"THE CONSEQUENCES OF GERMAN ECONOMIC AND MONETARY UNION"

by

Michael C. Burda*

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* Assistant Professor of Economics, INSEAD, Boulevard de Constance
Fontainebleau 77305 Cedex, France

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The Consequences of German Economic and Monetary Union

Michael C. Burda

INSEAD, OFCE (Paris)

and the Centre for Economic Policy Research

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Abstract

This paper analyzes some of the consequences of the pending economic and monetary union of the two Germanies. Particular emphasis is given to the real implications for the supply side of the German Democratic Republic and for resource flows between the two economic regions.

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The recent turn of events in Eastern Europe has provided economists with a laboratory experiment never imagined possible: the introduction of a market economy where none had previously existed. All the more extraordinary is the "experiment" posed by the economic monetary and social union (GEMU) between the Federal Republic of Germany (FRG) and the German Democratic Republic (GDR), by which the latter will drop its centrally planned economy and take the plunge into a free market system. In this peculiar setting, differences in tastes, language, and institutions will be largely marginalized, leaving only the market to answer the question: Can Ludwig Erhard's postwar *Wirtschaftswunder* be repeated in a country that has not known capitalism for almost a half-century?

This paper analyzes the German Economic and Monetary Union (GEMU) and its implications for both Germanies from several perspectives. The controversial introduction of the Deutschmark in the GDR extends the DM Zone to a region of considerable relative underdevelopment, and may affect both the stability of the EMS as well as German monetary policy, although these issues will be largely resolved in the coming months. This paper stresses *real* aspects of monetary union for economic adjustment in East Germany, which will linger long after the monetary questions have been settled. The real shocks that will buffet the GDR in the coming months will be accentuated by sharing a currency with a wealthier, more stable economic region, as the ability to devalue will be ruled out. On the other hand, joining the DM-Zone will deliver a

credibility bonus unequalled in the evolving Eastern European economies. The controversial parity at which the DM and the old Ostmark will be exchanged, especially for the most important price in the economy, that of labor, will have decisive impact on the competitiveness of the region. Overmanned and poorly equipped state enterprises will be forced in short time either to compete on the harsh terms of the world market or close. Only a handful of companies will emerge from this process unscathed.

Section 1 describes the highly volatile state of affairs at the time of writing.[1] Section 2 discusses some of the monetary and financial aspects of the currency conversion. Section 3 focuses on the real consequences of a monetary union, which will outlast any transient monetary effects over the next six months. The enormous demands for infrastructure, housing, business plant and equipment as well the public finance requirements of East German government budget and inevitable social transfers must be financed. Section 4 highlights some of the key issues in the context of a factor-specific model. Section 5 concludes with a summary of the economic costs of GEMU as well as their likely distribution.

I. The state of the world at time of writing

On May 18, 1990 a *Staatsvertrag* or state treaty was signed between the Federal Republic of Germany and the German Democratic Republic establishing a "economic, monetary, and social union."[2]

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[1]19 June 1990.

[2]It should be stressed that treaty is an agreement between two sovereign nations over conditions for economic, monetary and

Subject to modifications in the final days before ratification by the *Bundestag* and *Volkskammer*, the respective legislatures, the most important provisions of the *Staatsvertrag* are:

1) Introduction of the Deutschmark (DM) into the GDR; the Ostmark (OM), the GDR currency, will be converted at the following exchange rates:

- 1:1 for wages salaries pensions and governmental transfers
- 1:1 for savings accounts of GDR residents
  - up to OM 6000 for persons aged 60 and over
  - up to OM 2000 for children aged 15 and younger
  - up to OM 4000 for all other citizens
- --2:1 for remaining savings account balances of residents
- --2:1 for deposits of enterprises and the government
- --2:1 for debt of state enterprises (VEBs or Volkseigene Betriebe) the government and individuals
- --3:1 for accounts of nonresidents

2) The irrevocable transfer of central bank functions from the *Staatsbank*, the central bank of the GDR, to the *Bundesbank,* the central bank of the FRG; the the creation of a two-tiered banking system, in which the Staatsbank divests itself of its wholesale banking operation, the *Kreditbank*; special liquidity measures provided by the Bundesbank for the East German banking sector

3) The adoption of the West German tax system, including, the value-added tax, corporate income tax, and personal income tax, as well as the general customs rules of the EC

4) The adoption of West German social insurance institutions, including pensions, unemployment insurance, welfare support, etc

5) After valuation using conventional accounting principles, the privatization of VEBs with the goal of reducing the size of government, possibly through the sale of shares

6) Establishment of a market-oriented system with free exercise of professions and incorporation of businesses

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social, but not political union. It is however widely accepted that the newly reconstituted *Länder* in the GDR --Saxony-Anhalt, Saxony, Thuringia, Mecklenburg, and Brandenburg-- could petition to join the FRG under Article 23 of the Basic Law.

7) Agreement in principle to allow unrestricted sale and purchase of land by all entities including foreigners. A commission will decide on the question of restitution for previous owners

8) Respect of all existing contractual obligations of the GDR with COMECON economies

More recently a "German Unity Fund" DM 115 billions has been established, of which 90 would be funded by debt issue, 25 billion from diverted spending in FRG. This fund is intended to both cover the government budget shortfall of the GDR as well as provide for infrastructural investment funds.

II. Financial and Monetary Implications of Monetary Union

Monetary union has immediate financial implications for both Germanies. The conversion of inside assets at a generous exchange rate results in an increase in liquidity in the enlarged DM Zone. At the same time liabilities are also converted, implying a change in real indebtedness for economic agents at the outset of GEMU. Table 1 displays the consolidated balance system of the GDR banking system as of December 31, 1989. This includes assets and liabilities of the *Staatsbank* (the central bank of the GDR) as well as those of the vis-á-vis the foreign sector. It displays a considerable sum of deposits of East Germans (OM 162 billions) compared with only OM 17 billions in currency.

