
:	UNEMPLOYMENT (PERC. OF LAB. FORCE)	PPD	0.00	0.64	1.73	2.41	2.77	2.96
:	REAL COMPENSATION PER EMPLOYEE	P	0.00	0.48	-0.16	-1.41	-1.32	-1.32
:								
:								
:	REAL GOVERNMENT EXPENDITURE	P	0.00	-1.96	-1.92	-1.88	-1.83	-1.80
:	REAL CONSUMPTION	P	0.00	-0.57	-0.16	0.51	2.00	3.35
:	REAL INVESTMENT	P	0.00	1.20	-2.26	-3.80	-2.27	-1.26
:	REAL INVENTORY INVESTMENT	DG	0.00	-0.00	-0.27	-0.22	-0.04	0.10
:	REAL DOMESTIC DEMAND	P	0.00	-0.56	-1.25	-1.09	0.30	1.46
:	REAL EXPORTS OF GOODS AND SERVICES	P	0.00	13.51	11.54	10.32	11.28	12.10
:	REAL IMPORTS OF GOODS AND SERVICES	P	0.00	8.09	8.25	8.16	9.36	10.49
:	REAL GROSS DOMESTIC PRODUCT	P	0.00	1.19	0.05	-0.06	1.12	2.11
:	NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.23	0.22	0.20	0.17	0.14
:	REAL GROSS NATIONAL PRODUCT	P	0.00	1.42	0.28	0.14	1.29	2.26
:								
:								
:	BROAD MONEY (M3)	L	0.00	2.41	0.46	-0.30	0.19	0.70
:	THREE MONTH INTEREST RATE	PPD	0.00	2.72	1.60	0.73	0.41	0.23
:	LONG TERM INTEREST RATE	PPD	0.00	3.35	1.77	0.61	0.15	0.12
:	PUBLIC SECTOR DEFICIT	DG	0.00	2.99	3.81	4.33	4.46	4.51
:								
:								
:	PRICE OF EXPORTS OF GOODS	P	0.00	-0.77	-0.52	-0.41	-0.87	-1.47
:	PRICE OF IMPORTS OF GOODS	P	0.00	-4.42	-4.29	-4.17	-3.55	-3.50
:	PRICE OF EXP. OF GOODS AND SRV.	P	0.00	-0.19	0.12	0.21	-0.31	-0.97
:	PRICE OF IMP. OF GOODS AND SRV.	P	0.00	-4.33	-4.22	-4.09	-3.56	-3.52
:	US \$ RATE	P	0.00	-5.53	-5.53	-5.53	-5.53	-5.53
:	REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	2.19	2.09	1.91	1.61	1.40
:	CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	3.02	2.66	2.39	1.87	1.55
:	IMPORT RATIO	PPD	0.00	1.11	1.35	1.38	1.38	1.42
:	TERMS OF TRADE	P	0.00	4.32	4.52	4.48	3.35	2.64
:								

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE
 DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

FRANCE

UNIFICATION SIMULATION A:EMS PERM.

APPRECIATION

		YEAR: 1	2	3	4	5	6
:							
:							
:							
:	NOMINAL GNP	P	0.00	-0.57	-1.26	-1.18	-0.98
:	REAL GNP	F	0.00	-0.15	-0.15	-0.24	-0.24
:	GNP DEFLATOR	D	0.00	-0.46	-0.75	0.18	0.21
:	CONSUMERS EXPENDITURE DEFLATOR	D	0.00	-0.96	-0.66	0.14	0.21
:	COMPENSATION PER EMPLOYEE	P	0.00	-0.66	-1.06	-0.91	-0.71
:	EMPLOYMENT	P	0.00	0.00	-0.04	-0.09	-0.12
:	UNEMPLOYMENT(PERC. OF LAB. FORCE)	PPD	0.00	-0.07	0.03	0.07	0.09
:	REAL COMPENSATION PER EMPLOYEE	P	0.00	0.22	0.42	0.44	0.44
:							
:							
:	REAL GOVERNMENT EXPENDITURE	P	0.00	0.00	0.00	0.00	0.00
:	REAL CONSUMPTION	P	0.00	0.28	0.47	0.53	0.56
:	REAL INVESTMENT	P	0.00	-0.40	-1.10	-2.03	-2.51
:	REAL INVENTORY INVESTMENT	DG	0.00	-0.09	-0.07	-0.05	-0.01
:	REAL DOMESTIC DEMAND	P	0.00	0.01	0.02	-0.07	-0.09
:	REAL EXPORTS OF GOODS AND SERVICES	P	0.00	0.17	0.22	0.18	0.53
:	REAL IMPORTS OF GOODS AND SERVICES	P	0.00	0.91	1.07	0.95	1.16
:	REAL GROSS DOMESTIC PRODUCT	P	0.00	-0.70	-0.18	-0.27	-0.28
:	NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.06	0.03	0.04	0.03
:	REAL GROSS NATIONAL PRODUCT	P	0.00	-0.15	-0.15	-0.24	-0.24
:							
:							
:	BROAD MONEY (M3)	D	0.00	-0.42	-1.19	-0.44	-0.10
:	THREE MONTH INTEREST RATE	PPD	0.00	-0.31	0.84	1.19	1.21
:	LONG TERM INTEREST RATE	PPD	0.00	0.07	0.83	1.23	1.21
:	PUBLIC SECTOR DEFICIT	DG	0.00	-0.00	0.08	0.13	0.17
:							
:							
:	PRICE OF EXPORTS OF GOODS	P	0.00	-1.94	-2.40	-2.25	-2.07
:	PRICE OF IMPORTS OF GOODS	P	0.00	-3.60	-3.55	-3.44	-3.29
:	PRICE OF EXP. OF GOODS AND SERV.	P	0.00	-1.64	-2.15	-1.99	-1.80
:	PRICE OF IMP. OF GOODS AND SERV.	P	0.00	-3.58	-3.52	-3.41	-3.27
:	US \$ RATE	P	0.00	-5.49	-5.49	-5.49	-5.49
:	REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	-0.12	-0.15	-0.14	-0.13
:	CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	0.35	0.15	0.19	0.21
:	IMPORT RATIO	PPD	0.00	0.15	0.18	0.17	0.21
:	TERMS OF TRADE	P	0.00	2.02	1.41	1.46	1.51
:							

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE

PPD = PERCENTAGE POINT DIFFERENCE FROM BASE

D = DIFFERENCE FROM BASE RATE OF CHANGE

DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

table 4

Domestic and International Macroeconomic Effects
of German Economic and Monetary Union

table 5

WORLD SUMMARY		UNIFICATION SIMULATION A: EMS PERM.						APPRECIATION					
		YEAR: 1		2		3		4		5		6	
:													
:													
:	REAL GDP/GNP :												
:	GERMANY	0.00	1.42	0.28	0.14	1.29	2.26						
:	FRANCE	0.00	-0.15	-0.15	-0.24	-0.24	-0.25						
:	UK	0.00	0.33	0.26	0.19	0.24	0.38						
:	ITALY	0.00	-0.33	-0.23	-0.18	-0.03	0.06						
:	USA	0.00	0.32	0.40	0.20	0.20	0.29						
:													
:	REAL EXPORTS OF GOODS AND SERVICES :												
:	GERMANY	0.00	13.51	11.54	10.32	11.28	12.10						
:	FRANCE	0.00	0.17	0.22	0.18	0.53	0.90						
:	UK	0.00	1.47	1.65	1.48	1.42	1.45						
:	ITALY	0.00	-0.03	0.42	0.66	1.22	1.67						
:	USA	0.00	1.23	1.54	1.48	1.54	1.63						
:	OECD - (GOODS ONLY)	0.00	0.79	0.70	0.56	0.88	1.25						
:	NON OECD - (GOODS ONLY)	0.00	0.63	0.80	0.79	0.96	1.18						
:													
:	REAL IMPORTS OF GOODS AND SERVICES :												
:	GERMANY	0.00	8.09	8.25	8.16	9.36	10.49						
:	FRANCE	0.00	0.91	1.07	0.95	1.16	1.49						
:	UK	0.00	-0.00	-0.09	-0.07	0.19	0.63						
:	ITALY	0.00	0.21	0.20	0.11	0.33	0.58						
:	USA	0.00	-0.15	-0.25	-0.61	-0.46	-0.10						
:	OECD - (GOODS ONLY)	0.00	1.32	1.19	1.05	1.31	1.67						
:	NON OECD - (GOODS ONLY)	0.00	0.20	0.27	0.30	0.37	0.65						
:													
:	CURRENT BALANCE (PER CENT OF GNP) :												
:	GERMANY	0.00	3.02	2.66	2.39	1.87	1.55						
:	FRANCE	0.00	0.35	0.15	0.19	0.21	0.27						
:	UK	0.00	0.04	0.17	0.18	0.19	0.17						
:	ITALY	0.00	0.40	0.33	0.35	0.26	0.30						
:	USA	0.00	0.09	0.12	0.15	0.15	0.14						
:													
:	TERMS OF TRADE :												
:	GERMANY	0.00	4.32	4.52	4.48	3.35	2.64						
:	FRANCE	0.00	2.02	1.41	1.46	1.51	1.75						
:	UK	0.00	-1.37	-1.11	-0.95	-0.45	-0.12						
:	ITALY	0.00	1.69	0.86	0.57	0.31	0.35						
:	USA	0.00	-0.55	-0.58	-0.51	-0.38	-0.25						

