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1400 16th Street, NW / Suite 350
Washington, DC 20036
(202) 939 - 3450

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East Germany In From the Cold: The Economic Aftermath of Currency Union

George A. Akerlof*

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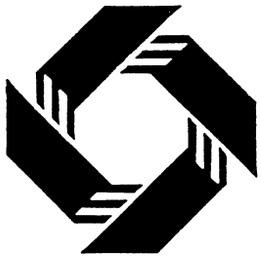

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East Germany In From the Cold: The Economic Aftermath of Currency Union

George A. Akerlof*

Professor of Economics
University of California at Berkeley

and

Senior Research Fellow
Institute for Policy Reform

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Adjustments in the East German economy resulting from the currency union with West Germany are a source of continuing problems. Recommendations for policies to assist in the adjustment process are developed. Two new data sets are used. The first data set adjusts previously unpublished expense data of GDR conglomerates to estimate the consequences of the price-cost squeeze in the goods market, and finds that firms employing only 8% of the labor force were viable after the currency union. The second data set is a survey of GDR workers to determine their propensity to migrate and the factors which are likely to influence their decision, and discovers that while a wage differential between East and West Germany will not induce migration, higher unemployment in East Germany will cause workers to migrate. Examination of the privatization process, and concludes that the negative value of many firms is causing this process to move slowly. Two policies are proposed to deal with these problems: a rapid infrastructure investment program and a program of employment bonuses.

*With Andrew K. Rose, Janet L. Yellen and Helga Hessenius
University of California at Berkeley

Introduction

At midnight on June 30, 1990 German economic, monetary and social union occurred: the Mark of the GDR was replaced by the Deutsche Mark; trade barriers were lifted; legal, tax, and social insurance systems were harmonized; and all existing barriers to capital and labor movements were removed. Within days, a severe price-cost squeeze was apparent. East German producers could not profitably sell their goods at prices which buyers--East German, West German or foreign--were willing to pay. Moreover, demand for domestically produced output fell as consumers diverted their spending toward Western products. As a result, there was a severe decline in output; unemployment and short-time hours rose rapidly. One of the worst and sharpest depressions in European history had begun. It continues unabated.

This paper will first document the basic facts of this depression: what has happened to output, employment, wages, prices, vacancies, and other macroeconomic aggregates. We then explore the twin reasons for the depression: producers can not supply products at market prices and meet their short-run variable costs; and there were declines in demand for domestically produced consumer and investment goods.

We examine the consequences of the price-cost squeeze for three separate markets. In the market for goods, we calculate the fraction of East German conglomerates that are unable to sell their products at world market prices while meeting only their variable costs. Our estimates are based on a unique unpublished data set which gives the expense that each major conglomerate in the GDR incurred, in Mark, to earn a DM of foreign currency in trade with nonsocialist countries. We adjust these expense figures to take account of important changes which have affected the costs of East German firms since

Currency Union. The adjusted data show that firms employing only 8 percent of the labor force were viable after Union in the sense that they could earn sufficient revenue to cover short-run variable costs in the absence of significant productivity improvements. These calculations undermine prior estimates of high productivity in socialist countries.

The second consequence of the price-cost squeeze is the high incidence of unemployment and short-time work prevailing and expected to continue in the labor market. In the State Treaty authorizing Currency Union, wages in Mark were converted into Deutsche Mark at par. At Currency Union, these wages were well above market-clearing, so that firms could not profitably employ much of their labor. With large and growing slack in the labor market, downward pressure on wages might have been anticipated. Yet, on the contrary, wages subsequently climbed higher still. Unions pressed for a schedule to attain wage parity despite the economic collapse in the East. A pattern-setting contract signed in March with the metal workers' union, IG Metall, achieves parity in 1994. In arguing for higher wages, the unions have said that such wage hikes are necessary to keep qualified Eastern workers from migrating to the West. We conducted a survey of East German workers in order to determine their propensity to migrate and the factors which are likely to influence their decisions. We found that few workers will migrate for higher Western wages; most prefer to work in the East in spite of the wage differential and are prepared to wait there for new jobs to appear if they become unemployed. They will accept jobs in the East which pay wages significantly lower than jobs in the West. The real cause of most migration will be the lack of availability of Eastern jobs--not the wage differential. Higher wages will cause more migration by increasing unemployment than they will deter by closing the wage gap. Over the longer

run, a significant proportion of the population will migrate. This migration, together with investment, will eventually cure the Eastern unemployment problem.

We also examine the consequences of the price-cost squeeze for the Treuhandanstalt, the newly formed agency which holds the shares of stock of former GDR public corporations in trust for the German Government. Privatization has proceeded slowly. Bureaucratic problems and confusion over property rights account for some delays; but these are not the fundamental causes of the Treuhand's difficulties. The fundamental problem impeding privatization is that the majority of East German firms have *negative* value if they are operated, since their costs exceed their revenue. Such firms can be sold for their real estate or scrap value, but not to individuals or firms who will operate them. Currently, the Treuhandanstalt is faced with a choice of either subsidizing or liquidating such money losing firms.

At the present time, the German government is offering subsidies to encourage investment spending in the East. They are also financing the budget deficits of the Eastern Länder (states) to permit them to pay their bills and make needed infrastructural investments. Infrastructure investments are important because they constitute a precondition for private investment on a significant scale. Moreover, these job-creating investments are especially cheap at present. They enable individuals whose support would otherwise be provided by the German Government to support themselves. If a typical individual moves from unemployment to employment, the government budget benefits by 79 percent of his previous compensation because of reduced payments for unemployment compensation and increased social insurance and tax revenues.

So far, however, the package of policies which has been enacted fails to deal

realistically with the questions of how to preserve existing jobs, to speed new job creation, and to make existing companies sufficiently close to being viable that they can be privatized. The major problem is that wages in the East are too high for existing firms to cover their costs. High wages also deter new investment. This creates an obvious need for governmental measures to close the gap between the high private cost of labor--due to high Eastern wages--and the low marginal product of labor--due to outmoded capital and technology. We propose a program of self-eliminating flexible employment bonuses (SEFEBs) to eliminate this gap. Our analysis shows that this program would give many workers a chance to keep their jobs and would also raise the level of new job creation through faster private investment. According to our estimates, even deep wage subsidies (75 percent of current wages) would have very low budgetary costs; and they might even *reduce* budget deficits--largely for the same reason that infrastructural investment is not costly: the government is already committed to a high level of income support even if workers are unemployed. By making many Treuhand firms profitable, employment bonuses will permit their rapid privatization. Firms which are privatized will speed the transition to a modern economy by introducing Western management, technology, and work habits.

We propose two policies: a rapid infrastructure investment program along with a program of employment bonuses. These policies address the twin East German problems of insufficient demand and a severe price-cost squeeze. Such programs are needed for the East German miracle to begin.

Finally, by way of introduction, we should emphasize that the focus of this paper is the economic situation in East Germany. Thus, only tangentially, do we discuss the effects of

Currency Union on the West German economy; we do not address at all the effects on the rest of Europe or on European integration. These other issues are important; they are, however, not the topic of this paper.[1]

I. The Consequences of Economic Union in the Product and Labor Markets

Output, Employment and Productivity. The most immediate and striking consequence of Currency Union was a depression in East Germany virtually without historic precedent. By December 1990, production of goods was 45.5 percent of its 1989 level. As Table 1 shows, much of this decline was concentrated in July 1990, the month of Currency Union. During this single month, industrial output in East Germany plunged 35 percent. The declines in output of goods were widespread, affecting every major industrial sector and virtually every commodity. Table 2 provides indices of output for ten industrial sectors, showing that no sector escaped the East German depression. Disaggregated data on production of selected commodities reveals dramatic examples of the severity of the Depression: for example, by December 1990, output of cement was at 21 percent, bicycles at 37 percent, cellulose at 25 percent, and pasta products at 27 percent of their respective production levels in December 1989.[2]

Direct measures of output provide clear evidence of a decline in the production of manufactured goods. No comparable output measures are available for other sectors of the economy. However, employment figures provide indirect evidence of substantial declines in economic activity outside of manufacturing. Table 1 tabulates the number of employees, including short-time workers, in four sectors of the economy. By November 1990, the number of employees in industry, construction, transportation and

communications, and trade had declined by 25 percent, 27 percent, 17 percent and 29 percent respectively, in comparison with their 1989 averages. These employment declines substantially understate the decline in manhours worked in East Germany because by November 1990, 20.1 percent of the workforce had been placed on involuntary "short-time" by their firms and were reporting for work roughly 50 percent of normal time.[3] Further, as Table 1 shows, industrial output declined by more than industrial employment so that labor productivity in East German industry fell after Currency Union. If, as seems likely, this same pattern holds elsewhere, the employment declines in nonindustrial sectors reported in Table 2 understate the relevant output declines in these sectors as well.

Unemployment, Short-time and Vacancies. As East German output declined, substantial slack developed in the labor market. The evolution of unemployment, short-time employment, and vacancies is reported in Table 3. By February 1991, the unemployment rate had reached 8.9 percent and an additional 21.5 percent of the workforce was on involuntary short-time. This was not accompanied by an expansion of new job openings; rather, vacancies plummeted. By January 1990, vacancies stood at a mere 14.5 percent of their level a year earlier. The increasing unemployment over 1990 has been accompanied by a fall in vacancies, with an almost perfect fit of unemployment and vacancies to an unshifting rectangular hyperbolic "Beveridge" curve.

Prices and Wages. The decline in East German output was accompanied by equally large declines in East German *producer* prices. Beginning on July 1, 1990, East German firms were required to set prices for their goods in DM; prior to July 1, all prices had been quoted in Mark. Firms in industries other than energy and water supply were given full discretion to set product prices. Table 2 shows the evolution of producer prices

between May 1990 and August 1990 by sector within industry. As is apparent, firms used their new discretion to lower prices substantially--by almost 50 percent in a single month.

Although producer prices were roughly halved following Currency Union, *consumer* prices remained almost unchanged until January 1991 when subsidies on energy were ended and those on transportation were partially eliminated; as of October 1990, the East German CPI stood about 2 percent below its 1989 level. Table 4 provides a detailed breakdown of the behavior of the CPI before and after unification. The divergent behavior of consumer and producer prices occurred primarily because enormous price subsidies on food were eliminated; the retail prices of food rose, while producer prices declined.

The divergent movements of producer and consumer prices led to divergent movements in real *product* and *consumption* wages. The State Treaty governing Currency Union specified that contractual wage and salary payments would be converted from Mark to DM at par. Since *preexisting* wage contracts remained unchanged in nominal terms, while producer prices fell roughly 50 percent, real *product* wages--the ratio of gross wages to product prices--approximately doubled in July 1990.[4] In contrast, real (gross) *consumption* wages--the ratio of gross wages to the cost of living--rose only minimally during July. This characterization of real wage behavior, however, abstracts from the large changes in nominal wages which occurred during 1990 both before and after Currency Union. Table 5 tabulates average gross monthly wages for full time workers by industrial sector. Nominal wages in industry rose 41.9 percent between the first quarter of 1990 and October, 1990, with 22.6 percent of this increase occurring prior to Currency Union.[5] As a consequence, real product wages in East Germany almost tripled between January 1990

and October 1990, while real (gross) consumption wages increased roughly 45 percent over this same period. Finally, in contrast to the 42 percent rise in nominal wages, net wages rose by only 22% through October 1990 according to our estimates.[6] The difference is due to the high West German rate of social security taxation and also the high marginal tax rate on income. This calculation omits, however, the perhaps substantial real income gains which occurred when imported consumer goods, unavailable prior to Currency Union, became freely available afterwards. Estimates of the change in the cost of living, which are based on a fixed consumption bundle, omit the gains from this enormous increase in choice.[7]

In summary, Tables 1 to 5 reveal the major consequences of Currency Union for output, employment, wages, and prices: output and producer prices each fell by roughly 50 percent as a consequence of Currency Union while the cost of living remained virtually unchanged. The precipitous declines which occurred in output and prices were concentrated in July 1990--the month of currency union. Employment has declined and short-time work has increased significantly albeit more gradually. As a consequence productivity, as of October, had declined dramatically. Over 30 percent of East Germans are now unemployed or on short-time; vacancies have all but disappeared. In spite of this, wages have increased substantially and continue to rise.[8] This paper seeks to explain the East German economic depression and develop policies to counteract it.