The balance sheet reveals the extent to which the DM conversion of Ostmark will affect the DM money supply. This derives most significantly from the conversion of household savings into DM deposits, as East Germans are not large currency holders. Arithmetically, the conversion has been estimated to increase the DM-Zone money supply M3 by roughly 100 billion DM

(See for example Passet 1990). Assuming the worst possible scenario leads to a considerably larger estimate:[3]

Each citizen receives 4000 at 1:1	64 billion
Remainder including currency at 2:1	56 billion
Deposits of Enterprises at 2:1	30 billion
	=150 billion

A large component of East German households' savings of 162 billion Marks --which represents about 69% of GNP --is "forced" involuntary portfolio choice. This includes savings as "down payment" for scarce consumer durable goods before November 1989. With access to both West German financial and goods markets, East German households can reallocate their wealth in financial assets or even durable goods such as automobiles. In comparison, savings accounts represent only 30% of West German savers' total household assets, which are roughly 180% of GNP (Table 2). A similar asset allocation of GDR households could imply a conversion of up to 70% of the deposits into financial assets. In this case there is no effect on aggregate demand. In contrast, durable goods are an alternative vehicle for saving, and as these are produced in the FRG this represents another source of real demand.

Despite recent concern in the financial and popular press, a higher long run inflation path for the DM Zone is highly unlikely, as this would ultimately require a fundamental change in monetary policy of the Bundesbank. Put differently, the monetary effect of

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[3]This number was also cited by the *Frankfurter Allgemeine Zeitung* of 13 June 1990, "Kein Stichtag bei Umstellung der Kontoguthaben in der DDR," p.17. If one takes the estimate cited there of 50 billions in savings converted at 1:1, the result is 145 billion (50+.5(180-50)+.5(60) = 145).

GEMU will represent a *level* rather than *growth* effect, since the latter requires a long-run increase in the underlying growth in monetary aggregates relative to real economic growth. This does not exclude, however, the short-term effects of increased aggregate demand on inflation, which we discuss below.

Estimating the level effect of GEMU on the evolution of German monetary aggregates poses a straightforward exercise in the demand for money, which for a given transactions technology, depends on the price level, the level of real activity, and nominal interest rates. First, *prices* relevant for the new money demand in the GDR after July 2 are likely to be roughly the same, or slightly higher in the short run.[4] As productivity in the GDR in tradable goods is lower than in the FRG, the usual Belassa/Samuelson arguments imply a lower price for nontradables and thereby a lower price level in the long run. This will be especially true if transport and rents remain regulated.[5]

Second, *real activity* in the DM-Zone will increase by the size of the GDR economy that survives the shake-down. Most recent estimates of East German GNP by the Deutsches Institut für Wirtschaftsforschung range from DM 230-240 billion or about 10% of

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[4]This is the conclusion of Nierhaus (1990), which assumes unchanged apartment rents and consumption patterns. These studies also ignore changing production of the GDR in response to market prices.Earlier estimates of the DIW (1985) suggested a price increase of 20% as subsidies are lifted, but these are offset by cheaper consumer durables and the elimination of the *produktgebundene Abgaben*, the punitive excise taxes on "luxury" items.

[5]Two examples: at 1:1, a square meter of apartment space in East Berlin rents for as little as DM 1,- (compared with 10 to 20 times higher in West Berlin) while a ticket on the S-Bahn in costs DM 0,20 (versus DM 2,20 in West Berlin).

West German GNP.[6] These estimates ignore considerable upheaval likely in the short run. At the same time a rapid expansion of economic activity in the underdeveloped service sector might boost GNP by at least 5%.

Other factors in the demand for money are likely to be of subsidiary importance. With interest rate equalization and sufficient interbank competition, demands for money will reflect transactions costs: here the effect of higher bank fees relative to GDR household income may increase money/cash holdings, but this will be offset by the lower opportunity cost of GDR residents' time (shoe leather costs).

Even under the most pessimistic estimate of a DM 150 billion increase in M3, the danger of the monetary overhang is exaggerated when compared with experiences in other East European economies.[7] In addition, there are two other reasons for optimism. First, while open unemployment in the GDR at the time of writing was only about 2%, most economists estimate a high unconditional probability of unemployment for East German workers for the next few years, even in successful enterprises. This turbulence in labor markets despite high overall economic growth will encourage *precautionary savings*, which will mitigate the potential for a consumption surge. Moreover, it is possible that significant savings deposits might be converted into currency, causing money

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[6]DIW (1990a) estimates GNP by applying West German indirect taxes to East German factor income data. In a controversial study, Filip-Köhn and Ludwig (1990) use input-output tables and export sector prices to value GDR value added.

[7]See Nuti, on Poland, European Economy 1990.

market multiplier and the liquidity of the DM zone to fall. As Table 2 indicates, East Germans held a relatively small fraction of national income in the form of currency compared with West Germans. The recent surge in the currency reported by the Bundesbank in April and May may be a prelude to what will happen after July 2.

Second, in order to avoid indebtedness in DM on July 2, many enterprises began using their deposits (M 60b) to repay their indebtedness to the banking sector (*Betriebsmittelkredite*, M 260b). As Table 1 indicates, their debt comprises the lion's share of the backing for old circulating medium, and will exist after July 2 as backing of new DM. This debt arose largely from the system of central planning in which enterprises were unable to generate internal funds for investment in plant and equipment. In a perverse sense, past investment initiative under the old regime will be penalized in GEMU as this debt becomes "hard" and serviced in DM at 2:1.

