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MACROECONOMIC ASPECTS OF GERMAN UNIFICATION

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ABSTRACT

The paper comments on the economic effects of the German unification. Apart from discussing the unification in an international perspective, analyzing the distributional consequences, and pointing to structural adjustment problems, it emphasizes the distinction between the frequently cited money overhang and the real asset overhang which characterizes communist countries. The paper argues that the unification paid too little attention to the latter, endowing East Germans with insufficient claims on state owned enterprises. The centralized privatization of state owned enterprises, which bypasses the East German population, is seen as a major obstacle to quick recovery, and an alternative privatization procedure is discussed.

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## 1. *A New Germany*

October 3<sup>rd</sup>, 1990, is German unification day. October 9<sup>th</sup>, 1989, would have been Leipzig's Tianamin Square day had the GDR government had full control over its armed forces. Luckily there was no bloodshed and communist rule was swept away with incredible speed and unprecedented ease by the people's revolution.

Germany is not reunited. The treaty that became effective on October 3<sup>rd</sup>, united West Germany with what was officially called "middle Germany", adding the six Länder Berlin, Mecklenburg West-Pommerania, Brandenburg, Saxony, Saxony Anhalt, and Thuringia to the Federal Republic of Germany. Silesia, East Pommerania, and East Prussia, the land of Nikolaus Kopernikus and Immanuel Kant, were not included. After the expulsion of 12 million Germans at the end of World War II, these territories were occupied and settled by Poles and Russians. The treaty is the first document in which Germany accepts the permanent separation of the eastern territories by stating that the unification of Germany is now "completed". A border treaty with Poland will soon (November 1990) confirm this interpretation.<sup>1</sup>

The unification is basically a "Hawaiian solution". Although substantial negotiations between the two remaining parts of Germany have taken place, the unification is not the kind of confederation between equal partners which article 146 of the West German constitution would have allowed. Instead, the unification followed article 23 which gave East Germany the right to unilaterally declare herself part of the Federal Republic of Germany.<sup>2</sup> As a consequence, practically all West German laws and institutions have been imposed on East Germany or will be imposed by the end of 1990. East Germany's role resembles that of Hawaii when it joined the United States of America. Hawaii did not significantly alter the legal system of the US.<sup>3</sup>

The expected economic consequences of the unification are regarded with mixed feelings. East Germans are afraid of the increasing unemployment, West Germans are

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<sup>1</sup>Brandt's Ostverträge did not give up the formal claim on the eastern territories, but ruled out the use of military force to get them back and acknowledged the Polish right to live in "safe borders". The corresponding passages of the unification treaty induced some parliament members to appeal against it in the Supreme Court, arguing that separate votes would be necessary on the different issues covered by the treaty. The appeal was rejected, and the treaty was accepted by the East and West German parliaments with the necessary majorities of 2/3 of the votes.

<sup>2</sup>This article will use the term East Germany to denote the territory of the former German Democratic Republic.

<sup>3</sup>Like many comparisons, this one may not be fully adequate. Hawaii had no revolution and it had adjusted its institutions gradually to those of the US, before it became a state.

afraid of inflation and excessive resource transfers to the East, and the world worries about Germany's economic might. Some observers, on the other hand, expect a united Germany to increase Europe's economic and political stability and help lead this part of the world to new prosperity.

Analysing the present frictions and predicting the consequences of unification is a difficult, if not impossible, task, given the complexity of the problem. It may even be futile. The first German Economics Minister, Ludwig Erhard (1953), may have been right when he expressed his "mistrust, scepticism, and sorrow" concerning attempts to anticipate and predict the economic problems of unification. Nevertheless, this paper dares to comment on some of the issues involved.

Section 2 puts the unification problem in an international perspective and comments on its implications for the world economy. Section 3 discusses the monetary conversion problem with particular emphasis on a distinction between the frequently cited money overhang and the real asset overhang that characterizes communist countries. Section 4 describes the dangers of centralized privatization and Section 5 comments on the structural unemployment expected in the transition to a market economy.

## *2. Unification in International Perspective*

The importance of unification for Germany's economic power is a matter of major concern among its neighbors and competitors in international markets. However, these fears are sometimes founded on misperceptions of simple economic facts.

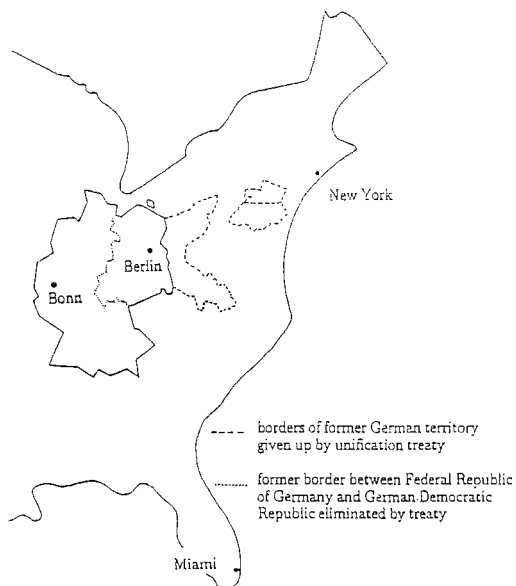
It is true that West Germany has had the world's largest trade surplus (\$ 72 b. ahead of Japan with \$ 65 b. in 1989) and that the addition of East Germany will lead to an increase in industrial power. However, even if East German per capita output rises to the West German level, German GDP will only increase from currently 25% of EC output to 30%, and it will be just 29% of US GDP.<sup>4</sup>

The misperceptions frequently derive from overestimations of Germany's size.

Geographically, united Germany is only equivalent to an American state (cf. Figure 1). Its area is smaller than that of Texas, California, or Montana, and while its population (78 m.) is the largest in Western Europe, it is less than one third of that of the US and less than one fourth of that of western Europe. It even ranks well below Japan or the Russian Republic whose population sizes are 123 m. and 147 m. respectively.

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<sup>4</sup>See OECD, Main Economic Indicators, October 1990, p. 24.



*Figure 1: The Germanies Compared to Another World*

Perhaps the most common overestimation concerns the size of *East* Germany. It is a widespread feeling that the unification joined two Germanies of similar size, and that the German economy as a whole will soon be twice as strong as that of West Germany. The truth is very different. While geographically East Germany makes up 30% of the united Germany, its population is 21% and its (pre-unification) GDP only 15%.<sup>5</sup> Figure 2 illustrates the relative importance of the new *Länder*, both in terms of their population sizes and in terms of their productive powers. The whole territory of East Germany has only as many people as West Germany's biggest Land (17 m.), North-Rhine Westfalia, and, in 1989, it had a production capacity resembling that of Baden Wurttemberg.

<sup>5</sup>Assuming a 1:1 exchange. See section 3.1. for the justification of this assumption.

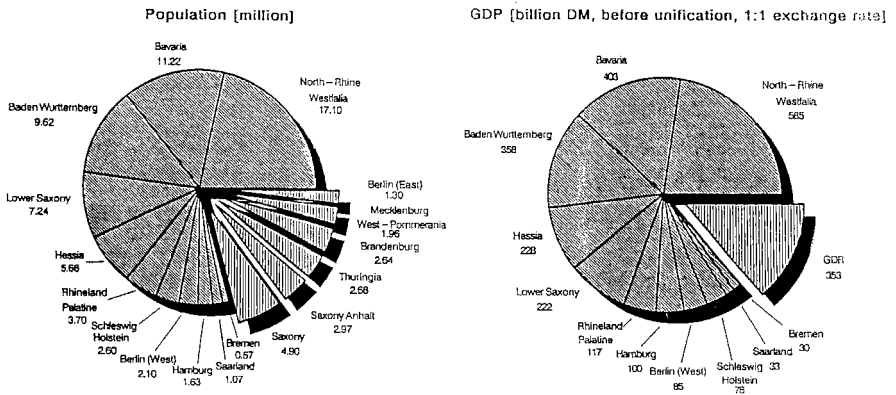


Figure 2: East and West Germany Compared

### 2.1. A Comparison With Other Eastern Countries

It is generally acknowledged that East Germany will have an easier transition to a prosperous market economy than other east European countries. West Germany's help makes an obvious difference.<sup>6</sup>

In Spring 1990, a German Unity Fund of DM 115 b. (\$ 77 b.) was created by the West German Federal and Länder governments to cover East German budget deficits over this and the next four years. The plan is to use rates of DM 22 b. and DM 35 b. in 1990 and 1991. However, as given in a joint report of the major West German research institutes, an additional DM 28 b. and DM 37 b. of annual public transfers are expected to flow from west to east in 1990 and 1991.<sup>7</sup> These transfers will primarily be necessary to maintain the East German social insurance system (45%) and to cover tax revenue losses

<sup>6</sup>West Germany is also a large supporter of east European countries. Direct subsidies to Poland, for example, amount to some \$ 78 m. in 1990 plus a cut in credit liabilities of \$ 506 m. agreed on in November 1989. At the same time US subsidies mostly for the environment and for food supplies amount to \$ 115 m. in 1990.

<sup>7</sup>Cf. Arbeitsgemeinschaft deutscher wirtschaftswissenschaftlicher Forschungsinstitute (1990), *Die Lage der Westwirtschaft und der deutschen Wirtschaft im Herbst 1990*. The DIW (Wochenbericht 39/90, 27 September 1990, p. 553) even estimated that the transfers in addition to the unification fund transfer would total DM 44 b. (\$ 29 b.) in 1991.

(27%). East Germany has adopted a variant of West Germany's indexed pension system, and its pensions are fixed in proportion to the *eastern* average wage income. It also has, in principle, West Germany's tax system. For most taxes, including the income tax, there is, however, a transition period up to the end of 1990 during which not much revenue will be collected. By January 1st, 1991, all West German tax laws will apply in East Germany.

In addition to the financial aid coming from the West, East Germany's movement to a market economy will be greatly facilitated by the fact that it is the only eastern country that can offer the stable legal and institutional environment necessary to attract international capital flows. This is the advantage of the Hawaiian solution. Other countries like Poland or Czechoslovakia will go through a lengthy period of search during which unstable and changing political coalitions will experiment with different institutional settings, including different shares of the government sector, different organizations of private firms, different regulatory interventions, and different tax systems. Private investment will be deterred by this instability, and it may take a long time for these countries to catch up. East Germany has related problems with its privatization procedure (see section 4), however, they are of minor importance in comparison to the problems its eastern neighbors may face.

The third reason why East Germany is likely to succeed quickly is its heritage of craftsmanship and expertise in high quality industrial production. Before the war, some of Germany's most advanced industries, including famous aircraft, automobile, fine mechanical, optical, and chemical plants like Junkers, DKW, Horch, Zeiss, Schott, and Leuna-Werke were in East Germany. Thuringia and Saxony were at the forefront of the world's technological development. Of course, the knowledge itself has deteriorated, but the tradition of assiduous vocational education and the spirit of successful entrepreneurship are still alive. These provide excellent starting conditions which are paralleled to a large extent in Bohemia (in Czechoslovakia) and Slovenia (in Yugoslavia), but much less so in other eastern countries or provinces.

Observers from other parts of the world are often not aware of the heterogeneity of east European countries, but this heterogeneity is obvious to east Europeans and is clearly reflected in the data available on incomes and productivity levels for the period before the second world war. The left side of Table 1 compares the per capita income of Germany with that of other, primarily eastern, European countries. It shows that, in 1938, Czechoslovakia's per capita income was 52% and Poland's only 31% of Germany's, and the right side makes it clear that, at about the same time (1936), East Germany's per capita GDP ranked high compared to that of other regions in West Germany. In fact, on average, West Germany, as defined today (the British, American, and French zones including

Saarland, but excluding Berlin), had a per capita output which was 7% below that of East Germany, as defined today.