Why Did Output Decline?

According to the theory of comparative advantage, the removal of barriers to trade in a small open economy like East Germany causes the prices of tradeable goods to attain equality with those prevailing in world markets. As relative product prices change,

profitability rises in sectors with comparative advantage (i.e., relatively low costs), providing an incentive for expansion in output; the opposite happens in sectors with comparative disadvantage.

If all factor prices, including wage rates, are flexible, no involuntary unemployment occurs when free trade is instituted, even in the extreme case in which labor (and capital) are completely immobile. Voluntary unemployment will undoubtedly occur, however, as workers leave declining sectors and move to expanding sectors in search of higher labor income, perhaps retraining en route.[9]

The comparative advantage paradigm offers clear predictions concerning the behavior of macroeconomic aggregates following a move to free trade: output and employment should expand in some sectors and contract in others. Unemployment should rise as workers leave contracting industries, but vacancies should also rise as new jobs are created in expanding sectors: the Beveridge curve should shift outward. The predictions of the theory of comparative advantage are grossly violated in the East German case. Output and employment have contracted in *all* sectors--not just in some sectors. The Beveridge curve has not shifted outward; rather, the East German economy moved along a fixed Beveridge curve.

The predictions of the theory of comparative advantage do not apply in the East German case for one overriding reason: wages in East Germany are well above the "full employment" market-clearing level. A significant gap between actual and market-clearing wages existed at the time of Currency Union; since that time, nominal wages have continued to rise. For this reason, the advent of free trade on July 1 placed the majority of East German firms in a severe price-cost squeeze. Few firms producing tradeable

goods could cover their short-run variable costs at the wage rates prevailing on July 1 even if they had been able to sell these goods immediately, in unlimited quantities, at "world" prices. This is the first cause of the current depression in East Germany.

The second reason for the swift decline in output was the sharp drop in demand for Eastern goods after Currency Union. Demand declined because East German consumers and firms diverted their spending for consumption and investment purposes toward previously unavailable West German products and away from East German goods on a massive scale. It seems likely that total investment spending also declined. Demand will soon fall further as exports to CMEA countries decline. Even in the absence of any price-cost squeeze, such declines in demand would have reduced output in East Germany because most Eastern firms faced highly inelastic *short-run* demand curves for their goods in world markets. These firms, abandoned by their traditional customers, simply could not find enough new buyers, quickly enough, to avoid a significant slump in sales--even at "world prices." In addition, a number of miscellaneous factors, which are beyond the scope of this paper, such as the lack of compatibility of Eastern goods and Western standards, and environmental and safety problems, contributed to the decline in output.

The two major factors which account for the decline in output can be illustrated in the standard demand and supply framework, shown in Figure 1. The curve SS depicts the East German supply curve of a typical tradeable good, as a function of its producer price in DM, following currency conversion at initial money wage rates. Assuming putty-clay technology, short-run variable cost is constant at the level $\hat{p}$. At this minimum price, supply is perfectly elastic up to capacity, Y_f. The value of $\hat{p}$ depends critically on the value of the wage, which was, in turn, at least initially, proportional to the exchange rate of

unity chosen to convert wage contracts denominated in Mark into their DM equivalents.[10]

The curve LRD depicts the *long-run* demand curve for the typical tradeable good. Long-run demand is assumed to be infinitely elastic at the world price p*. In the situation depicted in Figure 1, $\hat{p}$ exceeds p*, so that the firm--in the absence of technological change, improved labor productivity, or new product design--must go bankrupt unless subsidized. At the wages prevailing at Currency Union, most East German firms faced bankruptcy--the situation illustrated in this figure.

The curve labeled DD depicts the *short-run* demand for the typical East German tradeable good after Currency Union. It is not fully elastic because of difficulties in finding new customers on the part of firms and difficulties in switching suppliers on the part of customers. As drawn, the demand for this good after Currency Union amounts to Y_1 at the long run equilibrium price, p*. Sales fall short of Y_f, the full capacity output, because East German consumers, prior to Currency Union, had been denied freedom of choice. When trade became free, expenditures were diverted toward previously unavailable Western products. In order for firms to sell capacity output in the short run, prices for Eastern goods would have had to fall below the long-run equilibrium level p*--to p_s in Figure 1.

Equilibrium in the markets for most tradeable goods following Currency Union is illustrated by point E in Figure 1: sales fell far short of capacity production, and DM prices were above the level required for full employment in either the short run (p_S) or the long-run (p*). The output decline, from Y_f to Y_0, can conceptually be decomposed into two independent portions: the portion due to the demand switch away from East Ger-

man products; and the portion due to the price-cost squeeze. The distance $\Delta Y_{\text{demand shift}}$ represents the decline in output due to the demand shift. The distance $\Delta Y_{\text{price-cost squeeze}}$ represents the decline in output due to the price-cost squeeze--the loss in sales which occurred because firms could not price their products competitively and still cover short-run costs. Because the Treuhandanstalt has thus far provided loans and subsidies which allow firms to sell their products at prices *below* short run variable cost, the decline in output due to the price-cost squeeze has not yet fully materialized.

II. The Price-Cost Squeeze.

This section documents that wages are *in fact* above market clearing. That is, at prevailing Eastern wages and world market prices, most Eastern firms that produce tradeable goods are unable to cover even their short-run costs of production. We later discuss the various factors which account for the behavior of wages.

The Domestic Resource Cost of Foreign Exchange.

We have obtained a data set, previously used for planning purposes by the government of the former GDR, which we can adjust to estimate the extent of the current price-cost squeeze in East German industry. We will also use this data to assess the current "viability" of Eastern industry under alternative assumptions about the evolution of wages and productivity. We consider a firm to be "viable" if the world price of tradeable goods (p^* in Figure 1) exceeds the short-run average cost of production at full capacity ($\hat{p}$ in Figure 1). If the short-run average cost curve is horizontal, as drawn in Figure 1, viable firms earn positive quasi-rents and hence do not require subsidies to remain in business, although they may not operate at capacity if demand in the short run is insufficient.

Because viable firms may earn less than a competitive return on either existing capital or new investment, according to our definition, they may be unable to remain in business in the long run.

Planners in the GDR routinely tabulated the foreign currency proceeds from export sales to nonsocialist countries as well as the cost, at producer prices in Mark, of the goods which were exported, for every Kombinat (conglomerate) which sold products in the markets of Western and developing countries. Our data measures the *domestic resource cost of earning foreign exchange* of 116 Kombinate in 1989: the expense incurred--at producer prices in Mark--per DM earned in nonsocialist export sales. Alternatively stated, our figures give the long-run average cost (plus any excess profit) in Mark of earning a DM in world markets before Currency Union. Most Kombinate exported to nonsocialist countries (indeed, nonsocialist exports amounted to about 20 percent of GNP in 1989), and thus the data set covers almost the entire industrial sector.[11] Comparable data is also available for each of the 183 individual enterprises within these Kombinate which sold more than 10 million DM of goods in Western markets. Finally, our data set includes measures of the domestic resource costs of East German conglomerates in socialist trade--defined as the expenses incurred by East German firms per transfer ruble earned in CMEA sales.[12]

The expenses incurred by East German firms in selling their products in world markets, when appropriately adjusted, provide a good measure of the viability of East German firms under free trade.[13] In domestic markets, GDR consumers were unable to "vote with their feet;" hence the prices paid by East Germans for products produced in the GDR serve as a poor gauge of what consumers would have been willing to pay if they had

been free to choose Western goods. Similarly, the prices in CMEA trade are not useful because sales were politically negotiated. But the prices paid by customers in Western industrial and developing countries are an accurate reflection of their world market values under free trade. In this section we first present the unadjusted domestic resource cost data and then explain how it can be adjusted to yield a current measure of conglomerates' short run average variable costs and viability.

Table 6 and Figure 2 summarize the raw cost data. The average expense incurred in Mark, per DM earned in non-socialist sales, was 3.73 in 1989.[14] Alternatively stated, an index of the producer prices of East German industrial exports (in Mark) was over three times as high as an index of the producer prices (in DM) of comparable goods in Western markets.[15] Table 6 also presents domestic resource cost ratios disaggregated by industrial sector. The cost in Mark of earning a DM varies significantly across sectors ranging from a low of 2.08 in the energy sector to a high of 4.82 in the electronics sector. An inspection of the enterprise level data reveals that only a *single* firm in East Germany outside the energy sector--the State Porcelainworks of Meissen--had costs of less than unity per DM earned. The costs in the energy sector do not include the environmental costs due to the use of brown coal.

The sectoral averages presented in Table 6 conceal enormous intrasector variation in costs across Kombinate and individual firms. For example, in electronics, the Carl Zeiss Kombinat had an expense ratio of 3.66 per DM earned, while the Kombinat Mikroelektronik needed to spend 7.17 per DM.[16] Within the Zeiss conglomerate, however, Zeiss Precision Instruments of Jena had costs of 2.37 Mark per DM, while Pentacon of Dresden, the manufacturer of Praktica cameras which exported over 40

percent of its output to the West, had expenses of 7.04 per DM in foreign sales. The liquidation of Pentacon within months of Currency Union reflects the predictive power of these cost ratios; the Treuhandanstalt said that Pentacon was losing money on every camera sold.[17] Figure 2 illustrates the enormous variation in costs across Kombinate within sectors via box and whiskers plots of the univariate distributions of expenses per DM for each of seven broad sectors.[18,19]

Calculations of Short-Run Variable Costs after Currency Union.

The domestic resource cost data must be adjusted to obtain a measure of the viability of each Kombinat now. A firm is "viable" now, according to our previous definition, if its *average short-run variable cost* per DM earned is less than unity. Our raw data, the domestic resource costs, measure *total*--fixed plus variable--cost (plus any extraordinary profit) per DM earned. *Short-run variable* cost per DM earned--our measure of firms' viability--can be obtained from this data set by adjusting for the differences between *total* cost (plus extraordinary profit) and *short-run variable* cost, and for differences in costs *before* and *after* Currency Union. To adjust for differences between *total* cost (plus extraordinary profit) and *short-run variable* cost we remove all profits, interest and depreciation, exclusive of repairs necessary for current operation. To adjust for differences in costs *before* and *after* Currency Union we estimate the effects of changes in the tax structure, in the cost of imported intermediate inputs, and in wages. (We calculate the relevant adjustments at the *sectoral* level using information concerning the cost structure of each sector contained in the East German input-output table.)