Since this debt arose under circumstances beyond the control of state enterprises, its cancellation or assumption by the GDR government hardly violates established banking practice, and moreover would improve the liquidity and in some cases ensure the solvency of East German enterprises. The DIW (1990a) has suggested converting the debt into firm equity, substituting GDR government debt in the form of equalization claims (*Ausgleichsforderungen*) for enterprise debt on the balance sheet of the banking sector (see Figure 1). In another interesting twist, it was observed that many enterprises stopped paying GDR confiscatory taxes in the last weeks before monetary union, in order to extinguish as much debt

as possible.[8]

III. Real Implications of Currency Union at Parity

Demand Side

The demand side will be most affected in the initial year of GEMU. Evidence on capacity utilization, overtime hours, and wage settlements indicate that the West German economy is already overheating. Yet an additional demand jolt is preprogrammed as East Germans begin to expand their claim on West German output. Even if the spending surge of East German consumers is modest, the reconstruction plans for the GDR will put additional burdens on suppliers of primary inputs and construction materials. Current plans call for no new taxes to fund the reconstruction program, meaning a sharper shift in aggregated demand than anticipated. The consequences are likely to be an short run acceleration of inflation, especially in the capital goods sector, and a cashing in of the "insurance policy" of West Germany's large external surpluses in the 1980s. Some estimate that the FRG trade surplus --largely with EC countries-- could be halved in as little as two years.

A standard IS-LM analysis also predicts higher near-term real interest rates, especially if the Bundesbank continues to pursue an independent and restrictive monetary policy. As capital flows in from abroad, the Bundesbank will have little choice but

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[8]"Keine Inflation durch Kassenkredite," Frankfurter Allgemeine Zeitung 25 May 1990, p.13.

to revalue the DM, either alone or with the Franc, or risk abdicating its nth degree of freedom in the EMS, as unsterilized interventions and higher inflation endanger its hard money reputation. Not only would a revaluation restrict West German demand, but it would also plough the massive current account surplus back into a united Germany. Barring this, domestic inflation will accomplish the same end.[9]

Supply Side of the GDR

The inflationary effects of the coming demand surge can be mitigated by a strong supply response from East Germany, which would remove the heat from key sectors of German industry, as well as enhance the survival prospects of East German enterprises. Especially in primary metals and materials, the industry of the GDR has good prospects for being able to produce for its own reconstruction.

In order for newly-liberated Volkseigene Betriebe (VEBs) to stay in operation, prices of their inferior output must fall drastically. It seems inevitable that a *relative price divide* between East and West Germany will emerge as a striking consequence of GEMU. Already by the summer imports into the GDR had almost doubled compared with the previous year whereas FRG imports of GDR goods had actually fallen. The modest price reductions allowed by the de Mazière government in the run-up to full liberalization of prices on July 2 --may have prevented worse

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[9]In recent weeks the yield spread on French and Dutch over German 10 year government debt has fallen considerably, suggesting market expectations of the latter outcome.

outcomes. The widespread pessimism over the quality of GDR products in this regard (Siebert 1990) may be exaggerated, if prices are allowed to reflect quality differences. The large fraction of value-added at market prices of GDR output represented by punitive indirect taxes -- about 166% of the aggregate wage bill gross of subsidies, 117% net of subsidies in 1988-- will lend considerable freedom to enterprises to pursue deep price cutting. The DIW (1990a) has estimated a potential for a 20% drop in prices over the longer term.

In more vulnerable sectors, such as food, durable and nondurable consumer goods, and chemicals, a veritable collapse of production is expected. It is hoped that trade with the USSR (roughly 25% of GDR trade, DIW 1990c) will sustain many enterprises and thereby employment (roughly 15% of all employed work directly or indirectly for export to the USSR), but the ultimate cost will be paid by the government, as the Soviets will probably insist on concessions as the barter ruble contract becomes a DM contract.[10]

What is the overall viability of the GDR supply side? Available data, which stemmed from a planned economy that pursued quantity rather than value, are notoriously unreliable. Domestic, not world prices were the measure of value; the lack of competition, high punitive taxes and exorbitant subsidies yielded a textbook example of a distorted economy. It is thus difficult to assess the survival chances of industries, especially since roughly 85% of the economy was insulated from Western market

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[10]See DIW (1990c) and "Sowjetunion und DDR bleiben voneinander abhängig," Frankfurter Allgemeine Zeitung 7 May 1990 p.17.

conditions. Book value of firm assets is wildly overstated, as a large fraction of productive capital is quite old and should be valued at minimal allowable values.[11] Firms are undercapitalized if not already bankrupt, and debt of enterprises is large. The requirement of publishing an opening financial statement in DM, now set for October 1, will no doubt be a cold shower to many firms. On the other hand, the viability of enterprises will be improved now that they own the premises on which they are located.

Estimates of current labor productivity in the GDR economy are not very optimistic, ranging from 30-40% of the FRG level (see Table 3).[12] At the same time, the most recent DIW estimates put East German compensation levels per man (including social insurance contributions, etc) at about 31% of West German levels, at a 1:1 exchange rate; after the imposition of West German tax system, this will rise to about 37%. While these crude estimates contain a wide range of uncertainty, they do suggest, at least on average, that not all GDR industry will disappear. Indeed, managed properly there are several sources of productivity improvements imaginable in both the short and long runs.

Layoffs have both an immediate arithmetic effect on productivity as production is reorganized, as well as an

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[11]Over 50% of the fixed asset stock in industry is more than 10 years old, according to optimistic estimates of the GDR Statistical Office. Adjusting for embodied technology, the age of the capital considerably higher. See Siebert (1990) for more pessimistic estimates.

[12]See DIW (1990a), Schmieding (1990) and Filip-Köhn and Ludwig (1990). The last study was particularly controversial because it employed export prices to value East German output, effectively applying the Mirrlees criterion to this distorted economy.

"efficiency wage effect" on the remaining workforce. State enterprises, which long served as a vehicle of social protection will now layoff large numbers of unproductive personnel. Estimates in early summer hover around 2 million for a labor force of about 8.5 million, with large layoff expected in the fall of 1990. The pure arithmetic effect on productivity (with falling output) could be as high as 25%. In addition, *process improvements* such as accelerated delivery, reduction in production down time, improved maintenance of capital stock will lead to a noticeable medium run increase in worker productivity.