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE

table 6

BILATERAL TRADE: GERMANY

UNIFICATION SIMULATION A: EMS PERM. APPRECIATION

		YEAR: 1	2	3	4	5	6
EXPORTS :	P						
FRANCE		0.00	-1.51	-2.08	-2.40	-1.88	-1.18
ITALY		0.00	-1.54	-1.98	-2.02	-1.43	-0.88
UK		0.00	-1.91	-2.26	-2.24	-1.67	-0.92
USA		0.00	-4.71	-6.40	-7.11	-6.43	-5.38
JAPAN		0.00	-4.79	-5.03	-5.13	-4.69	-4.12
IMPORTS :	P						
FRANCE		0.00	7.82	7.14	6.95	8.13	9.10
ITALY		0.00	7.51	7.01	6.99	8.28	9.31
UK		0.00	6.70	5.92	5.78	6.47	7.24
USA		0.00	9.59	8.73	8.50	9.73	10.65
JAPAN		0.00	9.95	10.21	10.35	11.62	12.48

SIMULATION PERIOD : 1982 1 TO 1987 4

BILATERAL TRADE: FRANCE

UNIFICATION SIMULATION A: EMS PERM. APPRECIATION

		YEAR: 1	2	3	4	5	6
EXPORTS :	P						
GERMANY		0.00	7.82	7.14	6.95	8.13	9.10
ITALY		0.00	-1.02	-0.62	-0.72	-0.63	-0.63
UK		0.00	-1.73	-1.40	-1.31	-1.22	-1.01
USA		0.00	-2.02	-1.91	-2.28	-2.28	-2.10
JAPAN		0.00	-2.51	-2.15	-2.05	-2.08	-2.11
IMPORTS :	P						
GERMANY		0.00	-1.51	-2.08	-2.40	-1.88	-1.18
ITALY		0.00	-0.67	0.42	0.67	0.83	0.96
UK		0.00	1.71	2.08	1.76	1.45	1.46
USA		0.00	3.09	3.64	3.41	3.27	3.18
JAPAN		0.00	2.76	3.22	3.10	3.11	3.15

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE

table 7

BILATERAL TRADE: ITALY		UNIFICATION SIMULATION A: EMS PERM. APPRECIATION					
		YEAR: 1	2	3	4	5	6
EXPORTS :	P	0.00	7.51	7.01	6.99	3.28	9.31
GERMANY		0.00	-0.67	0.42	0.67	0.83	0.96
FRANCE		0.00	-2.87	-1.55	-0.90	-0.55	-0.22
USA		0.00	-2.51	-2.16	-2.21	-1.98	-1.65
JAPAN		0.00	-1.77	-1.82	-1.52	-1.26	-1.05
IMPORTS :	P	0.00	-1.54	-1.88	-2.02	-1.43	-0.88
GERMANY		0.00	-1.02	-0.62	-0.72	-0.63	-0.63
FRANCE		0.00	1.62	1.75	1.49	1.44	1.35
USA		0.00	-0.42	-0.62	-0.81	-0.94	-0.97
JAPAN		0.00	2.36	3.15	3.22	3.47	3.50

SIMULATION PERIOD : 1982 1 TO 1987 4

BILATERAL TRADE: U.K.		UNIFICATION SIMULATION A: EMS PERM. APPRECIATION					
		YEAR: 1	2	3	4	5	6
EXPORTS :	P	0.00	6.70	5.92	5.78	6.47	7.24
GERMANY		0.00	1.71	2.08	1.76	1.45	1.46
FRANCE		0.00	1.62	1.75	1.49	1.44	1.35
ITALY		0.00	0.40	0.06	-0.55	-0.75	-0.80
USA		0.00	0.28	0.39	0.34	0.29	0.28
JAPAN		0.00	0.28	0.39	0.34	0.29	0.28
IMPORTS :	P	0.00	-1.91	-2.26	-2.24	-1.67	-0.92
GERMANY		0.00	-1.73	-1.40	-1.31	-1.22	-1.01
FRANCE		0.00	-2.97	-1.55	-0.90	-0.55	-0.22
ITALY		0.00	1.59	1.66	1.69	1.81	2.02
USA		0.00	1.93	2.04	2.21	2.39	2.62
JAPAN		0.00	1.93	2.04	2.21	2.39	2.62

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE

table 8

BILATERAL TRADE: U.S.A.		UNIFICATION SIMULATION A: EMS PERM.				APPRECIATION	
		YEAR: 1	2	3	4	5	6
: EXPORTS :		P					
: GERMANY		0.00	2.59	8.73	8.50	9.73	10.65
: FRANCE		0.00	3.08	3.04	3.41	3.27	3.18
: ITALY		0.00	-0.42	-0.62	-0.81	-0.94	-0.97
: U.K.		0.00	1.59	1.66	1.69	1.81	2.02
: JAPAN		0.00	0.45	0.82	0.89	0.91	0.93
: IMPORTS :		P					
: GERMANY		0.00	-4.71	-6.40	-7.11	-6.43	-5.38
: FRANCE		0.00	-2.02	-1.91	-2.28	-2.28	-2.10
: ITALY		0.00	-2.51	-2.16	-2.21	-1.98	-1.65
: U.K.		0.00	0.40	0.06	-0.55	-0.75	-0.80
: JAPAN		0.00	0.61	0.82	0.56	0.68	0.86

SIMULATION PERIOD : 1982 1 TO 1987 4

BILATERAL TRADE: JAPAN		UNIFICATION SIMULATION A: EMS PERM.				APPRECIATION	
		YEAR: 1	2	3	4	5	6
: EXPORTS :		P					
: GERMANY		0.00	9.95	10.21	10.35	11.62	12.48
: FRANCE		0.00	2.76	3.22	3.10	3.11	3.15
: ITALY		0.00	2.36	3.15	3.22	3.47	3.50
: U.K.		0.00	1.93	2.04	2.21	2.39	2.62
: USA		0.00	0.61	0.82	0.56	0.68	0.86
: IMPORTS :		P					
: GERMANY		0.00	-4.79	-5.03	-5.13	-4.69	-4.12
: FRANCE		0.00	-2.51	-2.15	-2.05	-2.08	-2.11
: ITALY		0.00	-1.77	-1.82	-1.52	-1.26	-1.05
: U.K.		0.00	0.28	0.39	0.34	0.29	0.28
: USA		0.00	0.45	0.82	0.89	0.91	0.93

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE

The results of simulation A are summarized in table 3 (Germany), table 4 (France), table 5 (world summary) and table 6 to 8 (bilateral trade). Regarding West-Germany the growth effects of German unification are somewhat surprising. Only 1.4 pc additional growth in the first year, a much higher public sector deficit (+3 pc of gnp) and higher unemployment rate (+ 0.6 pc of labour force). In the following 2 years the results are even more negative. Several contradictory impacts induce these findings.

The huge transfer of public money to the East is mainly used to buy goods in West Germany. Thus West German exports face a positive impact. A proportion of these goods are imported from other western countries. On the other hand higher real interest rates dampen the expansionary effects. In addition to that, the revaluation of the EMS-currencies with the D-Mark included worsens competitiveness on export markets outside EMS area. Tax increases which are assumed to occur immediately after GEMU have considerable effects on the price level.

Furthermore: the permanent increase of population and labour force pushes real growth by increasing real consumption. At the same time unemployment rises, because labour market is not able to absorb the increasing labour supply.

Despite a tax induced price increase of more than 3 pc points in the first year and an additional wage increase of 2 pc points, consumer expenditure deflator increases only by 2 pc.. This is due to the fact of much lower import prices as a result of the revaluation. The low price effects lead to a relatively moderate wage development.

Additionally higher unemployment rates make nominal wage level reach its baseline again after five years. Real wages are even reduced by more than 1 pc point against baseline in the medium term.

Another interesting result is the development of real investment. Capital formation is positively influenced during the first year only. Afterwards real investment is considerable below baseline due to higher real interest rates.

Under these circumstances Germany's most important trading partner France is slightly negatively affected. Real growth is below baseline for the whole simulation period (-.2 pc). The positive impact on exports is dominated by negative real interest rate effects and the appreciation. Table 6 shows that the strong increase of real exports to West-Germany is accompanied by lower exports to all other countries. Therefore total real exports hardly grow at all. But at the same time imports from non-EMS countries are much higher due to the appreciation. Bilateral trade flows show the export and import reactions on demand and price effects in detail.

The world summary of table 5 indicates a split with respect to GNP growth between the EMS-countries France and Italy (negative effect) on one side and the non-EMS countries UK and USA on the other side. In this simulation only non-EMS countries gain from the German unification. They are not affected by higher real interest rates and the revaluation, instead they are in a situation of increasing exports to all other countries. The only price to be paid by them is a small negative

terms of trade effect.

Simulation B:

Permanent higher real interest rates in the EMS countries, but no appreciation
(tables 9 to 10)

This simulation can be considered as reflecting a situation of a single European currency with a higher "European" capital risk as a result of GEMU. The permanent huge capital demand of Germany keeps interest rates high in Germany and the EMS countries. Since capital and exchange rate markets interpret German unification as an European risk, for which the other European countries have to pay in case of failure, all exchange rates of the EMS countries remain unchanged. The increased risks diminish expected profits. In order to attract capital, interest rates have to rise without any appreciation of the exchange rates. By this assumption the equilibrium condition is met that foreign and domestic expected profits are the same. The unchanged exchange rates cause some inflationary problems especially for Germany where a strong increase in indirect taxes occurs without the counteracting import price effects. A price-wage-mechanism becomes effective which is stopped after 3 years of increasing unemployment. Nevertheless nominal compensation per employee remains well above baseline until the end of the simulation period (+3.5 pc), but real compensation per employee turns out to become negative in the medium term (-1 pc). In this respect there is not much difference to the results of simulation A.