In the former GDR, there was no important distinction between taxes, profits, and

interest. They were different accounting names with no meaningful economic distinction given to different parts of the "surplus" earned by a firm. Therefore we shall lump together the adjustments for taxes (net of subsidies), profits and interest payments. Taxes, profits, and interest payments (net of subsidies) in the former GDR, all of which entered domestic resource costs, were enormous: 59.2 percent of value added in industry.[20] To compute short-run variable cost we eliminate this entire surplus from the domestic resource cost figure and add in the relevant taxes after Currency Union. These are employer contributions to social security, which are higher now than in the GDR. Our adjustment intentionally excludes the VAT tax and the corporate income tax.[21]

The second important impact of Currency Union on variable costs in East Germany stems from the changes which have occurred in the costs of imported inputs. Twenty-two percent of total material use in East German industry consisted of imported inputs.[22] Currency Union has led to a substantial reduction in the costs of inputs from both nonsocialist and also from socialist countries. In the GDR, enterprises were charged 4.4 Mark per DM of imported inputs from nonsocialist countries and 4.67 Mark per transfer ruble of imports from CMEA countries. These numbers are simply the "shadow prices" (called "Richtungskoeffizienten") used internally to price foreign goods. Since Currency Union, the cost of a DM's worth of Western products has fallen from 4.4 to unity, leading to a substantial cost decrease. Further, the conversion rate which was used to price both purchases and sales from socialist countries, denominated in transfer rubles, was halved--from 4.67 to 2.34. This also resulted in a substantial cost reduction for Eastern firms, which will persist if historical prices for socialist imports into the GDR continue to prevail.

Table 7 reports the results of input-output simulations to quantify the adjustments to

domestic resource costs due to the radical changes in the fiscal system and pricing of imported inputs associated with Currency Union.[23] Input-output analysis takes intersectoral feedbacks into consideration in assessing cost reductions in each sector of the economy. Cost reductions which permit lower prices in one sector reduce the costs of material inputs used by other sectors, permitting price cuts elsewhere in the economy. We assume that producer prices will match short-run variable cost in each sector.[24,25]

The columns in Table 7 report percentage adjustments in the domestic resource cost by reason. Column 1 shows the adjustment due to the elimination of the very high enterprise taxes (net of subsidies) and interest burden on firms, coupled with an adjustment of employer contributions to social security to the West German level. For industry as a whole, the change in the system of enterprise taxation permits cost reductions averaging 36.1 percent. Column 2 assesses the lower depreciation. A 50 percent decline in depreciation allowances, leaving the remaining 50 percent of depreciation for currently needed repairs, yields a 4.8 percent adjustment. Column 3 shows the effect of the reductions in imported input costs discussed above. The total effect of this adjustment is substantial, giving rise to a 19.7 percent cost reduction in industry as a whole.

Wage movements have also exerted an important influence on costs. From the first quarter of 1990 to October, wages rose by 42 percent, as mentioned earlier. We estimate that a wage hike of roughly 10 percent would have been necessary to compensate workers for the net increases in payroll tax deductions (social security plus income tax) attendant upon Currency Union. A gross wage increase of this amount would have sufficed to leave net wages constant. Column 4 of Table 7 shows the adjustment in short run variable costs which would have occurred if wages had risen only by this amount. Since "surplus" was so

large that wages were only a small fraction of costs to begin with, this compensation raises variable costs by only 2.4 percent. Column 5 of Table 7 shows the impact of the further 32 percent change in gross wages through October 1990: these additional pay hikes have raised costs significantly.

Summing columns one to five we find that the difference between producer prices in the GDR prior to Currency Union and short-run variable costs after Currency Union amounted to 50.6 percent in industry. This reduction in costs corresponds closely to the reduction in East German producer prices from the beginning of 1990 through August of 51.2 percent. The logic behind our calculations provides a simple explanation for these price cuts.

The final two columns of Table 7 provide estimates of the percent, relative to *present* levels, by which each sector's short-run average variable cost would rise as a consequence of a further 1 percent across-the-board wage increase for Eastern workers and a wage increase of 1 percent confined to the sector in question. The same figures can be used to assess the impact on sectoral costs of economy-wide and sector-specific productivity improvements. At the present time, wage costs comprise a much larger percentage of total costs in the East than prior to Currency Union. In consequence, each 1 percent wage hike now will raise short-run variable cost by roughly .66 percent. We will use these figures to estimate the sensitivity of the survival prospects of East German firms to further wage and productivity changes.

Adjusted Domestic Resource Costs and the Viability of East German Industry.

In order to gain perspective on the viability of East German industry at the present time, it is necessary to compute short-run average variable cost for each sector and

Kombinat. The sectoral adjustment factors in column 6 of Table 7 measure the percentage difference between short-run average variable cost per DM earned and unadjusted domestic resource cost and thus can be used to estimate the current value of short-run average variable cost per DM earned for each sector and Kombinat within that sector. These *adjusted domestic resource cost* figures give our "*benchmark*" estimates of short-run average variable costs, in DM, per DM earned in world markets as of October 1990 and thus provide a characterization of the current competitiveness of East German industry.[26]

The picture which emerges is dismal. Column 3 of Table 6 presents estimates of the adjusted domestic resource cost by sector. Only the energy sector can cover its short-run costs. However, a few Kombinate and firms in other sectors are also viable as there is enormous variability in domestic resource costs across firms and Kombinate within sectors.

Table 8 describes the distribution of adjusted domestic resource cost ratios across Kombinate in East Germany under our benchmark assumptions and several alternative scenarios concerning wages and productivity.[27] This table gives the cumulative number of conglomerates and percentage of employment at varying levels of competitiveness. Under our benchmark assumptions only 8.2 percent of the industrial workforce is employed in "viable" Kombinate with expense ratios below unity. As is apparent, the majority of firms at present have short-run variable cost between 1 and 2 DM per DM earned.

Columns 3 and 4 of Table 8 report, respectively, the impact of a 10 percent wage hike, above and beyond the 42 percent hikes which had occurred through October 1990, and a 10 percent productivity increase. (The 10 percent productivity improvement yields the same results as a 20 percent productivity improvement with a 10 percent wage hike, the

additional amount which has probably occurred since October.) Such improvements in productivity can be expected. A survey conducted by the Ifo Institut für Wirtschaftsforschung in May 1990 to measure the extent of disguised unemployment in the GDR estimated that it amounts to approximately 18 percent in industry and 15 percent in the economy as a whole. Practices which lower productivity include widespread overmanning, political activities of workers, high absenteeism, frequent interruptions due to absence of inputs, and excessive in-house production of inputs.[28]

The final two columns of Table 8 present the results of simulations designed to assess the effectiveness of substantial cuts--of 50 percent and 75 percent--in total labor cost, as could be achieved through a policy of wage subsidies. As is apparent, subsidies of this magnitude would substantially raise the number of viable Kombinate--from 14 conglomerates hiring 8.2 percent of the industrial labor force in the benchmark case to 47 Kombinate hiring 36.6 percent of the industrial workforce with a 50 percent reduction in labor cost, to 88 Kombinat employing 77.2 percent of the industrial workforce with a 75 percent reduction in labor costs. In Section V, we discuss the economic desirability of adopting such wage subsidies.

At the time of Currency Union, it was widely rumored that one third of East German firms would go out of business. The micro data presented above offer a far more pessimistic view of the likely viability of the East German economy. In the absence of massive productivity improvements or substantial subsidization most Eastern industry will have to close down.[29]

The Price-Cost Squeeze and Exports after Currency Union.

Indirect confirmation of the price-cost squeeze comes from the behavior of exports

following Currency Union and the discussions which have taken place concerning these sales. The changes associated with Currency Union should have had little effect on the demand schedules of foreign buyers. Indeed, many foreign purchases were covered by long-term contracts. But an implication of the price-cost squeeze is that many firms should have realized losses if they filled such orders. It turns out that export sales, in real terms, declined much less dramatically than production: total exports to socialist and nonsocialist countries, excluding sales to West Germany, between July through November of 1990, amounted to 88.5 percent of their level during the same five months of 1989.[30] But there are many indications that firms are losing money on both socialist and nonsocialist exports and could only continue satisfying orders because the Treuhandanstalt has (implicitly or explicitly) subsidized the losses. If these bailouts end, many more firms will fail and the impact of the price-cost squeeze on output will be fully felt.

Exports to Socialist Countries. Table 6 shows the domestic resource cost of CMEA exports in Mark per transfer ruble earned before Currency Union and our estimates of their adjusted cost (short-run average variable cost) in DM per transfer ruble thereafter. (Prior to Currency Union these exports were 17 percent of GNP). In industry as a whole, the domestic resource cost of exports per transfer ruble earned was 4.65 in 1989. After Currency Union we estimate that the short-run average variable costs of CMEA exports fell to 2.30. Before Union, only half of export sales were "profitable" at the shadow rate of exchange (Richtungskoeffizient) of 4.67 Mark per transfer ruble. The remaining exports required subsidies from the GDR government. After Union the transfer ruble was "devalued" to 2.34 DM. Our estimates imply that, under these new conditions, roughly half of CMEA exports would be unprofitable and therefore require subsidies.

There is ample evidence that Eastern firms *did* require subsidies to fulfill CMEA contracts after July 1. For example Wartburg cars were exported at 7,600 DM which cost 14,400 DM to produce.[31] And the East German shipyards incurred heavy losses on their CMEA exports.[32] These sales continued only because, under agreements signed with the Soviet Union, Germany pledged that Eastern firms would honor existing export contracts; in consequence, export subsidies continued to be paid by the German government until January 1, 1991 to firms with outstanding contracts that were unable to cover their production costs. With the elimination of most subsidies on January 1, many East German companies are feeling the pinch of the price-cost squeeze. Newspaper accounts indicate that unless subsidies continue, output will have to be cut in many sectors as a consequence.[33] Even if export subsidies were to continue, CMEA exports are likely to decline in 1991 for a different reason: since January 1, 1991 all trade with CMEA countries has been denominated in hard currency rather than transfer ruble. Now that the Soviet Union and Eastern European countries have abandoned barter arrangements and are free to spend their hard currency earnings where they please, it seems quite likely that the demand for East German goods will decline, just as East German demand for CMEA products declined after Currency Union.[34] There are already indications that a major decline in trade with Eastern Europe will occur this year.[35]

Exports to Nonsocialist Countries. In the case of CMEA exports, the subsidies of the Treuhand have been explicit and widely discussed. In the case of nonsocialist exports, subsidies have been implicit: sales have continued, but losses have occurred and these have been "financed" by the Treuhandanstalt, which has guaranteed loans to firms unable to pay their bills. A case in point concerns a firm within the Robotron complex which exported

mechanical typewriters to the West. This firm continued selling abroad in 1990, but in December it was announced that typewriter production would cease in January 1991 and the firm would fire the 1000 workers producing them. These sales were unprofitable.[36] Similarly, it has been estimated that production of raw steel will probably fall by a further 45 percent during 1991 (it already fell 55 percent since January 1990), in part because East Germany had been providing high subsidies to steel exports in order to obtain hard currency.[37]

In summary, we have argued in this section that a substantial portion of the output decline in East Germany is due to the price-cost squeeze. Stated differently, wages in East Germany are well above the full employment, market clearing level--and rising. East German wages are now about 50 percent of West German levels. West German wages exceed U.S. wages by approximately 20 percent; thus East German wages amount to about 60 percent of U.S. wage levels. While the skill of the East German labor force may "justify" such wages in the long run, they are simply too high for existing Eastern firms to operate profitably at present.

In this regard, it is instructive to compare the experience in Poland with that of East Germany. In Poland, trade was freed with a fixed exchange rate which has succeeded in producing a current account surplus, as intended. At Currency Union, the average monthly wage in Poland, about 175 DM, was roughly 13 percent of that in East Germany after Mark conversion at one-to-one.[38] In 1989, however, Thad Alton estimated that GNP per capita in Poland was 47 percent of the GDR level.[39] The Mark/DM exchange rate which would have yielded the same ratio of wages to per capita income in East Germany as in Poland is 3.6.

III. The Collapse of Demand for East German Goods

Motorists at French double-track rail crossings are warned: "One train may hide another." The price-cost squeeze would have been sufficient to cause the East German depression; nevertheless, there is also another powerful reason for the output decline. There were large declines in demand for domestically produced consumption and investment goods as well as a probable decline in the level of investment. In addition, in the near future, a decline in exports to CMEA countries is apt to occur. (These shifts correspond to the distance labelled $\Delta Y_{\text{demand shift}}$ in Figure 1.) The simple Keynesian multiplier model describes the determination of aggregate demand under present conditions in East Germany; we employ this framework to explore the output and budgetary effects of government spending.

