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The big bang with the big brother: German unification in its third year

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KIELER DISKUSSIONSBEITRÄGE

K I E L D I S C U S S I O N P A P E R S

211

The Big Bang with the Big Brother

German Unification in Its Third Year

by Horst Siebert

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East Germany can be considered a laboratory experiment in the economics of transition. Of the three major issues in economic reforms in the transformation process — establishing an institutional infrastructure, creating monetary stability, and accomplishing adjustment in the economy, especially in the firms — two issues were solved nearly instantaneously. Monetary stabilization was achieved by extending the currency area of the deutsche mark to East Germany in the currency union of July 1, 1990. And the institutional infrastructure was, in principle, introduced at one stroke when East Germany joined West Germany, as provided for in Article 23 of the German constitution. Thus, only the third major issue of reform remains to be solved, namely real adjustment in the economy, especially in the previously state-owned firms.

In the German case, transformation of a socialist economy and integration of two different economic systems are occurring simultaneously. This creates favorable conditions for eastern Germany in that western Germany can provide it with huge transfers. Thus, one could describe German unification as being the big bang with the big brother. But there are also less favorable conditions that impede the adjustment process: the exchange rate is not available as a shock absorber, and wage equalization is an important issue.

I. The Long-Run Perspective and the Shock

In a long-run perspective, land and qualified labor were added to the western German economy. Eastern Germany can be expected to have a positive growth perspective due to the incentives of the market system, due to its integration into the international division of labor, and due to the capital accumulation that will be associated with a high growth rate. But the capital stock of eastern Germany was obsolete.

We know very well from the economics of transition [Siebert, 1991a; Long and Siebert, 1992] that the transition from a centralized socialist planning system to a market economy represents a shock to the representative socialist firm, changing all its constraints, including the price vector. For the overwhelming number of the 316 state-owned eastern German firms, this shock can be modeled as a sudden unexpected drop in the producer's price. This implies that the capital stock of the firm or the firm itself, as a net of contractual relationships, becomes largely obsolete.

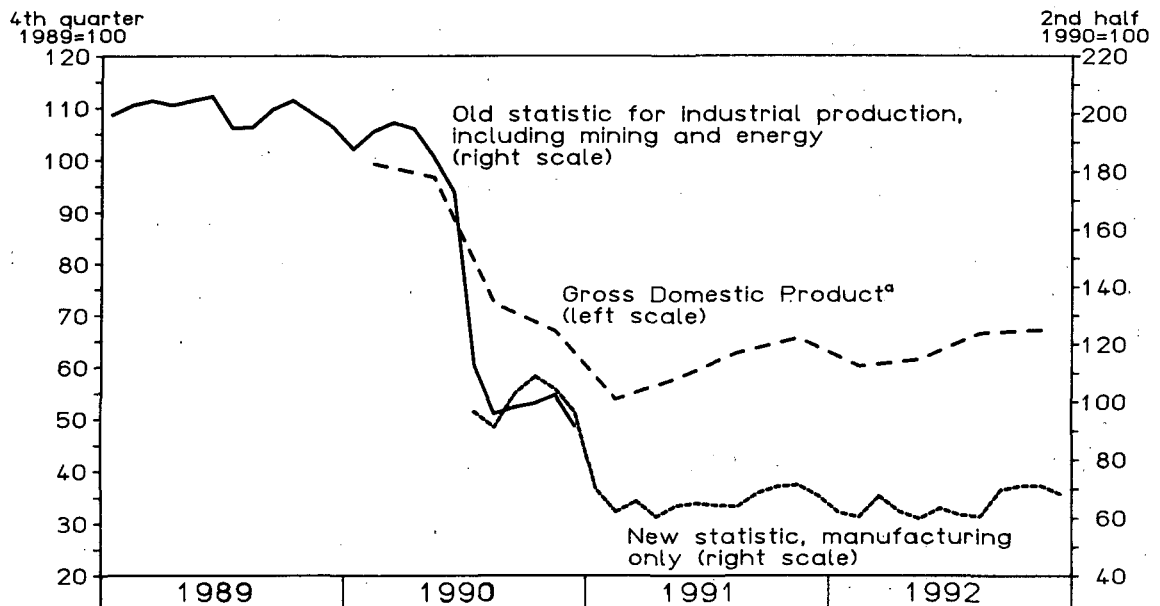
Aggregating over all firms indicates that the capital stock of the eastern Germany economy is obsolete to a considerable degree. It has to be rebuilt through investment. Human capital in its given occupations is also shown to be partly obsolete, although the qualifications of eastern German workers are judged as being not too different from those of western Germans. By reallocating and retraining, human capital can adjust. The concept of obsolescence can also be applied to infrastructure capital, which has to be improved and restructured. Another stock variable that is shown to be obsolete is the spatial structure of the economy. Last but not least, the capital of nature, the environment, which was polluted under the old system, will have to be restored.

German unification was a real shock to the East German economy. Productivity was at one-third of the West German level in 1989; the output of the manufacturing industry plummeted to one-third of

Revised version of a paper presented in the "Political Economy Lecture Series" of Harvard University, March 16, 1993. This paper is a sequel to my previous Kiel Discussion Papers: "The Economic Integration of Germany" (No. 160, May 1990), "The Economic Integration of Germany — An Update" (No. 160a, September 1990), and "Five Traps for German Economic Policy" (No. 185, April 1992).

the output in 1989. GDP fell to roughly 50 percent of the initial level (Figure 1). Exports fell to one-third of their level in 1989 (Figure A1 in the Appendix).

Figure 1 — Industrial Production and GDP in Eastern Germany, 1989–1992



*In 1991 prices.

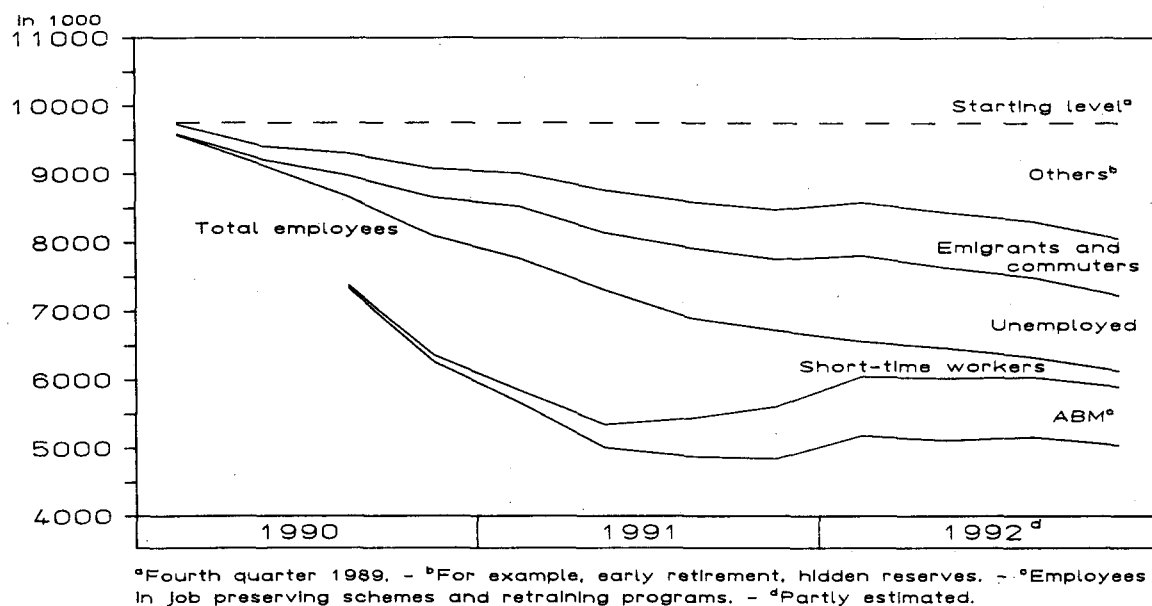
For the adjustment process of the economy in transition to a market system, we obtain a J-curve of aggregate output, falling abruptly and eventually catching up with the adjustment of still existing firms and with new firms' coming into existence. In 1992, the bottom of the J-curve of output was reached in eastern Germany.

In spite of a real GDP growth rate of 6.8 in 1992 a self-sustained growth process has not yet begun. GDP was 197.5 billion DM in 1992 (in constant 1991 prices), 7.7 percent of the western German level, whereas the population in eastern Germany accounts for 20 percent of the total German population. Aggregate domestic demand in eastern Germany in 1992 (in constant 1991 prices) amounted to 388.7 billion DM, i.e., 197 percent of GDP (for nominal figures, see Table A1). The trade deficit of roughly 190 billion DM was financed by public transfers, which are estimated at 150 billion DM for the government sector, and by private capital flows.