*Table 1: Europe before the War*

Net national income per head of population (1938, US dollars)		GDP per head of population (1936, Reichsmarks)	
Bulgaria	68	British Zone	596
Romania	70-75	Sovjet Zone	546
Yugoslavia	81	American Zone	427
Poland	104	French Zone	417
Hungary	112	Saarland	500
Czechoslovakia	176	Greater Berlin	697
France	236	Silesia, East Pommerania,	
Germany	337	East Prussia	229
		German Reich	494
		West German territory (without Berlin)	510

Source: Kaser and Radice (1985, p. 532)

Source: Abelshauser (1983, p. 14)

These facts make it clear how large the gaps are which some eastern countries will have to overcome before they can catch up with western living standards. It is not only the gap caused by communist rule which will have to be bridged!

## *2.2. Implications for the West*

The US policies of the eighties showed the extent to which international capital movements can disturb the world economy. While there are different opinions about whether the US budget deficit, the tight monetary policy, or the excessive investment incentives introduced in 1981 were the most important causes of the American greed for capital, there is broad agreement that the decade was characterized by an excessively large US capital demand. Estimates of the possible magnitudes put the long-run US capital import required to



satisfy that demand at \$ 1 trillion, and 90% of that figure has now been reached, although some of the causes of the US capital demand have weakened in the meantime.<sup>8</sup> The result of the extraordinary US demand for capital was a period of sharply rising interest rates (8% in real terms in the US, 1984), a high value of the dollar (DM 3.45 in 1985, more than 130% above its current value), and huge annual capital import flows (peaking at \$ 150 b. in 1987).

It is rather obvious that similar effects can be expected from opening East Germany and eastern Europe to the international capital markets. The countries of the East are filled with lucrative investment opportunities, skilled labor, but a limited real capital endowment most of which can no longer be used. These countries' capital demand will raise world interest rate levels and absorb funds that otherwise would have been available for investment in western Europe, the USA, and other parts of the world. Whether the artificially overvalued currencies of the East will devalue or revalue is not fully clear. However, it is clear that the value of the Dollar in terms of Deutschmarks or other currencies of the EMS must temporarily decline to reduce Germany's current account surplus and the US current account deficit. A low value of the Dollar is necessary for as long as it takes to bring about the required new allocation of the world capital stock.

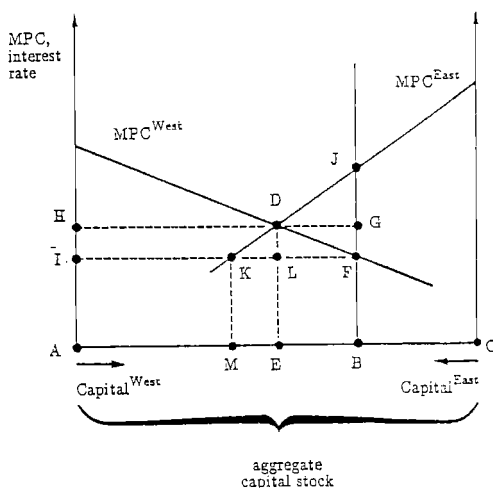
The world-wide shortage of capital will hurt the United States, which has relied so heavily on capital imports from Japan and Germany in recent years, and it will hurt wage earners throughout the western world whose factor supply becomes relatively more abundant. The lucky winners will be wealth owners who can enjoy a higher rate of return on their assets.

The simplest conceivable model which captures the steady state effects of the required adjustment is represented in the Kemp-MacDougall diagram of Figure 3. The figure depicts the world after the completed adjustment of the East, say in 10 years from now. The stock of wealth then owned by the West is AB and that owned by the East is

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<sup>8</sup>See Sinn (1984).

BC. The curve falling from left to right is the West's marginal product of capital curve and the curve falling from right to left is the corresponding curve for the East, where the capital used by the West is measured from left to right and that used by the East from right to left. The world capital market equilibrium is characterized by point D, where DE is the interest rate and EB the amount of capital owned by the West and being used in the East.<sup>9</sup>



*Figure 3: Opening the East to the World Capital Market*

Without the attractive investment opportunities of the East, the West would use all its capital at home, and the interest rate would be FB. Opening the East for western capital therefore increases the capital income earned by westerners by the amount HGFI. This gain consists partly of a welfare gain in terms of an increased national product (DGF) and partly of a comparative reduction in western wage incomes which equals EDFI. While the "cake" increases, wage earners receive a smaller part of it. It is clear who, in the

<sup>9</sup>The analysis abstracts from labor migrations because, under the assumptions specified below, the wage rates in the two regions are the same in equilibrium.

West, gains and who loses from the elimination of the borders.

Apart from the actual class of capital owners in the East, i.e. the communist nomenklatura, people in the East gain from two effects. First they gain from getting access to western technologies. This effect is not shown in the figure. It could be represented by an upward shift of the  $MPC^{\text{East}}$  curve from a very low level towards the one depicted. Secondly, they gain from importing western capital. The imported capital (EB) increases their *domestic* product by the amount DJBE, but since the capital income earned by westerners is only DGBE, easterners experience a net welfare gain in terms of an increased *national* product which is represented by the area DJG.

The only losers from the fall of the borders are western workers. This may explain why the West German Social Democrats were so reluctant to follow Chancellor Kohl's pace in the reunification process. East German wages are currently only one third of those in the West.<sup>10</sup> Of course, western workers cannot gain from the increased competition for capital.<sup>11</sup>

Predicting the magnitudes of the relevant effects in the context of the world economy goes beyond the scope of this paper, and may hardly be possible at all. There are no reliable statistics for eastern economies and, at this stage, it is unclear how quickly the Soviet Union will disintegrate and when it will create the institutional environment necessary to attract foreign investment.<sup>12</sup> Clearly the demand can be huge, even relative to the total capital stock available in OECD countries.

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<sup>10</sup>See appendix.

<sup>11</sup>The conclusion hinges in part on the static nature of the model. Among West German economists there is the wide-spread belief - unfortunately not one that has been founded on explicit model specifications - that the opening of the East will create so much "dynamism" that, in the long run, everyone will be better off than otherwise would have been the case. Western savings could be higher than otherwise and technological progress faster. To the extent that such effects come true, western workers may face a more optimistic lot than that predicted by the simple neoclassical model. The author wishes he could share these views.

<sup>12</sup>Despite the plan to move to a true market economy in only 500 days which the Russian Republic recently adopted against the central government's advice.

Despite these uncertainties, it might be useful to apply the model to the isolated world of the two parts of Germany and make some exemplary calculations – just to develop a feeling for the orders of magnitude involved. Suppose the countries will use the same linearly homogeneous production function with capital and labor as factors, where capital is an aggregate capturing all private real assets including the land values. The stock of private capital in West Germany, the distance AB or IF in Figure 3, is currently about DM 7.90 trillion and West Germany's population is 62.3 million.<sup>13</sup> This means that the capital stock per capita is about DM 127.000 and that East Germany, with a population of 16.4 m., could usefully employ a stock of capital, including land, equalling DM 2.1 trillion at the pre-unification market rate of interest. In Figure 3, this stock is represented by the distance MC.

The size of the East German capital stock must be known before the amount of capital imports needed can be calculated. The official value of the eastern stock of real assets was DM 1.75 trillion in 1989, but this figure vastly overstates the value which the stock attains under market conditions. According to a new estimate of the East German Institute for Applied Economic Research (IAW), 67% of the official stock of assets must be written off under West German valuation rules; i.e., according to this estimate, the usable East German stock of real assets is only DM 576 b. This value could still be an overstatement if the popular view among West Germans that the East German economy is a "heap of junk" has any validity. However, no better estimate has been published so far, and for reasons that will be given in section 4.1.3. it would be wrong to base the discussion of this section on the expected *sales* revenues of the Treuhandanstalt. These will certainly be lower than the value of the East German stock of real assets in a situation of market equilibrium, where only marginal units of capital are traded.

Appendix II makes an attempt to evaluate the East German stock of land

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<sup>13</sup>See appendix I, section 6, and appendix II. The (1989) West German stock of private net fixed assets is DM 5.85 trillion and the stock of private land is DM 2.05 trillion.

which can ultimately be used for private production. The current value of this stock, assuming eastern and western prices have become equalized in 10 years' time is DM 421 b., but for the purposes of this calculation it seems more consistent to value the East German stock of privately usable land at current West German land prices. Using this method the value is DM 524 b.

The total stock of capital, including land, which is available for private production in East Germany is therefore approximately DM 1.1 trillion (= DM 576 b. + DM 524 b.). Subtracting this from the DM 2.1 trillion stock of capital that could usefully be employed in East Germany with pre-unification interest rates, the East German excess demand for capital – the distance KF or MB in Figure 3 – becomes just DM 1 trillion.<sup>14</sup>

The excess demand for capital will necessarily increase the interest rate level and absorb part of the West German capital stock that would otherwise be available. With the assumed identical and linearly homogeneous production functions, the equilibrium capital import by East Germany, the distance LF in the figure, equals  $\lambda \cdot$  DM 1 trillion = DM 770 b., where  $\lambda = 0.77$  is the West German share in the joint work force.<sup>15</sup> Note that this is a static capital import based on 1989 figures and neglects the growth trend. The true dynamic capital import is likely to be higher than this and, unlike in the static model, it could be nourished by West German savings without its capital stock necessarily declining. The reason for concentrating on the static reallocation effects is that these give more cautious estimates of the absolute magnitudes involved and are unlikely to distort the relative magnitudes.

The relative increase in West Germany's capital income resulting from the increase in interest rates is, using the definitions of Figure 3,

<sup>14</sup>This is more than the DM 574 b. which Siebert (1990) estimated. The reason for the divergence is primarily that Siebert assumed that 50% of the East German capital is obsolete while the IAW figures used here are based on the estimate that 67% is obsolete.

<sup>15</sup>Cf. appendix I.

$$\frac{GF}{FB} = \frac{LF}{IF} / \eta$$

wherein  $\eta$  is the capital demand elasticity and  $LF/IF$  is the relative decline in the stock of capital employed in West Germany. It is a general result of production theory that

$$\eta = \frac{\sigma}{\alpha}$$

where  $\sigma$  is the substitution elasticity between capital and labor, and  $\alpha$  is the partial production elasticity of labor or, under competitive conditions, simply the share of private sector wages in the private sector value added. In West Germany,  $\alpha \approx 0.63$  and  $\sigma$  is known from various investigations in western countries to approximate 0.6.<sup>16</sup> Thus  $\eta \approx 0.95$ . Since  $LF/IF = \text{DM } 770 \text{ b.} / \text{DM } 7.90 \text{ trillion} \approx 0.097$ , the equilibrium *increase* in West German capital incomes resulting from the unification turns out to be

$$\frac{GF}{FB} \approx 10.2 \% .$$

The corresponding *decline* in labor incomes is

$$\frac{GF}{FB} \cdot \frac{1-\alpha}{\alpha} \approx 6 \%$$

minus the western part of the welfare gain in terms of an increased West German national income.

The West German welfare gain is, however, only a second-order effect. The figure makes it clear that the absolute annual welfare gain accruing to the West is half of the absolute increase in the rate of return to capital,  $GF = [GF/FB] \cdot FB$ , times the East's import volume  $LF$ . Equating  $FB$  with the pre-unification rate of return to capital, which the appendix I calculates as 7 %, and using the results  $GF/FB \approx 10.2 \%$  and  $LF \approx \text{DM } 770 \text{ b.}$  gives the absolute welfare gain as

$$\frac{1}{2} \cdot \frac{GF}{FB} \cdot FB \cdot LF \approx \text{DM } 2.7 \text{ b.}$$

or as 2 % of the DM 1,172 b. wage income. The overall decline in wages caused by the unification would therefore be 5.8 %.