First we present a collage of statistics to indicate the behavior of consumption, investment, government spending, and imports in East Germany. (Export behavior was covered earlier.) Ideally, national income accounting figures would be used to compare expenditures before and after Currency Union. But such comparisons are treacherous because they necessarily entail the conversion of expenditures in Mark into DM.[40] No official statistical series giving comparable pre and post Union data is currently available.

Consumption and Imports. The Bundesbank (among others) had feared that currency conversion and the opening of free trade might lead to an enormous surge in consumption. However, East Germans did not go on a spending spree following Economic Union on July 1. Household budget data collected by the Statistical Office in East Berlin shows that the rate of saving out of household net income was 13.5 percent in September 1990 and 14.8 percent in October versus 16.7 percent in the first 5 months of 1990 and 12.7 percent

in 1989.[41]

While there was no binge in overall consumption, residents of the East substituted Western products for domestic goods on a massive scale. The household budget data show that with the opening of trade with the West, Easterners took the chance to buy goods--especially cars and electrical appliances--which had been unavailable or prohibitively expensive in the GDR. The demand for these items surged in July and August. By September they continued to account for 21 percent of the expenditure of Eastern residents.[42] The switch toward Western goods also occurred because the variety in Eastern production had been low by Western standards with little production of high quality goods. Anecdotes of East-West quality differences abound, affecting even cabbages, which allegedly contain more worms in the East than in the West. Many observers say good products have been shunned as well as bad.

Although no aggregate statistics are available which clearly quantify the magnitude of this switch there are many indications of its proportions. Within weeks of unification, most observers were astounded to find so few goods of local origin in Eastern stores.[43] A survey of Eastern grocery stores in September revealed high import penetration: the proportion of Eastern products in retail sales amounted to: 4 percent of the coffee and cocoa, 6 percent of the chocolate, 12 percent of fresh cheese, 24 percent of sugar, 29 percent of detergent and 65 percent of margarine.[44] The West German statistical office reported that during September 1990, 2.4 billion DM of goods were shipped from West to East Germany--a 277 percent increase over the same month in 1989.[45] These figures do not measure total purchases of Western goods by Eastern residents since purchases made in the West by Easterners are not included. Exceptionally strong growth in West Germany

has been attributed by most observers, including the Bundesbank, to "the immense import pull exerted by the economy of the GDR after its western frontiers had been opened." The Bundesbank cited this as one of the main reasons for the decline in the German foreign trade surplus in August of 1990. Moreover it attributed to Eastern purchases made in the West very large increases in retail sales for food, drink and tobacco, very strong growth in sales of electrical equipment and apparatus, and a "spate of orders" for domestic passenger cars in the six months before Currency Union.[46]

Investment. In 1989, gross investment in East Germany amounted to 77.0 billion *Mark* (21.8 percent of GNP.)[47] In the first quarter after Currency Union investment was at an annual rate of 37.8 billion *Deutsche Mark*.[48] This probably represents a fall in real investment.[49] There was a significant rise, as in the case of consumption, of imports. In September 1990, shipments of investment goods from West to East Germany occurred at the annual rate of 11 billion DM.[50] Therefore we conclude that domestic production of investment goods must have fallen considerably. This conclusion is corroborated by three other observations. Output of cement in East Germany was at 20.6 percent of its December, 1989 level in December, 1990. The number of completed dwelling units in 1990 was 32 percent lower than in 1989.[51] A November, 1990 survey of firms in the building industry showed a high ratio of respondents who considered business "bad" to those who considered it "good" (the ratio of "bads" to "goods" was not quite as large as in industry where output was at 50 percent of its 1989 level.)[52]

The unsurprising decline in investment[53] by as yet unprivatized firms in the East, could conceivably have been offset by direct investment from outside East Germany. In this regard, a survey of investment intentions is revealing. Private West German firms in

1991 were planning about 13.5 billion DM worth of investment (3 percent of FRG investment) in East Germany.[54] This level of investment may seem surprisingly low to readers of German newspapers, since there have been dramatic announcements of investments by large firms, e.g., Volkswagen, 4.2 billion DM; Siemens, 1 billion DM; Mercedes Benz, 1 billion DM; IBM Germany, 200 million DM.[55] But these, unfortunately, appear to be more the iceberg than its tip. While fully half of the firms in the poll planned some investment, most of this investment was small and consisted primarily of facilities for distribution: the major reason firms wanted to invest in East Germany was "to be closer to the market." In the words of one German economist, "Given West German money, the East Germans only want to buy West German products. And Western industry is interested, naturally enough, first in selling products there, not in building factories and making them."[56]

One important reason for the slow pace of Western investment is Eastern wage costs, the problem emphasized throughout this paper. While wages in East Germany are lower than in West Germany, wages elsewhere, e.g., Greece, Portugal and the rest of Eastern Europe, are lower still. In consequence, Plan Econ, a Washington consulting company, considered it "hardly a surprise that non-German investors were staying out of East Germany."[57]

Infrastructural investment supported by the Federal government will in fact be more important than private investment by Western firms. Estimates are difficult to make from the Federal Budget because expenditures are not everywhere broken down between East and West. They range from a low of 35 billion DM to a high of 55 billion.[58] At the minimum, these expenditures will include 6.5 billion for telecommunications;[59] 8.0 billion

for the East German Reichsbahn; 3.4 billion for road construction;[60] and a 5.0 billion subsidy program for investment by localities in schools, hospitals and retirement homes.[61]

Government Spending. Local government will be a significant contributor to the East German recession. The removal of high taxes and other governmental collections at Economic Union resulted in the loss of revenues for state and local governments. This loss has been partly compensated by contributions from the West, mainly from the Federal government, of approximately 62 billion DM out of projected expenditures of 97 billion DM in 1991.[62] This contribution, however, is not sufficient to avoid significant layoffs. At the end of 1990 there were 1.7 million state and local employees, of whom 300,000 were in "Wartestand" (the state of waiting--roughly the public sector equivalent of short-time in the industrial sector.) By the end of 1991 DIW projects that only 1.05 million will be employed (with no one in the state of waiting.)[63] These cuts are consistent with the projections by the German labor ministry in October 1990, of a decline of 700,000 public employees.[64] In addition, the army will be reduced to 50,000 troops from 178,000 in 1989.[65]

The Multiplier, Budget Cuts and Infrastructure Investment.

In present circumstances, the German government is naturally preoccupied with limiting its spending in the East and controlling the budget deficits of the five new Länder. If spending in the East is curtailed, however, East German firms will have lower sales and production will fall even further. Moreover, it will be almost impossible for the German government to achieve deficit reduction via spending cuts in the East. More importantly, such reductions, if achieved, would lower output dramatically. Alternatively stated, spending increases undertaken now will not be very costly from the perspective of either

social welfare or the budget. The policy implications are straightforward: reductions in spending in East Germany should be avoided at the present time, and needed infrastructure investments--especially those using local factors of production and locally produced intermediate inputs intensively--should be undertaken as soon as possible, while unemployment remains high. These morals follow from the simple Keynesian multiplier model, which provides a good approximation to the determination of output and deficits in the current depression. The simple "Keynesian Cross" model is relevant in analyzing the consequences of spending changes in East Germany because interest rates, exchange rates, and prices can all be considered fixed. Interest rates and exchange rates are fixed because they are determined outside East Germany; prices are fixed because they have already fallen to average short-run variable costs ($\hat{p}$ in Figure 1) or below; as we show later, there is an elastic supply of labor at the current wage.

The model we have in mind is straightforward. Income (Y) is the sum of consumption (C), investment (I), government spending (G) and exports (X), net of imports (M). Output is produced by labor (N) according to the production function $Y = N/b$. There is a transfer to the unemployed, $TR = \theta(1-t-\gamma)w(L-N)$ where w is the East German wage, t is the marginal income tax rate, γ is the rate of both employer and employee contributions to social insurance, L is the labor force and θ is the net replacement ratio due to unemployment benefits. Consumption depends on disposable income: $C = C_0 + c[(1-t-\gamma)wN + TR]$. Imports have consumption, investment and government components so that $M = m_o + m_cC + m_II + m_GG$. Investment, government spending and exports are autonomously set at I, G and X respectively.

The equilibrium level of income in this model is $Y = \alpha A$, where $A = (1-m_c)(C_0+\theta c(1-t-\gamma)wL)+(1-m_I)I+(1-m_G)G+X-m_0$ is autonomous spending on domestic output and α is the multiplier. The multiplier is $\alpha = 1/[1-(1-m_c)c(1-t-\gamma)(1-\theta)bw]$. Taking reasonable benchmark parameters of $\theta = .68$, $t = .2$, $\gamma = .1825$, $m_c = .5$, $c = .85$, and $bw = .65$ (the approximate value of labor's share in East Germany at the present time), the multiplier is extremely low: $\alpha = 1.058$. With reasonable parameter values, the multiplier is low because consumption of domestic goods (the only component of GNP which varies positively with income) varies remarkably little with the level of output; in turn, this is due to the high marginal propensity to import and the existence of unemployment compensation which automatically stabilizes workers' real income.

The model can be used to approximate the impact of changes in government spending on the overall East German budget deficit. We define the East German budget deficit broadly as the difference between the outlays and receipts of *all* governmental entities in East Germany, including the Federal, Länder, and local governments, the social insurance funds, and the Treuhandanstalt. It is this aggregate deficit which must ultimately be financed by West Germany. Although the budget of each governmental entity is now determined separately and decisions are taken independently, there are obvious spillovers between the activities of one entity and the receipts or spending of others.

The revenue accruing from economic activity in East Germany consists of the net surpluses (or deficits) of the former Kombinate which are owned by the Treuhandanstalt. These amount to $(Y - w(1+\gamma)N)$. In addition, there is income tax revenue amounting to twN and social insurance contributions of $2\gamma wN$. Total outlays consist of government purchases, G, and transfer payments, as defined above. In this model, the increase in the

budget deficit caused by a one DM increase in government spending (or investment) is $1 - \alpha(1-m_G)[1 - (1-\theta)(1-t-\gamma)bw]$. With the benchmark parameters previously assumed, a one DM increase in government spending raises the deficit by only .078 DM if the marginal propensity to import out of government spending is 0. If $m_G = .2$, the impact on the deficit amounts to .262 DM; and with $m_G = .5$, this impact rises to .539. The clear implication of this model is that new projects which call for higher government spending in East Germany can be undertaken now at low cost to West German taxpayers. Such spending creates jobs now when idle labor is available to work and also has long-run payoffs. The budgetary cost of government spending is low for two major reasons: first, the new spending creates jobs; employed workers pay income taxes and contribute to social insurance rather than drawing unemployment compensation. Second, the spending creates additional revenues for the firms, creating profits for the Trust or, more realistically, reduces Treuhand subsidies.