The number of employed in eastern Germany fell from 9.9 million in the second half of 1989 to 5 million at the end of 1992, if we only consider the first labor market (Figure 2). The transition in employment will not follow a full *J* but a *U*. Note that total employment in the prereform period reflected the conditions of the old system. After all the adjustment has taken place, long-run equilibrium employment (for instance, for married women) will be considerably lower than the prereform level. Because its response to output is delayed, employment is still falling, while industrial output is stagnating and GNP is rising slightly. Registered unemployment is at 1.2 million, 400,000 commute, and 1.7 million are in the second labor market, out of which 800,000 have gone into early retirement. During the upswing a time-lag is also to be expected before employment reacts.

A simple formula tells us how much time is needed for eastern Germany to catch up with western Germany. Consider a case where eastern Germany reaches 80 percent of the western German level of GNP per capita. This is not an unrealistic frame of reference, since in western Germany some regions are characterized by a similar percentage. In this case, everything depends on the difference in the real

Figure 2 — The Decline of Employment in Eastern Germany, 1990–1992



growth rates between eastern and western Germany. Table 1 shows for various growth differentials the years needed for an adjustment of 80 percent to take place.¹ Such calculations should be taken with a grain of salt; it is quite conceivable that in specific years high growth rates in the 15 percent range will occur in eastern Germany.

Table 1 — Time Needed for Eastern Germany to Reach 80 percent of Western German Level of GNP Per Capita

Growth differential	5	8	10	15	17	20	25
Years	21.2	13.2	10.6	7.1	6.2	5.3	4.2

Self-sustained growth can only start if the obsolete capital stock is rebuilt from scratch. 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 DM (Table A2).² 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, and road, railroad, waterway, postal, and communications infrastructures. 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 assuming a ten-year period of adjustment, a

¹ Let Y_{91}^W and Y_{91}^E be the initial GNP in eastern and western Germany, let α be the level to be reached, let $\beta = 0.25$ indicate the size of the eastern German population relative to western Germany, and let r^W and r^E denote the growth rates, then

$$\alpha \beta Y_{91}^W (e^{r^W t}) = Y_{91}^E (e^{r^E t}) \quad \text{and thus} \quad t = \frac{\ln(Y^E / Y^W) - \ln \alpha \beta}{r^W - r^E}.$$

² The total western German capital stock was 12,687 billion DM in 1991, that of the enterprise sector 5,201 billion DM.

rough calculation shows that private investment of 90 billion DM and public investment of 40 billion DM per year, i.e., 130 billion DM per year, would be needed.³

Actually, investment was 110 billion DM in 1992, amounting to 47 percent of eastern German GNP. Private investment accounted for 50 percent of total investment. For 1993, investment in the order of 130 billion DM is expected [Sachverständigenrat, 1992].

It would be tempting to apply the western German output-capital ratio to calculate the growth effect of a given investment. For instance, applying the western German average output-capital ratio of 5.0 to the investment of 130 billion DM expected for 1993, the increase in GNP should be 26 billion DM. Private investment, if it were 60 billion DM, would yield a proportionately higher increase in GNP of 24 billion DM, using an output-capital ratio for the enterprise sector of 2.5. These calculations are misleading in different ways. On the one hand old capital is still being scrapped, and this has a negative effect on aggregate output. Over time, this effect should become less important. On the other hand, in an economy where the capital stock is rebuilt from scratch, the output effect of investment should be higher than given by the average output-capital ratio.

The marginal output-capital ratio, measured by the increase in GNP to the increase in the gross capital stock, has shown great variation since 1950. Whereas in the late 1980s values were around 0.45, the early 1950s saw values larger than 1 (Table A3). This would indicate a situation in which investment would increase GNP by the same amount.

II. The Adjustment Process

It has been hotly debated whether the western German comprehensive currency and economic reform of 1948 can serve as an analogy for eastern Germany. The monetary overhang of inflation that had been suppressed since 1936 was reduced by exchanging 100 reichsmarks into 6.5 new deutsche marks for financial assets and using a 1:1 ratio for a standard sum up to 60 DM per head. Central administration of the economy was eliminated and prices for most commodities were freed (exceptions were basic foods, iron and steel, wages, housing rents, and public services).

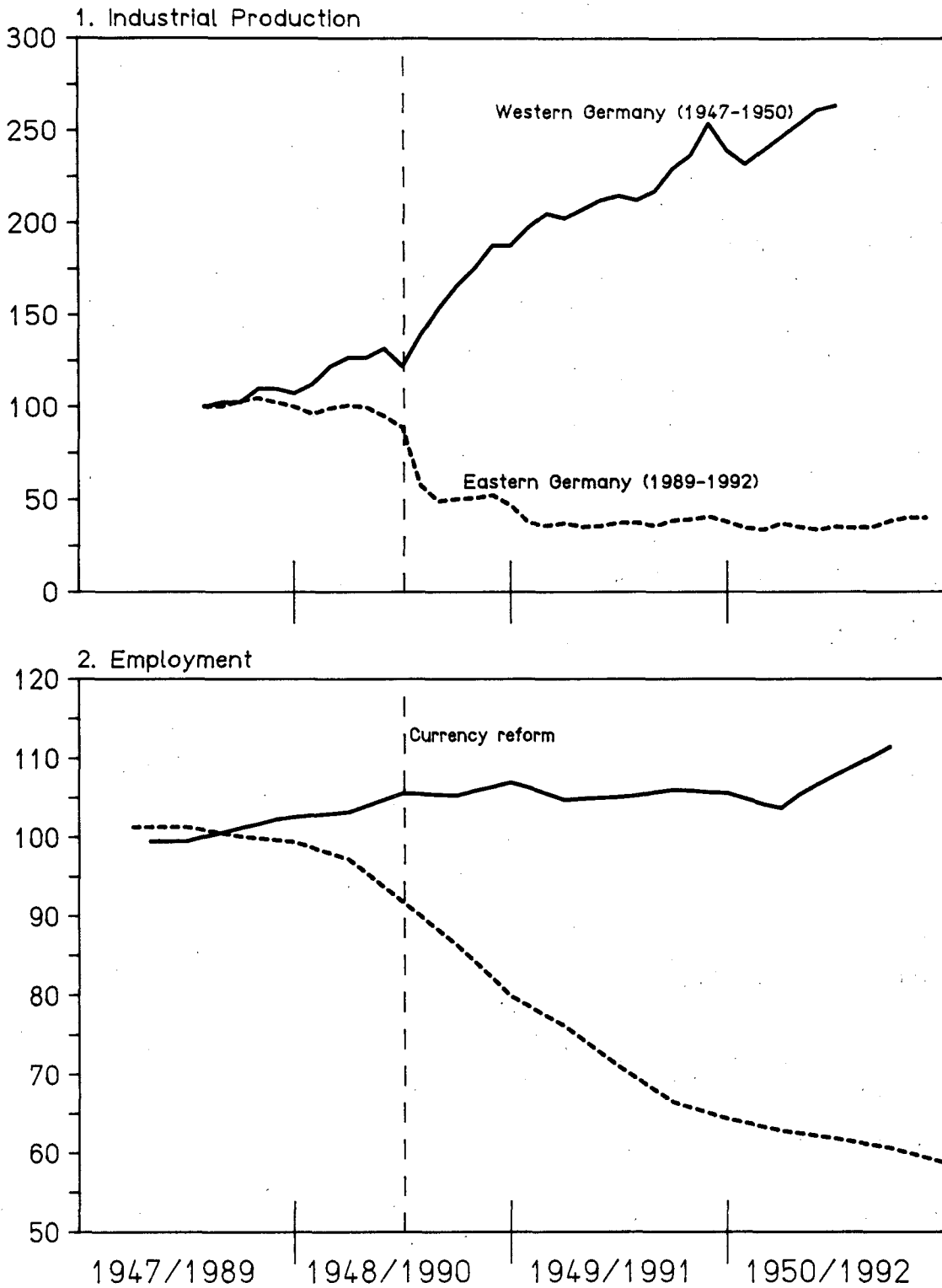
The current situation differs from 1948 [Balogh, 1950; Wallich, 1955] in many respects, ranging from the distortion faced by socialist firms as they experience an unexpected shock to ownership uncertainty and administrative bottlenecks (Figure 3). It must be remembered, too, that the initial shock in postwar Germany really occurred in 1945, and not in 1948 [Schatz and Schmidt, 1992; Schmieding, 1991]. In 1945, industrial production in western Germany dropped to a quarter of the level it had reached in 1936 [Ritschl, 1985]. By 1948, the industrial production level had nearly doubled relative to its 1945 level, standing at roughly 50 percent of its 1936 level. Thus, some adjustment had already taken place prior to 1948, eliminating the most important bottlenecks. Compared to the J-curve of output in eastern Germany in 1990–91, output increased after the Erhard reforms in 1948, and, in contrast with the U-curve, employment then remained stable even though unemployment rose due to the inflow of refugees.⁴ Besides there being specific bottlenecks in eastern Germany, additional factors contribute to making 1990 different from 1948: the appreciation of the East German Mark, labor market regulations and the wage-setting process, and the aspirations of the East German population.