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<sup>16</sup>Arrow, Chenery, Minhas, and Solow (1961) estimated a value of 0.57 and Berndt and Wood (1981) estimated one of 0.63. For the value of  $\alpha$  cf. appendix I.

If the capital demand of other eastern countries is of similar significance for the rest of the western countries, these orders of magnitude would not necessarily change in a multi-country model, and whether they are large or small is partly a matter of judgement. It is, however, clear that the static West German welfare gain is negligible compared to the redistributive effects. The decline in annual wage incomes in absolute terms, on the other hand, is DM 68 b. (= 5.8 % · DM 1,172 b.). This happens to be slightly more than the average annual public funds which are estimated to flow from West Germany to East Germany in 1990 and 1991 (DM 61 b., cf. section 2.1). This fact gives some indication of who in the West might ultimately foot the unification bill.

### *3. The Currency Conversion Problem*

From July 2<sup>nd</sup>, 1990, the two Germanies were pre-united by sharing the Deutschmark as a common currency. Stocks of Eastmarks were changed into Deutschmarks at an average rate of 1.8:1 and all monetary contracts have been converted to a Deutschmark base.<sup>17</sup> Children below 15 years could exchange 2000 Eastmarks, adults below 60 years 4000 Eastmarks, and pensioners 6000 Eastmarks on a one-to-one basis. Most other amounts of money and financial claims, including company debt of about 260 b. Eastmarks, were exchanged or converted at a rate of 2:1. Price contracts, wage contracts, and pension claims were converted at a rate of 1:1 (where pensions were recalculated using the West German schedules amended with the eastern pension claims as lower bounds).

The currency conversion was aimed at achieving three major tasks. First, the wage conversion was to maintain or establish GDR competitiveness. Second, the money exchange was to inject just the right amount of liquidity. And third, the conversion of

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<sup>17</sup>Cf. Monatsberichte der Deutschen Bundesbank, 42, No. 7, Juli 1990. For the exact quantities see appendix I.

claims was to provide GDR citizens with a fair endowment for their new start in the united Germany. Satisfying all three goals was difficult, if not impossible, and it is understandable that there were heated debates among experts in West Germany on how, precisely, the conversion of the currencies should be organized. The actual outcome was a compromise between the government which had publicly committed itself to a 1:1 exchange and the Bundesbank which favored a much more restricted exchange.

In the international press, the compromise was considered as overly favorable for East Germans who were believed to enjoy significant windfall gains. The predominant opinion was that the currency conversion would boost commodity prices and erode the value of the Deutschmark.

So far, these fears have not materialized. Apart from a small reaction of the price level to the recent oil price increase, there has been no inflationary impact on the Deutschmark and, while there is a boom in West Germany, there is a severe depression in the East. It seems likely that large parts of the East German economy will collapse before the ultimate recovery. At the time of writing (November 1990) East Germany's production is only half what it was in 1989.

### *3.1. Purchasing Power Parity*

The major reason for the misperception of the economic implications of the currency conversion was a general ignorance of the purchasing value of the Eastmark. It is true that the black market exchange rate in the beginning of the year 1990 was 7:1 or even 11:1, but this rate reflected little else than speculative expectations at the eve of the collapse of the East German state.

The purchasing power parity between the two currencies, based on average consumption baskets, was instead very close to 1:1, and in fact, there is increasing evidence



that the Eastmark may even have had a somewhat higher purchasing value than the Deutschmark. Table 2 gives an overview of recent estimates of the exchange rate that would have maintained East Germans' purchasing power.

*Table 2: The Exchange Rates Required to Maintain the Purchasing Power of East German Financial Wealth*

Bundesbank <sup>1</sup>	100 Eastmark = 107 DM	pre-unification basket
DIW <sup>2</sup>	100 Eastmark = 120 DM	expected post-unification basket
DIW <sup>3</sup>	100 Eastmark = 128 DM	actual price change in East Berlin from January to July 1990, pre-unification basket
Joint office of statistics <sup>4</sup>	100 Eastmark = 98 DM	actual price change, October 1990 compared to average 1989, pre-unification basket
Ifo <sup>5</sup>	100 Eastmark = 98 DM	expected price change, pre-unification basket

<sup>1</sup>Unofficial estimate, as reported by K. Köhler, member of the directorate of Deutsche Bundesbank, in his lecture to the Department of Economics, University of Munich, May 5<sup>th</sup>, 1990.

<sup>2</sup>DIW, Wochenbericht 21/90, 25 May 1990, p. 294.

<sup>3</sup>DIW, Wochenbericht 32/90, 9 August 1990, p. 446-450.

<sup>4</sup>Gemeinsames Statistisches Amt, Preisindex für die Lebenshaltung, November 1990. The equation was 100 Eastmarks = 94 DM in July 1990 which is equivalent to a 16 % annual inflation rate in the East.

<sup>5</sup>Ifo Schnelldienst 43, 13/90, 7 May 1990, p. 24-26.

The comparisons between the currencies are difficult because relative prices in the East and the West differed significantly. The East German government spent about 50 b. Eastmarks each year to subsidize food, housing, and other elementary goods, and it collected 43 b. Eastmarks with particular excise taxes on luxury commodities. As a result, a TV set cost about 3 times as much as in the West and a loaf of bread only one sixth.<sup>18</sup>

Given these large differences in relative prices, the choice of baskets is theoretically important for the comparison. However, as the first of the two DIW studies shows, it is not clear that a basket based on western prices would necessarily result in a

<sup>18</sup>Cf. Ifo Schnelldienst 43, 13/90, 7 May 1990, p. 24.

lower value for the East German currency. The reason is that the negative income effect which the DIW estimated as resulting from the currency union can overcompensate substitution effects and increase the weight of basic products in the basket even though these are becoming more expensive.

It is important to note that the exchange rates given in the table represent expected or actual numerical price increases from the currency unification and *cannot* be identified with purchasing power parities in the usual sense. All estimates are based on the assumption that rents in the East are being kept frozen after the unification and that the Deutschmark has a higher value in East than in West Germany. A purchasing power parity comparison between the East and West German currencies would measure the pre-unification purchasing powers in the respective currency regions and would therefore have to take into account the fact that the rents in the West are much higher than in the East. Currently, West German households spend on average 20% of their incomes for rents, but East Germans used to spend only 3%. The rent per square meter in the East is only one fifteenth of what it is in the West. Adjusting the calculations for this effect would result in much higher values for the Eastmark than reported in the table.

At the moment, a true purchasing power comparison that takes the lower East German rents into account may be of limited relevance because the assumption that the rents are frozen is still correct. However, it is likely that the rents will soon be freed. When this happens, the theoretical exchange rate required to maintain the purchasing power of any pre-unification stock of East German financial wealth will jump up to the purchasing power parity. It is already clear at this stage that the utility costs included in the rent will strongly increase in the next few months and that this will boost the East German price level. The price increase is already visible. The official East German price index, which the table showed to have fallen from 100 in 1989 to 98 in October 1990, increased by nearly four percentage points in the first three months following the currency unification. If this trend persists, the official statistics will soon replicate the DIW's result

that even a 1:1 exchange would have been unfavorable for East Germans.

An effect that works in the other direction is the significant quality differences between East and West German products. If the expected or calculated price increases that follow from the unification simply reflect quality improvements in the consumption baskets purchased by easterners then there is no need to offer exchange rates better than 1:1 in order to maintain the purchasing power of East German financial wealth. Unfortunately, there are no estimates that show the strength of this effect. The penetration of the East German market with luxury commodities is known to be high. However, these commodities cover only a small fraction of a typical household's budget, and it seems hard to believe that the bias resulting from the assumption of frozen housing rents will be overcompensated by the quality effect. Further statistical studies will hopefully clarify this issue.

Despite all the difficulties in interpreting the data it should be clear from this discussion that a 1:1 exchange would not have been as utopian as some commentators of the unification had believed and certainly it cannot be claimed that the actual average exchange of 1.8 Eastmarks for 1 Deutschmark created windfall gains for East Germany.

### *3.2. The Problem of Two-sided Competitiveness*

A major concern in the debate preceding the currency unification was the appropriate conversion of wage contracts for ensuring the competitiveness of the East German industry. While it was (correctly) expected that many wage contracts would be rewritten soon after unification, there was a general agreement that the sluggishness of wage adjustments overall was sufficiently high to make the officially agreed wage conversion non-neutral during an extended transition phase.

The major problem was that competitive neutrality had two dimensions. On

the one hand, East Germany was to become attractive for direct investment and East German firms were to be able to survive in the common market with West Germany. This called for low wages. On the other hand, East German workers were not to be stimulated to move to the West. This called for high wages.

The 1:1 conversion on which the governments agreed fixed the East's wage level at about one third of the western level. Previous studies of the DIW had indicated that the productivity of the East German industry was about 50 % of that of West Germany, and the Bundesbank put this ratio at only 40 %.<sup>19</sup> From both perspectives, a starting wage level of 33 % seemed to be roughly compatible with the requirement of competitive neutrality in one of its two senses.

At this stage (November 1990) the wisdom of that decision seems somewhat dubious, though. The wave of bankruptcies and lay-offs sweeping currently through East Germany lends support to those who had recommended starting with lower wages in order to facilitate a widening of the wage spread which the transition to a market economy requires. On the other hand, starting with a wage of only  $\frac{1}{3}$  of the western level, as these commentators had suggested, would have created excessively large incentives for the population of the East to simply pack their luggage and move west. There was no real solution of the problem of two-sided competitiveness. Moreover, there is another explanation of the wave of bankruptcies that rivals with the view that wages in the East are too high. That explanation will be developed in section 3.8.

### *3.3. The Money Overhang and the Real Asset Overhang*

All eastern economies seemed to be characterized by a substantial money overhang. They all had more liquidity than they needed for transactions purposes or at least more than a

<sup>19</sup>See DIW Wochenbericht No. 14/90, 5 April 1990, and Monatsberichte der Deutschen Bundesbank 42, No. 7, July 1990, p. 7.

comparable western economy with the same income level was using. They could afford the money overhang, since an increase in the price level or a reduction in the interest rate, which would have resulted in a western economy, was prevented by state controls.

Similarly, and almost by the definition of a communist country, all countries of the East were characterized by a real asset overhang. The marketable private claims which people held in their hands were only a small fraction of the total real assets available. The governments were the owners of these assets, not the individuals. Thus, a stylized picture of the typical eastern country is one where the individual household is overly stuffed with money, but where money is about all it possesses.

The German Democratic Republic was no exception to this rule. In 1989, the stock of money balances in the M3 sense (i.e. including savings accounts) was 237 b. Eastmarks.<sup>20</sup> Relative to net money income, about the only reliable income aggregate offered by East German statistics, this was 142 %.<sup>21</sup> By way of contrast, M3 relative to the personal disposable income in the West was only 89 %. There was a money overhang of 53 % of net money income or, in absolute terms, of 88 b. Eastmarks. Using the pattern of the West, 150 b., and not 237 b., Eastmarks would have been the appropriate stock of money balances for the German Democratic Republic.

Subtracting the money held by East German firms (61 b. Eastmarks) from the aggregate stock of money balances gives the stock of money possessed by East German households as 176 b. Eastmarks. If one adds 15 b. for insurance claims one obtains the total pre-unification stock of private marketable wealth of East German households. It equals 191 b. Eastmarks. This wealth is only 11 % of the official value of the stock of net fixed assets which was 1.75 trillion Eastmarks in 1989 ("Grundmittelbestand", without land).<sup>22</sup>

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<sup>20</sup>Households owned only cash and savings accounts which carried interest but could be used like demand deposits.

<sup>21</sup>Communist statistics did not show GDP or GNP figures according to the OECD definitions since these included the "unproductive" work of the service and government sectors. The net money income is roughly equivalent to the personal disposable income according to the OECD definitions.