The rocketing East German budget deficit has produced numerous calls for spending cuts in the East in order to control the costs of unification to West German taxpayers and the associated deficit spending in East Germany.[66] The model also shows that such attempts could prove costly for GDR output and employment. If East German spending is adjusted to hit a fixed deficit target, a 1 DM reduction in the target brought about by spending cuts could take a heavy toll on output. The magnitude of this burden depends on the fraction of government spending for Eastern goods. A 1 DM reduction in the deficit due to lower government spending lowers output by $(1 - m_G)/[m_G + bw(1-\theta)(1-t-\gamma)(1-m_G-c(1-m_C)]$. With $m_G = 0$, this output multiplier is 13.54. With higher values--.2 and .5--for m_G this output impact drops to 3.22 and .98 respectively. That is, when the marginal propensity

for government to spend on imported goods is low, enormous expenditure and East German output cuts are required to avoid East German budget deficits. The deficit is difficult to reduce because spending cuts, directed at East German products, swell the unemployment rolls, raising unemployment compensation payments, and reducing the profits (or raising the required subsidies) of companies held by the Treuhandanstalt. Since the reduction in the deficit is so small when the spending cuts are directed at Eastern goods, the size of the cuts required in order to lower the deficit is extremely large, as is the associated decline in Eastern employment and output.[67,68]

IV. Developments in the Labor Market

The dramatic decline in output after Currency Union was accompanied by a substantial growth in unemployment (either overt or involuntary "short time" work); employment also declined sharply, though not to the same extent or with the same speed as output.[69,70] As of February 1991, 30.4 percent of the labor force was either unemployed or on short time; vacancies in January 1991 stood at 14.5 percent of their level in January 1990. These developments are summarized in Tables 1 and 3.

The existence of such substantial labor market slack could be expected to produce downward pressure on real wages. However, consumer prices have remained relatively stable throughout the period, and nominal wages have risen dramatically. Eastern wages began to rise during the early spring of 1990; the growth in wages continued after July 1. These increases (reported in Table 5) amount to 42 percent of gross wages for full time industrial workers between the first quarter of 1990 and October 1990.

Despite these increases, Eastern wages are still roughly 50 percent below Western

wages.[71] High Eastern unemployment accompanied by a large East-West wage differential provide strong incentives for migration. While it is clear that migration will contribute significantly to the reduction of Eastern unemployment over the long run, we will show that it will occur sufficiently slowly to make a relatively small contribution to lowering unemployment over the next several years.

In this section we explore issues which affect the Eastern labor market, focussing on the key questions of migration and the rise in wages since Currency Union. Many of our results are based on surveys we conducted in February 1991 in East Germany. One of our surveys consisted of 210 personal interviews of individuals, arbitrarily approached in cafeterias, shopping areas, and train stations in Dresden, Leipzig, Magdeburg and Rostock. These individuals were at least 16 years old, had grown up in the former GDR, worked during the previous year, and were currently in the labor force. They were asked a series of questions about labor market opportunities in East and West Germany, their migration intentions, and their opinions concerning wage developments in the East since Currency Union. In addition, 45 identical surveys were administered, mainly to unemployed people, at employment offices in Eastern Germany. We also distributed 1000 surveys which could be answered and mailed to the USA; we have received 301 admissible written responses. Finally, a variant of the survey was administered in person to 107 students at universities in Dresden, Leipzig and Magdeburg who had grown up in the former GDR and planned to seek employment after graduation. University students are of special interest because they tend to be extremely mobile and highly skilled.[72,73]

Migration.

Freedom of labor mobility was enshrined in the State Treaty, though there had been much migration before Economic Union. Table 9 presents monthly migration flows between East and West Germany since October 1989. Much of the influx occurred during late 1989 and early 1990, before East Germans knew that unification would occur; many migrants were taking advantage of what was viewed as a potentially short window of opportunity. When it became clear that the migration option was permanent, flows fell to lower levels.

Annual migration flows during 1989 and 1990 amounted to about 2 percent of the East German population.[74] These flows are large, but they are not without historical precedent. From 1950 to 1959, 2.6 million individuals migrated from the GDR and other Eastern European countries to the FRG.[75]

If migration continues at its current pace, it will be a significant factor in the long-run reduction of Eastern unemployment, but insufficient to eliminate Eastern unemployment quickly. In January 1991 there were 2.61 million unemployed and short-time workers in the East; with migration at the peak (1989) annual rate of 344,000 and 64.4 percent of the migrants employed[76], it would take over 11 years to eliminate the current unemployment and short-time in the East through migration alone. Since much of this future migration will be caused by high unemployment, as we shall demonstrate, it will not occur so rapidly as to keep unemployment low.[77]

The Propensity to Migrate. There are three major findings of our survey: first, the great majority of the population is reluctant to migrate and do not anticipate doing so. Second, there is a sufficiently numerous minority who consider it very likely that they will migrate

as to cause migration from East Germany to be of comparable magnitude to the migration which has occurred since September 1989. Third, a significant fraction of East Germans consider migration a serious option and could be pushed into moving. Wage differentials will not induce them to move, but lack of work for a sufficiently long period will drive them to it. The answers to survey questions concerning migration and employment conditions are summarized in Table 10.

To gauge the chances of migration, we asked respondents[78] to rate their chances of working in West Germany on a scale of 0 to 10. Zero meant "I will not work in West Germany under any circumstances." 10 meant "I will definitely work in West Germany." We shall loosely refer to this scale as the "migration" scale, but, because working in the West is not synonymous with living there, we also asked respondents whether they might commute to the West. Commuting was particularly important for those who indicated a high intention of working in the West. Eight percent of respondents rated themselves 8, 9 or 10 on the scale, and thus gave a clear indication of their intention of working in the West. Of these, 54 percent indicated that they might commute to jobs in the West rather than live there. Thirty-eight percent of respondents rated themselves 0, 1 or 2 on the migration scale; these respondents gave clear indication of their intention to stay in East Germany. The remainder of the sample--a clear majority--gave answers between 3 and 7. In the opinion of our interviewers such scores indicate that working in the West is an option for them which they understand and, if driven to it, will do. Twenty-nine percent rated themselves at 5. Respondents' answers are *not* proportional to their subjective probability of working in the West. Many of those who scored themselves as 5 on our scale gave other indications of their strong attachment to the East so that migration would

be a last resort. On the basis of this scale, students were the most willing to migrate, with an average of 4.9; both employed and unemployed respondents averaged 3.5.[79,80]

An important indication that East Germans are reluctant to move appears in their expressed willingness to wait for jobs to appear in the East which are comparable to those now available. We asked nonstudents who were unemployed: "Imagine the following situation: you learn that new, secure jobs will be created in East Germany which pay wages comparable to your old job. If you can be reasonably certain that you will be offered a job, would you be prepared to wait for this job?" We asked the same question to employed respondents, asking them first to imagine that they had lost their current job. Eighty-five percent said they would be willing to wait for such a job. When asked how long they would wait the *median* answer was 6 months. When asked what they would do next only 11 percent of those who would wait indicated any intention of looking for work in the West. More (14 percent) said they would begin retraining. Many others said they would look for different jobs in the East or "wait some more" (sic). Nor did most of the 15 percent of respondents who indicated that they would not wait *for the job we described* indicate that they would work in the West.[81]

This reluctance to move was similarly clear for university students, who as the migration scale confirmed, are much more mobile than the population at large. Eighty-nine percent of students said that they would prefer to work in the East if they were offered jobs with comparable wages and working conditions in both East and West. We asked this group: "Suppose that you have tried to find a job in East Germany but were not successful. You find out that new, secure jobs will be created in East Germany which will pay wages comparable to those *now* prevailing in the East. If you are reasonably certain

that you will be offered one of these jobs would you be willing to wait for that job?" Seventy-five percent of those asked indicated that they *would* be willing to wait for these Eastern jobs which they think pay less than half those in the West. Furthermore the average length of time they would wait is fairly long. The median wait is 6 months.[82] Finally, it should be emphasized that for both students and nonstudents, the willingness to wait for a job in the East is just as high for those who think they can find work easily in the West as for those who think that it would be difficult.

We attempted in a number of ways to gauge the sensitivity of migration to wage differentials. We find no systematic evidence that wage differentials on their own are an important driving force for migration. Our respondents are well aware of the differences in wages that prevail. They expected, optimistically, that they would receive a 154 percent wage increase if they worked in the West. (We estimate the monthly gross income differential at 100 percent.[83]) Nevertheless, in spite of these differentials, as we have noted, the vast majority of respondents did not care to move. In regressions attempting to explain the migration propensity, as measured by the migration scale, we found no economically significant correlation between expected wage gains and self-score on the migration scale. To investigate the possibility that the current wage differential has little effect on migration because it is expected to be eliminated rapidly, we asked employed individuals to agree or disagree with the statement: "If I keep my current job, I expect that my wages will rise quickly." Unemployed individuals were asked to respond to the analogous statement: "If I stay in East Germany and find a new job, I think that my wages will rise quickly." Only 46 percent of respondents agreed or agreed strongly with this statement. Thirty-one percent disagreed or disagreed strongly. In addition, the willingness

to migrate was uncorrelated with wage expectations even when attention is confined to those who think it would be easy to obtain work in the West, suggesting that wage differentials are not an important factor governing migration decisions. We consider the willingness of employed and unemployed respondents to wait in the East for a job offering wages identical to that on their current or previous job, rather than look in the West for a job which they think offers more than double the pay, additional evidence of the unimportance of wage differentials to migration decisions. The wage differential may attract some, but not the vast majority.

More people, however, may be pushed to the West by lack of available jobs. Respondents in our survey were fully aware of the prospects of job loss and the difficulties which they would face in finding new work in the East. Seventeen percent of our sample was already unemployed. Twenty-two percent of those employed were on short time. Of the employed respondents only 39 percent disagreed with the statement "If I stay in East Germany I will probably lose my job." Twenty-eight percent agreed or strongly agreed and the remaining 33 percent partly agreed and partly disagreed. The great majority (73 percent) of employed people fear that if they lose their job it will be difficult to find a new one. Similarly, 78 percent of the unemployed feel that a new job will be difficult to find. In these circumstances, migration becomes a possibility that must be entertained. As the ratings given on the migration scale indicate, the majority of individuals *have* entertained this possibility. This explains why 62 percent of the sample rate themselves above 2 on the migration scale in spite of clear indications that they would prefer to stay. Uncertainty about the odds of obtaining Eastern work in the future will make migration more likely. For example, while 75 percent of the students who preferred working in the East at equal

pay were willing to wait for a job in the East if it was reasonably certain that one would materialize, this number fell to 35 percent if the prospect of getting such a job was only fifty percent over the course of a year. Older people seemed less willing to migrate in response to job uncertainty, as indicated by the small number of individuals who told us they would work in the West following the wait for a job which, in the end, did not materialize.

At least initially, unemployment will not push previous jobholders to migrate because German unemployment benefits are fairly generous. For the first year of unemployment, benefits are 68 percent of terminal net wages for those with children and 63 percent for those without; these benefits decline to 58 and 53 percent respectively after one year.[84] However, they do not last indefinitely. After two years they are replaced by welfare at the same level. But welfare is means tested and is not granted if a spouse is employed or receiving either unemployment compensation or welfare benefits. Since most prime age married couple households in East Germany have two earners, a two-year spell of unemployment threatens an ultimate reduction in family income of one half if the spouse is employed and more than two-thirds if both are unemployed.[85] As a result, East Germans cannot expect to remain unemployed for *very* long periods living on their unemployment benefits at more or less their previous standard of living. If jobs continue disappearing at present rates, and new jobs do not materialize, migration will become a necessity.

Thus far, East Germans who have migrated and looked for work, have found it quite quickly in the West--more quickly than the West German unemployed. 538,000 GDR citizens migrated from July 1989 through June 1990. Using the West German

unemployment durations structure and the assumption that previously employed migrants who did not enter training would be seeking jobs, yields predicted unemployment[86] for migrants in June, 1990 of 138,700. In contrast the actual unemployment of migrants in that month was 84,000.

Nevertheless, it is important to realize that the first migrants do not represent a random sample of the Eastern populace, since the decision to migrate is voluntary. People with unusual initiative or transferable skills were more likely to migrate. A random selection of the East German population would probably not have found jobs so quickly.[87]

Studies of migrants have also shown that despite high formal qualifications, they were underprepared for work in the West, especially for using Western technology. Those who found it especially difficult were engineers, service sales people and cashiers.[88] The difference between East and West is epitomized, although exaggerated, by the coal shoveling jobs held by some of our survey interviewees in Saxony. They were understandably puzzled why they should be asked the survey question: "Do you think that it would be easy or difficult to find a job in West Germany?"[89]

Our survey sought to determine more generally whether East Germans thought it would be easy or difficult to obtain work in the West. A small majority of the survey respondents thought it would be difficult to find work in the West. For instance, 66 percent of employed respondents and 61 percent of unemployed respondents stated that it would be hard to find work in West Germany; 76 percent of those who considered it hard to find work thought it would still be difficult if they changed occupation.