table 9

GERMANY		UNIFICATION SIMULATION B NO EMS APPRECIATION						
		YEAR: 1	2	3	4	5	6	
:								
:								
:								
:	NOMINAL GNP	P	0.00	5.11	5.48	5.99	6.81	7.39
:	REAL GNP	P	0.00	2.75	1.78	0.99	1.72	2.59
:	GNP DEFLATOR	D	0.00	2.35	1.34	1.30	0.06	-0.31
:	CONSUMERS EXPENDITURE DEFLATOR	D	0.00	2.57	1.07	1.13	0.13	-0.24
:	COMPENSATION PER EMPLOYEE	P	0.00	3.22	4.12	3.64	3.62	3.32
:	EMPLOYMENT	P	0.00	0.76	1.25	1.24	1.55	2.11
:	UNEMPLOYMENT(PERC. OF LAB. FORCE)	PPD	0.00	0.47	1.32	2.06	2.55	2.82
:	REAL COMPENSATION PER EMPLOYEE	P	0.00	0.71	0.53	-1.02	-1.16	-1.21
:								
:								
:	REAL GOVERNMENT EXPENDITURE	P	0.00	-1.96	-1.92	-1.88	-1.83	-1.80
:	REAL CONSUMPTION	P	0.00	-0.56	0.10	0.52	1.86	3.23
:	REAL INVESTMENT	P	0.00	2.08	-1.59	-4.55	-3.39	-1.86
:	REAL INVENTORY INVESTMENT	DG	0.00	0.12	-0.11	-0.15	-0.03	0.10
:	REAL DOMESTIC DEMAND	P	0.00	-0.26	-0.81	-1.15	0.02	1.28
:	REAL EXPORTS OF GOODS AND SERVICES	P	0.00	16.66	14.81	12.70	12.88	13.21
:	REAL IMPORTS OF GOODS AND SERVICES	P	0.00	7.92	8.28	7.85	8.83	10.06
:	REAL GROSS DOMESTIC PRODUCT	P	0.00	2.51	1.52	0.76	1.53	2.42
:	NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.23	0.25	0.23	0.19	0.16
:	REAL GROSS NATIONAL PRODUCT	P	0.00	2.75	1.78	0.99	1.72	2.59
:								
:	BROAD MONEY (M3)	D	0.00	2.63	2.28	0.72	0.64	1.02
:	THREE MONTH INTEREST RATE	PPD	0.00	3.80	2.25	1.66	0.99	0.63
:	LONG TERM INTEREST RATE	PPD	0.00	3.52	2.67	1.74	0.89	0.61
:	PUBLIC SECTOR DEFICIT	DG	0.00	2.68	3.28	3.90	4.13	4.20
:								
:	PRICE OF EXPORTS OF GOODS	P	0.00	0.45	1.32	2.29	2.41	2.20
:	PRICE OF IMPORTS OF GOODS	P	0.00	-0.17	-0.01	0.20	0.87	0.99
:	PRICE OF EXP. OF GOODS AND SERV.	P	0.00	0.79	1.76	2.77	2.88	2.64
:	PRICE OF IMP. OF GOODS AND SERV.	P	0.00	-0.11	0.04	0.26	0.82	0.92
:	US \$ RATE	P	0.00	0.00	0.00	0.00	0.00	0.00
:	REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	2.57	2.45	2.29	1.94	1.62
:	CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	3.05	2.89	2.72	2.21	1.80
:	IMPORT RATIO	PPD	0.00	0.85	1.09	1.17	1.21	1.28
:	TERMS OF TRADE	P	0.00	0.89	1.72	2.50	2.03	1.70
:								

SIMULATION PERIOD : 1982 1 TC 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE
 DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

table 10

WORLD SUMMARY		UNIFICATION SIMULATION B NO EMS APPRECIATION						
		YEAR: 1	2	3	4	5	6	
:								
:								
:	REAL GDP/GNP :	P						
:	GERMANY		0.00	2.75	1.78	0.99	1.72	2.59
:	FRANCE		0.00	0.24	0.10	0.02	0.05	0.13
:	UK		0.00	0.28	0.32	0.22	0.22	0.33
:	ITALY		0.00	0.24	0.02	-0.19	-0.14	-0.01
:	USA		0.00	0.13	0.17	0.11	0.14	0.21
:								
:	REAL EXPORTS OF GOODS AND SERVICES :	P						
:	GERMANY		0.00	16.66	14.81	12.70	12.88	13.21
:	FRANCE		0.00	1.74	1.61	1.44	1.74	2.22
:	UK		0.00	0.93	1.10	1.07	1.17	1.33
:	ITALY		0.00	1.65	1.68	1.56	1.85	2.22
:	USA		0.00	0.64	0.81	0.86	1.02	1.25
:	OECD - (GGCDS ONLY)		0.00	1.22	1.13	0.90	1.08	1.41
:	NON OECD - (GGCDS ONLY)		0.00	0.62	0.72	0.70	0.84	1.04
:								
:	REAL IMPORTS OF GOODS AND SERVICES :	P						
:	GERMANY		0.00	7.92	8.28	7.85	8.83	10.06
:	FRANCE		0.00	0.34	0.01	-0.26	-0.22	-0.04
:	UK		0.00	0.47	0.48	0.29	0.30	0.56
:	ITALY		0.00	0.45	-0.01	-0.49	-0.39	-0.02
:	USA		0.00	0.21	0.18	-0.08	-0.07	0.13
:	OECD - (GGCDS ONLY)		0.00	1.52	1.37	1.13	1.27	1.55
:	NON OECD - (GGCDS ONLY)		0.00	0.30	0.45	0.47	0.56	0.86
:								
:	CURRENT BALANCE (PER CENT OF GNP) :	PPD						
:	GERMANY		0.00	3.05	2.89	2.72	2.21	1.80
:	FRANCE		0.00	0.35	0.40	0.40	0.41	0.47
:	UK		0.00	0.12	0.10	0.13	0.19	0.20
:	ITALY		0.00	0.30	0.39	0.47	0.45	0.44
:	USA		0.00	0.04	0.05	0.07	0.08	0.09
:								
:	TERMS OF TRADE :	P						
:	GERMANY		0.00	0.89	1.72	2.50	2.03	1.70
:	FRANCE		0.00	-0.12	-0.23	-0.34	-0.36	-0.33
:	UK		0.00	-0.10	-0.23	-0.33	-0.13	0.02
:	ITALY		0.00	0.08	-0.04	-0.17	-0.21	-0.17
:	USA		0.00	-0.03	-0.10	-0.18	-0.17	-0.11
:								

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE

SIMULATION PERIOD : 1982 I TC 1987 4

The relative advantages of this scenario (compared to simulation A) are the much higher export and import volumes of the EMS countries. Real exports of goods and services are more than 1 pc above baseline in all European countries. In Germany real imports of goods and services are increased up to 10 pc above baseline. West-Germany doubles its growth in the first year compared with the previous simulation (2.8 pc instead of 1.4 pc) and has still considerable positive effects in the following years. France and Italy can realize small positive growth effects of the same magnitude as UK and USA, despite the fact that France and Italy are faced with a real interest rate increase of 1 pc point. In the USA growth is affected only half as strong as in the previous simulation resulting from lower exports to the EMS countries. This is due to the fact that there is no longer a price advantage for US goods in Europe.

At the first glance it seems surprising to consider a capital risk as an advantage for the European countries. But if the negative expectations are justified, the capital suppliers may have to pay a price, e.g. by reduced profits of European firms.

Under these circumstances growth and bilateral trade in Europe can develop much better. France and Italy are no longer forced to share the burden of the German unification, while the higher real interest rates are dominated by higher exports. Probably this scenario is much closer to reality than scenario A. Looking at international capital and exchange rate markets it seems as if there are still higher real interest rates in the EMS countries but no appreciation.

Simulation C:

Temporary Interest Rate Shock and Appreciation (tables 11 to 12)

The following simulation C is based on the assumption that the supply of capital reacts highly flexible. Under these circumstances the permanent increase of capital demand from GEMU will induce additional capital supply on the world capital market. Therefore real interest rates increases are only temporary. Assuming furthermore perfect foresight on capital markets a one year higher real interest rate by one pc point leads to a one percent appreciation of the EMS currencies for one year.

In such a situation the negative effects due to higher interest rates and the appreciation of the EMS currencies are much lower for those countries than in the case of the permanent increase. As expected, all countries benefit from the additional demand without suffering from the negative effects which would occur in the presence of a permanent increase of real interest rates. Growth rates of GNP are above baseline for the whole simulation period and the wealth effects of GEMU are distributed symmetrically among the analysed countries, i.e. in this scenario there are no special winners of GEMU. Nevertheless the temporary interest rate shock scenario brings up much more advantages for the European countries than for the United States compared to the permanent interest rate increase. France and Italy are in a much better situation because of their higher

GERMANY

UNIFICATION SIMULATION C: TEMPORARY SHOCKS.