It might seem that a currency depreciation would have been appropriate to ease the burden of transition for East Germany. But in any case, political rationality dominated purely economic considerations, as the need for a very quick political union all but eliminated the two-currency-area option.

³ Calculations for public investment do not include environmental protection.

⁴ The Marshall plan is often cited as one important factor contributing to a quick recovery in West Germany. But it accounted only for 1.4 percent of West German GNP, whereas now western German transfers to eastern Germany make up more than half of the GNP in eastern Germany.

Figure 3 — The Comparison between West Germany in 1947–1950 and Eastern Germany in 1989–1992^a



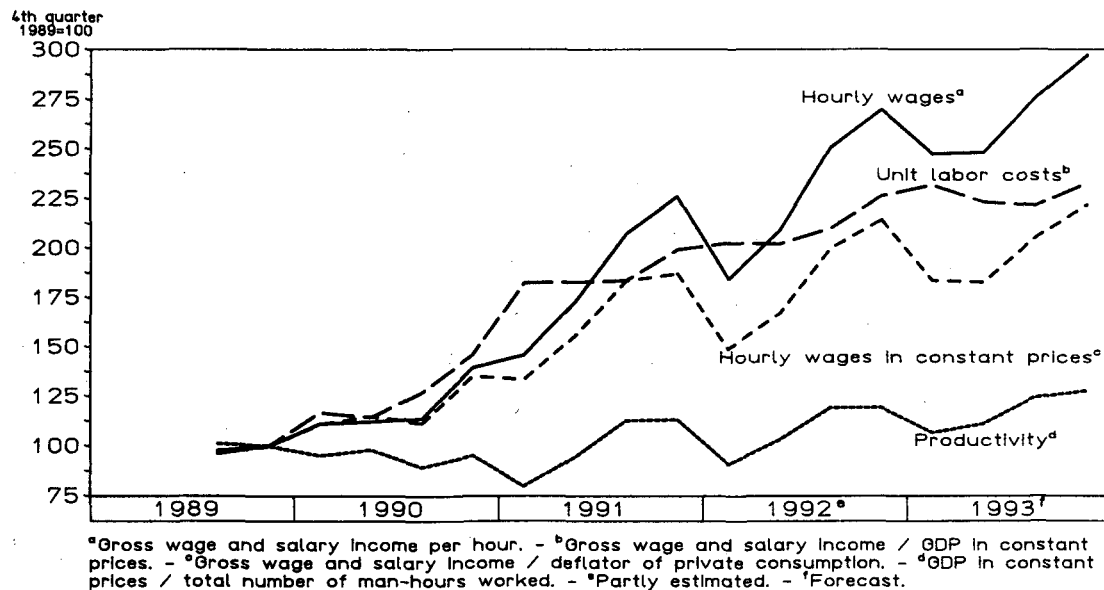
^aThird quarter 1947 and 1989 = 100.

Neglecting the myriad of product-, firm-, or sector-specific exchange rates, the choice of a “one to one” rate amounted to an appreciation of the East German mark of 440 percent vis-à-vis the deutsche mark. This admittedly is in contrast with the 21 percent depreciation of the deutsche mark in 1949. In addition, the artificial system of fixed exchange rates within the COMECON, the so-called transferable ruble, has ceased to exist; intra-COMECON trade has collapsed. Moreover, internal problems in the CIS have sharply cut a source of external demand previously crucial for East German firms (see Figure A1).

With the exchange rate no longer available as an instrument, competitiveness depends, in principle, on the wage rate. Trade unions have pushed for high wage increases. Converting wages at a rate of 1:1 formed expectations among the East German population. As bargaining took place before privatization had started, the previous managers were still in place, and West German managers only partly represented the capital owner, the trade unions did not have a strong counterpart. Moreover, as many managers and workers expected to lose their jobs soon, wage bargaining represented an end game, especially as unemployment benefits were expected to be linked to wage rates. Last but not least, there was no attempt by the government to control the wage increases. In contrast, Poland instituted a special tax to discourage wage increases.

At the end of 1992, the negotiated wage per hour in eastern Germany had reached 70 percent of the western German level, whereas productivity, estimated at one-third of the West German level prior to the currency union [Siebert, 1990], was at 39 percent. The wedge between productivity and wages has widened (Figure 4).

Figure 4 — Wages, Productivity, and Unit Labor Costs in Eastern Germany, 1989–1993



Source: DIW [1992]; own calculations and estimates.

The marked difference from 1948 is the aspiration level of the eastern German population. They expected to reach the western German consumption level quickly, and this expectation was formed by the political promise of the 1:1 conversion rate. This topic dominated the election campaign in East Germany in March 1990, and politically the 1:1 conversion rate can be interpreted as a lever to influence the composition of the first free East German parliament, which, incidentally, had to sign the unification treaty.

The eastern German experience reminds us that a supply response needs time. In addition, a major issue is the extent to which bottlenecks in eastern Germany are hindering investment and preventing the growth process from starting and gaining momentum. These factors are the uncertainty with respect to property rights, a public administration system that had (and still has) to be set up, and — what is very important — delays in administrative and political decisions. This is mainly due to the institutional set-up of authorization procedures adopted from the West German system. Larger infrastructure projects in western Germany, such as main highways or new railroad tracks, require up to twenty years from the start of planning to completion. It is quite clear that with time horizons of this length, the infrastructure in eastern Germany cannot be built up quickly. It remains to be seen whether a law attempting to reduce the requirements of authorization procedures will be successful. An initially insufficient infrastructure in communications and transportation was also a bottleneck.

III. Privatization

Privatization involves land (including houses) and firms. Two million applications have been submitted by expropriated land-owners seeking to have their ownership rights reinstated. Each of these applications has to be decided on administratively. Title records are not up to date and inheritance relationships are rather complex. Moreover, each administrative decision can be challenged in the administrative court system. It is estimated that 14 percent of the applications had been decided by January 1993. It is expected that it will take ten years to clarify the remaining ownership claims.

The most important issue is the reprivatization and the privatization of previously state-owned firms. As regards the reprivatization of firms, roughly 7,000 firms out of 17,000 had been reprivatized by January 1993. As regards the privatization of firms, the Treuhand had privatized or partly privatized 11,234 firms out of 12,672 firms in the productive sector by January 1993. Formally, the Treuhand still has 2,442 firms in its portfolio. For some of them, privatization is nearly completed so that the task is to privatize the remaining 1,400 firms (March 1993). Out of these, 300 are agricultural estates. Based on the sales contracts, the employment of 1.4 million persons and the investment of 140 billion DM are to be expected. In addition, an investment of 30 billion DM in the energy sector is planned. The Treuhand still has 400,000 employees, after starting out with 4.08 million in 1990.

The bulk of privatization has been accomplished. The Treuhand will probably be closed at the end of 1993 or early in 1994. Out of the firms in the enterprise sector remaining to be privatized, 22 firms have between 1,000 and 1,500 employees (hence a total of 26,771), and 36 firms have more than 1,500 employees (total employment 187,245). In industry, 850 firms, with 240,000 Treuhand employees, are left to be privatized.

IV. An Explicit Structural Policy?

The breakdown of the eastern German economy has led to the political demand for an explicit structural policy for eastern Germany. The main argument is to soften the adjustment process for firms in order to reduce the negative impact on employment.

Such a policy would perpetuate the inefficiencies of the socialist planning system because it would de facto be oriented towards the old structures. The option of modernizing eastern Germany would be lost. East Germany would remain a problem area for many years to come. The inefficient firms would have to be subsidized heavily. As subsidies are determined politically, they would become locked in, and it would be extremely difficult to reduce them in the future. Moreover, managers and entrepre-

neurs would be engaged in rent seeking instead of fulfilling their role of innovating and implementing new allocations of factors of production.

Subsidized old firms would get in the way of new firms. They would block location space that is needed for the creation of new firms. This is especially relevant when location space is in short supply due to the uncertainty about property rights. We also know from West German sectoral policy that subsidized firms tend to determine the wage rate of a region. Subsidies allow them to pay a high wage, which impedes the new firms. Last but not least, subsidized firms often compete with new firms on the product markets.