At a longer horizon, *infrastructure* will be improved considerably, but only after several years of persistent investment in telecoms, roads, highways, railroads and pollution abatement. In the same vein, new *business fixed investment* will embody the newest forms of technology and will further stimulate total factor productivity.

The potential to attract large resource flows will depend, of course, on the GDR's attractiveness to both West German and foreign investors. Ostensibly, low labor costs, low prices of nontradable goods like rents, services, well-educated workers, weaker trade unions with collective bargaining at the enterprise level, lack of zoning laws, abundance of space for expansion all make East Germany an investment site competitive with current EC favorites of Spain and Portugal. On the other hand, there is a risk of the "*Mezziogiorno syndrome*," in which the GDR would be condemned to a state of structural underdevelopment and net receiver of transfers for decades. Two scenarios that are often discussed are a wage surge following the abolition of key

subsidies, leading to an effectively "better" exchange rate; another is the real effects of massive unrequited transfers that are inevitable in the near future. For example, if unemployment is 2 million, transfers implied by the currently minimal unemployment benefit amount to DM 495/month x 12 ≅ 6000x 2 million for a year = 12 billion DM. These unemployed will be withdrawn from the productive base and thus increase the demand for nontradables in East Germany. While these transfers will stimulate underdeveloped trade, banking, and personal service sectors, they will also raise the price of nontraded goods and thus prices and wages, thereby reducing locational advantage.

Structural change and the functioning of factor markets will prove critical

Even after rapid improvements in economic efficiency of existing enterprises, monetary and economic union will bring powerful forces of structural change to bear on the East German economy. Free trade of goods and services and freedom movement of factors of production across East and West will guarantee that reallocation of productive potential will constitute an essential ingredient in the transformation of the GDR supply side. Table 4 compares the current structure of employment in the GDR with that the FRG, both currently and in 1974, a year in which labor productivity was roughly half its current level.

The most striking fact is the similarity of the GDR's employment structure with that of the FRG in the early 1970s. Indeed the global sectoral development of the GDR seems to follow the three sector hypothesis of the development economics literature, despite obstruction of market forces by central

planning. This suggests that the supply side -- differential rates of productivity growth in agriculture, industry, and services -- might be more important than income elasticities of demand in driving the three-sector result.

A second striking fact is the modest sectoral employment shifts implied by structural change. Should the GDR move to an employment structure prevailing in the FRG today implied by the crude categories of Table 4, this would entail a net shift of about 312,000 jobs or about 3.5% of the labor force. If instead the GDR moves to the employment structure of the FRG in 1974, the implied shift is only 156,000. While these reallocations cannot happen overnight (they took two decades for the FRG), they must happen relatively quickly and thus the efficiency of the labor market is essential. Here we have little experience to guide us. One important fact is that in developed industrial economies, the inflow and outflow into unemployment due to job losers is remarkably high, and has been rising throughout the 1980s (Burda and Wyplosz 1990). Labor market turnover through unemployment is by no means a sign of a sick economy, but characteristic of structural change. The East German unemployment insurance system, which is largely that of the FRG after 1 July, has contemplated requiring participation in job retraining programs as a condition for longer term support, a move that will prevent deterioration of human capital through long unemployment spells.

In all sectors, net job loss will be largest in the agriculture, and this prediction is supported by the urgency with which a recent DM 11.3 billion aid package was announced for East

German farmers in June.[13] In manufacturing, where specialization was discouraged by state policy and overmanning was rampant, significant restructuring is also likely. A compression of the inefficient and environmentally hazardous energy sector has already begun. In contrast, construction and the service sectors will gain considerably in the course of structural change. The former will profit from massive infrastructural improvement envisioned in the near-future; for the latter, there are enormous demands for trade, financial, and personal services, which were underdeveloped and sometimes nonexistent in the old regime.[14] In the hairstyling industry, for example, the GDR boasts 4000 salons with total employment of 40000, about 2.5 workers per 1000 inhabitants; in West Germany, there are more than 47500 salons with roughly 217500 employees, or about 3.5 hairstylists per 1000 people. In this area alone conservative estimates point to an additional 25000 jobs.[15]

Self-employment represents another source of hope for the unemployed. A considerable base of managerial talent --small to medium size entrepreneurs who were expropriated in 1972-- are ready to reenter the market, as evidenced by the much-heralded 60,000 applications for business permits in the GDR after the enabling legislation was passed. At 1989 West German levels, the GDR economy could support 750,000 self-employed and family help,

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[13]See "Umfangreiche Hilfen für DDR-Landwirte," Frankfurter Allgemeine Zeitung 13 June 1990, p.15.

[14]In the Marxist net material product accounting system, health, education, banking, and transport, were ignored as a source of value-added.

[15]Example taken from "Deutsche Wirtschaft," Beilage der Frankfurter Allgemeine Zeitung 28 May 1990 p. B33.

excluding the farm sector.

The Wild Card: Migration

The most pressing problem facing a German Economic and Monetary Union is the massive income and wealth gap between the FRG and the GDR. See Tables 2 and 3. For GDR residents, migration represents an easy option for several reasons. First there is the lack of bureaucratic hindrance, since all citizens of the GDR have the constitutional right to West German citizenship. Second, language does not function as a barrier to migration. Third, penalties for East Germans have disappeared, and the West German government even continues to support Übersiedler, although this policy has been scaled back in recent months.

The potential for immigration can be seen in recent statistics. Last year more than half a million emigrated to the FRG; of these about 350,000 came from the GDR, largely in a span of four months. By mid 1990 an additional 175,000 had emigrated from the GDR to the FRG; if half of these were adults, this represents roughly 2.5% of the GDR labor force in six months. Although migration has slowed considerably after the announcement of 1:1 parity in March (DIW 1990b) it will certainly resume if the expected mass layoffs do occur.