		YEAR: 1	2	3	4	5	6
NOMINAL GNP	P	0.00	4.91	5.64	6.89	7.98	8.53
REAL GNP	P	0.00	2.53	2.06	2.01	2.69	3.14
GNP DEFLATOR	C	0.00	2.38	1.17	1.28	0.36	0.07
CONSUMERS EXPENCITURE DEFLATOR	D	0.00	2.42	1.10	1.07	0.36	0.08
COMPENSATION PER EMPLOYEE	P	0.00	3.04	4.06	4.05	4.40	4.20
EMPLOYMENT	P	0.00	0.73	1.27	1.57	2.04	2.54
UNEMPLOYMENT(PERC. OF LAB. FORCE)	PPD	0.00	0.50	1.30	1.81	2.18	2.49
REAL COMPENSATION PER EMPLOYEE	P	0.00	0.67	0.58	-0.46	-0.49	-0.76
REAL GOVERNMENT EXPENDITURE	P	0.00	-1.96	-1.92	-1.88	-1.83	-1.80
REAL CONSUMPTION	P	0.00	-0.56	0.29	1.14	2.40	3.39
REAL INVESTMENT	P	0.00	1.93	-0.73	-1.24	0.46	1.52
REAL INVENTORY INVESTMENT	CG	0.00	0.10	-0.02	0.16	0.27	0.31
REAL DOMESTIC DEMAND	P	0.00	-0.31	-0.44	0.15	1.35	2.19
REAL EXPORTS OF GOODS AND SERVICES	P	0.00	16.13	14.93	13.21	13.31	13.29
REAL IMPORTS OF GOODS AND SERVICES	P	0.00	7.95	8.63	9.17	10.35	11.23
REAL GROSS DOMESTIC PRODUCT	P	0.00	2.29	1.81	1.81	2.52	3.00
NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.23	0.24	0.20	0.17	0.14
REAL GROSS NATIONAL PRODUCT	P	0.00	2.53	2.06	2.01	2.69	3.14
BROAD MONEY (M3)	D	0.00	2.59	2.57	1.89	1.51	1.24
THREE MONTH INTEREST RATE	PPD	0.00	3.62	1.32	0.65	0.32	-0.09
LONG TERM INTEREST RATE	PPD	0.00	3.48	1.57	0.79	0.28	-0.06
PUBLIC SECTOR DEFICIT	DG	0.00	2.73	3.15	3.38	3.42	3.50
PRICE OF EXPORTS OF GOODS	P	0.00	0.24	1.22	2.15	2.48	2.56
PRICE OF IMPORTS OF GOODS	P	0.00	-0.89	-0.03	0.15	0.92	1.09
PRICE OF EXP. OF GOODS AND SERV.	P	0.00	0.62	1.65	2.63	2.97	3.04
PRICE OF IMP. OF GOODS AND SERV.	P	0.00	-0.83	0.02	0.21	0.88	1.05
US \$ RATE	P	0.00	-0.94	0.00	0.00	0.00	0.00
REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	2.51	2.37	2.02	1.66	1.41
CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	3.04	2.78	2.43	1.90	1.58
IMPORT RATIO	PPD	0.00	0.90	1.10	1.21	1.30	1.38
TERMS OF TRADE	P	0.00	1.46	1.63	2.41	2.06	1.97

SIMULATION PERIOD : 1982 1 TC 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE
 DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

table 11

table 12

WORLD SUMMARY		UNIFICATION SIMULATION C: TEMPORARY SHOCKS					
		YEAR: 1	2	3	4	5	6
: REAL GDP/GNP :		P					
: GERMANY		0.00	2.53	2.06	2.01	2.69	3.14
: FRANCE		0.00	0.18	0.30	0.43	0.47	0.53
: UK		0.00	0.29	0.33	0.31	0.32	0.39
: ITALY		0.00	0.15	0.33	0.45	0.54	0.56
: USA		0.00	0.16	0.18	0.12	0.16	0.24
: REAL EXPORTS OF GOODS AND SERVICES :		P					
: GERMANY		0.00	16.13	14.93	13.21	13.31	13.29
: FRANCE		0.00	1.48	1.82	1.96	2.32	2.69
: UK		0.00	1.02	1.18	1.30	1.44	1.57
: ITALY		0.00	1.37	1.89	2.01	2.31	2.47
: USA		0.00	0.74	0.88	1.00	1.21	1.44
: OECD - (GOODS ONLY)		0.00	1.15	1.23	1.21	1.43	1.65
: NON OECD - (GOODS ONLY)		0.00	0.63	0.78	0.91	1.11	1.28
: REAL IMPORTS OF GOODS AND SERVICES :		P					
: GERMANY		0.00	7.95	8.63	9.17	10.35	11.23
: FRANCE		0.00	0.43	0.36	0.40	0.37	0.43
: UK		0.00	0.33	0.49	0.46	0.51	0.68
: ITALY		0.00	0.41	0.57	0.82	1.04	1.18
: USA		0.00	0.15	0.18	-0.03	-0.01	0.15
: OECD - (GOODS ONLY)		0.00	1.48	1.50	1.52	1.68	1.85
: NON OECD - (GOODS ONLY)		0.00	0.28	0.47	0.58	0.72	1.02
: CURRENT BALANCE (PER CENT OF GNP) :		PPD					
: GERMANY		0.00	3.04	2.78	2.43	1.90	1.58
: FRANCE		0.00	0.35	0.33	0.34	0.39	0.43
: UK		0.00	0.10	0.14	0.17	0.21	0.23
: ITALY		0.00	0.31	0.26	0.24	0.27	0.29
: USA		0.00	0.05	0.06	0.08	0.09	0.11
: TERMS OF TRADE :		D					
: GERMANY		0.00	1.46	1.63	2.41	2.06	1.97
: FRANCE		0.00	0.23	-0.33	-0.39	-0.46	-0.48
: UK		0.00	0.31	-0.16	-0.27	-0.08	0.02
: ITALY		0.00	0.34	-0.15	-0.12	-0.05	0.09
: USA		0.00	0.12	-0.09	-0.15	-0.17	-0.14

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE

competitiveness. The United Kingdom gains from overall increased growth rates in Europe. Compared to simulation A only the United States have lower growth rates because of the increased competitiveness of the European countries on the world markets. The benefits for the US from increased growth rates in the EMS are smaller than for the UK since trade linkages are not as close.

VI Realignment (tables 13 to 15)

In addition to above simulations we run an alternative scenario reflecting a different policy regime. If the other EMS countries are not willing to accept higher real interest rates combined with an appreciation of their currencies against the US Dollar a strategy of an exchange rate realignment within the EMS is unavoidable.

Such a strategy certainly raises the question about the creditibility of exchange rate policy within the EMS. However one could argue that such a extraordinary event like GEMU could justify a single realignment.

Then the negative impacts from GEMU which arise for EMS members would be less severe. The scenario of a devaluation of their own currencies against the D-Mark would be the "best case" for Germany's main trading partners in Europe. They would benefit from the additional demand for goods and services from Germany without suffering from the contractive effects on investment resulting from higher interest rates. In addition they would not loose their competitiveness towards the rest of the world.

table 13

GERMANY		UNIFICATION SIMULATION D: REALIGNMENT						
		YEAR: 1	2	3	4	5	6	
:								
:								
:								
:	NOMINAL GNP	P	0.00	3.76	2.84	2.64	2.95	3.06
:	REAL GNP	P	0.00	1.20	-0.06	-0.16	1.18	2.24
:	GNP DEFLATOR	D	0.00	2.59	0.37	-0.10	-1.02	-0.99
:	CONSUMERS EXPENCITURE DEFLATOR	D	0.00	1.59	0.38	0.01	-0.72	-0.82
:	COMPENSATION PER EMPLOYEE	P	0.00	2.00	1.59	0.30	-0.22	-0.94
:	EMPLOYMENT	P	0.00	0.52	0.62	0.65	1.17	1.90
:	UNEMPLOYMENT(PERC. OF LAB. FORCE)	PPD	0.00	0.66	1.81	2.52	2.85	2.98
:	REAL COMPENSATION PER EMPLOYEE	P	0.00	0.45	-0.34	-1.61	-1.41	-1.32
:								
:								
:	REAL GOVERNMENT EXPENDITURE	P	0.00	-1.96	-1.92	-1.88	-1.83	-1.80
:	REAL CONSUMPTION	P	0.00	-0.56	-0.28	0.39	1.95	3.42
:	REAL INVESTMENT	P	0.00	1.09	-2.47	-3.90	-2.05	-0.95
:	REAL INVENTORY INVESTMENT	DG	0.00	-0.02	-0.30	-0.25	-0.04	0.11
:	REAL DOMESTIC DEMAND	P	0.00	-0.60	-1.39	-1.21	0.33	1.56
:	REAL EXPORTS OF GOODS AND SERVICES	P	0.00	13.07	10.87	9.63	10.86	11.89
:	REAL IMPORTS OF GOODS AND SERVICES	P	0.00	8.25	8.19	7.97	9.36	10.63
:	REAL GROSS DOMESTIC PRODUCT	P	0.00	0.97	-0.28	-0.35	1.02	2.10
:	NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.23	0.22	0.19	0.16	0.14
:	REAL GROSS NATIONAL PRODUCT	P	0.00	1.20	-0.06	-0.16	1.18	2.24
:								
:	BROAD MONEY (M3)	C	0.00	2.40	0.09	-0.57	0.15	0.75
:	THREE MONTH INTEREST RATE	PPD	0.00	2.56	1.54	0.57	0.25	0.15
:	LONG TERM INTEREST RATE	PPD	0.00	3.34	1.65	0.44	-0.01	0.03
:	PUBLIC SECTOR DEFICIT	CG	0.00	3.03	3.93	4.47	4.55	4.56
:								
:	PRICE OF EXPORTS OF GOODS	P	0.00	-0.96	-0.74	-0.74	-1.35	-2.05
:	PRICE OF IMPORTS OF GOODS	P	0.00	-5.10	-4.82	-4.69	-4.21	-4.22
:	PRICE OF EXP. OF GOODS AND SERV.	P	0.00	-0.34	-0.08	-0.11	-0.78	-1.55
:	PRICE OF IMP. OF GOODS AND SERV.	P	0.00	-5.06	-4.78	-4.65	-4.23	-4.25
:	US \$ RATE	P	0.00	-5.53	-5.53	-5.53	-5.53	-5.53
:	REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	2.15	2.02	1.82	1.53	1.34
:	CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	3.03	2.59	2.29	1.80	1.49
:	IMPORT RATIO	PPD	0.00	1.18	1.40	1.40	1.40	1.44
:	TERMS OF TRADE	P	0.00	4.97	4.94	4.75	3.59	2.82
:								

SIMULATION PERIOD : 1982 1 TC 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE
 DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