The alternative to such a conservationist policy is to decouple the protection of people and the conservation of inefficient firms. Transfers to people will ease the burden of adjustment. Basically, this is the approach being used, with transfers being made to those on short-time work and with active forms of employment policy (among them so-called "employment companies," which employ 350,000 persons) and retraining programs (400,000 had been retrained at the end of 1992) being implemented.

There is not only a political call for a structural policy for the existing firms, but also additional pressure for a more active role of government in developing future industries. It is argued that the government should decide which sectors should be developed and which industries should be targeted for the future. This approach is very likely to be a severe failure. The government does not have information on which products will sell well, which production procedure will be efficient, and which industry will flourish in the future. The root of the issue is the Hayekian problem of information on future economic and technological possibilities. This information is not available today, and competition is decisive for revealing this information. Industrial targeting will forego competition as an exploratory device [Hayek, 1968]; by not allocating the risks of failure to the investor, such a policy would set the wrong incentives.

V. Fiscal Policy and the Macroeconomic Policy Mix

Unification was also a shock to the German economy as a whole. Germany after unification is characterized by a high capital demand, with capital being needed to replace the capital stock in eastern Germany and to finance public consumption transfers. At the same time, there is an excess supply of labor, with 3.5 million officially unemployed and 2.5 million in the secondary labor market.

Another basic condition in Germany is the need for governmental transfers, which are running at 150 billion DM per year. In addition, German fiscal policy has to finance the interest payments on the additional debt burden, which roughly calculated is 30 billion DM [Siebert, 1993].⁵ All in all, Germany will have to finance 180 billion DM per year (6 percent of GNP). There are three options: (1) Increasing the debt, (2) reducing expenditures while shifting public expenditures to eastern Germany, or (3) increasing taxation.

The overall German government budget deficit, including the federal, 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 telecommunications services and the railroads are included, the public sector capital demand amounted to roughly 170 billion DM in 1992.

It is estimated that the Treuhand will accumulate a debt of 250 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

⁵ Note that part of the interest payments on the so-called inherited debt is already included in the calculation of the transfers.

Figure 5 — Public Debt and Budget Balance in Germany, 1950–1994 (percent of GNP)

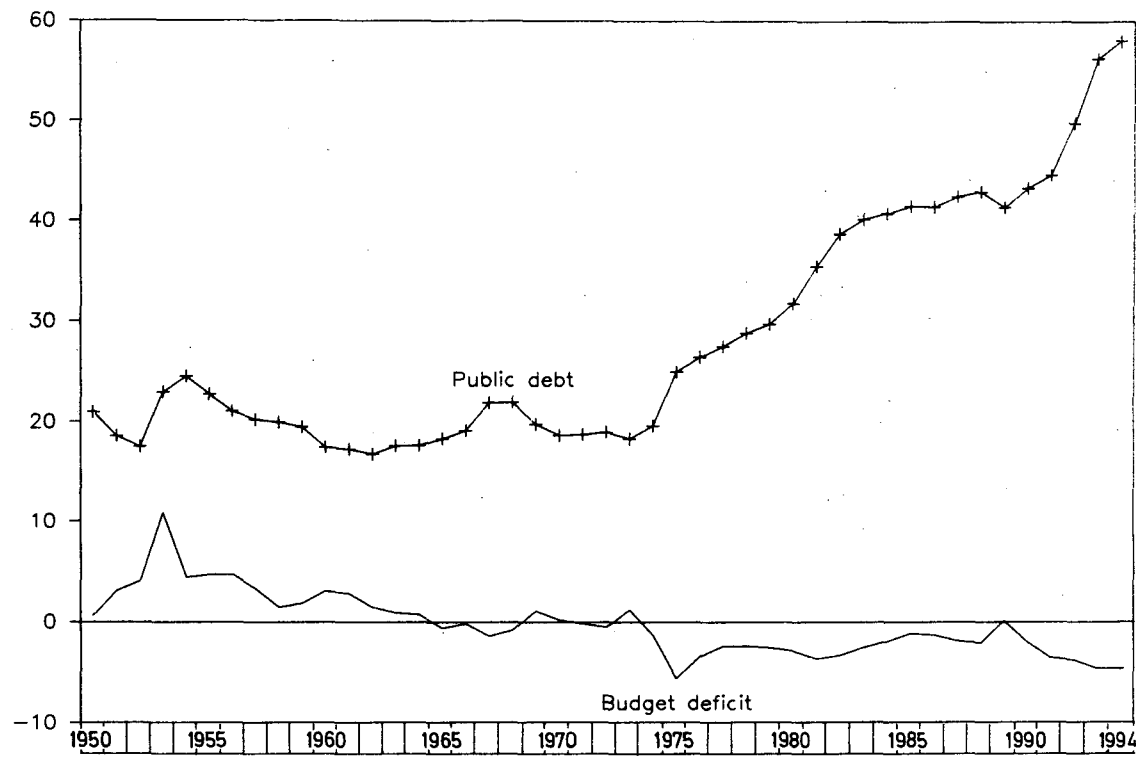
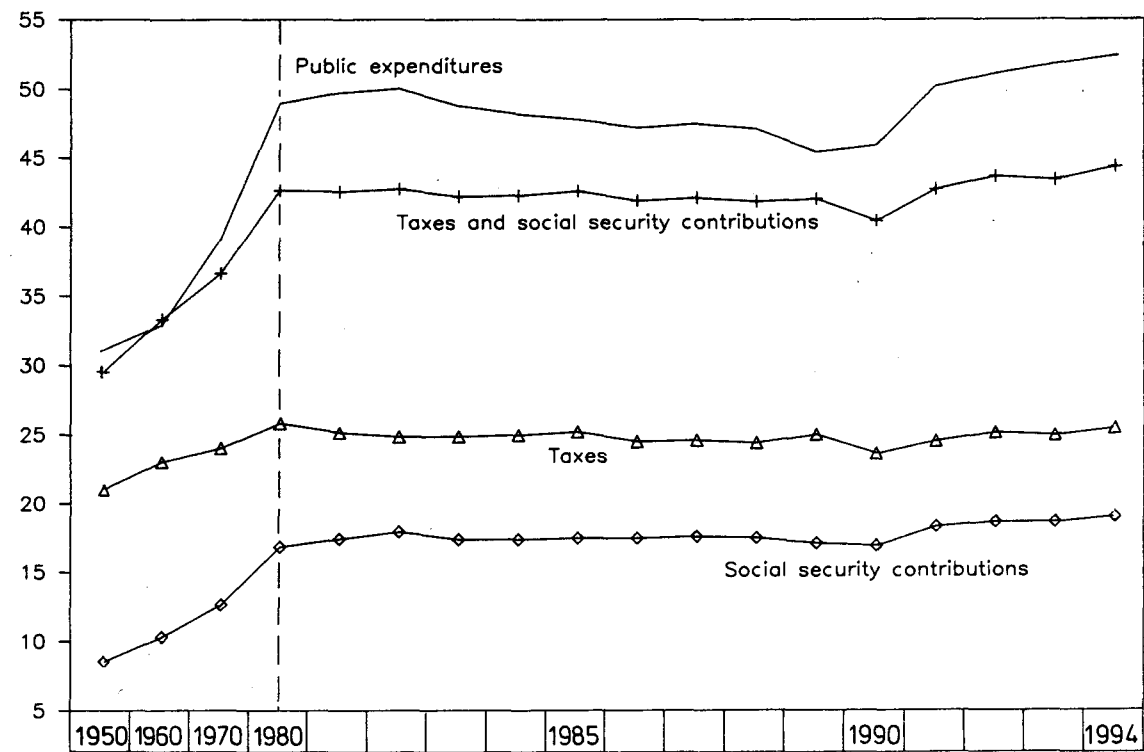


Figure 6 — Public Expenditures, Taxes, and Social Security Contributions in Germany, 1950–1994 (percent of GNP)



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, funded by the federal government and the *Länder*, will have accumulated 95 billion DM at the end of 1994. The debt of the public housing sector will be 50 billion DM.

The debt of the total public sector, which amounted to 929 billion DM in 1989, will have reached 1.9 trillion DM by 1994. Thus, public debt will double within five years. In relative terms, the ratio of public debt to GNP will rise from 41 percent in 1989 to 58 percent in 1994 (Figure 5). Public expenditures relative to GNP will rise from 45 percent in 1989 to over 52 percent in 1994 (Figure 6).

The risk for the future is that the budget deficit will have a strong impact on economic policy. The government may lose its maneuvering space because of high interest payments. Unexpected expenditures may arise. Government revenue may fall because of a less favorable business cycle, as in 1993. Financing expenditures may raise either interest rates or taxes, and this will choke off investment. The most serious danger is that the financial constraints will develop into a severe burden for the western German economy, which has to finance the transfers to eastern Germany. This could trigger a vicious circle in which the problems of the east eventually influence the efficiency of the west.