In our surveys, we also inquired about a wide variety of factors which might be

expected to affect mobility. We found that one of the most important reasons for staying in the East to our respondents were family and friends there; 78 percent of nonstudents and 54 percent of students agreed that "It is very important for me to continue living close to my family and friends here in East Germany." Furthermore, individuals who reported that they did not have many friends or relatives in West Germany were less willing to work in the West as measured by their ratings on the scale of 0 to 10. (Sixty-two percent of students and 53 percent of nonstudents indicated that they did have close family or friends in the West.) As East Germans move West in increasing number, this growing stock of "Zugezogene" will act as an attractor toward those remaining in the East. As in a Schelling "tipping" model[90], a reason for continuation of the flow from East to West will be the stock of family and friends who are building up in the West.

We also found that some potential explanations of migration patterns do not appear to be very important to the members of our survey. For instance, neither Eastern pollution nor high Western housing costs seem to affect migration. These negative results hold in both our nonstudent and our student surveys.[91]

The results obtained in our survey confirm the results of earlier studies which show the reluctance of Germans to migrate. For example, Eichengreen (1990) has pointed out that only 1.3 percent of the FRG population moved between Länder in 1983, in comparison to the 3.3 percent of the US population who moved residence from one state to another. This low rate of migration occurred despite considerable interregional variation in per capita income: the coefficient of variation of per capita income in 1983 was .21 for 31 regions of the FRG compared with .16 for the lower 48 American states.[92]

Just because the vast majority of East Germans will wait a long time to leave, and will

thus not escape from the growing joblessness there, does not mean conversely that a large migration to the West will not occur. A small fraction of the population who are disposed to leave can still yield a large migration relative to the flows which have occurred so far. Our nonstudent sample found 8 percent of the population who rated their chances of working in the West 8, 9 or 10. If half of the 8's, three-quarters of the 9's and all of the 10's *who said they would not commute* actually migrate to West Germany, then 4.15 percent of the workforce will migrate. If the labor force participation rate of migrants is .64, as in 1988, and if migration occurs over the next one to two years, total migration would amount to 551,000 over this period. This is comparable to the rate of migration in the six months prior to Currency Union.

In West Germany, there is considerable fear of migration from the East. Indeed 44 percent of our Eastern survey respondents agreed with the statement "I don't think I would be welcome in West Germany."[93] These fears have affected policy. For example, Chancellor Kohl's offer of February 6, 1990 to enter into a monetary and economic union with the GDR was prompted, at least in part, by the continuing large scale GDR emigration. Important aspects of the State Treaty were directly aimed at reducing immigration into the FRG. Most importantly, the decision to convert wage contracts at par was an attempt to ensure a reasonable standard of living for East German workers. In addition, unemployment insurance benefits paid to GDR residents migrating to the West were reduced in January 1990 from being calculated on the basis of FRG remuneration to a standardized integration allowance with maximum duration of one year.[94]

We view the Western fear of *economic* loss from migration from East Germany as exaggerated. One of the significant fears--in addition to concerns about higher rents and

greater congestion--is that immigration will lower Western wages.[95] Is that fear rational? The effect of immigration from East Germany on wages can be approximated. A migration of 2.5 million workers from East to West over the next decade would increase the West German labor force by 9 percent.[96] Suppose the production function of West German output is Cobb Douglas with a labor share of .65[97], and labor is paid its marginal product. If the West German capital stock is unaffected by this migration flow, wages will be depressed by 3.15 percent [=.09 x (1-.65)], which amounts to a .32 percent reduction in the (geometric) annual wage growth. On the alternative assumption that West German entrepreneurs borrow capital at world market rates, which are unaffected by the migration, the German capital-labor ratio remains unchanged as a consequence of the migration, and there is no depression of German wages at all.[98] A further indication of the ability of the West German economy to absorb migration inflows is the decrease in the Western unemployment rate by .5 percent between the third quarter of 1989 and July 1990, despite the surge in migration during this period. In any case, it is important to note that approximately half of the migration into Western Germany is composed of ethnic Germans from outside East Germany.

Wage Movements

One of the most striking consequences of Currency Union has been the enormous increase in real wages which accompanied it. In the first half of 1990, average industrial wages per full time worker rose 22.6 percent. From July through October 1990, industrial wages rose 15.8 percent. Table 5 reveals the near uniformity of these increases across industrial sectors. Comparable wage increases were achieved in other sectors: for example, between July and October 1990 these amounted to 17.1 percent in mining, 20.6

and 11.7 percent in wholesale and retail trade respectively, and 22.2 percent in insurance. Further wage increases are being negotiated in most sectors. For example, in January 1991, construction workers were granted increases bringing their wages to 60 percent of West German levels; in April 1991, their wages will rise to 65 percent of the West German level.[99] There were also reductions in working hours negotiated in most contracts, with a 40 hour workweek guaranteed in many contracts signed in August.

A simple reason for the wage increases, the law of one price, suggests that Economic Union created a single labor market in which only one wage can prevail. In such a unified labor market, any wage differential induces employers to switch jobs from West to East and workers to move in the opposite direction. According to this logic, wages in East Germany are rising because East German workers are moving into West Germany, while capital is moving into East Germany. These movements *are* occurring, but they are proceeding slowly. Using reported ratios of jobs created per DM invested of four large scale investors in West Germany--Volkswagen, Siemens, IBM and Opel--the 13.5 billion DM total of investment by Western firms projected for 1991 would result in 112,000, 371,100, 100,000 and 169,000 jobs respectively. This is more than the proverbial drop in the bucket, but also considerably less than the needs of the East German economy. In contrast to the slow movements of both migration and investment, wages moved rapidly. As the first section showed, wages were too high at Union for the profitable employment of many East German workers; since Union, wages have moved in the wrong direction, away from equilibrium.

Wages rose while migration was relatively small and falling; thus it appears implausible that wage increases were granted in *response* to migration by East German workers or

because East German workers were unwilling to accept wage cuts in order to maintain employment. Our survey asked unemployed respondents to agree or disagree with the statement "I would be prepared to accept a job paying up to 20 percent less than my old job paid." Employed respondents were, analogously, asked if they would accept such a pay cut in order to gain work in the event that they lose their current job. Twenty-eight percent of the participants in our survey indicated that they would be willing to accept such a cut in pay. This suggests that there is a significant stock of workers not only available to East German industry at current wages, but even at substantial reductions in pay.

Some combination of five factors are probably responsible for the wage increases. *First,* the increases in pay which occurred following Currency Union may partly have been intended to compensate workers for higher payroll deductions and the removal of price subsidies following Union. Our survey asked East German workers who had received wage increases their opinions concerning the reasons. The responses are summarized in Table 11. Fifty-two percent of respondents in our main survey agreed with the statement that "wages rose in order to make up for the elimination of price subsidies (for example, for basic foodstuffs) and increases in social insurance contributions." Thirty-three percent disagreed.

Following Union, both employee and employer contributions to social insurance rose substantially. GDR contributions consisted of 10 percent of earnings, up to a statutory ceiling of 600 Mark per month, paid by the employee and 12.5 percent paid by the employer; at Currency Union, combined social security contributions (for health, old age, and unemployment) rose to 36.5 percent, split evenly by firms and workers. The FRG

personal income tax was also adopted in the East, phased in over two steps. Earnings in the East are sufficiently low, and exemptions under the FRG tax code sufficiently high, that the average income tax rate for East German households is now substantially lower than before Union. We estimate that it amounts to about 4.5 percent, although the marginal tax rate for East Germans is currently about 20 percent.[100] Whereas income and social insurance taxes together amounted to 14.9 percent of gross wages in 1989, these payments currently amount to 22.75 percent of gross wages for the typical household.[101]

In East Germany, necessities were greatly subsidized by the government: non-luxury food, rent and public transportation. Food subsidies were eliminated at Union; railway subsidies were partially eliminated on January 1, 1991; subsidies on gas and electricity used for heating were also reduced in January 1991; rent subsidies will be phased out gradually. It was widely expected that consumer prices would rise after Union due to the removal of food subsidies. In fact, the aggregate CPI remained almost unchanged; although the prices of some necessities increased, the prices of many manufactured and luxury goods fell. However, the reduction in energy and transportation subsidies caused a 7.3 percent increase in the CPI in January 1991. And the rent increases scheduled for October 1991 are likely to erode net real wages by a further 4.3 percent.[102]

These factors are not sufficient to account fully for the gross wage hikes of the magnitude that have occurred. As noted previously, we estimate that net wages rose approximately 22 percent between the end of 1989 and October 1990. By February 1991, consumer prices had risen 6.4 percent above their 1989 level. Thus, as of February 1991, real net wages in East Germany were at least 15 percent higher than before Union. Even taking account of the scheduled rent increases next October, net real wages are now

significantly higher than before Currency Union.[103]

A *second* potential cause of the Eastern wage increases might be a strong sense among Eastern workers that wage equality between East and West is fair. In the words of Reiner Gohlke, former head of the Reichsbahn and the first managing director of the Treuhandanstalt, "It is unfair that an engine driver should receive three times the pay to make a roundtrip from Hamburg to Leipzig as to make the same journey in the opposite direction."[104] The argument for equality also has a historical basis: prior to World War II, East Germany was on par with (indeed a little bit richer than) West Germany. Moreover, the formal educational attainment of East Germans remains comparable to that of their counterparts in the West. The East Germans have already suffered 40 years of deprivation due to socialism, and the continuation of inequitable pay only prolongs the effects of an unfair historical accident.

This explanation for wage increases does not receive strong support in our survey. Most East Germans doubt that their wages increased because it would have been unfair for them to stay so far below Western levels; only a minority--31 percent--agreed. Fifty-seven percent disagreed or strongly disagreed. But, interestingly, 76 percent of the respondents to our survey disagreed, many strongly so, with the statement "it is fair for a West German firm that establishes an enterprise in East Germany to pay lower wages as long as the unemployment rate in East Germany remains so high."[105] Presumably East Germans feel that if they work for a Western firm with productivity and technology equal to that in the West, they should receive "equal pay for equal work." Lower wages because of higher unemployment would be exploitation. But, at the same time, East Germans recognize that wage increases jeopardize employment in the East and that no productivity

increases have yet occurred which could warrant such increases.[106] Thus, it is not unfair for Easterners to receive lower pay in existing jobs. Sixty-two percent of all East Germans in a poll conducted by Infratest (and 79 percent of West Germans) agreed that wages in the East should not rise "too quickly."

Third, the wage increases that occurred may reflect the behavior of strong unions bargaining on behalf of Eastern workers. Unions probably perceived such wage hikes as welfare enhancing for their membership. Sixty-four percent of employed respondents who had experienced wage increases agreed that "My wage income rose because unions fought for higher wages." Only 22 percent disagreed.

It was clear, even from the beginning, that Currency Union would result in considerable readjustment with a great deal of unemployment and many plant closings. In a poll conducted in East Germany by the West German Allensbach Institut, only 45 percent of respondents thought their current firm would surely survive.[107] The German government offered workers generous unemployment benefits, based on terminal wages. In such an "end game", it would pay workers to increase their wages, so that if unemployed or placed on short-time, they would receive higher benefit payments. Over a quarter (28 percent) of our survey respondents thought that their employer and/or union was concerned that their benefits not be too low in case of short-time or unemployment.