<sup>22</sup>East Germany did allow private land ownership but it severely restricted the

Of course, as argued above, a large fraction of this stock is useless under market conditions. However, even if only 33 % of the net fixed assets are counted, as the IAW suggested, the private wealth would turn out to be just one third of the "true" value of the economy's stock of net fixed assets.

### *3.4. The Planned and the Actual Money Supply*

The political debate in Germany largely neglected the real asset overhang and focussed nearly exclusively on the money overhang. This explains the policies actually chosen by the West German government and the Bundesbank. The exchange pattern described above was meant to provide just the required stock of M3 which was calculated above (150 b. DM). As shown in the appendix, the M3 endowment of East Germany would have been DM 151.4 b. if all inhabitants had exchanged exactly the maximum quantities allowed for their age.

Interestingly enough, however, the actual increase in the stock of money balances (M3) which has just been published by the Bundesbank is DM 180 b. <sup>23</sup> This shows that DM 30 b. of the DM 88 b. money overhang have not been abolished. The reason is a mistake in the Bundesbank's calculations resulting from the fact that there were some money stocks hidden in remote corners of the East German economy which unexpectedly qualified for exchange into Deutschmarks. These stocks were found in foreign trade organizations which had been previously counted as "banks" and whose monetary claims against normal banks had therefore not been included in the official measure of the East German money stock. The mistake is not negligible in absolute terms, but it clearly does not imply major inflationary risks. DM 30 b. is just 2.1 % of the total stock of money

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marketability of land titles.

<sup>23</sup>Monatsberichte der Deutschen Bundesbank 42, No. 10, October 1990.

balances (M3) in the two parts of Germany.<sup>24</sup>

### *3.5. Wealth Effects of the Currency Conversion*

While the Bundesbank successfully managed the currency conversion in a way that eliminated two thirds of the money overhang, it was not successful in eliminating the real asset overhang. On the contrary, that overhang was increased rather than reduced by the policies chosen.

Some economists had argued that it would be best to choose a 1:1 exchange throughout and to solve the problem of the money overhang by not exchanging all money into money. They preferred the overhang to be first converted into "frozen" savings accounts which, in a second step, would then have to be converted into long term assets, preferably into the shares of the newly created East German joint stock companies.

The Bundesbank neglected such proposals. Sharing or fearing the opinion expressed in the international press, it argued that a 1:1 exchange for the total money stock would create "massive gains in purchasing power" and result in an "inflationary consumption wave".<sup>25</sup> Given that the Bundesbank possessed at least some of the statistical information reported in Table 2, this was a surprising policy decision which was hard to understand at the time and is even harder to understand today. If the Bundesbank has tried to "err on the right side", it has done so with remarkable success.

The "success" is a substantial exchange loss for East German households. As mentioned above, before the unification East German households' financial wealth was 191 b. Eastmarks. Assuming a full exhaustion of the exchange limits, 66 b. of these could be exchanged at a rate of 1:1 against Deutschmarks. The remainder, 125 b. Eastmarks, was

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<sup>24</sup>The Bundesbank said that it had expected a M3 increase of DM 160 b. and admitted a mistake of DM 20 b. (ibid. p. 7). Based on this figure, the unexpected M3 increase is 1.4%.

<sup>25</sup>Monatsberichte der Deutschen Bundesbank, 42, No. 7, July 1990, p.16.

exchanged or converted at a rate of 2:1. Equating units of Eastmarks with units of Deutschmarks, as suggested by the purchasing power comparisons made above, this means that East German households experienced a loss of DM 62 b. or DM 3,765 per person. The loss is one third of their wealth.

It is true, of course, that the loss is not a net loss for East German households from the unification. They will certainly gain from the economic prosperity which the unification is very likely to bring about in only a few years. However, it is a *comparative* loss in wealth that could have been avoided with the "frozen accounts" strategy.

In addition to warning with regard to windfall gains, the Bundesbank objected to the 1:1 exchange because it feared that the East German company debt of 260 b. Eastmarks would not be sustainable under market conditions. It argued that forcing East German firms to pay the market rate of interest, rather than the symbolic interest rate with which their creditor, the East German State Bank, had been satisfied with previously, would drive a large proportion of them into bankruptcy.

This argument was probably correct. It was not necessary, however, to solve the bankruptcy problem the Bundesbank's way. It would have easily been possible to reduce the company debt without at the same time depriving households of part of their savings. Applying a 2:1 ratio to the company debt of 260 b. Eastmarks, but not to the stock of housing loans, which totalled 108 b. Eastmarks, would have left the East German banking system with claims of DM 238 b.<sup>26</sup> This would still have been enough to cover the private insurance claims (14.7 b.) and the bank deposits of companies (60.6 b.) and households (159.7 b.) which would have totalled DM 235 b. under a 1:1 exchange.

That this policy would have been feasible, becomes even clearer if one realizes that, from an economic point of view, there is no need to cover non-interest bearing demand deposits with interest bearing claims. The need to cover such items under

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<sup>26</sup>The East German State Bank agreed that it would be necessary to cut the company debt in half, but argued that housing loans should be converted at a rate of 1:1.



ordinary book-keeping rules is a meaningless artifact resulting from the requirement that assets and liabilities be counted at their face values rather than the present values of the payment flows they induce. In present value terms, only the private sector's savings and time deposits are liabilities, the demand deposits, on which (in Germany) practically no interest is paid, are not. In West Germany, savings and time deposits are 73% of the private claims against the banking system. Applying this percentage to the DM 220 b. bank deposits of households and firms in the East shows that, with a 1:1 exchange, the interest bearing liabilities of the banking sector, including the insurance liabilities, could have been limited to DM 176 b. ( $= 73\% \cdot \text{DM } 220.3 \text{ b.} + \text{DM } 14.7 \text{ b.}$ ). This would have left a comfortable DM 62 b. surplus of interest bearing claims with which even the GDR government debt (DM 21 b.) or other liabilities could have been covered.

Accountants might not have been fully happy with this procedure. To satisfy them, and to cover formal accounting deficits, the banking system could have been given permanent, non-interest bearing and non-tradeable claims against the government sector. These claims are useless from an economic point of view, but they would have helped keep the books in order.

Admittedly, a unilateral cut in company debt would seem strange in a market economy where most of this debt is backed by claims of the household sector. However, East Germany was not a market economy. As shown, the company debt exceeded household sector claims by an amount sufficient to make the unilateral cut possible. An important function of the company debt in the communist state was to provide the government with a revenue source and, in fact, the companies had often been forced to borrow from the State Bank even though they did not want to. The interest on the company debt was a hidden form of profit tax. Replacing this tax with western corporate tax and cutting the debt in half was certainly an appropriate policy for the transition to a market economy. Reducing the already too small stock of savings was not a necessary complement.

### *3.6. The Bundesbank Unification Gain*

The East German exchange loss is a fact that contradicts popular beliefs. Another such fact concerns the Bundesbank's "losses" from the currency conversion. Laymen in Germany often argue that the exchange of "good" western for "bad" eastern money implied Bundesbank losses equal to the volume exchanged. Every economist knows, of course, that such a view is nonsense. If a central bank extends its currency region by simply giving its money away, its only resource costs are the printing expenses, and if it can manage to lend rather than give the money away, it will even enjoy seignorage profits. As long as the money does not exceed the amount the new currency region needs for transaction purposes, the resource claims to which the owners of the money are entitled will never be realized.

The Bundesbank is supervising the East German State Bank and its system of local banks, but it did not make money gifts and it did not exchange a single Deutschmark for Eastmarks. As well, the compensation claims which the local banks received to avert bankruptcies arising from the uneven exchange pattern are directed towards the East German State Bank (now called "Credit Bank") and not the Bundesbank. The Bundesbank simply increased the monetary base in East Germany in exchange for promissary notes issued by the East German banking system which will have to be serviced at the current market conditions. Thus the Bundesbank enjoys the full seignorage of the newly issued base money. Using the West German M3 multiplier, which was 5.4 before the unification, this implies that the unification-induced increase in the monetary base is DM  $180 \text{ b.} / 5.4 = \text{DM } 33 \text{ b.}$  This number expresses the (present value) Bundesbank gain from the unification.

### 3.7. Portfolio Reactions

The increased wealth overhang which resulted from the particular method by which the money overhang was eliminated has implications for the behavior of East German households in asset and goods markets. Two basic reactions can be expected.

The first reaction is a portfolio adjustment. Since East German households received only money and were not endowed with long-term assets, it can be expected that they will use some of their money to buy such assets. In West Germany, M3 is just 50% of the household sector's overall financial wealth.<sup>27</sup> East Germans started from a situation where M3 is nearly all their financial wealth. Clearly, the East German percentage of M3 in overall financial wealth will move some way towards the West German one.<sup>28</sup> It will not however become equal to the West German percentage since the overall financial wealth in the East is so small relative to other economic aggregates. If they adopted the western percentage East Germans would have too little liquidity relative to their transactions volume.

As was calculated in the previous section, the total financial wealth of East German citizens after the currency conversion is DM 129 b. (= DM 191 b. - DM 62 b. exchange loss). It consists of DM 7.5 b. insurance claims and DM 121.5 b. money in the M3 sense. If 50% of this wealth is kept in the form of M3, then DM 57 b., or nearly one third of the DM 180 b. increase in of the stock of money balances caused by the currency conversion, will be changed into assets with longer maturities given the interest rate

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<sup>27</sup>See appendix I.

<sup>28</sup>Another portfolio reaction is an adjustment in the liquidity structure of M3. Firms convert some of their demand deposits into time deposits and households convert savings accounts into cash and demand deposits. Anticipating these reactions and the resulting change in reserve requirements, the Bundesbank waited one month after the currency conversion until it subjected the East German banking system to minimum reserve requirements.

structure, and if only half of the adjustment towards the western percentage occurred, then the portfolio effect would still be about DM 28 b.

The attempt to change such large quantities of money into long-term interest bearing assets would increase the market values of these assets and induce a decline in long-term interest rates. The consequent stimulation of interest sensitive real investment would make inflation a potential danger. To prevent this obvious outcome, the Bundesbank will have to step in and make the preferred restructuring of East German wealth portfolios possible by exchanging money for interest bearing assets. In short, it will be forced to accommodate the restructuring process with a contractionary open market policy.

The Bundesbank has implicitly announced this policy by stating in its October 1990 report that it "expects" the portfolio effect to reduce the increase of M3 caused by the currency conversion from an initial 15% to 10% in the long run.<sup>29</sup> This corresponds to the full DM 57 b. portfolio shift calculated above. With the West German M3 multiplier of 5.4, the volume of contractionary open market operations would be about DM 10 b., and the Bundesbank unification gain would shrink from DM 33 b. to 23 b. Note that the latter figure must be considered a lower bound for the unification gain since, for the reason explained, the actual portfolio effect is likely to be smaller than one third of the East German M3.

### *3.8. Demand Reactions*

The other reaction to the increased wealth overhang is a reduced level of consumption. Lifetime optimizers and Keynesian consumers alike will react to the elimination of one third of their wealth by cutting their consumption expenses. This will induce downward

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<sup>29</sup>Monatsberichte der Deutschen Bundesbank 42, No. 10, October 1990. p.7.

multiplier effects of the Keynesian kind and may steer the economy into a depression.

It is true that, theoretically, there are strong countervailing effects that mitigate the development. If East German households know that they will personally benefit from the transfers which West Germany pumps into eastern public budgets, there should be a positive wealth effect on consumption. Moreover, East German households may know or believe that they will not lose from the 2:1 exchange rate because the use of this exchange rate implies a devaluation of company debt and increases the revenue from privatization. In these cases, the depressive effects of the increased real asset overhang may not come through. However, such rationality arguments seem rather artificial in a rapidly changing, partly collapsing economy where no one is able to predict the future with reasonable accuracy. The mechanics of the Modigliani-Miller theorem or of Ricardian equivalence may simply not be applicable under such circumstances.