In the solidarity pact of March 1993, an attempt was made to integrate the eastern German *Länder* into Germany's horizontal transfer system among the *Länder* (*Finanzausgleich*) and to allocate the financing of the transfers to the different federal layers of government. Although the solution found was positive in the sense that the discussion on what to do and what not to do came to an end, the compromise solution does not satisfy economic criteria:

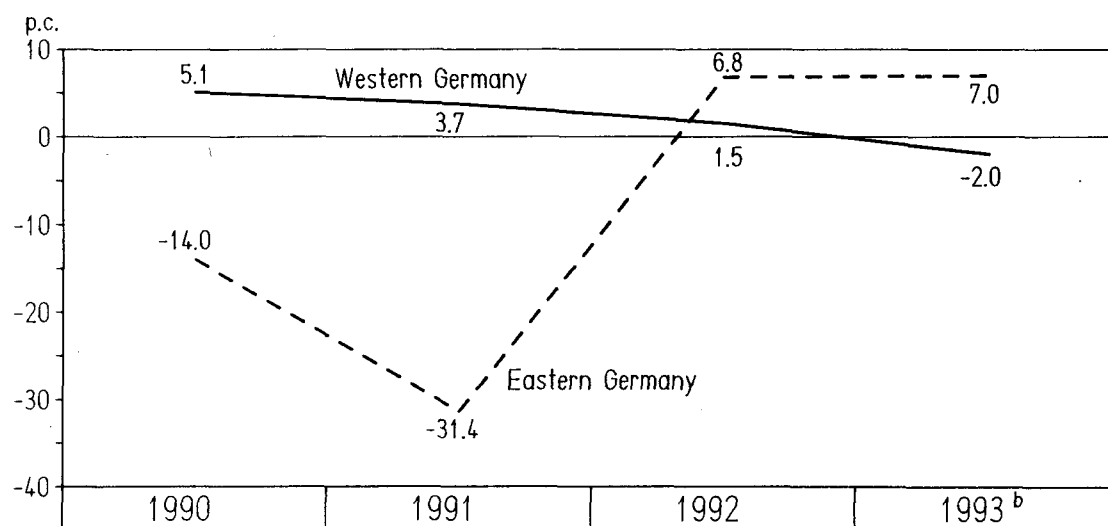
- The *Länder* and communities in western Germany, representing public expenditures of 540 billion DM, account for only an underproportional part of the financial burden, which is mainly shouldered by the federal government, which has expenditures of 430 billion DM.
- It apparently was not possible for the political process to cut expenditures considerably; instead, it took recourse to raising taxes.
- The conditions for economic growth in western Germany have worsened for the 1990s, with the share of government expenditures rising from 45 in 1989 to over 52 percent in 1994 and the share of taxes and social security contributions rising from 41.7 in 1989 to almost 45 percent in 1994. The additional growth stimulus provided by eastern Germany will be partly offset by the changed quality of the western German economy.

A consolidation strategy was not followed in setting up the solidarity pact. In the future, the principal task of German economic policy must be to bring down the share of government expenditures to GNP. This should be done by cutting expenditures. The politically easiest way to do this is to cap the nominal increase in government expenditures. Whereas the federal government is attempting to keep the nominal increase of expenditures below 3 percent for 1993, there is no mechanism available by which the *Länder* and the municipalities in western Germany can be forced to reduce their spending. Instead of limiting increases in expenditures, it would be more appropriate to use a zero-base budgetary approach to cut expenditures, including subsidies, and to restructure expenditures under the new economic environment of a united Germany. In many areas, western Germany and eastern Germany compete for investable funds. This holds, of course, for infrastructure projects in western Germany which may be postponed for a year or two; it applies to subsidies for specific western German sectors, such as the hard coal industry, which competes directly with the brown coal industry in eastern Germany, and it holds for regional policy subsidies going to regions in western Germany that are better off than areas in eastern Germany. So far, the political process has not had enough vigor to restructure governmental expenditures. The German public has not yet understood that the unification of Germany has changed some conditions that were basic to West German policies, some of which no longer prevail.

Privatizing infrastructure as an interesting option to reduce governmental expenditure has not been pursued; in eastern Germany, it would have had the additional advantage of providing infrastructure much more quickly. The communications sector could have been privatized, financing itself by means of user charges. Unfortunately, this policy has not been followed. German economic policy has not been daring and innovative enough to introduce the privatization of some parts of infrastructure. Privatization still is an option in the transportation sector, for instance, with respect to airports, roads, and railroad connections; privatization can also be used for industrial parks and local environmental projects such as water purification plants. Finally, it could be applied to many activities at the municipal level. In these cases, the government would only have to set the frame of reference within which private projects could be undertaken.

Germany experienced a unification boom in 1990 and 1991, which was a Keynesian demand boost, with the transfers from western Germany financing an increase in demand in eastern Germany (Figure 7). But with transfers having reached a certain level, there is no additional demand stimulus, unless transfers are increased. This, however, would give rise to opportunity costs in the future, such as increased government debt. The recession of 1993 in western Germany can be considered to be the implication of the Keynesian program: the discussion on financing the transfers has sown considerable uncertainty in the western German economy. The high government spending and the high increase in wages in the unification boom have contributed to the recession.

Figure 7 — Cyclical Changes in the GDP^a of Eastern and Western Germany, 1990–1993

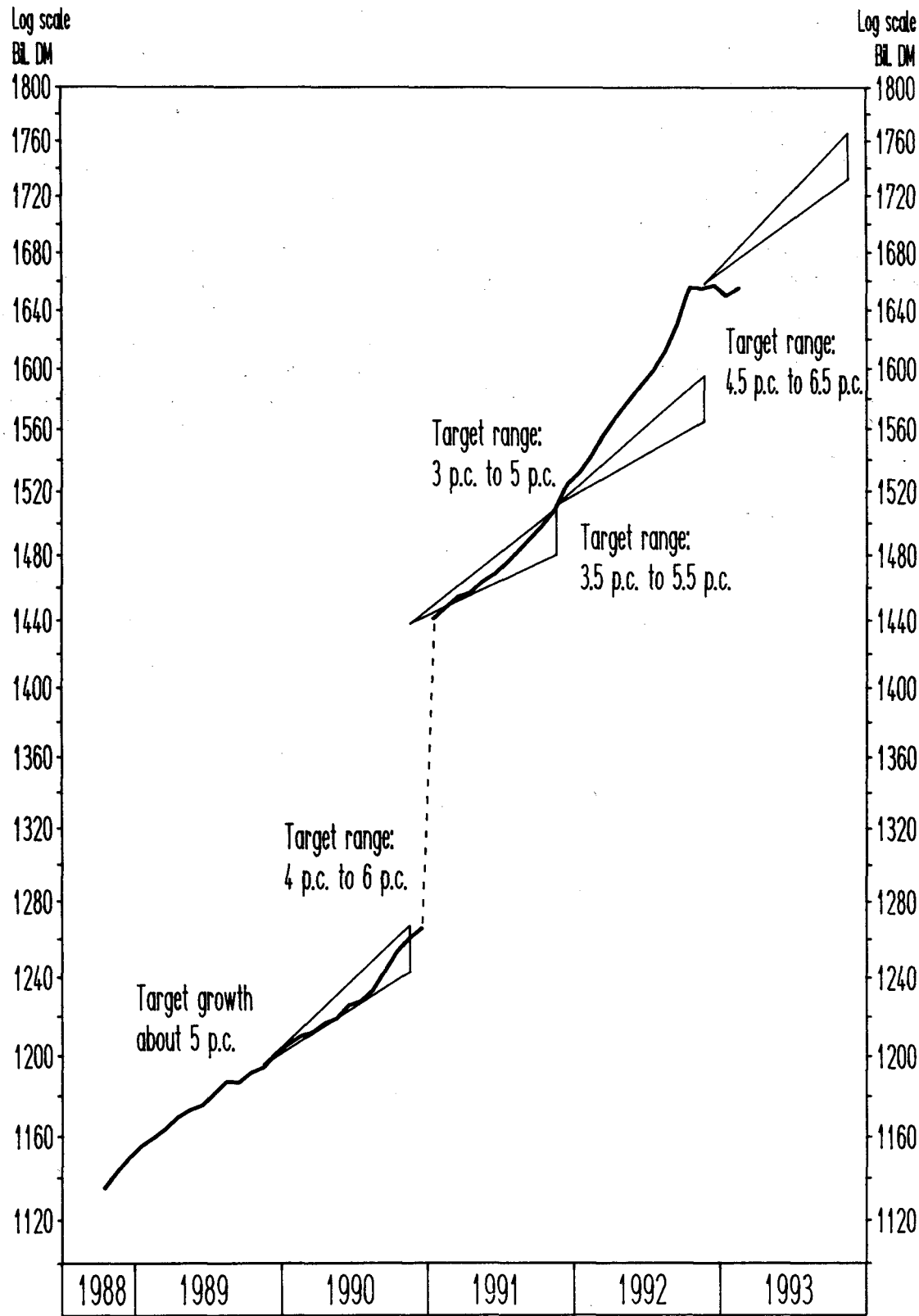


^aAt constant prices; percentage change over previous year. - ^bForecast.