		YEAR: 1 2 3 4 5 6						
:								
:								
:								
:	NOMINAL GNP	P	0.00	0.64	0.57	0.52	0.71	0.79
:	REAL GNP	P	0.00	0.76	0.32	0.02	0.35	0.61
:	GNP DEFLATOR	D	0.00	-0.14	0.41	0.26	-0.14	-0.19
:	CONSUMERS EXPENDITURE DEFLATOR	D	0.00	0.09	0.39	0.24	-0.11	-0.19
:	COMPENSATION PER EMPLOYEE	P	0.00	0.07	0.36	0.52	0.43	0.29
:	EMPLOYMENT	P	0.00	0.11	0.21	0.13	0.13	0.22
:	UNEMPLOYMENT (PERC. OF LAB. FORCE)	PPD	0.00	-0.08	-0.16	-0.10	-0.10	-0.17
:	REAL COMPENSATION PER EMPLOYEE	P	0.00	-0.01	-0.08	-0.14	-0.13	-0.08
:								
:								
:	REAL GOVERNMENT EXPENDITURE	P	0.00	0.00	0.00	0.00	0.00	0.00
:	REAL CONSUMPTION	P	0.00	-0.24	-0.25	-0.19	-0.25	-0.30
:	REAL INVESTMENT	P	0.00	1.93	0.86	-0.68	0.93	0.74
:	REAL INVENTORY INVESTMENT	CG	0.00	0.28	-0.09	-0.23	-0.16	0.13
:	REAL DOMESTIC DEMAND	P	0.00	0.47	-0.10	-0.46	-0.15	0.08
:	REAL EXPORTS OF GOODS AND SERVICES	P	0.00	1.95	1.49	1.20	1.88	2.57
:	REAL IMPORTS OF GOODS AND SERVICES	P	0.00	0.64	-0.33	-0.93	-0.34	0.17
:	REAL GROSS DOMESTIC PRODUCT	P	0.00	0.75	0.28	-0.04	0.29	0.56
:	NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.01	0.04	0.06	0.05	0.06
:	REAL GROSS NATIONAL PRODUCT	P	0.00	0.76	0.32	0.02	0.35	0.61
:								
:	BROAD MONEY (M3)	D	0.00	1.01	-0.23	-0.56	-0.51	0.48
:	THREE MONTH INTEREST RATE	PPD	0.00	-1.12	1.30	1.19	1.19	0.98
:	LONG TERM INTEREST RATE	PPD	0.00	-1.15	1.80	0.21	-0.96	1.11
:	PUBLIC SECTOR DEFICIT	DG	0.00	-0.19	-0.12	-0.06	-0.15	-0.19
:								
:	PRICE OF EXPORTS OF GOODS	P	0.00	0.35	0.72	0.90	0.84	0.68
:	PRICE OF IMPORTS OF GOODS	P	0.00	1.16	1.45	1.55	1.49	1.29
:	PRICE OF EXP. OF GOODS AND SERV.	P	0.00	0.26	0.64	0.82	0.74	0.56
:	PRICE OF IMP. OF GOODS AND SERV.	P	0.00	1.20	1.49	1.59	1.52	1.31
:	US \$ RATE	P	0.00	0.00	0.00	0.00	0.00	0.00
:	REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	0.23	0.38	0.44	0.45	0.48
:	CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	0.09	0.29	0.40	0.38	0.41
:	IMPORT RATIO	PPD	0.00	-0.02	-0.09	-0.14	-0.10	-0.07
:	TERMS OF TRADE	P	0.00	-0.93	-0.84	-0.76	-0.77	-0.74
:								

SIMULATION PERIOD : 1982 1 TC 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE
 DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

table 14

table 15

WORLD SUMMARY		UNIFICATION SIMULATION D: REALIGNMENT						
		YEAR: 1	2	3	4	5	6	
:								
:								
:	REAL GDP/GNP	P						
:	GERMANY		0.00	1.20	-0.06	-0.16	1.18	2.24
:	FRANCE		0.00	0.76	0.32	0.02	0.35	0.61
:	UK		0.00	0.31	0.24	0.11	0.20	0.39
:	ITALY		0.00	0.52	-0.28	-0.76	-0.12	0.25
:	USA		0.00	0.24	0.30	0.14	0.16	0.25
:								
:	REAL EXPORTS OF GOODS AND SERVICES	P						
:	GERMANY		0.00	13.07	10.87	9.63	10.86	11.89
:	FRANCE		0.00	1.95	1.49	1.20	1.80	2.57
:	UK		0.00	1.24	1.29	1.07	1.18	1.34
:	ITALY		0.00	1.99	1.61	1.26	1.86	2.44
:	USA		0.00	0.98	1.20	1.11	1.24	1.43
:	OECD - (GOODS ONLY)		0.00	0.97	0.66	0.41	0.87	1.37
:	NON OECD - (GOODS ONLY)		0.00	0.69	0.68	0.57	0.84	1.15
:								
:	REAL IMPORTS OF GOODS AND SERVICES	P						
:	GERMANY		0.00	8.25	8.19	7.97	9.36	10.63
:	FRANCE		0.00	0.64	-0.33	-0.93	-0.34	0.17
:	UK		0.00	0.14	0.03	-0.10	0.21	0.70
:	ITALY		0.00	0.68	-0.85	-1.90	-0.50	0.53
:	USA		0.00	0.00	-0.12	-0.45	-0.29	0.08
:	OECD - (GOODS ONLY)		0.00	1.39	1.00	0.73	1.17	1.64
:	NON OECD - (GOODS ONLY)		0.00	0.27	0.32	0.27	0.42	0.81
:								
:	CURRENT BALANCE (PER CENT OF GNP)	PPD						
:	GERMANY		0.00	3.03	2.59	2.29	1.80	1.49
:	FRANCE		0.00	0.09	0.29	0.40	0.38	0.41
:	UK		0.00	0.06	0.12	0.14	0.18	0.16
:	ITALY		0.00	0.15	0.49	0.71	0.41	0.32
:	USA		0.00	0.07	0.09	0.11	0.12	0.12
:								
:	TERMS OF TRADE	P						
:	GERMANY		0.00	4.97	4.94	4.75	3.59	2.82
:	FRANCE		0.00	-0.93	-0.84	-0.76	-0.77	-0.74
:	UK		0.00	-0.90	-0.93	-0.70	-0.26	0.03
:	ITALY		0.00	-0.53	-0.41	-0.43	-0.55	-0.40
:	USA		0.00	-0.34	-0.42	-0.38	-0.26	-0.14
:								

SIMULATION PERIOD : 1982 1 TC 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE

The strategy of an exchange rate realignment within the EMS has the consequence that the main winners from GEMU change. In the former simulations the non-EMS countries gain at a greater extent by GEMU because they benefit from higher exports to all EMS countries. After the realignment the lack of competitiveness of the EMS countries vanishes. In the new situation positive effects on exports of all countries are closely related to the extent of their trade relations to Germany. The greatest expansion can be detected in France and Italy. Furthermore, both countries have broader room for an expansionary monetary policy to lower interest rates, which stimulates investment. For their economic situation the realignment is the "best case".

For Germany a realignment would be the "worst case". The positive effects on the final demand from higher exports to East Germany are reduced to a great extent by diminished investments and lower exports to the rest of the world. The direct effects of the realignment lead to lower exports to the countries of the European Community. Furthermore German goods become less competitive on the world markets because of higher relative export prices.

In the first year after GEMU German GNP increases by a rate of 1.2 pc difference from base benefitting from the higher exports to East Germany. But in the following two years growth rates are reduced due to the secondary effects of lower investment as well as lower exports to the rest of the world. This impact dominates the additional demand from East Germany.

However the final effects on German GNP growth in presence of a realignment strategy are similar to those of an overall EMS appreciation. At the end of the simulation, period in both scenarios Germany is on the same growth path. Nevertheless in the course of the simulation period GNP is lower than in the former case. This loss of welfare is not compensated. Hence in the case of an overall EMS appreciation the costs of GEMU are shared among the EMS countries. However in the case of a permanent increase of real interest rates a realignment strategy would create the possibility of an independent monetary policy which is less tight than in Germany.

The loss of GNP-growth in Germany caused by this realignment strategy is minor compared to the much higher GNP growth of the other EMS countries.

VII A Compound Scenario (tables 16 to 18)

It seems useful to combine several assumptions of the preceding simulations to compile a picture which is as close as possible to the real timing of shocks induced by GEMU. Special attention will be paid to the sequencing of the demand shock and the tax increase.

The basic assumptions remain unchanged for the following simulations. A first deviation from previous settings is made with respect to tax increases. In accordance with the real sequence of decisions we assume that taxes were increased one year after GEMU. During the first year, public spending was mainly financed