Unfortunately, the current situation in East Germany is characterized by a deep economic recession. The number of unemployed is rising rapidly from currently half a million to an estimated 1.5 million in 1991, more than 1.5 million people are working short-time, and, perhaps the most alarming figure, in August the retail sales volume in East Germany was 45% below the level reached under communist rule in the year before.

Part of this development is attributable to the fact that for some industries even a wage which is one third of that in the West is too high to be competitive. Another part is certainly attributable to the fact that East German consumers substitute western for eastern products. A third, however, simply results from the fact that the currency conversion impoverished East German households.

On the first day after the currency conversion (July 3rd) the pre-written stories on crowds of East German consumers plundering the banks and squandering their money appeared in the press. How wrong the stories were! The truth was that East Germans were overly cautious, consumed little, and withdrew much less cash from saving accounts than the Bundesbank and most other observers had expected.

#### 4. *The Privatization Problem*

Apart from the problem of monetary transition, the privatization of industry is one of the main problems in transforming a communist system into a market economy.

Since the war, East Germany has been under communist rule. Between 1945 and 1949 it was occupied and ruled by the Soviet Union, and from 1949 onwards it was formally independent but in fact ruled by a communist puppet regime. During both periods, large parts of the East German stock of wealth were expropriated.

The Soviet occupation forces expropriated one third of the land of East Germany, ending the rule of the "Prussian Junkers" and great landowners, who had dominated Brandenburg, Mecklenburg, and West Pomerania. The land was redistributed to the half million small farmers who have been the landowners since then. The Soviets also nationalized large sectors of industry, including basic materials, banking, and insurance. It is estimated that this nationalization covered 40 percent of GDP or 7000 companies.<sup>30</sup>

The German Democratic Republic nationalized most of the remaining companies during its forty years of existence, exempting only very few small handicraft businesses. It also forced the farmers into production co-operatives (Landwirtschaftliche Produktionsgenossenschaften) where all profits were shared by the participants. However, there were no large scale expropriation programs for agricultural and residential properties. House owners and farmers were able to keep their formal property titles. Only the marketability and fungibility of their assets was severely restricted. Between 50 % and 60 % of the East German land continued to be privately owned despite the communist rule.

Nevertheless, land was expropriated in many cases. Company lots and real estate left behind by hundreds of thousands of refugees were not taboo for the greedy state.

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<sup>30</sup>Cf. Schulte and Döinghaus (1990).

The property was sometimes kept, sometimes sold to new private owners. No one knows exactly how many expropriations and nationalizations took place in East Germany. However, it is known that, in 1990, one million applications for the return or compensation of expropriated East German properties have been filed.

#### *4.1. The 49 Rule and the Pre-Coasian State*

The unification treaty sharply distinguished between the two expropriation waves. Everything expropriated before 1949 is treated as a result of history and does not qualify for compensation other than that already given to those who lost their properties in the East (*Lastenausgleich*). Everything expropriated since the foundation of the German Democratic Republic will, as a rule, be returned to the previous owners. The communist state is regarded as illegal, and its acts are nullified wherever possible. The wheel of history is turned back to 1949.

There are, of course, many exceptions from the rule. Whenever the previous property was converted by using it for social purposes, for complex residential constructions, or for business purposes, the previous owners can claim compensation, but not necessarily the return of the property. Moreover, new owners of expropriated land cannot be forced to return this land if they have built permanent structures on it. They or the government may only have to pay compensation to the previous owners. However, the unification treaty (article 41 and amendment III) leaves no doubt that the previous owners have the stronger rights. Unless further laws will significantly simplify the legal procedures, the previous owners will institute hundreds of thousands of law suits to clarify property rights.

The decision to reinstate old rights is a logical consequence of West Germany's claim to have been the only legal state in Germany. It reflects the way lawyers

think about the course of history and, as a by-product, it offers them glamorous income possibilities over the next decade.

In economic terms, the decision may have been the biggest mistake in the otherwise efficient and well-designed unification policy of the West German government. Of course, economists know about the problems of time consistency in policy making and the importance of warranting property rights. However, consideration of these aspects does not lend any support at all to the policies chosen. The time consistency is not a real problem, since no one would have made the West German government responsible for its eastern counterpart's deeds and no one would have expected property rights in the West to be unsafe simply because the communists did not respect them in the East. And the establishment of well-defined property rights is exactly what has been prevented by the "49 rule". The decision to roll back the wheel of history has created unnecessary uncertainty and has pushed East Germany into a pre-Coasian state, where market forces cannot unfold their virtues.

It is the message of the Coase theorem that, for an efficient allocation of resources, it does not matter *how* property rights are established. A trade in endowments (for example rental or leasing contracts) will always allow scarce resources to flow to the place of their most efficient use. What is important is *that* property rights are established. If, and only if, the rules of the game are clarified and everyone knows exactly what he owns, can the market's invisible hand do its job.

Unclear property rights will be a major obstacle to investment in East Germany. The present owners will not invest and the previous owners will not do so either unless who ultimately owns the property is clarified. Nor will investors buy the contested properties and begin the new business as everyone expects them to do. The invisible hand is manacled.



#### *4.2. The Legal Role of the Treuhandanstalt*

The present owner of the companies in East Germany is the "Treuhandanstalt", a resolution trust of the German ministry of finance whose task is the privatization of the East German industry. The Treuhandanstalt is a bureaucracy that was established at the beginning of 1990 by the communist government in a desperate attempt to prevent the privatization of state owned property. It received its new role under the subsequent civil government of de Maiziere (Treuhand Law of June 1990) and came under the ministry's control with the unification treaty.

The Treuhandanstalt owns about 7900 East German companies most of which will have to be privatized. The exceptions are about 1900 public utility companies whose ownership will probably be transferred to local communities.<sup>31</sup> Some of the companies are East German "combines" (Kombinate), huge entities comprising complete industry branches which have no counterparts in the West. The combines will have to be split into many independent companies before privatization is possible. The 7900 companies represent no less than 40,000 separate factories!

Privatization is to be carried out in two steps. In the first step, the East German companies will be transformed into either joint stock companies or GmbH's, a particular German form of limited liability association characterizing most West German companies. To do this, association agreements and starting balance sheets had to be produced. The deadline for submitting these documents to the Treuhandanstalt was October 31<sup>st</sup>, 1990; but half the firms were granted extensions and are expected to deliver the documents in November or December of 1990. The Treuhandanstalt will check and correct the balance sheets, and the final versions of the revised sheets are due by May 1991.

In the second step, the companies will then be sold on the international capital market. There are no restrictions on potential buyers other than those imposed by

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<sup>31</sup>See Frankfurter Allgemeine Zeitung, 30 August, 1990.

Germany's antitrust board.<sup>32</sup> In particular, there are no constraints on the nationality of the buyers. The Treuhandanstalt is, for example, already negotiating with buyers from the USA, Japan, Britain, and France, and a number of successful deals can be expected for the near future. At the time of writing (November 1990) 30 "pearls" have already been sold, and up to 200 companies might be sold by the end of the year.

### *4.3. Risks of the Privatization Process*

It is too early at this stage to make ultimate judgements on the activities of the Treuhandanstalt. However, some risks in this institution's role as a catalyst at the start of the East German market economy are already visible.

#### *4.3.1. Sluggish Privatization*

The first risk is that the Treuhandanstalt may not be able to move fast enough to prevent the collapse of the East German economy. Selling a whole economy is not like selling apples. The British government needed a whole decade to privatize a few dozen companies. The Treuhandanstalt is expected to sell thousands of firms in the next few months. It will lag hopelessly behind these expectations.

#### *4.3.2. Cross-Subsidization*

The second risk is that the Treuhandanstalt will use its sales revenues to subsidize unprofitable firms by awarding them interest bearing compensation claims against itself. The right of cross-subsidization was given to the Treuhandanstalt by the unification treaty, and it can be justified with the fact that the East German companies' debt resulted often from political rather than economic decisions. Unfortunately, however, there is reason

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<sup>32</sup>That board recently forbade Lufthansa to buy the East German airline Interflug. This made British Airways the most promising bidder. If British Airways does not ultimately want to buy Interflug and if no other purchaser can be found, Lufthansa may again have a chance.

enough to fear that political pressure will force the Treuhandanstalt to save jobs in useless enterprises and thus prevent the necessary structural changes.

#### *4.3.3. Competition and Market Concentration*

The third risk is that East German companies will be bought by their West German competitors in order to increase or defend their market shares. It is an open secret that many recent purchases of East German firms have been motivated by such considerations. The unification opens up the chance of increasing the efficiency of the German economy by strengthening its competitive forces. If West German firms simply gobble their East German counterparts this chance will be missed.

#### *4.3.4. The Erosion of Sales Prices*

The fourth risk is that the Treuhandanstalt will not be able to sell its companies at satisfactory prices. The clearance sale of tens of thousands of factories will quickly drive the price of factories to zero and may ultimately force the Treuhandanstalt to give away its companies instead of selling them. While it is true, of course, that one of the reasons for low prices is simply the bad state of East German companies, there are at least three systematic effects pointing towards a strong undervaluation of East German companies under the sales policies chosen.

##### *The Zero-One Problem*

The first effect is a strange bias in the sales policy of the Treuhandanstalt towards selling companies as a whole rather than piecemeal. As far as the author knows, the Treuhandanstalt has not attempted to sell shares of East German companies in the stockmarkets where a large number of individual purchasers could each buy a small share of a company. The institution is instead looking for other companies to take over the East German ones and offers zero-one choices. Apart from the problematic competitive effects

mentioned above, this procedure significantly narrows the set of potential purchasers and implies that there is a steep demand curve for eastern companies on which prices will fall sharply. It is said that even investment banks lost interest in purchasing East German stock when they realized that they would not be able to put together well-diversified portfolios of parts of companies but would have to buy companies as a whole.

A frequently cited argument in favor of the policy of selling whole companies to other companies is the facilitation of a transfer of technological knowledge. This argument cannot be fully neglected. It is not, however, in the author's opinion, ultimately compelling. After all, there are consulting firms which sell technological knowledge and it is possible to hire the skilled managers of competing firms who would bring the knowledge with them. The technology transfer requires management transfers, but management transfers are not limited to intrafirm relocation. Managers are not slaves, they have a market. A privatization of the East German economy, however this is done, will create strong incentives for buying the knowledge where available. There is no reason for mistrusting the market forces.

#### *The Stock-Flow Mismatch*

The second reason for an erosion of East German stock prices is simply that the Treuhandanstalt is trying to sell the existing stocks of East German assets rather than limiting sales to the increments of these stocks which are necessary to modernize the East German economy. Trying to sell a whole economy is a dubious activity from a macroeconomic perspective, for it may result in a serious mismatch between stocks and flows.

It is true that, in principle, the Treuhandanstalt can trade its stocks of East German assets for stocks owned by the West. This would happen if the Treuhandanstalt used its revenue to buy interest bearing assets in the West. It would thus supply the stocks of funds which its purchasers need to buy its assets. The policy would be feasible and avoid

the stock-flow problem. Unfortunately, however, it does not harmonize well with the privatization idea. A bureaucracy owning the financial equivalent of a whole economy does not fit much better to a market system than one that owns this economy directly.

An alternative to the Treuhandanstalt's owning financial assets is transferring the sales revenues to the East German Länder governments or to the companies in need of financial aid. Actually, this is what is suggested by the unification treaty and what will most likely happen with any sales revenues the Treuhandanstalt will fetch. If these institutions rechannelled the funds to the capital market by lending them directly or indirectly to the western buyers, the policy would again be self-financing. However, clearly this will not happen. Needy governments and companies are borrowing constrained. They will use the transfers for everything but lending them back to the West.