While migration can serve as a brake on West German wage settlements (remarkably, nominal wages have increased more slowly than forecast), population movements on the order of late 1989 are politically unacceptable and probably economically undesirable. In the most important housing sector, a highly regulated rental

market and supply of houses in the FRG cripples the correct market response to such an imbalance and suggests that unlimited immigration is not first-best.

IV. A Simple Model of Supply Side

We can use classic tools of trade theory to analyze these processes, namely the two sector model of Jones (1965) modified for fixed or less mobile factors by Mayer (1974), Mussa (1974, 1978) and Neary (1978). While what follows is a full employment model, this is only meant to characterize the potential (ie sustainable) level of output for the two countries, given factor endowments, tastes, and technologies.

Both countries are assumed to produce tradable output with the same linearly homogeneous aggregate production function $Y= AF(K,L)$, where K is physical capital, L is labor, and A is Hicks-neutral total factor productivity due to education, infrastructure, learning, embodied technical progress, and general operating efficiency.[16] Denoting FRG and GDR variables with subscripts W and E respectively, we have $A_W > A_E$. For the moment, capital and labor are in fixed supply at $\bar{K}$ and $\bar{L}$, so $L_W + L_E = \bar{L}$ and $K_W + K_E = \bar{K}$.

Regardless of A_W and A_E, constant returns to scale implies that the efficient allocation of L and K between the two countries such that a weighted sum of both countries outputs is maximized --the contract curve-- is a straight line in the familiar

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[16]The analysis can be modified in a straightforward way to account for different production functions and types of technical progress.

Bowley-Edgeworth box depicted in Figure 1. The initial endowment is point F which shows the GDR as a relatively capital-poor country, where capital is measured at world prices and reflects true economic obsolescence. Thus capital-labor ratios are given by AE/AG for the FRG and CE/GD for the GDR.

Directly below the Edgeworth box we locate the demands for labor in the two countries which would obtain under conditions of perfect competition in product and (segmented) labor markets at wages w_E and w_W, with traded output prices equalized at a normalized price of unity.[17] Thus for each country the labor demand is the set of points traced out by the condition $A_W F_L(K_W,L_W)=w_W$ and $A_E F_L(K_E,L_E)= w_E$, where East German enterprises have fully adjusted through layoffs and structural change and have absorbed the initial stock of unemployment. Under these conditions it can be shown that the evolution of relative factor rewards in the two countries to capital r_E/r_W, and w_W/w_E are governed by the relationship

$$\hat{r}_E-\hat{r}_W = \frac{\theta_{LW}}{1-\theta_{LW}}\hat{w}_W - \frac{\theta_{LE}}{1-\theta_{LE}}\hat{w}_E .$$

Where θ_{ij} is the share in factor income accruing to factor i in country j, and carets (^) denote growth rates. When $\theta_{LE}=\theta_{LW}$, the percentage change in the gross return on capital is a simple linear function of the change in the wage differential.[18] Labor demands are given by

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[17]We will later discuss the effect current proposals to levy duties on West German exports to East Germany.

[18]This would occur if production function had the Cobb-Douglas form or if factor intensities were identical.

$$\hat{L}_W = -\frac{\sigma}{1-\theta_{LW}}(\hat{A}_W - \hat{w}_W)$$

and

$$\hat{L}_E = -\frac{\sigma}{1-\theta_{LE}}(\hat{A}_E - \hat{w}_E)$$

where σ is the elasticity of substitution between capital and labor.

While labor is not instantly mobile, wage differentials --and probably more important, changes thereof--will stimulate migration. However, wages relevant for firms measured in the national income and product accounts differ from the take-home wages received by consumers. The difference is generated by *nontraded, or home goods* including rents, transportation, health care, personal services, etc. If the relative price of these in terms of national output is denoted as p_H, then the evolution of consumption wages follows $\hat{w}-\lambda\hat{p}^H$, where λ is the share of income spent on home goods. The relative price is taken as exogenous and under control of the government via regulations or subsidy policies.[19] We model migration as linear in the change in the consumption wage differential between the two countries:

$$\hat{L}_W = \phi[\hat{w}_W - \hat{w}_E - \lambda(\hat{p}^H_W - \hat{p}^H_E)] \qquad \phi>0$$

A justification of this formulation might be a "fixed cost of migrating" at the individual level, which would induce a band of inaction, as in Dixit (1989). Since this is a full employment

[19]Here we implicitly assume that the subsidy is financed by lump sum taxes.

model, labor supply and labor demand are equal, so demand and supply subscripts are suppressed. In addition, the labor force constraint implies

$$\hat{L}_W = -\gamma\hat{L}_E$$

where $\gamma = L_E/L_W$. The solution of the model in terms of its exogenous variables is

$$\hat{r}_E - \hat{r}_W = \frac{\phi(\theta_{LE}+\gamma\theta_{LW})}{\sigma\gamma + \phi[(1-\theta_{LE})+\gamma(1-\theta_{LW})]}\,[\hat{A}_E - \hat{A}_W + \lambda(\hat{p}^H_W - \hat{p}^H_E)]$$

$$\hat{w}_W - \hat{w}_E = \; = \frac{\sigma\gamma}{\sigma\gamma + \phi[(1-\theta_{LE})+\gamma(1-\theta_{LW})]}\,(\hat{A}_E - \hat{A}_W)$$

$$+ \frac{\phi[(1-\theta_{LE})+\gamma(1-\theta_{LW})]}{\sigma\gamma + \phi[(1-\theta_{LE})+\gamma(1-\theta_{LW})]}\,\lambda(\hat{p}^H_W - \hat{p}^H_E)$$

$$\hat{L}_W = \frac{\sigma\gamma\phi}{\sigma\gamma + \phi[(1-\theta_{LE})+\gamma(1-\theta_{LW})]}\,[\hat{A}_W - \hat{A}_E + \lambda(\hat{p}^H_E - \hat{p}^H_W)]$$

$$\hat{L}_E = \frac{\sigma\phi}{\sigma\gamma + \phi[(1-\theta_{LE})+\gamma(1-\theta_{LW})]}\,[\hat{A}_E - \hat{A}_W + \lambda(\hat{p}^H_W - \hat{p}^H_E)]$$