		YEAR: 1	2	3	4	5	6	
:								
:								
:								
:	NOMINAL GNP	P	0.00	3.27	3.48	3.36	5.02	6.00
:	REAL GNP	P	0.00	3.32	2.16	0.59	1.44	2.53
:	GNP DEFLATOR	D	0.00	-0.05	1.38	1.48	0.78	-0.13
:	CONSUMERS EXPENCITURE DEFLATOR	D	0.00	-1.15	2.96	1.25	0.65	-0.13
:	COMPENSATION PER EMPLOYEE	P	0.00	0.44	2.29	1.73	1.94	2.00
:	EMPLOYMENT	P	0.00	1.06	1.44	1.21	1.36	2.02
:	UNEMPLOYMENT(PERC. OF LAB. FORCE)	PPD	0.00	0.24	1.17	2.08	2.70	2.89
:	REAL COMPENSATION PER EMPLOYEE	P	0.00	1.58	0.57	-1.21	-1.64	-1.45
:								
:								
:	REAL GOVERNMENT EXPENDITURE	P	0.00	-1.96	-1.92	-1.88	-1.83	-1.80
:	REAL CONSUMPTION	P	0.00	2.63	0.68	0.22	1.67	3.32
:	REAL INVESTMENT	P	0.00	5.04	0.50	-5.88	-4.26	-1.91
:	REAL INVENTORY INVESTMENT	DG	0.00	0.26	-0.05	-0.33	-0.08	0.08
:	REAL DOMESTIC DEMAND	P	0.00	2.29	-0.01	-1.77	-0.29	1.31
:	REAL EXPORTS OF GOODS AND SERVICES	P	0.00	15.34	17.00	15.05	14.88	15.11
:	REAL IMPORTS OF GOODS AND SERVICES	P	0.00	13.16	12.15	10.01	11.01	12.45
:	REAL GROSS DOMESTIC PRODUCT	P	0.00	3.17	1.94	0.36	1.25	2.38
:	NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.15	0.21	0.23	0.19	0.14
:	REAL GROSS NATIONAL PRODUCT	P	0.00	3.32	2.16	0.59	1.44	2.53
:								
:	BROAD MONEY (M3)	D	0.00	2.44	0.60	0.27	0.81	1.41
:	THREE MONTH INTEREST RATE	PPD	0.00	-0.69	5.21	1.67	1.43	0.74
:	LONG TERM INTEREST RATE	PPD	0.00	0.31	3.71	2.07	1.41	0.77
:	PUBLIC SECTOR DEFICIT	DG	0.00	4.77	3.30	4.25	4.62	4.60
:								
:	PRICE OF EXPORTS OF GOODS	P	0.00	-1.51	-0.22	0.86	1.45	1.34
:	PRICE OF IMPORTS OF GOODS	P	0.00	-4.62	-0.30	-0.06	0.96	1.20
:	PRICE OF EXP. OF GOODS AND SERV.	P	0.00	-1.24	0.08	1.22	1.84	1.72
:	PRICE OF IMP. OF GOODS AND SERV.	P	0.00	-4.49	-0.21	0.03	0.78	0.94
:	US \$ RATE	P	0.00	-5.53	-0.00	0.00	0.00	0.00
:	REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	0.96	1.85	2.14	1.65	1.24
:	CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	1.92	1.99	2.49	2.02	1.53
:	IMPORT RATIO	PPD	0.00	1.60	1.66	1.61	1.63	1.70
:	TERMS OF TRADE	P	0.00	3.40	0.28	1.19	1.04	0.77
:								

SIMULATION PERIOD : 1982 1 TO 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE
 DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

FRANCE

UNIFICATION SIMULATION E COMPOUND SCENARIO

		YEAR: 1	2	3	4	5	6	
:								
:								
:								
:	NOMINAL GNP	P	0.00	-0.38	-0.18	0.63	0.87	1.04
:	REAL GNP	P	0.00	0.12	0.68	0.44	0.42	0.55
:	GNP DEFLATOR	D	0.00	-0.56	-0.38	1.14	0.28	0.05
:	CONSUMERS EXPENCITURE DEFLATOR	D	0.00	-1.08	0.21	1.05	0.31	0.06
:	COMPENSATION PER EMPLOYEE	P	0.00	-0.74	-0.53	0.24	0.48	0.53
:	EMPLOYMENT	P	0.00	0.05	0.14	0.22	0.24	0.28
:	UNEMPLOYMENT(PERC. OF LAB. FORCE)	PPD	0.00	-0.04	-0.10	-0.16	-0.18	-0.21
:	REAL COMPENSATION PER EMPLOYEE	P	0.00	0.25	0.27	0.08	0.02	0.01
:								
:								
:	REAL GOVERNMENT EXPENDITURE	P	0.00	0.00	0.00	0.00	0.00	0.00
:	REAL CONSUMPTION	P	0.00	0.24	0.08	-0.07	-0.14	-0.19
:	REAL INVESTMENT	P	0.00	-0.01	0.45	0.25	0.46	0.87
:	REAL INVENTORY INVESTMENT	DG	0.00	-0.04	0.15	0.07	-0.00	0.03
:	REAL DOMESTIC DEMAND	P	0.00	0.10	0.28	0.07	-0.01	0.06
:	REAL EXPORTS OF GOODS AND SERVICES	P	0.00	1.48	2.97	2.26	2.53	3.06
:	REAL IMPORTS OF GOODS AND SERVICES	P	0.00	1.40	1.36	0.69	0.60	0.81
:	REAL GROSS DOMESTIC PRODUCT	P	0.00	0.03	0.63	0.37	0.35	0.47
:	NET FACTOR INCOME FROM OVERSEAS	DG	0.00	0.09	0.04	0.07	0.07	0.07
:	REAL GROSS NATIONAL PRODUCT	P	0.00	0.12	0.68	0.44	0.42	0.55
:								
:	BROAD MONEY (M3)	D	0.00	-0.27	-0.38	1.00	0.46	0.35
:	THREE MONTH INTEREST RATE	PPD	0.00	-0.50	1.19	0.64	0.18	-0.01
:	LONG TERM INTEREST RATE	PPD	0.00	-0.08	0.77	0.66	0.14	-0.00
:	PUBLIC SECTOR DEFICIT	DG	0.00	-0.08	-0.13	-0.15	-0.17	-0.21
:								
:	PRICE OF EXPORTS OF GOODS	P	0.00	-2.06	-0.58	0.36	0.63	0.69
:	PRICE OF IMPORTS OF GOODS	P	0.00	-3.79	-0.10	0.34	0.65	0.69
:	PRICE OF EXP. OF GOODS AND SERV.	P	0.00	-1.76	-0.63	0.33	0.59	0.63
:	PRICE OF IMP. OF GOODS AND SERV.	P	0.00	-3.77	-0.09	0.35	0.66	0.69
:	US \$ RATE	P	0.00	-5.49	-0.00	0.00	0.00	0.00
:	REAL VISIBLE BALANCE (PER CENT OF GNP)	PPD	0.00	0.04	0.33	0.33	0.38	0.44
:	CURRENT BALANCE (PER CENT OF GNP)	PPD	0.00	0.59	0.31	0.45	0.48	0.53
:	IMPORT RATIO	PPD	0.00	0.18	0.10	0.04	0.03	0.04
:	TERMS OF TRADE	P	0.00	2.11	-0.55	-0.03	-0.07	-0.06
:								

SIMULATION PERIOD : 1982 1 TC 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE
 DG = DIFFERENCE FROM BASE AS A PERCENT OF GDP

table 17

Domestic and International Macroeconomic Effects
 of German Economic and Monetary Union

		YEAR: 1 2 3 4 5 6					
REAL GDP/GNP :		P					
GERMANY		0.00	3.32	2.16	0.59	1.44	2.53
FRANCE		0.00	0.12	0.68	0.44	0.42	0.55
UK		0.00	0.53	0.44	0.35	0.37	0.49
ITALY		0.00	-0.03	0.91	0.64	0.55	0.59
USA		0.00	0.40	0.25	-0.01	0.14	0.29
REAL EXPORTS OF GOODS AND SERVICES :		P					
GERMANY		0.00	15.34	17.00	15.05	14.88	15.11
FRANCE		0.00	1.48	2.97	2.26	2.53	3.06
UK		0.00	2.11	1.75	1.34	1.45	1.70
ITALY		0.00	1.14	3.17	2.37	2.53	2.78
USA		0.00	1.64	1.35	1.06	1.27	1.59
OECD - (GOODS ONLY)		0.00	1.77	2.09	1.62	1.83	2.20
NON OECD - (GOODS ONLY)		0.00	1.15	1.26	1.12	1.29	1.53
REAL IMPORTS OF GOODS AND SERVICES :		P					
GERMANY		0.00	13.16	12.15	10.01	11.01	12.45
FRANCE		0.00	1.40	1.36	0.69	0.60	0.81
UK		0.00	0.34	0.83	0.81	0.80	1.04
ITALY		0.00	0.85	1.74	1.28	1.10	1.32
USA		0.00	0.05	0.38	-0.04	0.10	0.39
OECD - (GOODS ONLY)		0.00	2.51	2.48	1.93	2.06	2.39
NON OECD - (GOODS ONLY)		0.00	0.42	0.75	0.80	0.92	1.26
CURRENT BALANCE (PER CENT OF GNP) :		PPD					
GERMANY		0.00	1.92	1.99	2.49	2.02	1.53
FRANCE		0.00	0.59	0.31	0.45	0.48	0.53
UK		0.00	0.15	0.34	0.20	0.23	0.25
ITALY		0.00	0.56	0.22	0.26	0.38	0.42
USA		0.00	0.11	0.11	0.10	0.10	0.10
TERMS OF TRADE :		P					
GERMANY		0.00	3.40	0.28	1.19	1.04	0.77
FRANCE		0.00	2.11	-0.55	-0.03	-0.07	-0.06
UK		0.00	1.24	0.34	0.16	0.27	0.35
ITALY		0.00	1.90	-0.35	0.12	0.30	0.54
USA		0.00	-0.50	0.06	0.01	-0.09	-0.07

SIMULATION PERIOD : 1982 1 TC 1987 4

P = PERCENT DIFFERENCE FROM BASE
 PPD = PERCENTAGE POINT DIFFERENCE FROM BASE
 D = DIFFERENCE FROM BASE RATE OF CHANGE

table 18

Domestic and International Macroeconomic Effects
 of German Economic and Monetary Union

by higher public deficits raising much concern about budget control. By this timing the expansive demand shock becomes effective before the negative tax shock. Hence it can be expected that during the first year GNP growth should be higher than in the previous simulations.

Early 1990 financial markets expected a permanently higher need for capital in Germany combined with excellent medium term profit chances induced by the fast restructuring of the East German economy. This perception has changed meanwhile. The difficulties of the unification process obviously have been underestimated. There is a widespread notion that the German government is not able to manage the transition without a longer period of economic crisis. Hence the prevailing perception is now that capital assets in Germany are more risky than they would have been without GEMU.

To feed this picture into the model some major modifications compared to the previous simulations are required. With respect to interest rates it is assumed that real rates in Germany and the other EMS countries will rise by one percentage point for one year. In Germany higher rates will prevail due to the perceived riskiness whereas in the other EMS countries they will move back to the baseline after the first year. This reflects the changing attitude towards financial investment in Germany. During the first year higher demand for capital leads to higher interest rates in Germany. A new equilibrium on capital market establishes by an appreciation of the DM. If other EMS members stick to the agreed policy rule of unchanged exchange rates central banks have to induce an increase of interest rates

there too.