The remaining alternative is therefore the exchange of East German assets for Western goods. As the Western purchasers cannot liquidate old assets by selling them to the East, they must use their savings to purchase the Eastern assets, thereby transferring claims on western investment and consumption goods to the East. This is the stock-flow problem. It is logically and practically impossible to sell the Eastern stock of assets at one point in time against the Western flow of savings. The sales necessarily have to be stretched over time if the Treuhandanstalt wants to get positive prices. A quick sale will necessarily drive the prices of East German assets to zero.

By way of contrast, there would be no fundamental problem if the resource transfer from the West to the East were limited to the necessary net investment. If the East sold claims on increments of capital and used the proceeds to buy these increments in the Western investment goods markets, flows would be matched by flows. The mismatch between stocks and flows would not occur.

#### *Faked Balance Sheets*

In addition to the zero-one problem and the stock-flow mismatch there is a third effect

that may result in an undervaluation of East German asset prices. This effect originates from the system of compensation claims which was introduced in East Germany to avert unnecessary bankruptcies. Firms that can prove they are viable, but equity poor, receive interest bearing claims against the Treuhandanstalt to improve their equity base, and equity rich companies are punished by having to accept interest bearing liabilities from the Treuhandanstalt.<sup>33</sup> It is clear that East German managers, who are very experienced in fooling their authorities with faked balance sheets, will react to the compensation claims system by fabricating starting balance sheets for the Treuhandanstalt that make their companies appear worthless, though not hopeless. The Treuhand bureaucrats will then find it easy to crown their sales efforts with success by charging dirt-cheap prices.

#### *4.4. Another Method of Privatization*

As shown in section 3, a shortcoming of the monetary conversion was that the real asset overhang, which characterizes communist countries, was increased rather than reduced. No attempt was made to convert the Volksvermögen, the "people's wealth", into marketable assets owned by East German households. The Treuhandanstalt is, in principle, an adequate vehicle for carrying out this task, and indeed the unification treaty (article 125) and the Treuhand Law (preamble) explicitly offer this option. However, it seems that the sales policies actually chosen will silently bypass the legal options.

The alternative to the institution's "clearance sales" of East German companies would be decentralized privatization where East German households became the legal owners of these companies and could then decide for themselves whether they wanted to sell them. The first step in this decentralized privatization process would be the

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<sup>33</sup>The precise rule is that a company has to accept a liability if its debt falls short of its real estate property value, i.e. if its equity capital exceeds its value of real assets net of real estate. A compensation claim is given to a company if it has no equity, but seems profitable enough to be rehabilitated. See Dietsch and Rommert (1990).

foundation of corporations and the production of introductory balance sheets just as under the current rules. However, step two would not consist of the Treuhanderanstalt's attempt to sell whole companies in the market place. Instead, it would consist of distributing shares to the East German population and, at the same time, introducing these shares in the world stock markets. The shares would quickly find their market values, and the East German households could then decide whether and, if so, when they wanted to sell them.

Apart from the fact that this privatization path would be a more liberal and market-oriented procedure than the sales via a bureaucracy, it would have a number of advantages that parallel the problems of the present privatization procedure as discussed above.

First, and most importantly, it could be much faster. In principle, the shares of the whole industry could be distributed in one step, very much as the distribution of Deutschmarks to East Germans was. It is true that, normally, the introduction of new shares in the stock market is also difficult and time consuming. However, given the unique historical situation, it would be appropriate to facilitate the process by making an amendment to the stock market law which introduces a special category of "Eastern Stock", tailored to the special conditions involved.

Second, there would be no cross-subsidization in addition to the initial allocation of compensation claims. No sales revenues could be used to extend the life of dying firms.

Third, distributing shares among households rather than selling East German companies to companies in the West would help establish more competition in goods markets and boost the efficiency of the German economy.

Fourth, the stock-flow mismatch could be largely avoided and it would thus be much easier for firms to raise the new equity required for real investment. As many East German households would decide to keep rather than sell their shares, the supply of a particular company's stock would in this case be smaller than with a centralized sale of the

total stock by the Treuhandanstalt. And as the households would sell almost perfectly divisible shares rather than whole company units, more demand for a company's stock could be mobilized in international capital markets. For both of these reasons, share prices would be higher with a decentralized than with a centralized solution, and the possibilities for placing new shares and generating the equity capital needed for new investment would be much better. The success stories of newly founded joint stock companies in the United States are a good example of what could happen. It would be a big mistake not to make use of the wave of interest and enthusiasm for the German revolution that has recently swept right around the world. Wealth owners in Japan, the United States and elsewhere are just waiting for the opportunity to buy new shares issued by East German companies so they can participate in the profits these companies are expected to generate.

The Treuhandanstalt's policy is to sell existing companies and to use the proceeds for preventing other companies from going bankrupt and, hopefully in the future, for helping fund the government budget. Not a single Deutschmark out of these proceeds will be used for investment in the firms sold. In order to finance such investment the buyers will have to mobilize additional funds, but their capacity for doing that may already have been exhausted.

Fifth, the distribution of shares could compensate for the impoverishment of East German savers brought about by the currency conversion, and it could overcome the lack of consumption demand and the problematic consequences for aggregate demand that were described above.

Of course, it would be difficult to determine what the precise distribution of shares among the households should be. Some of the shares could be distributed in proportion to those parts of the savings accounts that had been devalued at a rate of 2:1. Others could be distributed on a per capita basis. Also it might be advisable to reduce the risks to be borne by the new and inexperienced shareholders by giving them shares in mutual funds rather than in the companies themselves. The details would have to be



determined by political consensus very much like other redistributive measures of the state.

A more practical difficulty would be that the Treuhandanstalt has a number of expensive tasks in addition to the privatization. It has, for example, to satisfy the claims of previous owners whose properties cannot be returned and it will have to pay for environmental damage. For these purposes, a certain proportion of the shares could be reserved for the Treuhandanstalt which could then sell these in the international stock exchanges. Provided the proportion stays small, most of the virtues of the decentralized privatization process could be preserved.

### *5. Structural Unemployment*

The paper's analysis concludes with a few remarks on the problem of structural unemployment. This problem arises from the fact that unification has suddenly endowed East Germany with new technological knowledge, new incentive systems, and new factor and commodity prices. The result of these changes will be a substantial reallocation of labor and capital among the economy's sectors.

Table 3 shows that the structure of the East German economy differed significantly from that of its West German counterpart. Some of these differences are characteristic of all communist countries and can be attributed to their ideological roots.

A good example is the underrepresentation of the trade and service sectors. In the communist ideology, such sectors were considered "unproductive" (though not useless) and were therefore not included in national output figures. The result was that planning authorities, which focussed on the measurable growth performance of the communist state, could improve their statistics by expanding the processing industries at the expense of the service sectors.

Table 3: Structural Differences between East and West Germany

Sectoral labor market structure	East Germany <sup>1</sup>	West Germany <sup>2</sup>	Lay-offs <sup>3</sup>
Agriculture, forestry, fishing	9.9	4.2	5.7
Energy and mining	3.2	1.4	-
Energy and water supply	1.3	0.8	0.5
Mining <sup>4</sup>	1.9	0.6	1.3
Processing industries	33.8	29.7	-
Chemicals	1.6	2.0	-
Petroleum refining	0.6	0.1	0.5
Rubber products, plastics	1.0	1.4	-
Stone, clay	1.0	0.7	0.3
Porcelain, glass	0.7	0.5	0.2
Metal production and working	2.0	2.4	-
Steel, aluminium	1.2	0.6	0.6
Mechanical engineering	3.9	3.9	2.0
Vehicle construction and repair	2.2	4.1	-
Electrical engineering	4.3	3.7	0.6
Office machines and computers	0.6	0.3	0.3
Precision tools, optical equipment	0.6	0.9	-
Iron and sheet metal goods	1.2	1.1	0.1
Timber industry, paper industry, printing	2.2	2.9	-
Musical instruments, toys	0.7	0.2	0.5
Clothing, leather	2.1	1.3	0.8
Textiles	2.3	0.8	1.5
Food	3.6	2.8	0.8
Construction industry	6.1	6.6	-
Trade	7.8	14.5	-
Wholesale, distributors	2.8	5.1	-
Retail	5.0	9.4	-
Transport	6.8	5.6	-
Railways <sup>5</sup>	2.6	1.0	1.6
Shipping, ports	0.4	0.2	0.2
Other transport	2.4	2.5	-
Communications	1.4	1.9	-
Services, government non-profit organisations	32.4	38.0	-
Credit, insurance <sup>6</sup>	0.7	4.4	-
Hotels and catering	1.9	3.7	-
Health and veterinary services <sup>7</sup>	4.1	5.1	-
Consultancy	1.4	4.8	-
Other services	3.1	4.9	-
Education, science	6.8	4.9	1.9
Social services	1.7	1.1	0.6
Culture, media, sport	1.4	1.1	0.3
Public administration <sup>8</sup>	5.1	6.6	-
Other government services <sup>9</sup> (X-sector)	4.2	0	4.2
Churches, associations, parties <sup>10</sup>	2.0	1.4	0.6
Total	100.0	100.0	25.1

## Sources:

<sup>1</sup> DIW Wochenbericht No. 17/90, 5 April 1990, p. 243. (The DIW estimates are based on figures published by the Zentralverwaltung für Statistik der DDR, Bericht über die Berufstätigen in der DDR per 30.9.1989); apprentices not included.

<sup>2</sup> Statistisches Bundesamt, Arbeitsstättenzählung vom 25. Mai 1987, Fachserie 2, Heft 4; figures for agriculture: Statistisches Bundesamt, Bevölkerung und Erwerbstätigkeit Fachserie 1, Reihe 4.1.1., 1989; microsurvey of 1987.

<sup>3</sup> Positive differences between East and West German percentages.

<sup>4</sup> Including uranium mining.

<sup>5</sup> Including railways saving bank.

<sup>6</sup> Including social insurance.

<sup>7</sup> Including university clinics.

<sup>8</sup> Including police and ministry for security, but no soldiers.

<sup>9</sup> Other government areas, not included in official statistics (so called X-sector).

<sup>10</sup> Including the so called mass organisations of the GDR.

Another example of the dominant role of ideology is the relative strength of agriculture, energy, and mining. The reason for these capital intensive sectors being overrepresented relative to the West can be traced back to Marx's labor theory of value.<sup>34</sup> According to that theory, prices should reflect the labor content of commodities, but not the full capital costs. Capital costs in excess of depreciation were considered as the surplus which was wrongly expropriated from the workers in capitalism, but which had no role to play in a communist economy.<sup>35</sup> It is true that the communist countries soon learned painfully how expensive such an ideology was in terms of wasted resources and were themselves forced to introduce interest charges. East Germany made this step in the early sixties with the introduction of the "new system of planning and steering the economy" (NÖSPL), speaking bashfully of "production fund charges" (Produktionsfondsabgabe) rather than interest. However, these charges were compromises between western interest rates and the labor theory's requirement that there should be no such charges. As a result, the production costs of the capital intensive sectors continued to be underrepresented and the magnitudes of these sectors remained excessive.

Apart from the ideological reasons for structural differences, an east-west time lag in structural change is visible in the data. There was a time when clothing, textile, and food industries absorbed similar percentages of the labor force in West Germany as they do in East Germany today. New labor saving inventions and strong international competition made it both possible and necessary for West Germany to move to lower labor

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<sup>34</sup>Thereby disproving Marx's view that "the being determines the mind" (Das Sein bestimmt das Bewußtsein.) and confirming Hegel's view of history. The irony of communism is that it claimed to follow Marx, but violated his precepts by dictating an ideology that was in sharp contradiction to the real productive conditions (reale Produktionsverhältnisse). The abolition of communism is exactly what Marx's abstract theory of revolution predicts (although not of course what Marx believed would happen). Because a state's ideology conflicts with its "material base" (materielle Basis), there is a revolution that adjusts the ideological super-structure (ideologischer Überbau: state, institutions, and ideology) to the material base.