The analysis above indicates that the rate of return gap $\hat{r}_E - \hat{r}_W$ *can be significantly influenced by the evolution of nontraded goods prices*. To the extent that they are under the control of the GDR or FRG governments, relative home goods prices (rents, transport, personal services) can serve as a tool to

reduce migration from and raise investment in the GDR. Such a policy would have all the effects of a depreciation without an exchange rate. Ironically, the logic is exactly Minford's (1985) applied in reverse: depressing housing prices will inhibit labor mobility. In this respect the reluctance of the GDR to adopt a big-bang deregulation of the housing market and the concomitant rise in rents is probably beneficial for the evolution of business fixed investment. The cost of such a strategy, of course, would be the further neglect of renovation of the GDR housing stock. With a given amount of available investment, policymakers should probably favor capital stock improvement over residential construction, especially if the former embodies technology and thus positive growth externalities. In addition, elimination of generous subsidies provided to GDR migrants to the FRG would further decrease the consumption wage gap between the two countries.

A second conclusion is that the government can choose the "high K track" by directly influencing the evolution of A in both countries. An increase in A_E would raise labor demand and product wages in the East and thus reduce migrant outflow; since total factor productivity increases, the relative rate of return on capital remains unaffected. A decisive surge of public capital spending on roads, bridges, telecommunications, etc, would enhance total factor productivity, and increase both wages and the return to capital in the GDR. Although much of this transfer should occur without government help, the new "German Unity Fund" is probably driven by this thinking.

This analysis must be modified for, but is not significantly altered by, the presence of labor market distortions eg

collective bargaining in the FRG. If markets do not clear, then relative unemployment will drive migration and the analysis can be modified correspondingly. One need only alter the model to allow for a labor offer curve. As long as unions are sensitive to unemployment, the main conclusions will carry.

Third, it is straightforward to understand the current lobbying underway in the GDR for import duties on FRG goods. With perfect mobility of labor, it would increase the price of the factor used most intensively (labor) in the GDR relative to the FRG. This however, would also depress the rate of return on GDR investment, and thus in the *long run* is against the interest of both factors of production. This is similar to the conflict between short and long-run interest of factor owners described by Mussa (1974) in a two-sector factor specific model.[20] With migration modeled as depending on the change in consumption wages instead, both factors in the GDR stand to gain from tariffs. The usual objections remain however, that smuggling across borders would quickly distort the allocation of retail activity across the two Germanies.

The absence explicit modelling of the evolution of capital is intentional, and the model is therefore not closed. Naturally, the evolution of rate of return differential r_E/r_W will be a key determinant of aggregate physical capital flows as in models of Mussa (1978) and Neary (1978); for the reasons of fixed cost

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[20]In an effort to stem this protectionist tide, the West German government has recently announced a VAT reduction on GDR products sold in the FRG. See "Waren aus der DDR begünstigt," Frankfurter Allgemeine Zeitung 15 June 1990 p.17.

inertia, $\hat{r}_E - \hat{r}_W$ would matter as well.[21] A more detailed analysis would consider changes in economic and political risk as well as the price of capital goods, costs of adjustment, and the expectations formation of agents (Mussa 1978). The wage margin faced by firms will in turn be influenced by the evolution of the real consumption wage differential between the GDR and the FRG, which determines the incentive to migrate.

The effect of a flow of capital from the West to the East $(\hat{K}_E - \hat{K}_W)$ will be to shift the endowment point from F down towards the diagonal; migration from East to West moves F to the right. At the same time, the demand for labor will rise in the GDR and fall the FRG, closing the product wage gap. Note that $\hat{L}_E = 0$ is consistent with a positive product wage gap, as long as individuals face large fixed costs of migrating.

This sketch of a model leaves several questions unanswered. In reality the evolution of wealth in both countries will also affect $\hat{p}^H_E - \hat{p}^H_W$, to the extent that some of these goods are not controlled by the government. In addition, the total endowment of physical capital will be affected by activities of foreigners, increasing the height of the Bowley-Edgeworth box.

V. Conclusion: The Economic Costs of GEMU

Perhaps the most discussed aspect of the economic and monetary union within the two Germanies is the magnitude of

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[21]Without level effects, the model would likely be characterized by hysteresis, or state dependence, as endogenous variables would have no tendency to return to original values once the source of change was removed.

resource transfers necessary to effect dramatic improvements in GDR living standards. These resources include basic infrastructure, telecommunications, productive plant and equipment, construction of new housing stock and restoration of old, and the cleanup of decades of environmental neglect. Estimates range from 500 billion to over 2 trillion DM over the next ten years. Relatively speaking, such resource flows are not unusual: DM 100 billion per year (ECU 50 billion) represents only 4% per year of the new DM Zone's GNP. Current account deficits in Spain and the UK have recently climbed to comparable levels, and have been much higher in smaller countries.[22] US current account deficits since 1982 sum to more than 20% of GNP! It is easy to forget that current account deficits of the war-ravaged continental European nations were well above these figures. Moreover, the likely take-off of East German GNP will reduce the relative significance of the flows, just as the US has "grown" out of its own current account deficit. Rising world real interest rates will call forth savings and, given Germany's net creditor position vis-a-vis the rest of the world, lighten the transfer burden.[23]

Perhaps more interesting is the *burden* of financing these resource flows. By the national income identity, the accounts of the public, household, business, and foreign sectors will be

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[22]One should not forget the Italian budget deficit, which draws in 10% of GNP per annum. Here however, private domestic sources provide most of the financing.