Assuming that the appreciation has been considered as permanent, the extend to which D-Mark appreciates should be the same as for our simulation A, i.e. 5.5pc. Hence according to our rule the EMS currencies also appreciate towards the rest of the world by the same percentage rate. In the second year, when perception changes the risk argument requires that exchange rates return to baseline since otherwise the expected benefits from financial investments would just be offset by the higher value of the DM and the supposed additional risks would not be covered. Hence we assume that the exchange rates return to the baseline from the second year on. This exchange rate movement applies to all other EMS countries as long as central banks comply to unchanged currency relations. However, only for Germany risks have been increased, but not for the other EMS countries. With exchange rates returning to baseline, financial assets in those countries then yield a higher expected profit than those in Germany. To avoid pressure on DM which could finally lead to its devaluation, interest rates in the EMS countries have to return to baseline thus equilibrating the capital market again. So in the end, only Germany is left with higher interest rates whereas the other EMS countries face the same rates as on baseline. Exchange rates remain unchanged for all countries.

This setting implies that there is no perfect foresight on assets markets since the appreciation during the first year is much too high by hindsight. The extend of the imposed contractive impact of the interest rates and exchange rates shocks should be settled somewhere in between those of simulation A and simulation C.

Recent calculations and forecasts of the National Accounting System in Germany have led to the conclusion that imports may increase more than exports in 1990/1991. To take account of these probable developments we are forced to change our assumptions on the import shock for our compound scenario. Instead of an exogenously imposed shock of just 18 bill. DM per year we now assume that imports in fact may rise by 36 bill. DM. The main reason for doubling this amount is that apart from the different import structure of East German demand, West German firms in many sectors of the economy were working almost at full capacity level in 1990. This was mainly due to the continuous economic upswing during the second half of the eighties. Hence the increased demand possibly cannot be satisfied by domestic production and imports must rise to a larger extent than our model may capture.

The results show the expected pattern of GNP behaviour. During the first year German GNP rises by 3.3 pc above baseline. This is significantly higher than in all previous simulation runs. The basic reason for this consists in the higher deficit spending by the German government during the first year. Thereby a positive demand shock is triggered which remains unabashed by tax rises throughout the first year. A second impact is induced by the appreciation. Import prices decline with respect to the baseline and immediately lead to a lower consumption deflator as well as nominal interest rates. Both effects cause consumption and investment to rise. The model seems to overestimate the impact of exchange rate shocks since there is a one to one impact on import prices by definition. Such a modelling does

not take into account that contracts and a sluggish price reaction by international traders may in fact smooth the exchange rate shock. Therefore price effects have to be interpreted rather carefully. It can be assumed that a more realistic modelling which smoothes exchange rate effects would lead to a slightly smaller GNP increase in this scenario.

This development takes place in addition to the "export" push by sales into the former GDR which is by far not compensated by the loss of competitiveness through a higher value of the DM.

Again as in the other simulations positive GNP growth is still not sufficient to absorb the increased labour supply. Employment as well as unemployment rise throughout the simulation period. This means we cannot suppose that employment problems in Germany will be overcome during the following 5 years. On the contrary, they may even get worse.

It seems interesting to analyse which part of the actual German economic development can be explained by GEMU. Therefore we compare the results of the latest DIW forecast for economic development from the second half of 1990 to the second half of 1991 with our simulation results. According to them almost three quarters of total expected West German GNP growth during 1990 /1991 which amounts to 4.5 pc should be attributed to the unification impacts (3.3 pc). The respective results for the components are that 2.7 pc out of 3.8 pc expected

consumption growth can be explained by GEMU. For investment the respective figures are 5.0 pc out of an expected 7.4 pc. The overwhelming importance of GEMU is particularly obvious for foreign trade figures. Without GEMU Germany would face only a small increase of imports and a stagnation of exports due to the recession in major Western economies. With unification both variables boost.

However the simulations include an important warning message for further development. After the tax increase becomes effective, German GNP converges towards the baseline for two consecutive years. After the initial boom incited by GEMU the continuing need for transfers to the East requires a restrictive budget policy for the west. Consequently GNP growth rates decline and the economy faces a moderate recession with growth rates below albeit levels still above baseline. So the overall welfare effects will not vanish in the West. At the same time inflation rises mainly due to higher VAT. This results in climbing nominal interest rates. Consequently investment as well as consumption show lower growth rates. This development cannot be offset by the positive effect, the end of the appreciation exhibits on exports.

The conclusion to be drawn for West Germany from these results is that the "unification boom" will end after one year. The economy then will face lower growth rates accompanied by higher inflation. A slight recovery will occur after four years, which is mainly due higher private consumption and to lower imports whilst exports thanks to the assumed permanent influx of demand from the former GDR stay high. The downward adjustment of wages caused by increasing unemployment

let profits and thereby investment rise.

The international impacts of this simulation setting are somewhat mixed as far as the EMS countries are concerned. The higher interest rates in the EMS during the first year push investment downward. But this impact will be offset by higher exports to Germany. The latter increase for France and Italy by 14 pc during the first year. On the other hand EMS countries loose competitiveness towards the rest of the world leading to a decline of e.g. French exports to USA of almost 2 pc. From the second year onwards situation changes. The imposed decline of interest rates and the return of exchange rates to baseline finishes the contractive shocks. Consequently investment as well as consumption rise and recession ends. Instead, growth rates e.g for France are about 0.5 pc above baseline.

For non EMS members the unification effects again are unanimously positive. During the first year they have significantly higher exports to Germany as well as to other EMS countries. The latter is a result of higher competitiveness due to the appreciation of EMS currencies. Later on, exports slightly converge to baseline since EMS members regain competitiveness on international markets. In total, these countries benefit from German imports to a rather large extent. GNP in USA and Great Britain are on average about 0.4 pc higher throughout the simulation period. Their exports to Germany rise by 16 pc (USA,Japan) rsp. 11 pc (UK) during the first year and 13 pc (USA, Japan) rps 10 pc (UK) in the final period.

To sum up it can be concluded from these results that two assumptions which we

consider as realistic have major positive impacts on the German economy. The first one is the higher deficit spending during the first year which sets the economy on a higher expansion path right from the beginning of GEMU. The second is the changed perception of risks which prevent the appreciation of EMS currencies. The latter are beneficiary for all EMS economies. In addition to that, foreign economies also gain from the supposed higher capacity utilization level which induces imports to rise to a much larger extent than previously assumed. In general the combination of these assumptions lead to the conclusion that GEMU has stimulated the world economy and will do so for the next years despite higher interest rates in Germany.

VIII Conclusion

Our basic question with respect to the impact of GEMU on world economy was whether the positive growth effects of increased German imports dominates the negative impulses induced by rising interest rates and varying exchange rates. From our simulations on the multi country model QUEST one can draw the conclusion that the former impact is in fact stronger than the latter one. Hence in general the world economy benefits from German unification impact.

It seems appropriate to distinguish between the effects on EMS members and the rest of the world since former are tied to the German economy by quasi fixed exchange rates. It turns out that even for them the positive impact prevails in most

simulations. Thus our results differ from those of other studies.¹¹ They predict at least for the first years after unification a decline of growth for EMS countries except Germany (Masson/Meredith) or even Germany included (Mc. Kibbin). Two reasons may explain the difference. First the interest rate elasticities of the used models differ. Those of QUEST obviously tend to be lower. Furthermore East German demand for West German products has been estimated a bit lower. The Masson /Meredith paper assumes only 58 bill DM for the first year and on average 98 bill. for the following 5 years compared to 110 bill. in our simulations. Furthermore the increased import elasticities of GNP to be observed during the last months have not been considered. The global demand shock originating from GEMU then is significantly lower¹². It can be concluded from this that our results for the world economy are more positive mainly due to higher imposed demand shocks and a lower interest rate elasticity of demand.

Economic policy recommendations have to be based on the perception of risks involved with GEMU. At the beginning of 1990 when risks seem to be low and economic prospects fairly positive for Germany, a realignment strategy within the EMS would have had favourable effects. The growth push for EMS members other than Germany would have proved rather positive increasing their competitiveness

¹¹ See Masson,P./Meredith,G. (1990): *Domestic and International Macroeconomic Consequences of German Unification*, in: Lippschitz,L. /Mc Donald,D. (1990) and Mc Kibbin (1990): *Some Global Macroeconomic Implications of German Unification*. *Brookings Discussion Papers* Nr. 81.

¹² In the Mc. Kibbin paper demand shocks resulting from exports to East Germany have not been considered at all.

on international markets. The negative growth impact on Germany is comparably low since exports to other EMS countries react very sluggish on the appreciation of the DM. The credibility problem involved with such a strategy does not seem too severe in the light of a dramatic event like German unification.