Germany is in the process of finding a new macroeconomic policy mix. Fiscal policy has to solve the problem of financing the transfers to eastern Germany without disturbing the western German economy. Wage policy has to take into consideration the excess supply of labor (Table A4). In eastern Germany, long-run wage agreements attempted to raise wages quickly (26 percent in 1993 in the metals industry). This widening wedge between productivity and wages must be reduced by more moderate wage rounds. In western Germany, the wage increase of 5.8 percent in 1992 exceeded the productivity increase of 0.9 percent, and a similar distortion occurred in 1991. Wage policy must come back to being orientated towards productivity.

German monetary policy has operated under difficult conditions. *First*, the inflation rate is still high at over 4 percent in early 1993. *Second*, the increase in the money supply during German unification

Figure 8 — Targets for and Actual Paths of Money Supply (M3) in Germany, 1988–1993



in 1990 was relatively high, and the actual increase in prices in the years 1992 and 1993 may well be the result of the increase in the money supply two years earlier (Figure 8). *Third*, money growth was high in 1992, up to 10 percent, and it is too early to tell whether this trend will change considerably in 1993. In any case, long-term interest rates have come down, and are not too different from those of the United States.

VI. An Analytical Model

We do not yet have a complete model for the integration and the transformation process. However, the paradigm to be applied has to include elements of integration theory and transformation theory:

(i) From the point of view of integration theory, two economies merge and exploit comparative advantages. Trade will be created and diverted. Intraindustry trade will develop. Nontradeables will show a different pattern than tradeables.

(ii) Mobility of capital will be an important vehicle of adjustment. Capital mobility will come mostly in the form of direct investment, mergers, and acquisitions, or as public investment. Mobility of labor, though relevant, may be neglected in order to keep the model manageable. The mobility of factors changes the endowment of the two economies.

(iii) Starting at a low productivity level and a largely obsolete capital stock in eastern Germany, there will be a growth process fueled by capital and technology transfer, and hopefully by a Schumpeterian process involving the creation of new firms and the organizational restructuring of industry. Bottlenecks, i.e., investment barriers, may be explicitly introduced in order to explain the time profile of investment.

(iv) Transfers from the west to the east finance the divergence between absorption and production in the east. The way the transfers are financed has an impact on investment, production, and employment in the west.

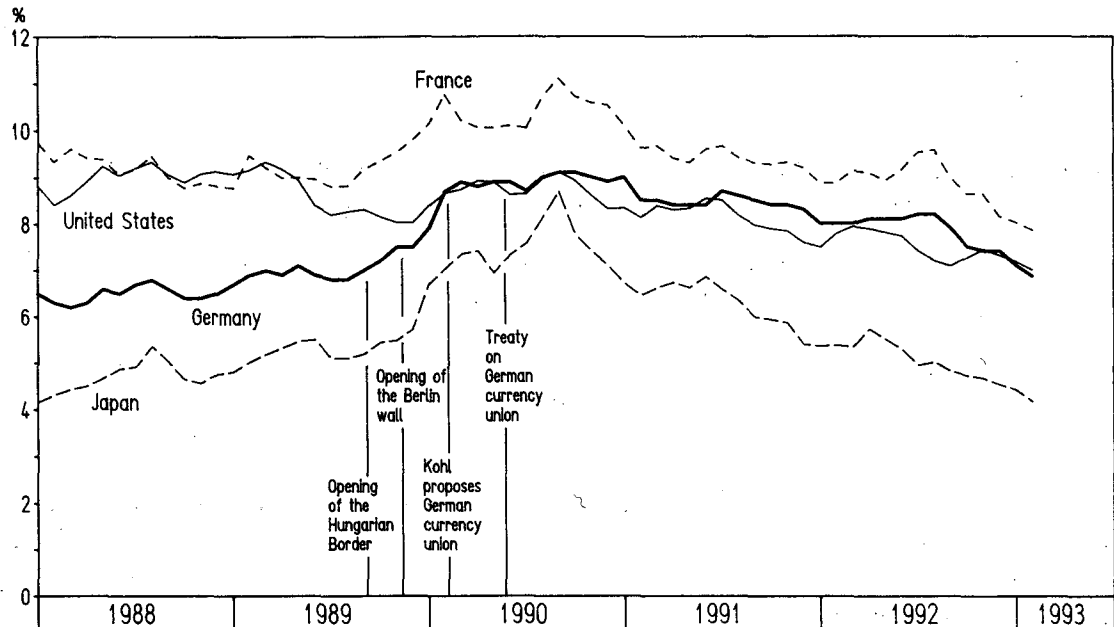
VII. International Repercussions

German unification has not only been a real shock to eastern Germany and united Germany, but to the world economy, and especially to the European economy. 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], or like 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 has 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 and labor, given the state of technology and the available stock of capital. The transition to a market economy makes the existing capital stock obsolete, because the price vector of the economy is changed. This shifts the factor price frontier inward. The introduction of new technologies and new equipment shifts it outward. Note that the initial inward move corresponds to the J-curve effect.

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. The extent of the supply shock will also depend on the financing of infrastructure, for instance, whether it is financed privately, by bonds, or by taxation. Finally, the interest rate observed may reflect inflationary and exchange rate expectations.

The nominal long-term interest rate (on government bonds) increased in Germany from below 7 percent in the middle of 1989 to around 9 percent after the announcement of the monetary union on February 7, 1990. It came down in early 1993 to below 7 percent (Figure 9).

Figure 9 — Long-Term Interest Rates in Germany, France, Japan, and the United States, 1988–1993



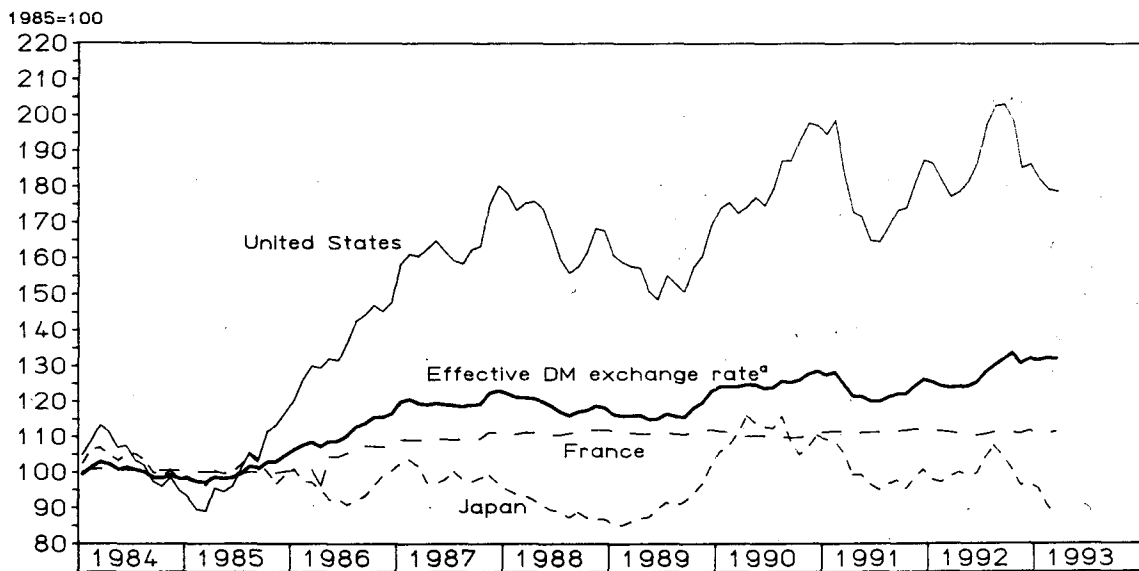
An expansionary fiscal policy, with transfers being largely financed by bonds, will add demand-side pressure on the interest rate. If the Bundesbank sticks to a strict policy stance aimed at maintaining noninflationary growth, the increase in the interest rate will choke off demand. Thus the situation is similar to the early 1980s in the US when there was a conflict between an expansionary fiscal policy and monetary restraint. In addition, high wage demands by western German trade unions, as in 1991 and 1992, have aggravated the situation and induced the Bundesbank to pursue a stricter monetary policy.