[23]Given a crude estimate of Germany's net external position of DM 1 trillion, a one percentage point increase in the real interest rate means an additional DM 10 billion per year.

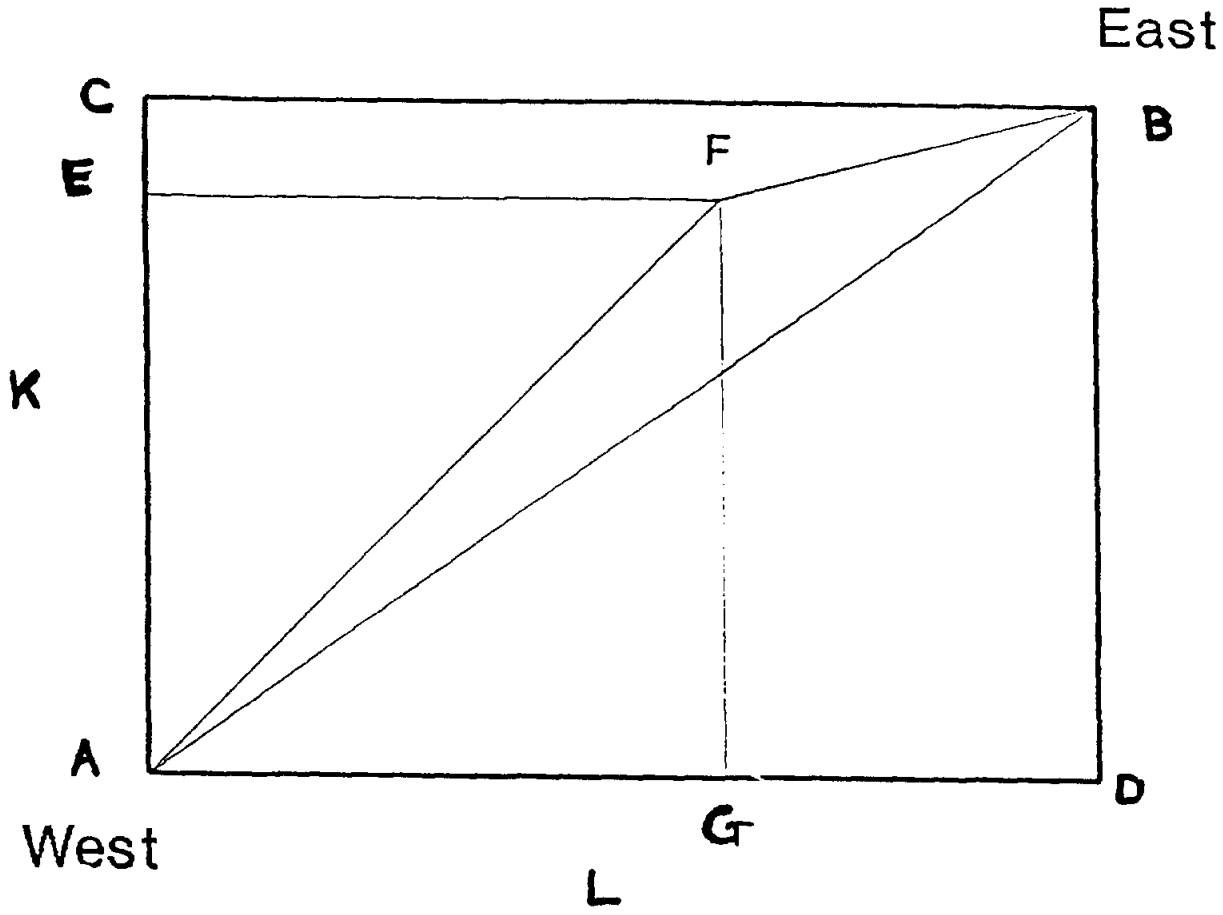
called upon to provide these resources. The domestic private sector is expected to supply the lion's share of resources by either directly investing in East German enterprises or by lending to East German individuals. No public agency can carry such a burden alone. The legal questions however, surrounding the *Eigentumsverhältnisse* (property rights) might effectively slow significant flows of resources. Beginning with the land reform of 1946, a succession of official expropriations stripped many citizens of their physical assets. In addition, the property of refugees and illegal emigrés was seized. Hence purchase of real estate and existing production facilities entails significant risk of "re-expropriation" by the original owners. Similarly, unknown environmental liabilities and cleanup costs of existing enterprises in heavy industry attenuate the attractiveness of investment opportunities.

As the model suggests, labor will not wait for private capital. *Faute de mieux*, it is likely that government will effect a transfer of similar magnitude to stem the migration tide. The establishment of a DM 115 billion fund (90 billion bond issue plus 25 savings) over four years will be available for funding infrastructural investment as well as the East German budget shortfall, and even more aggressive public expenditure is to be expected. In addition, the widespread unemployment will be paid out of West German funds in the initial period; assuming 2 million unemployed plus retraining schemes, might lead to transfers on the order of DM 12-15 billion. Welfare payments, retirement pensions now paid from the FRG budget and subsidies for construction will also provide an additional impetus.

The redistribution within East and West Germany is another aspect of the resource flow. Although the state treaty provides for the establishment of a value-added tax in the GDR and, in 1991, an income and corporate income tax, it is unlikely that significant revenues will be generated in the short-run. Hence the projected GDR budget deficit of more than DM 50 billions, (about 20% of estimated GNP), will be largely assumed by the FRG. While immediate contribution from East German households to savings is unlikely, the GDR government is wealthy, owning 90% of productive capacity and more than 70% of the housing stock. The rapid privatization of a large block of enterprises and housing stock would enable the GDR government effectively to reduce its own claim on the flow of resources. In any case, the pending German Keynesian boom -- as Alain Minc recently described it in *Zeit* magazine-- will lead to higher tax collection in both countries.