However such a recommendation must remain hypothetical in a situation where prospects of Germany's economic future are rather uncertain. The main problem to be dealt with now is apart from the removal of institutional investment drawbacks in East Germany that high interest rates in Germany - which may be appropriate for the economic situation in the West - delay a fast economic expansion in the East. Therefore a coordinated policy at least within the EMS should make a strong case for a monetary policy of lower interest rates. By this, pressure on West German rates to stay high is reduced. The Bundesbank is not urged to tighten its policy as a reaction to a weak DM. The possible slightly higher inflation rates in EMS countries may be seen as a "price " to be paid in exchange of the benefits these countries acquire as a consequence of German unification.

figure 3

GNP Deviation As Percent Difference from Base

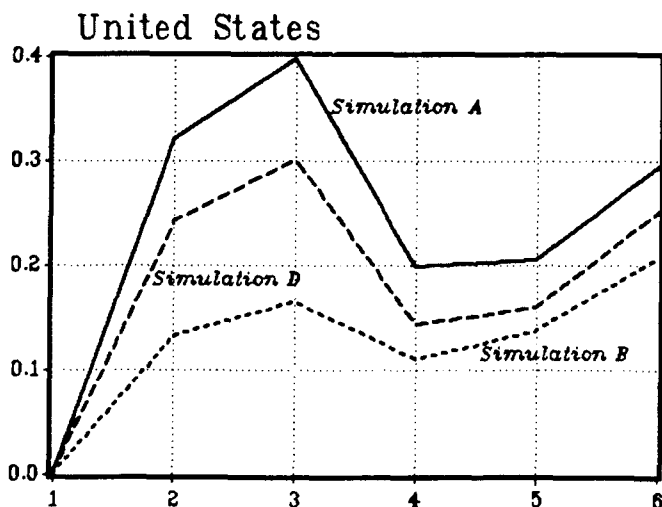
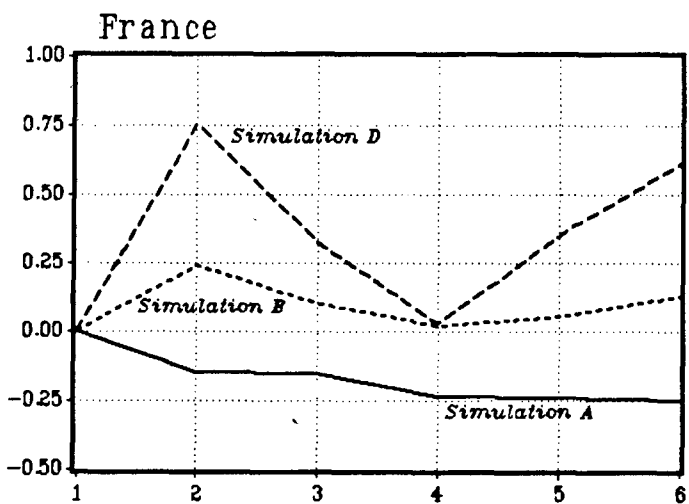
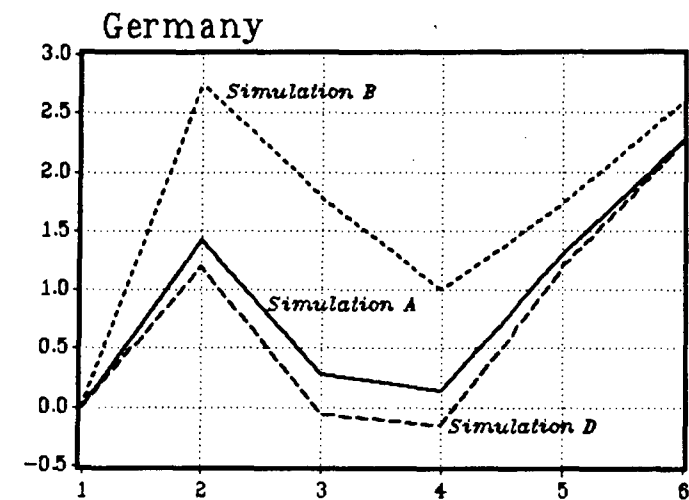


figure 4

Terms of Trade As Percent Difference from Base Germany

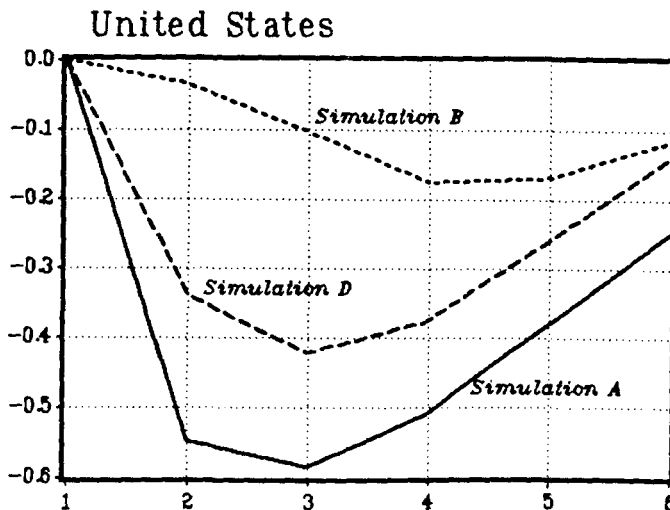
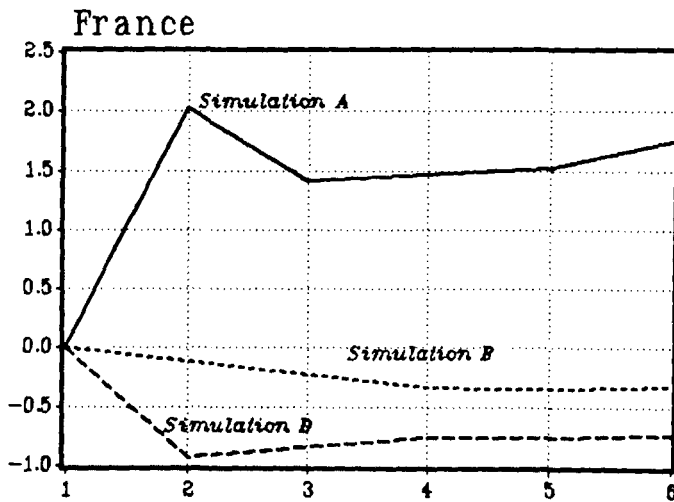
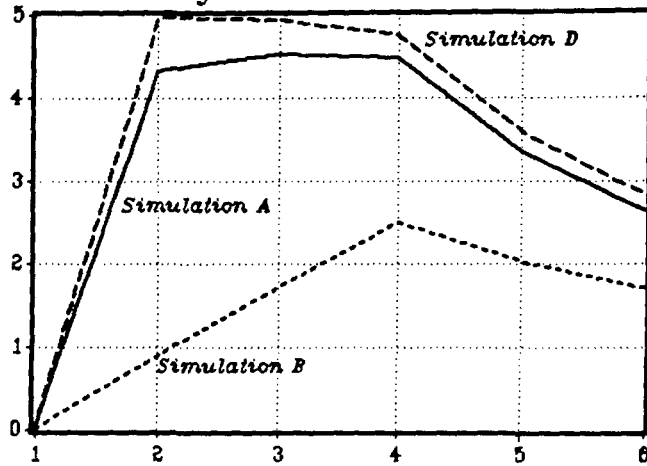


figure 5

Total Real Exports

As Percent Difference from Base

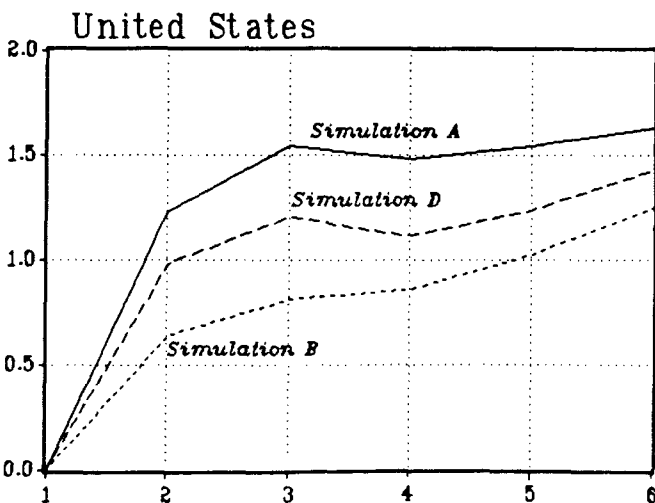
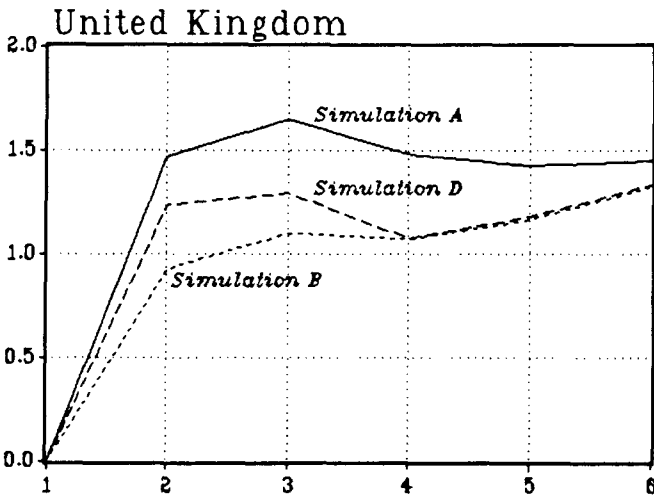
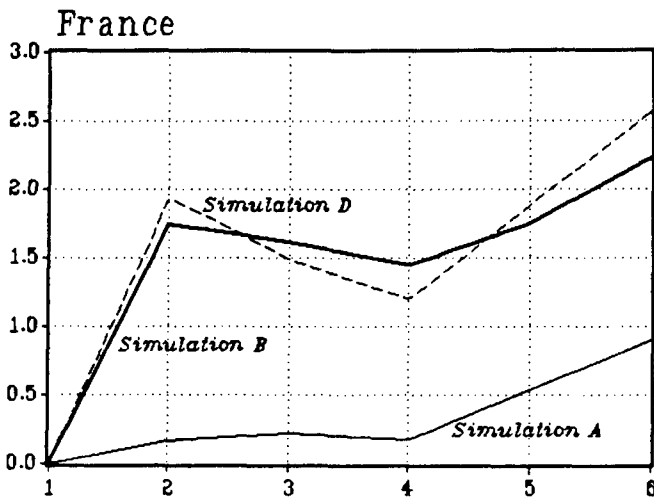


figure 6

Compound Scenario E : GNP

As Percent Difference from Base