Unions may have fought for higher wages in part because they believed that wage hikes would have only a small negative impact on employment in the East. Consider a union, bargaining on behalf of its membership and trying to maximize its members' expected utility. The optimal wage demand for the union depends on the elasticity of labor demand. If the elasticity of labor demand is low, it would be rational for unions to

bargain for high wages. This may well be the opinion that unions hold. Some support for this view comes from our survey. Less than a third (29 percent) of respondents thought unions were restrained in their bargaining because of their fear that firms would go out of business.

Lawrence and Lawrence[108] have a simple reason why labor demand is apt to be inelastic in an end game. The long-run elasticity of demand for labor depends on the responsiveness of both the level of investment to wages, and the capital intensity of new investment to wages. In an end game situation, where an industry is clearly dying, investment will be low whatever the level of wages since firms already have more capital than needed. As a result, the elasticity of demand for labor is low and labor has incentive to raise wages and appropriate the quasi rents of the firm. Our earlier analysis casts doubt on the validity of the idea that the elasticity of labor demand is actually low at present. According to our analysis, wages are currently so high that labor has already appropriated more than all of the quasi rents of existing enterprises. If subsidies end, many businesses will be closed. A reduction in wages would allow more firms to remain in business. For example, a 10 percent wage cut, under our preferred assumptions, would enable 7 Kombinate with 12.3 percent of the work force to meet their short-run costs, rather than 4 with 8.2 percent of the work force--a 50 percent increase in the number of workers in viable firms. This suggests that the short-run elasticity of labor demand is actually quite high, so that such wage push reflects miscalculation on the unions' part.

There are two alternative reasons, however, that unions might discount this analysis. First, the unions may assume that the Treuhandanstalt simply will not permit firms to go out of business regardless of their financial viability, so that the "effective" elasticity of

labor demand is actually low. Second, the unions may reason that wage increases will have little adverse effect on the flow of new investment and job creation in East Germany. This reasoning makes considerable sense if Western firms intend to follow pay policies which our Eastern survey respondents consider fair: namely, to offer Western rates of pay in new Eastern operations regardless of the level of unemployment (and wages in existing jobs) in East Germany.

A *fourth* hypothesis concerning Eastern wage increases is that Western unions pushed for East-West wage parity in order to enhance union solidarity and to slow migration. Western unions helped Eastern unions organize negotiations for wage increases.[109] They also urged Eastern unions to push for wage equalization.[110] (The vast majority of Eastern workers are covered by union contracts.) For example, IG Metall announced in November that the union would demand wage increases in the current bargaining round of about 50 percent for East Germany so that wages would rise to 60 to 65 percent of Western levels. The union argued that "unity requires equal wages."[111] It is quite clear that unions' pressure for "parity" is a major force for wage increases. IG Metall has succeeded in negotiating a contract which will result in wage parity in just four years. The union has justified this aggressive pursuit of parity--both publicly [112] and in private conversation with us--on the grounds that, without high wages, migration will be so large that there will be a shortage of qualified people in the East. Seldom has an argument been so specious. With massive unemployment in the East it is hard to believe that qualified job applicants will not be abundant. Furthermore, our survey found that most jobholders, on losing their current job in the East, would wait for another if it were available, *despite* the East-West wage differential. An article in the January 1991 issue of

the trade journal of the German Unions, Die Quelle, explains the other important argument for wage parity: "The Eastern Reserve Army drives down Western wages and threatens the unity of the unions. This is the reason for wanting a unified labor market as quickly as possible."[113] While this concern with West German wages and union solidarity may explain the demand for parity, our survey results suggest that parity without employment will not stop the migration, which unions fear as a threat to Western wages.

A *fifth* reason for the large wage increases is that management offered no effective resistance to union pay demands. The standard form of collective bargaining in Germany is between a regional or national association of employers and a single industrial union.[114] Where was management at the time of the negotiations? At the time of the wage increases, management was in disarray. Many firms were already losing money and were dependent on subsidies from the Treuhandanstalt to continue operations. A large proportion of Eastern managers remained from the previous regime. They were unaccustomed to collective bargaining and knew that they would ultimately lose their own jobs, no matter what wage agreements they negotiated.[115] The Trust, the holder of the stock of the newly formed firms, chose not to intervene in wage negotiations, although there are clear indications of their dissatisfaction with the agreements negotiated by the managers of Treuhand companies. For example, in a dispute over severance pay, the Trust criticized managers for signing contracts offering, in its view excessive payments of 10,000 to 15,000 DM to laid off workers.[116] Apparently, the Trust failed to intervene because, in Germany, the government has traditionally remained aloof from labor negotiations. Thus, superior union organization, at a time when management was not in a good position for concerted resistance against wage increases, and the owner of the firms--

the Treuhandanstalt--remained uninvolved must have played an important role.

Choice of Conversion Rate. In the spring of 1990, one of the key questions surrounding Currency Union concerned the rate at which wage contracts denominated in Mark would be converted into Deutsche Mark; the State Treaty set this conversion rate at one Mark per DM. Some economists argued that it would make little difference what rate was chosen since, in labor negotiations subsequent to July 1, wages would fall if they had been set above their equilibrium level and rise if the conversion rate were too low. According to a variant of this argument, wages were sticky downward and not upward. If wages rose subsequent to Union (as in fact occurred) then the conversion rate did not matter, since the conversion rate could only be a binding constraint against downward movements.[117]

This last argument is correct if wage bargains are made about the *level* of wages. In fact, however, wage bargainers often act as if they are negotiating about the *increases* or *decreases* in wages. Thus the *level* of wages in DM set by the conversion rate at Union may have had considerable effect on wage negotiations, if only by affecting "initial conditions".

To see whether wages were affected by the exchange rate, we directly asked employed respondents who had experienced wage increases since July 1 their opinions on the statement "My current wage would be much lower now if wage contracts had been converted at the rate of 2 Mark to one Deutsche Mark (rather than at the rate of one Mark to one DM) at Currency Union." Sixty-nine percent of respondents strongly agreed with the statement; however, 25 percent disagreed or disagreed strongly. Whatever the real truth may be, many East German workers believe that the nominal wages established

at Currency Union made a difference to their current wages even after the first round of post-Union wage negotiations.

V. Privatization and the Problems Facing the Treuhandanstalt

In March 1990, all publicly held East German firms were converted into joint stock companies with the shares held on behalf of the government by a Trust, the Treuhandanstalt. The major purpose of the Trust is to privatize the 8,000 companies[118] in its holdings, which together employ 3.65 million workers.[119] In the meantime it oversees the management of these companies and serves as an intermediary between the government and the companies, especially in the provision of guaranteed loan repayments. As of late February, 1991, the Trust had privatized almost 700 firms (or parts thereof) with sales value of 3.1 billion DM.[120] The slow rate of devolution can be attributed to five factors.[121]

First, the speed and scale of change made routine management tasks Herculean; for example, the Treuhandanstalt had to guide the 8000 firms in creating supervisory and management boards of directors involving approximately 120,000 appointments.[122] The people chosen for these boards were to be knowledgeable, but they were not supposed to have close Stasi connections. (It is estimated that 2.5 percent of all GDR residents were Stasi informants and .5 percent were Stasi agents.)

Second, the Trust does not have clear title to all of its holdings. Properties expropriated after the establishment of the GDR at the end of the Soviet occupation could be claimed by their original owners, as could properties taken between 1933 and 1945 for religious and political reasons.[123] One indication of the scope of potential claims is that

30 percent of East German industry was not yet nationalized at the time the German Democratic Republic was established.[124] Sensibly, owners of property which has been considerably altered can only claim compensation, not the return of the original property. Nevertheless there are many cases where the exact division of legal rights is unclear. The inability of the Trust to transfer clear legal title makes it difficult for property to be sold, even with the Trust's promise of indemnity against losses.[125] There have been 17,000 claims for the reprivatization of companies or parts of companies[126] of which 3000 had been processed in February, 1991. In addition over 1,000,000 other claims to property had been filed, overwhelming the offices in charge of processing them.[127] Recently, it has been decided that job-creating projects by investors will take precedence over claims of former owners until the end of 1992; this is expected to ease the property rights log jam.[128]

Third, East German industry and agriculture fail to meet Western environmental, health and safety standards. The air stinks; the waters of the brooks and rivers are syrupy;[129] and the soil is so polluted that in some areas even earthworms are extinct. More scientifically, emissions of SO_2 and NO_x are high; the streams and rivers have high levels of contaminants, including mercury, cadmium, lead, copper and zinc; and the soil contains high levels of wastes, including dioxins and residues from the use of pesticides.[130] Agriculture, chemical, and mining are particularly affected. The Trust has had a hard time finding reputable firms who want to tackle the environmental problems involved in running these industries, even though the Trust has typically negotiated agreements which indemnify purchasers against liability stemming from past environmental damage.

Fourth, the Soviet Occupation and the GDR regime nationalized and concentrated production throughout the economy--in industry, in agriculture and in services. Industry provides the most extreme example. In 1970 there were 12,000 enterprises; by 1985 less than 4,000 were left, each of which itself was a part of one of 214 industrial Kombinate.[131] The size distribution of industry in East Germany is very different from West Germany, especially in the absence of middle-sized firms. The Trust must decide how to bundle for sale the enterprises under its control.

Finally, the *fifth* major problem of the Treuhandanstalt in privatization is due to the losses of its constituent firms; these losses make the firms hard to sell to individuals who will operate rather than scrap them. This problem is a direct consequence of the price-cost squeeze and its implications are the focus of the remainder of this section.

The Treuhandanstalt could probably sell most of its enterprises easily for scrap or real estate. But it is unwilling to do so. It wants the people or firms who take over existing enterprises to continue employing workers and to create new jobs.[132] Its actions to date clearly illustrate its concern about employment. In several instances, the Trust has accepted a symbolic payment of a single DM for the sale of firms when the buyers have given explicit job guarantees.[133] The Trust has refused to sell firms to buyers who just wanted to use the real estate; in one case, the Trust accepted the *third* highest bid for a cigarette company because the winning bidder promised to transfer some of its production from West to East.[134]

In a market economy without distortions, the Trust would maximize social welfare by maximizing the proceeds from privatization. Each enterprise should be sold to the highest bidder, with no additional conditions of sale. However, the Treuhand's emphasis on job

creation is *warranted* because there is a major distortion in the East German economy. Wages are significantly in excess of market clearing. In the absence of a job creation policy, employment in East Germany will be well below the socially optimal level. The Trust is acting in the country's best interest by promoting employment as an objective. On this basis, though, the firms are very hard to sell. The high wages which must be paid to the workers at existing firms constitute a serious problem in making sales. Consider an analogy. Suppose that there is a hardware store owner who is selling shovels at a very cheap price. But the owner says that a condition of sale is that the shovels must be used. And his brother-in-law must be employed to use the shovel and paid much more than the competitive rate for his labor. Not many people are likely to buy the shovels. Indeed, to get rid of his stock of shovels (and get his brother-in-law employed), the hardware store owner may have to pay buyers to purchase the shovels, and not just sell them at a low price. The Treuhandanstalt is trying to sell East German industry and it is willing to take *low* prices; but on the terms of employment it wants, most of the firms have *negative* value.

More formally, if capital is used in fixed proportions with labor (as occurs in the putty-clay model after the capital has been built), the quasi-rents to a unit of capital are $q - wl$, where q is the output of the capital, w is the real wage, and l is the labor used with that capital. The market value of the capital is the expected present discounted value of these quasi-rents, $(q - wl)/(\delta + r)$, where δ is the rate of depreciation and r is the rate of interest. This market value is negative for wages which are sufficiently high if the machines are used and not scrapped.