In the meantime the Deutsche Bundesbank, West German taxpayers, current creditors of the West German government, and the European Community will be the likely contributors to the next German economic miracle. At 4.5% of GNP in 1989, the considerable West German current account surplus will finally prove its function as "saving for a rainy day."

FIGURE 1



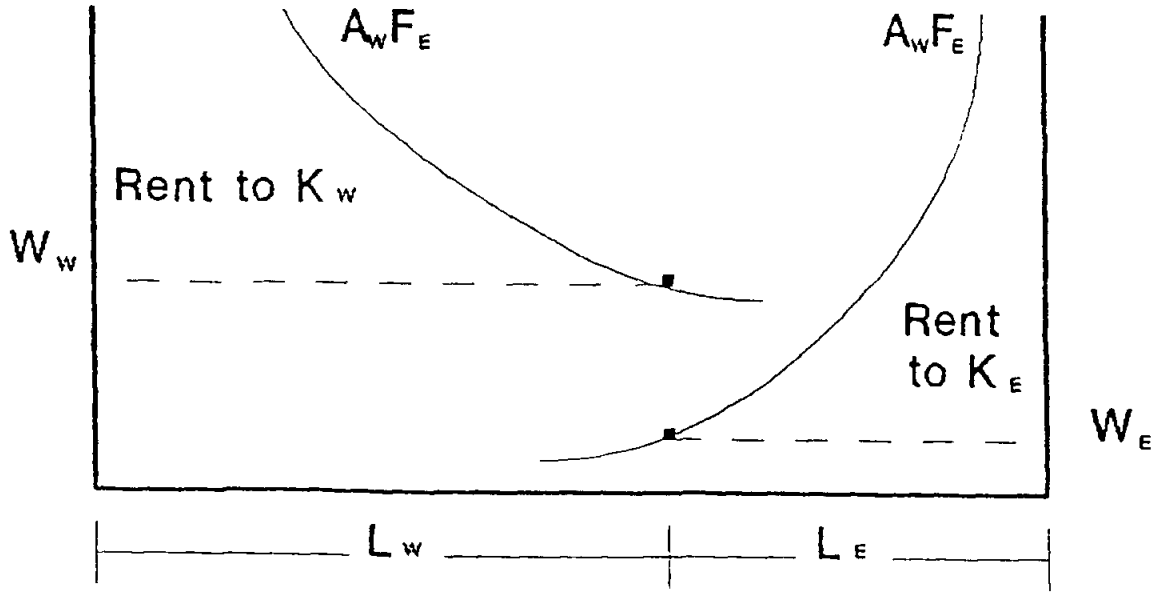


Table 1
Consolidated Balance Sheet of the Banking System in the GDR, Yearend 1989
(billions of Ostmark)

Assets		Liabilities		
Loans to Enterprises	260	Liabilities to Households		176
		Of which:		
Loans to Local Govts incl housing	132	Savings accounts	162	
		Insurance policies	14	
		Cash in circulation		17
Loans to Households	26	Deposits of Enterprises		60
Foreign Assets				
Socialist countries	12	Deposits of Local Govts		23
Nonsocialist "	33			
		Foreign Debt		
		Socialist countries		1
		Nonsocialist		67
Other Assets	4			
		Net Worth and other reserves, incl "Richtungskoeffizient" Fund[24]		122
Total[25]	467			467

Source: Geschäftsbericht der Staatsbank der DDR; DIW.

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[26]Reserves created to compensate for excess of domestic prices of imported goods sold over world market prices, less subsidy of goods exported at prices less than domestic levels, converted at the fictive exchange rate of 1 OM = 1DM.

[25]May not sum exactly due to rounding.

[26]Banking, insurance, hotels and restaurants, health, consulting, and other services.

Table 2
Monetary Aggregates 1989

	Total (bill OM/DM)	Per capita (OM/DM)	% of GNP
Currency (1989)			
GDR	17.0	1024	7.2%
FRG[1]	146.9	2377	6.4%
Savings accounts of households (1988)			
GDR	151.6	9091	64.5%
FRG	714.6	11579	31.6%
M2 (1989)			
GDR[2]	222	13373	94.4%
FRG	776.4	12563	34.3%
All Financial Assets of Households (1988)			
GDR	183.8	11022	78.2%
FRG	2514.7	40747	111.3%

[1]Includes cash held by foreigners
[2]Includes deposits of Kombinate

Source: Sachverständigenrat, Deutsche Bundesbank, Staatsbank der DDR

Table 3
Economic Statistics
(1988)

	GNP (billions DM)	Population (thousands)	Employees (thousands)	GNP/ head	GNP/ worker
GDR	230-240	16600	8670	14200	27100
FRG	2260.4	61800	24350	36800	92800

Table 4
Structure of Employment in the GDR and FRG

	GDR (1989)	FRG (1988)	FRG (1974)
Agriculture	920 (10.3%)	1271 (4.9%)	1842 (7.0%)
Industry	4026 (45.2%)	10469 (40.1)	12311 (46.5%)
Manufacturing	3168 (35.6%)	8273 (31.7%)	9618 (34.6%)
Energy/Mining	295 (3.3%)	479 (1.8%)	517 (2.0%)
Construction	563 (6.3%)	1717 (6.6%)	2176 (8.2%)
Trade/Transport/Comm.	1349 (15.1%)	4870 (18.7%)	4968 (18.7%)
All Other Services	2615 (29.3%)	9469 (36.3%)	7376 (27.8%)
"Private" Services[27]	1041 (11.7%)	4267 (16.4%)	3171 (12.0%)
Gov't and Households	1574 (17.7%)	5202 (19.9%)	4205 (15.9%)
TOTAL	8910	26079	26497

Sources: DIW, Staatliche Zentralverwaltung für Statistik der DDR, Sachverständigenrat

[27]Banking, insurance, hotels and restaurants, health, consulting, and other services.

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