<sup>35</sup>Interestingly enough, the rate of surplus was larger in East than in West Germany. It follows from the figures of the appendix that the share of wages in GDP was 0.4 in East Germany, but 0.53 in West Germany. When depreciation had the same magnitude relative to GDP in both states, the above statement is implied.

force percentages in these industries. East Germany would have done so too at some stage, but it was lagging behind.

There are certainly many other reasons for the structural differences between the two Germanies, but, whatever they are, most will no longer be relevant in the unified Germany. It is not implausible to suggest that East Germany's industry structure will approximate and even match that of West Germany with the passage of time.

During the transition process, structural unemployment will be unavoidable. A crude measure of the unemployment is calculated in the last column of Table 3. This column contains the positive differences between the East and West German participation percentages for the different sectors. These indicate the lay-offs that will be necessary in East Germany. The sum of all necessary lay-offs is one quarter of the East German work force or about 2.3 million people.<sup>36</sup>

Of course, the number of lay-offs is equal to the number of "vacancies" that can be calculated by adding the negative differences in the East and West German percentages. Note, however, that the match between these two numbers is a long-run phenomenon, and not something that can occur instantaneously. As the categories formed in the table represent industry branches, the lay-offs mean that the people will have to change their professions - and not just their jobs - if they want to find new employment. Given that the German economy relies so much on extensive vocational training and sharp distinctions between the professions this is a very serious problem.<sup>37</sup> Germany is not America where people have learned to be flexible and are used to switching from one

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<sup>36</sup>Adding the "x sector" of employees not counted in official statistics (4.2%) to the official work force results in a total employment of (9.3 m.). The number mentioned in the text is one quarter of this enlarged measure of the work force.

<sup>37</sup>For most occupations, Germany has an education system with a period of theoretical and practical training rarely under 3 years. There is a hierarchy of qualifications which signal the exact educational status of a worker. For example, a painter is awarded the title "associate painter" after successful training in the occupation for 3 years, and a more elevated title that is awarded to some of the senior painters is "master painter". The vocational education system is the strength of the German economy in terms of producing high quality output, but is its weakness when it comes to speed of adjustment.

occupation to another in the course of their lives.

It should also be noted that the number of lay-offs cannot be equated to measured unemployment figures. It merely indicates one major source of this unemployment. Inefficiencies will lead to bankruptcies and unemployment even if a sector is the same size as in West Germany, and the sector-internal employment structures may differ substantially from those in the West, causing lay-offs not captured in the table. Moreover, the problem of insufficient demand resulting from the unfavourable monetary conversion will arise in all sectors. Without a doubt, East Germany will have to pass through an extended period of severe unemployment that will affect every fourth employment contract.

## *6. Conclusion*

A year ago, when the people of East Germany escalated their "Monday's demonstrations" into a true revolution they may not have known the course history would take as a result. But they did know that what they were doing was risky. While they escaped the bloodshed that could have followed, they cannot escape going through a period of austerity and restraint. The structural unemployment problem which the unification causes will task East Germans' patience.

Some of the anticipated problems of unification have been mastered with surprising ease. The monetary conversion went, except for the 20-30 b. Deutschmarks overlooked, exactly as the Bundesbank had hoped it would. It did not create inflationary pressures, and there is no reason to fear that the value of the Deutschmark will be eroded.

Nor is there any reason for West Germans to fear that they will have to pay for the currency conversion. The contrary is true. The Bundesbank gained from the conversion, and East German households lost about one third of their wealth.

Unfortunately, this exchange loss may have contributed to the current depression in East Germany by causing negative Keynesian multiplier effects.

This is not to say that there are no costs to the West. Transfers in the order of magnitude of the West German trade surplus will be necessary to cover the East German budget deficits in the next few years, and the increased scarcity of capital and abundance of labor will have consequences for the West German income distribution. It is very likely that workers in the West will have to foot the lion's share of the unification bill, but this is an unavoidable consequence of history.

Perhaps the most serious mistake in West Germany's mainly successful unification policy was the decision to return the property expropriated by the East German state to the previous owners. This decision will occupy the courts for years to come and may create a serious bottleneck for investment.

The success of the transition to a market economy will crucially depend on the efficiency of the Treuhandanstalt in privatizing the East German economy. Privatizing the economy by organising a clearance sale for 6000 companies and combines will quickly send the market price for East German companies down nearly to zero and is dangerously time consuming. One alternative would be privatization by distributing company shares to East German households and by leaving it up to them whether and, if so, when to sell those shares. That way the market price of shares would stay high and it would be much easier for East German companies to sell the shares they need to issue for the purpose of new investment.

A side effect of this decentralized privatization procedure would be the elimination of the real asset overhang, which characterizes the communist economy and which was enlarged by the currency conversion. The "people's wealth" (Volksvermögen) would at last go to the people.

Whatever the policies chosen, it is clear that East Germany has a much better chance of catching up with western living standards than other eastern countries. It

enjoys the help of its countrymen in the West, can offer a stable institutional environment for direct investment, and can build on its excellent pre-war tradition of craftsmanship and "high tech" production.

Hopefully the unification of Germany will be advantageous for all eastern Europeans. Poland, Czechoslovakia, Hungary, and other countries, perhaps in the end even the countries of the crumbling Soviet Union, will gain from the economic progress and stability of the united Germany. Germany has accepted the permanent separation of her former eastern territories, and there are no unsolved border problems remaining in Mitteleuropa. The period of peace and prosperity that lies ahead will benefit all. Trade is not a zero-sum game, and national success stories are not mutually exclusive.

Appendix I  
East and West Germany Compared  
(1989, before unification)

Unless stated otherwise, the data are taken from Statistisches Bundesamt, DDR 1990, Zahlen und Fakten, Wiesbaden 1990; Statistisches Bundesamt, Statistisches Jahrbuch 1990 für die Bundesrepublik Deutschland, Wiesbaden 1990; Monatsberichte der deutschen Bundesbank 42, No. 5, May 1990; Statistisches Jahrbuch 1990 der Deutschen Demokratischen Republik 34, Berlin 1990; and Jahresbericht 1989 der Staatsbank der DDR.

1) Labor Force	East	West
Population	16.4 m.	62.3 m.
	(ratio East/West = 26 %)	
Work force	8.9 m.	29.7 m.
Employed	8.9 m.	27.7 m.
Participation rate	54 %	48 %
Female particip. rate	50 %	37 %
Unemployment rate	0 %	7.1 %
2) Output and Incomes	East (Mark)	West (DM)
Produced National Income (without services)	260.4 b.	—
— per worker	38,759	—
Gross value added without the service sector	—	1,449 b.
— per worker	—	67,400
Gross domestic product	353.4 b. <sup>1</sup>	2,237 b.
	(ratio East/West = 15.8 %)	
— per employed worker	39,700	80,750
	(ratio East/West = 49.2 %)	
— per worker	39,700	75,300
	(ratio East/West = 52.7 %)	
— per capita of population	21,500	36,300
	(ratio East/West = 59.2 %)	

<sup>1</sup>An alternative estimate by DIW (Wochenbericht 57, No. 17/90, 26 April 1990, p. 223) is 346.1 b. Eastmarks.



	East (Mark)	West (DM)
Private value added (net of indirect taxes)	—	1,505.1 b.
Gross wage income (including em- ployers' social insurance contribution)	141.2 b.	1,171.5 b.
Gross private sector wage income	—	948.8 b.
Share of private wages in private value added (partial production elasticity of labor under competitive conditions)	—	63.0 %
Rate of return to capital (private sector value added - private sector wages)/(private net fixed assets + private land value); see section 6)	—	7.0 %
Average monthly gross wage earnings (including employer's contribution to social insurance)		
- Whole economy	1,322	3,966
	(ratio East/West = 31 %)	
- Manufacturing	1,324	3,657
- Construction	1,310	2,958
- Agriculture and forestry	1,242	2,597
- Commerce	1,168	2,893
- Transport and communication	1,436	3,311
Net money income (= $Y_{EAST}$ ; simi- lar to personal disposable income)	167.5 b.	
Personal disposable income (= $Y_{WEST}$ )		1,403.8 b.
	(ratio East/West = 12 %)	
Net money income, personal disposable income per capita and		
- per year	10,200	22,500
- per month	850	1,900
	(ratio East/West = 45 %)	

## 3) Government Revenue and Expenditure

	East (Mark)	West (DM)
Tax revenue	269.7 b.(1988) <sup>2</sup>	535.5 b.
- VAT	—	131.5 b.
- Personal Income tax	10.0 b. (1988)	278.6 b.
- Corporate tax	—	34.2 b.
- Excise taxes	43.1 b. (1988) <sup>3</sup>	53.6 b.
- Others	—	97.6 b.
- Social insurance contributions	18.8 b. (1988)	413.5 b.
Subsidies (to firms, other than price subsidies)	106.8 b. (1988)	75.6 b.
Transfers (to households)	36.3 b. (1988)	61.8 b.
Price subsidies for elementary goods	49.8 b. <sup>3</sup> (1988) (1971: 8.5 b.)	
of which:		
- Food and beverages	31.9 b.	
- Manufactured goods	11.9 b.	
- Transport services	5.0 b.	
Pensions	17.2 b. (1988)	173.9 b. (1988)
Average monthly government pensions	427	1,018
Taxes/GDP	—	23.9 %
Social insurance contributions/GDP	5.3 %	18.5 %
Government deficit	- 0.2 b.	26.3 b.
Government deficit/GDP	—	1.2 %
		(1990: 2.7 % <sup>4</sup> - 3.7 % <sup>5</sup> )
		(1991: 3.2 % <sup>4</sup> - 4.5 % to 5 % <sup>5</sup> )
		(USA 1989: 2.6 %)
Government contribution to NDP (value added)	—	222.7 b.
Government expenditures/GDP	76.3 %	31.2 %

<sup>2</sup>Total government revenues.

<sup>3</sup>With the unification (October 3rd, 1990) most price subsidies and excise taxes have been removed and, except for housing, all prices have been freed.

<sup>4</sup>Arbeitsgemeinschaft deutscher wirtschaftswissenschaftlicher Forschungsinstitute, Die Lage der Weltwirtschaft und der deutschen Wirtschaft im Herbst 1990, in DIW Wochenbericht 57, No.43 ·44/90, 25 October 1990.

<sup>5</sup>Estimated by Deutsche Bundesbank (cf. FAZ, No. 260, 7 November 1990, p. 17).

Government consumption/GDP	—	18.5 %
<b>4) Monetary Aggregates</b>	<b>East (Mark)</b>	<b>West (DM)</b>
Cash circulation with households and non-banking firms		
- total	17.0 b.	146.9 b.
- per capita	1,036	2,350
Demand deposits (East: savings deposits)	159.7 b.	303.7 b.
Demand deposits of firms with central bank	60.6 b. <sup>6</sup>	0
Savings deposits <sup>7</sup>	159.7 b.	715.2 b.
M1	237.3 b.	450.6 b.
M2	237.3 b.	776.4 b.
M3	237.3 b.	1,255.5 b.
Household financial assets <sup>8</sup>		
- total	191.4 b.	2,515 b. (1988)
- per capita	11,670	40,400
Ratios to net money income ( $Y_{EAST}$ ) and personal disposable income ( $Y_{WEST}$ ), respectively		
	<b>East</b>	<b>West</b>
Cash	10.1 %	10.5 %
Demand deposits (East: savings deposits and demand deposits of firms)	131.5 %	21.2 %
M1	141.7 %	32.1 %
M2	141.7 %	55.3 %
M3	141.7 %	89.4 %
Household financial assets	114.3 %	187.2 % (1988)

<sup>6</sup>Jahresbericht 1989 der Staatsbank der DDR.