From the supply side, there should be an appreciation of the deutsche mark in post-wall Germany [Bürda, 1990; Lehment, 1990]. This appreciation can be motivated both by the capital account and the current account. As concerns the capital account, the appreciation of the deutsche 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 deutsche mark area) and consequently raising demand for the deutsche mark (Figure 10). As concerns the trade account, the appreciation is a vehicle to bring about a reduction in the overall trade surplus. This reduction was necessary because eastern Germany has a trade deficit, thus reducing the overall German trade surplus. The German current account has changed from a surplus of 110 billion DM in 1989 to a deficit of 40 million DM in 1992 — a swing of 150 billion DM.

Of course, the appreciation of the deutsche mark is not explained only by German unification. Other factors, for instance, in the US, might also imply an appreciation of the deutsche mark, and political instability in the CIS a depreciation. Moreover, it is unclear to what extent the appreciation had already been anticipated in 1990. Thus, an appreciation would no longer be required.

Policy may change the outcome, though. If subsidies dominate the adjustment process, old inefficiencies will be perpetuated, limiting the rise in capital efficiency in eastern Germany. More subsidies

Figure 10 — Exchange Rates for Germany, France, Japan, and the United States, 1984–1993 (1985 = 100)



^aAgainst 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 German export shares (1984 – 1986).

burden the budget and lead to an increase in debt or in taxes. 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, which necessitates a real exchange rate depreciation. According to this scenario, Germany would repeat the history of the US in the 1980s by undergoing an investment boom financed by foreign debt, and a transitional appreciation that is corrected later on. Even if German unification is not financed by foreign debt directly, the intertemporal mechanism of stocks is operating: a reduced current account means a smaller stock of direct and portfolio investment abroad, which weakens the tendency toward appreciation.

The prediction of a depreciation of the deutsche mark, however, crucially depends on the assumption that western Germany's 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 has the opportunity to incorporate more modern technology than western Germany and can thus enjoy the advantage of a latecomer. 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 foreign capital accumulation and prevent a long-run depreciation (unless hurt by misguided structural policies).

German unification represents a country-specific shock to the EMS mechanism. There is no doubt that high 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 deutsche mark to appreciate will put the EMS under pressure. Without realignment, the other EMS countries will experience an increase in interest rates, and the ECU, pulled up by the deutsche mark, can be expected to appreciate against other currencies, 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 an aside: In the 1980s, potential investors were looking for investment opportunities in the world economy, since productivity in the industrialized countries was falling. Germany is an invest-

ment scenario. One should not complain about high long-term interest rates when there is an investment opportunity.

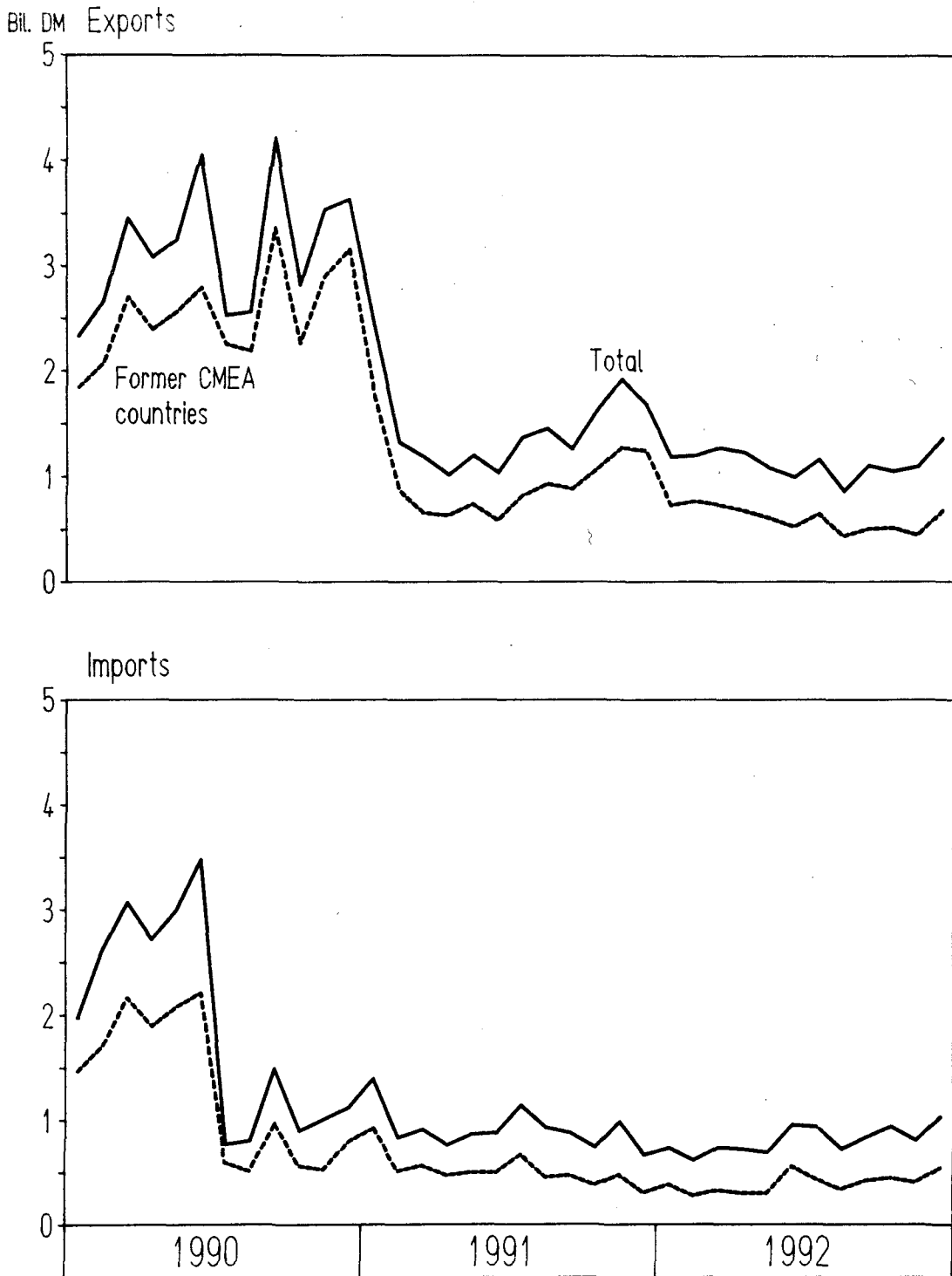
VIII. Conclusion

Two opposite scenarios for the united Germany were drawn very early in the discussion [Siebert 1990]: the Mezzogiorno and the New Frontier. In the worse case, existing inefficient firms are subsidized in order to protect people. The inefficiency of the eastern German economy continues and the opportunity to modernize is squandered. Then, a severe drain on Germany's resources would affect the maneuvering space of fiscal policy in the future. In the alternative scenario, the positive effects of German unification prevail after the bottlenecks have been overcome. Unification 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 become reality.

If German economic policy does not make serious mistakes, the long-run effects will dominate, as in the Hicksian theory of the business cycle, where the lower turning point comes about by "autonomous investment hammering in the basement." Capital accumulation in eastern Germany is likely to play a similar role. So I am optimistic and quote Shakespeare: "There is a tide in the affairs of men which, taken at the flood, leads on to fortune. Omitted, all the voyage of their life is bound in shallows and in miseries. On such a full sea are we now afloat, and we must take the current when it serves ..." (Julius Caesar, IV, 3).

Appendix

Figure A1 —Foreign Trade^a of Eastern Germany, 1990–1992



^aWithout intra-German trade.

Table A1 — Nominal GNP and GDP of East^a and West Germany, 1992

	East Germany		West Germany	
	bil. DM	percent	bil. DM	percent
<i>GNP and expenditure items</i>				
Gross national product	242.4	100.0	2 772.8	100.0
Private consumption	213.5	88.1	1 491.5	53.8
Government consumption	105.9	43.7	499.4	18.0
Investment	108.1	44.6	597.2	21.6
machinery & equipment	46.7	19.3	259.7	9.4
construction	61.4	25.3	337.5	12.2
Aggregate domestic demand	437.1	180.3	2 576.1	92.9
Exports	52.8	21.8	931.4	33.6
Imports	247.5	102.1	734.7	26.5
Gross domestic product	231.5	—	2 772.0	—
<i>Gross value added by origin</i>				
Gross value added	243.5	100.0	2 680.3	100.0
Agriculture, forestry and fishing	4.0	1.6	33.0	1.2
Manufacturing, energy, mining and construction	79.7	32.7	1 021.7	38.1
Trade, transportation and communications	37.8	15.5	383.1	14.3
Services	63.8	26.2	883.2	33.0
Government, private households and nonprofit organizations	58.3	23.9	359.3	13.4

^aIncluding East Berlin.