<sup>7</sup>Savings deposits in East Germany were equivalent to sight deposits: arbitrary amounts could be withdrawn at any time.

<sup>8</sup>Financial assets include cash, savings deposits, and 15 b. personal insurance savings in the case of the East Germany. Include bonds in the case of West Germany.

**Money overhang with 1:1 exchange and applying western ratios (DM)**

Lower bound (M3 overhang)

$$1989: 237.3 \text{ b.} - 89.4 \% \cdot 167.5 \text{ b.} = 87.5 \text{ b.}$$

Intermediate estimate (M2 overhang)

$$1989: 237.3 \text{ b.} - 55.3 \% \cdot 167.5 \text{ b.} = 144.7 \text{ b.}$$

Upper bound (M1 overhang)

$$1989: 237.3 \text{ b.} - 32.1 \% \cdot 167.5 \text{ b.} = 183.5 \text{ b.}$$

Explanation: money overhang  $\equiv M_{\text{EAST}} - k_{\text{WEST}} \cdot Y_{\text{EAST}}$ , where
 $M_{\text{EAST}} \equiv$  cash owned by households and non-banking firms + household savings deposits + demand deposits of non-banking firms with central bank

 $k_{\text{WEST}} \equiv$  Cambridge k of West Germany (based on personal disposable income)

 $Y_{\text{EAST}} \equiv$  net money income of private households in East Germany (similar to disposable income according to OECD definitions)

Due to the fact that savings deposits could be withdrawn at any time in East Germany, these deposits are fungible like checking accounts in West Germany. On the other hand, there are hardly any long term assets available (with the exception of insurance savings plans of 14.7 b.). The magnitude of the money overhang depends on the definition of money supply used (M1, M2, or M3). The Bundesbank focussed exclusively on the M3 overhang.

Given the price level in East Germany and using the above estimates the following DM money supply should have been provided:

M1 (cash + demand deposits)	= 167.5 b. · 32.1 %	= 53.8 b.
M2 - M1 (time deposits at less than four year notice)	= 167.5 b. · (55.3 % - 32.1 %)	= 38.9 b.
M3 - M2 (savings deposits)	= 167.5 b. · (89.4 % - 55.3 %)	= 57.1 b.
		149.8 b.

Assuming the conversion pattern described in the treaty on the monetary union, stocks of East German currency were exchanged according to the following rules by July 1st,

1990. All amounts were exchanged to DM-M3 equivalents and they could be withdrawn as cash on demand; no quantities were "frozen" as many consultants had suggested.

Exchange 1:1

Persons up to 14 years of age	2,000	
Persons from 15 through 59 years	4,000	
Persons above 59 years	6,000	
Given the East German population structure this implied a DM-M1 increase totaling		65.5 b.

Exchange 1:2

In principle, the excess of M3 over DM 65,500, that is 237.3 b. - 65.5 b. = 171.8 b., was eligible for this rate. The DM-M1 increase was

85.9 b.

Exchange 1:3

However, a small part of the excess of M3 over DM 66,000 was owned by non-GDR residents. To the extent this consisted of East German bank accounts created in 1990, the 1:3 exchange rate applied. It is unknown (to the author) which exact amounts fell under this category.

Sum: DM-M3 increase according to treaty 151.4 b.

**M3 Money overhang with exchange according to treaty and applying western ratios**

151.4 b. - 32.1 % · 167.5 b. = 97.6 b.

5) Prices	East	West
Inflation: cost of living index (1970 = 100)	99.5	197.7

Purchasing power parity: See Table 2 of the text.

6) Assets and Liabilities	East (Mark)	West (DM)
Private gross fixed assets <sup>9</sup>	—	10,032.7 b.
Net fixed assets (total) <sup>10</sup>	1,745.0 b. 575.8 b. <sup>11</sup>	6,512.6 b.
- in the manufacturing sector	1,250.0 b. 462.5 b. <sup>11</sup>	—
Private net fixed assets	—	5,850.5 b.
Private land value	—	2,049.8 b. <sup>12</sup>
Private and privatizeable land value (East Germany)	420.9 b.- 524.5 b. <sup>13</sup>	—
Capital-output ratio <sup>14</sup>		3.3
- overall	—	—
- in the manufacturing sector	4.8	—
Net foreign debt	21.2 b.	-426.8 b.
Company debt (East: gross of accounts with central bank)	260.4 b.	1,169.6 b.
Housing loans	108.5 b.	729.4 b.
Government debt	—	923.5 b.
7) Saving and Investment		
Gross investment	77.1 b.	435.6 b.
Depreciation	33.4 b.	276.7 b.
Net investment	43.7 b.	199.6 b.

<sup>9</sup>At replacement cost.

<sup>10</sup>Without land.

<sup>11</sup>Estimate of the Institute of Applied Economic Research (IAW), Die ostdeutsche Wirtschaft 1990/1991, 22. Oktober 1990.

<sup>12</sup>Own estimate: see Appendix II.

<sup>13</sup>Own estimate: see Appendix II.

<sup>14</sup>West Germany: net fixed assets divided by net domestic product at market prices; East Germany: net fixed investment ("Grundmittelbestand") divided by produced national income.

Aggregate saving	-----	267.9 b.
Savings propensity (out of personal disposable income and net money income respectively)	6.3 %	13.6 %
<b>8) Foreign Trade</b>	<b>East (Mark)</b>	<b>West (DM)</b>
Exports less imports	+ 3.0 b.	+ 134.7 b.
Current account <sup>15</sup>	-----	+ 104.2 b.
Capital account	-----	- 128.2 b.

#### 9) Expenditures as Percentages of Disposable Income<sup>16</sup>

	East	West
Food and beverages	41.5 %	23.2 %
Manufactured goods	45.3 %	40.0 %
Services (including housing)	13.2 %	36.8 %
of which:		
- Rent	2.7 %	20.1 %
- Utilities (electricity, gas, heating)	1.9 %	5.7 %

#### 10) Endowment with Consumer Durables<sup>17</sup>

Private car	54 %	96 %
TV-set	96 %	99 %
- of which: color TV	57 %	95 %
Telephone	17 %	99 %
	East	West

<sup>15</sup>Statistisches Bundesamt, Volkswirtschaftliche Gesamtrechnungen Fachserie 18.

<sup>16</sup>1988 East: all households. West: 4-person employee household with gross income between DM 2,900 and DM 4,400.

<sup>17</sup>1989 East: Percentage of households owning the respective specified consumer durable; West: 4-person-employee households with a gross income between DM 3,000 and DM 4,500 (Statistisches Bundesamt; Statistisches Jahrbuch für die Bundesrepublik 1990, Wiesbaden 1990).

Refrigerator (without freezer)	99 %	81 %
Freezer (with and without refrigerator)	43 %	75 %
Washing machine	99 %	97 %
Housing		
- Number of appartements and housing units	7 m.	26.6 m. <sup>18</sup>
- Number of people sharing a unit	2.3	2.3
- Living space per capita	27.6 m <sup>2</sup>	35.5 m <sup>2</sup> <sup>18</sup>
Proportion of living space built after 1948	35 %	70 % <sup>18</sup>
Proportion of units equipped with bath shower	82 %	96 % <sup>18</sup>

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<sup>18</sup>1987: Statistisches Bundesamt, Wirtschaft und Statistik No. 8, August 1989, p. 494.



## Appendix II

## Land Values in West and East Germany (1989)

In co-operation with Ronnie Schöb

*West German Land Values*

The size and structure of private West German land as given in the first column of Table A1 is reported in the West German statistical yearbook 1990 and in the monthly statistical report published by the West German Ministry of Finance. The prices of the various land categories given in the second column are based on the West German statistical yearbook 1990 and on information provided to the authors by the Federal Forest Office, Stockdorf.

Table A1: *Private Land Values in the West,  
Current Values (1989)*

Land category	Size [m. ha]	Price per ha [DM]	Value [b. DM]
Agricultural land (without forests)	13,488.1	30,924	417.1
Forests	2,832.6	12,500	35.4
Urban Land	1,685.4	947,700	1,597.3
Total, average	18,006.1	--- 113,839	2,049.8 ---

Sources: Statistisches Bundesamt, Statistisches Jahrbuch 1990 für die Bundesrepublik Deutschland, Wiesbaden 1990, Tab. 8.13, 8.18, 23.10; Bundesministerium der Finanzen, Statistischer Monatsbericht 6/1990, S. 401; information provided to the authors by Bundesforstamt Stockdorf. Own calculations.

The urban land prices are average reported sales prices in 1989. These prices underestimate the land values because most sales occur in suburban areas where land prices are lower than in urban centers. While public traffic areas like roads, railroads, airports etc. are not included in the figures, it was not possible to separate out urban areas covered with public buildings. These areas probably explain only a small fraction of the total land value reported in the table.

*East German Land Values*

The difficulty in calculating the East German counterpart of Table A1 is that there are no market prices for land and that it is unclear how much of the land can be privatized. This section reports two sets of calculations based on the alternative assumptions that i) western land prices apply immediately and that ii) they apply after an adjustment period, ending with the year 2000, during which no rent will be generated by East German land.

i) The structural composition of the total East German stock of land is reported in the West German statistical yearbook 1990 but, naturally, there are no estimates of the areas that would be available in a privatized economy. The figures reported in the first column of Table A2 have been constructed from the available information assuming that all (non-forest) agricultural areas will ultimately be privatized, that the same fraction of forested areas will be privatized as in West Germany (38%), and that the ratio of eastern urban areas to their western counterparts equals the ratio of the respective housing spaces available today (20%). Multiplying the areas reported in the first column with the current (1989) West German land prices gives the land values reported in the third column. Based on current West German land prices, the total value of private and privatizable land in East Germany is DM 524.5 b. This figure must be considered as an upper bound since it implies an immediate equalization of eastern and western land rents at the time of unification.

*Table A2: Private and Privatizable Land Values in the East*

Land category	Size [m. ha]	Immediate adjustment		Adjustment at the year 2000	
		Price per ha [DM]	Value [b. DM]	Price per ha [DM]	Value [b. DM]
Agricultural land (without forests)	6,171.0	30,924	190.8	24,817	153.1
Forests	1,133.5	12,500	14.2	10,031	11.4
Urban Land	337.1	947,700	319.5	760,547	256.4
Total, average	7,641.6	---	524.5	---	420.9
	---	68,637	---	55,080	---

Sources: Statistisches Bundesamt, Statistisches Jahrbuch 1990 für die Bundesrepublik Deutschland, Wiesbaden 1990, Anhang 1, Tab. 5.1. Own calculations.

ii) The other extreme is the assumption that East German land will be unable to generate any rents until the year 2000 and will thereafter yield the same rents as western land. This produces the results reported in the last two columns of Table A2.

In a perfect capital market, the market rate of interest equals the expected growth rate of the land price plus the land's rental rate. Inflating West Germany's land prices and discounting the result with the market rate of interest therefore is equivalent to discounting the current (1989) West German land prices with the rental rate over the adjustment period. The West German average agricultural rental rate in the period from 1975 to 1987 equalled 1.1%<sup>19</sup>. When all land prices grow at the same rate, this rental rate can be taken to apply to all land categories. To be on the safe side, a rate of 2% was used to calculate the implicit East German land prices. The prices are reported in the last but one column of Table A2 and the corresponding land values in the different categories are shown in the last column. A conservative estimate of today's value of the East German stock of land that will ultimately be in private hands is therefore DM 420.9 b.

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<sup>19</sup>Source: Statistisches Bundesamt, Statistisches Jahrbuch 1990 für die Bundesrepublik Deutschland, Wiesbaden 1990; Tab. 8.8, 8.13.

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