Source: Statistisches Bundesamt [1991; 1992].

Table A2 — Capital Stock and Investment in East Germany and West Germany

	West Germany 1990	East Germany 1988	East German capital stock after adjustment ^a
	bil. DM	bil. M	bil. DM
1. Gross domestic product			
Total	2,599	346	
Enterprises (without housing)	1,974	—	
Goods-producing sectors (mining, manufacturing, construction, electricity, gas, and water)	1,000	200 ^b	
2. Gross investment			
Total	570	95	
Enterprises (without housing)	367	68	
Goods-producing sectors	142	46	
Housing	137	12 ^c	
3. Gross capital stock			
Total	12,687 ^d	1,635 ^d	3,172
Enterprises (without housing)	5,201 ^{c,d}	1,300 ^e	1,300
Goods-producing sectors	2,205 ^{c,d}	780 ^d	551
Housing	5,067 ^{c,d}	—	1,267
For information: Public infrastructure	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	

^aCalculated as 25 percent of the West German capital stock in 1990. — ^bIncluding goods-producing crafts. — ^cNew construction and modernization. — ^dEvaluated at replacement costs; yearly averages; excluding roads, waterways and civil engineering, including rail and postal services. — ^eCapital stock at 1986 prices. — ^fIncluding roads, waterways, sewage systems, and rail and telecommunications systems; for 1988.

Source: Statistisches Bundesamt [1990]; Staatliche Zentralverwaltung [1989]; own estimates.

Table A3 — Gross Capital Stock, GNP, and Marginal Output-Capital Ratios for West Germany, 1950–1990 (billion DM)

	Gross capital stock	Capital stock of the housing sector	Difference (1)–(2)	GNP	Marginal output-capital ratio ^a
	(1)	(2)	(3)	(4)	(5)
1950	1,704	694	1,010	378.1	–
1951	1,765	726	1,039	413.5	1.22069
1952	1,833	762	1,071	450.6	1.159375
1953	1,913	806	1,107	488.3	1.047222
1954	2,008	855	1,153	522.8	0.75
1955	2,122	910	1,212	584.7	1.049153
1956	2,254	970	1,284	628.6	0.609722
1957	2,392	1,033	1,359	665.6	0.493333
1958	2,533	1,098	1,435	692.6	0.355263
1959	2,687	1,167	1,520	744.6	0.611765
1960	3,031	1,314	1,717	859.8	0.584772
1961	3,224	1,389	1,835	896.4	0.310169
1962	3,428	1,464	1,964	937.5	0.318605
1963	3,635	1,539	2,096	963.3	0.195455
1964	3,856	1,619	2,237	1,026.4	0.447518
1965	4,095	1,704	2,391	1,080.3	0.35
1966	4,338	1,793	2,545	1,111.1	0.2
1967	4,569	1,884	2,685	1,108.4	–0.01929
1968	4,790	1,975	2,815	1,172	0.489231
1969	5,026	2,065	2,961	1,259.8	0.60137
1970	5,285	2,154	3,131	1,322.8	0.370588
1971	5,564	2,248	3,316	1,363.1	0.217838
1972	5,853	2,352	3,501	1,422.3	0.32
1973	6,143	2,464	3,679	1,491.1	0.386517
1974	6,409	2,567	3,842	1,491.9	0.004908
1975	6,645	2,656	3,989	1,473	–0.12857
1976	6,873	2,741	4,132	1,554.7	0.571329
1977	7,108	2,829	4,279	1,594.4	0.270068
1978	7,350	2,920	4,430	1,649.4	0.364238
1979	7,606	3,014	4,592	1,715.9	0.410494
1980	7,873	3,113	4,760	1,733.8	0.106548
1981	8,130	3,210	4,920	1,735.7	0.011875
1982	8,363	3,303	5,060	1,716.5	–0.13714
1983	8,587	3,395	5,192	1,748.4	0.241667
1984	8,810	3,490	5,320	1,802	0.41875
1985	9,027	3,580	5,447	1,834.5	0.255906
1986	9,248	3,663	5,585	1,874.4	0.28913
1987	9,475	3,745	5,730	1,902.3	0.192414
1988	9,710	3,827	5,883	1,971.8	0.454248
1989	9,963	3,914	6,049	2,046.8	0.451807
1990	10,245	4,004	6,241	2,138.7	0.478646

^aCalculated as additional income per year in proportion to the additional capital stock.

Source: Sachverständigenrat, unpublished.

Table A4 — Adjustment in Transition, Data for East Germany^a

	GDP ^b	Industrial output	Total employed	Self-employed, unpaid family workers	Employees	Short-time workers	Registered unemployed	New firms ^c	Consumer price index	Monthly wage per employee ^d	
	bil. DM	2nd half 90 = 100	1,000	1,000	1,000	1,000	1,000		2nd half 90/1st half 91 = 100	DM per month	rate of change ^e
1/90							7				
2/90	81.04		9,568	207	9,361		11			1,400 ^f	10.2
3/90							38				
4/90							65				
5/90	78.97		9,130	289	8,841		95		94.7	1,410 ^f	25.9
6/90							142		86.3		
7/90		96.3				656	272	33,542	93.8		
8/90	58.37	91.5	8,672	360	8,312	1,500	361	27,866	93.9	1,250	11.6
9/90		102.5				1,729	445	26,127	95.3		
10/90		108.9				1,704	537	25,204	96.8		
11/90	53.14	104.6	8,102	412	7,690	1,710	589	22,992	96.6	1,410	19.5
12/90		96.3				1,794	642	22,073	97.3		
1/91		84.2				1,841	757	18,673	102.5		
2/91	42.45	72.6	7,773	449	7,324	1,947	787	18,661	102.9	1,440	2.9
3/91		80.5				1,990	808	17,688	104.1		
4/91		72.5				2,019	837	21,625	105.1		
5/91	44.91	74.8	7,311	481	6,830	1,968	842	17,140	105.6	1,610	14.2
6/91		73.6				1,899	843	15,445	105.9		
7/91		75.5				1,611	1,069	14,930	106.7		
8/91	48.68	74.5	6,907	504	6,403	1,449	1,063	12,086	106.8	1,870	49.6
9/91		78.8				1,333	1,029	10,756	107.1		
10/91		81.3				1,200	1,049	12,589	117.3		
11/91	50.16	82.4	6,726	526	6,200	1,103	1,031	10,180	118.0	2,170	53.9
12/91		76.3				1,035	1,038	8,086	118.0		

Table A4 continued

	GDP ^b	Industrial output	Total employed	Self-employed, unpaid family workers	Employees	Short-time workers	Registered unemployed	New firms ^c	Consumer price index	Monthly wage per employee ^d	
	bil. DM	2nd half 90 = 100	1,000	1,000	1,000	1,000	1,000		2nd half 90/ 1st half 91 = 100	DM per month	rate of change ^e
1/92		72.7				521	1,343	9,104	118.8		
2/92	45.26	70.1	6,460	544	5,916	519	1,290	9,560	119.2	2,100	45.8
3/92		77.3				494	1,220	10,637	119.8		
4/92		73.0				466	1,196	9,282	120.0		
5/92	48.36	69.8	6,380	560	5,820	437	1,149	8,243	120.6	2,300	42.9
6/92		73.4				417	1,123	7,461	120.8		
7/92		72.2				338	1,188	7,927	120.7		
8/92	51.58	73.0	6,270	573	5,697	287	1,169	5,910	120.6	2,580	38.0
9/92		79.9				251	1,111	6,849	120.7		
10/92		84.1				240	1,097	7,012	120.8		
11/92	53.70	83.5	6,254	579	5,675	237	1,086	6,331	121.1	2,910	34.1
12/92		78.8				233	1,101	4,944	121.3		
1/93		73.4				214	1,194		129.4		
2/93						235	1,181		130.1		
3/93						246	1,141		130.3		

^aIncluding East Berlin; not seasonally adjusted. — ^bIn 1991 prices. — ^cNet registrations. — ^dWage sum per employee (excluding short-time workers) for the total economy. Figures for the first two quarters of 1990 in East German marks, figures since the third quarter of 1990 in deutsche marks. — ^ePercentage change against corresponding quarter of the previous year. — ^fIncluding special payments due to the discontinuation of funds and reserves prior to the currency conversion.

Source: Statistisches Bundesamt [1992]; Deutsches Institut für Wirtschaftsforschung [1992]; Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung [1991]; own calculations.

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