The percentage of Kombinate with positive quasi-rents under alternative assumptions were tabulated earlier. It was shown that, at present, the great bulk of East German

industry cannot cover its short-run variable costs, so that quasi-rents are negative. If the Trust wants entrepreneurs to buy these enterprises and use the existing labor, they will find no takers unless some arrangement is made, such as co-payments for the employment of labor; in the absence of such copayments, the firms have *negative* value. The case of the hardware store owner who wants to sell a shovel and gain work for his brother-in-law is still analogous. The hardware store owner might agree to pay a generous fraction of his brother-in-law's excessive wage. If the fraction of the wage is sufficiently large, the buyer will find it worthwhile to purchase the shovel. An inducement of this sort is necessary to get buyers to take the stock of shovels off the hands of the store owner and get his brother-in-law gainfully employed.

Unprivatized firms must either be subsidized on an ongoing basis by the Trust or else liquidated. Disguised liquidations have already taken place on a large scale as firms have been sold or allowed to restructure themselves since Economic Union. Throughout the fall and winter of 1990-91, a litany of deep cuts in employment and large layoffs has been announced.[135] A director of the Treuhandanstalt has estimated that eventually, 50 percent of employment will be eliminated in the Treuhand's firms.[136] Apparently, these cuts will occur despite the Trust's concern for job creation because the Treuhand has not been given a mandate to rescue failing firms on a broad scale.

Employment Bonuses.

The status quo in East Germany is simply not acceptable. The question remains, what is to be done? A simple plan, a variant of which we favor, would be to offer wage subsidies or employment bonuses (EBs) to all private (nonagricultural) employment located in the former GDR. Any private firm hiring a worker in the East would be paid a

specified fraction of that worker's initial wage. With the bonus program in place, all firms presently owned by the Treuhand would be auctioned off--to the highest bidder, without additional conditions of sale.[137] Firms which could not be sold would be liquidated.

The high level of wages relative to productivity in East Germany is a major distortion in factor prices which results in too little current employment and too slow a pace of investment and new job creation. The subsidy offsets this distortion. The EB program would raise the value of the Treuhandanstalt's properties enabling the Trust to sell enterprises which have negative value in the absence of such a scheme. The subsidy would enable the Trust to achieve its goal of employment creation without having to evaluate each bidder's detailed employment and investment plans.[138] With an appropriately chosen subsidy in place, the social and private gains from hiring more labor exactly coincide, so that further decisionmaking can be left to the marketplace: the subsidy gives privatized firms the incentive to hire labor just to the point where the value of the marginal product of hiring the last worker equals the value to that worker of his/her lost leisure. Furthermore, managers of newly privatized firms will be more effective than the Treuhandanstalt's officials in restructuring existing enterprises, transferring Western technology and productivity raising measures, and resisting further wage increases.

The Budgetary Impact of an EB Program. The major objection that can be levelled against an EB program is that it is costly. But a subsidy program generates large offsetting budgetary savings since workers who would otherwise be unemployed gain employment through the EB program. Consider further the analogy of the hardware store owner who offers a copayment for the employment of his brother-in-law. While such a proposition might result in large payments to the shovel purchasers, it could save money for the store

owner if he has agreed to support his sister's family in the event that the brother-in-law is unemployed. This is the situation for the German government now: they are already *committed* to supporting the incomes of East Germans at a high level. The German government will most likely come out ahead even if they pay substantial wage subsidies because such a program is likely both to preserve many existing jobs and also to significantly speed the creation of new jobs.

In East Germany, a worker who is unemployed receives unemployment benefits, pays no income taxes, and makes no contributions to the social insurance fund. In addition, there are no employer copayments for social insurance. For the "typical" worker, the unemployment benefit is 68 percent of the net wage. Social insurance contributions are 18.25 percent of the gross wage for both the employee and the employer. The average income tax rate for East Germans is about 4.5 percent. At these rates, the revenue gain from moving a worker out of unemployment into a job is substantial: 79.1 percent of the worker's compensation.[139] A program of wage subsidies offering benefits below this 79.1 percent level saves the German government money on every individual who is employed under the program who would otherwise be unemployed.

Under an across-the-board wage subsidy program, however, benefits are paid to workers who would have been employed even in the absence of the subsidies--not just to workers who would otherwise be unemployed. In the East German case, some jobs would be preserved in Treuhandanstalt firms, and some new job creation would take place even without the subsidy program. For these inframarginal workers, it could be argued that the bonuses are costly since there is no revenue gain to offset their cost.

It turns out, however, that this argument is *not* valid when it is applied to inframarginal

workers in, as yet unprivatized Treuhandanstalt firms--those who would be employed even in the absence of a bonus program. The windfalls created by the employment bonuses accrue to the government itself. As long as wages are not changed by the EBs, the payment of EBs to workers in Treuhandanstalt properties who would otherwise be employed results in *no* revenue loss to the Treuhandanstalt; *the Treuhandanstalt recoups the cost of its EBs in the sale of its property.* Let's return to the example of the hardware store owner. If the owner offers a 1000 DM EB to any shovel buyer who hires his brother-in-law, this would increase the value of the shovel by 1000 DM to anyone who would hire the brother-in-law in the absence of the bonus. The hardware store owner can recoup the cost of the EB by raising the sale price of the shovel. An employment bonus proposal whereby wage subsidies would be granted in the East was recently put forth by the unions which are concerned about the disappearance of jobs. This proposal was retracted when it was realized that the bonuses would be granted both to profitable as well as unprofitable firms.[140] This criticism should be discounted in the case of subsidies which preserve jobs on existing capital in as yet unprivatized firms owned by the Treuhandanstalt. But it does apply in the case of new jobs which are created outside the Treuhand sector or as a consequence of new investment in Treuhand firms. A complete analysis of an East German employment bonus program therefore requires separate discussion of the budgetary costs and savings of bonuses paid on existing jobs in unprivatized Treuhand firms and on new jobs created after the scheme is put into effect. We consider these in turn.

Budgetary Costs and Benefits for Current Treuhand Workers. A simple diagram illustrates the benefits and costs of EB's paid on existing jobs in firms which are currently in the portfolio of the Treuhandanstalt. In Figure 3, DD represents the demand curve for labor as a function of worker compensation aggregated over all of the Treuhand's properties. At the initial compensation level, w_0, employment is OA. An employment bonus in the amount eb (= JC) raises employment to OB. The payment of this bonus has three distinct budgetary effects. First, there is the direct cost of the program--the rectangle CFLJ--which is the product of the bonus (JC) and the total number of employees on which it is paid (OB). The second budgetary effect of the program is positive: the government puts the unemployed to work, generating additional income tax revenue and higher contributions to the social insurance funds, and savings on unemployment compensation. This effect is measured by the area ABIG, the product of the number of additional workers employed (AB) and the budgetary cost per unemployed worker (BI). The third budgetary effect of the program is to enhance the market value of the Treuhand's properties, resulting in greater revenue for the Trust when the enterprises in its portfolio are sold. In the absence of the subsidy program, the value of the firms is measured by the present discounted value of the triangle JKM; with bonuses, the value of the firms rises to the present value of CFM. The extra revenue realized by the Trust due to the bonus program in the current period is CFKJ. Summing up the three budgetary impacts of the program, the overall net budgetary cost of the employment bonuses is equal to the difference between two areas: KHIL - ABFHG. As Figure 3 illustrates, this sum is negative when there is a large budgetary cost for unemployed workers. In this realistic case, the program generates an overall budgetary gain, not a loss.[141] Both the

government and the workers gain from the employment bonus program. Assuming that leisure has no value, workers gain because they earn higher income working than they do from receiving unemployment benefits. Their net benefit is the rectangle GKLI. Finally, there is a net social gain, the trapezoid AKFB, which is the sum of the gains to the workers and to the government.

Using Figure 3 it is possible to estimate the budgetary effects of subsidies to existing jobs in Treuhandanstalt firms with our earlier calculations of the impact of employment bonuses in Table 8. A 50 percent EB to Treuhand workers raises the fraction of employment in viable firms from 8.2 to 36.6 percent and generates budgetary savings of 11.94 billion DM per year if all workers in viable firms are employed. A 75 percent EB raises the fraction of employment in viable firms from 8.2 to 77.2 percent and generates budgetary savings of 22.3 billion DM. Insofar as there is less than full employment in viable firms, the budgetary surplus due to the program is proportionately less. With less employment, there will be proportionately fewer subsidies given out, but also proportionately less benefit.

We can illustrate how these calculations are made. According to Table 8, if all workers at viable firms are employed, the increase in employment due to a 50 percent subsidy is 28.4 percent of all employees--from 8.2 to 36.6. Subsidies of half of initial compensation thus have a direct cost of .5 x .366 of the total compensation of all Treuhand employees (subsequently denoted w_0L_0). This is the area CFLJ in Figure 3. The budgetary benefit can be found by summing three areas. First, there is the benefit from fewer unemployed workers. This is the area ABIG, which is .791 x .284 x w_0L_0. The contribution of the subsidy to the increased value of Treuhand properties is the sum of the

two areas CEKJ and EFK. JC is one half the wage, so CEKJ has area .5 x .082 x w_0L_0 and the area of the triangle EFK is .5 x .5 x .284 x w_0L_0. The net budgetary surplus is 15.4 percent of the compensation bill.

In the preceding example, unlike the typical case where subsidies are given, the capitalists get no gain from the EBs. Any gain they might realize is exactly offset by higher competitive bids for the property of the Treuhandanstalt. This occurs even in noncompetitive situations with few bidders: in most models of auctions, a program which increases a good's value by the same amount for all bidders will raise the auction price of an item by the identical amount. In the case of EBs, if the bidders' employment of labor is unaffected by the bonus payments, all bids should increase by the amount of the bonuses.

Budgetary Costs and Benefits of the Bonus for New Jobs. A full analysis of the budgetary impact of an employment bonus scheme requires separate consideration of the costs and benefits of bonuses paid on new jobs which are created after the bonus scheme is instituted and bonuses paid to workers who are currently outside of Treuhandanstalt firms. At present, the number of such workers who would be covered by an employment bonus scheme are quite small.[142] Thus we focus on the budgetary consequences of bonuses paid on new jobs created by new investment. The number of workers in such jobs will become quite large as new investment, we hope, rapidly comes to dominate the productive capital in the East German economy.

An employment bonus paid to workers on *new* capital will create new jobs in two ways. First, the subsidy to wages will affect the optimal labor-capital ratio of new investment: for example, with capital subsidies we might expect capital intensive

investments such as oil refineries to locate in East Germany; with labor subsidies we might instead expect labor-intensive investments such as corporate billing services to be located there. With a Cobb-Douglas production function, the cost-minimizing labor-capital ratio is inversely proportional to the effective wage. With a deep wage subsidy of 75 percent this ratio increases by a factor of 4; with a subsidy of 60 percent it increases by a factor of 2.5.

Second, employment bonuses will increase the volume of investment by raising its profitability. By lowering effective wages, employment bonuses decrease unit labor costs and raise quasi rents (q-wl) per unit of newly invested capital. In consequence, Tobin's q--the ratio of the market value of the profit stream from new investment relative to the cost of the capital goods--would rise; the optimal rate of investment would rise accordingly. We expect this effect to be quite large: a deep wage subsidy should substantially lower labor costs and increase profits; at only 3 percent of total West German investment, current private investment by West German firms in East German firms has considerable scope for expansion; and deep wage subsidies make East Germany competitive with other alternative production sites elsewhere in Eastern and Southern Europe.

By speeding the pace of job creation in these two ways, deep wage subsidies on new investment permit a more rapid reduction in East German unemployment, resulting in considerable budgetary savings on unemployment benefits. These savings must be weighed against the cost of paying for subsidies on new jobs which would have been created even in the absence of the program. Some sample calculations show that the savings from expanded job creation are likely to be large enough that the overall budgetary cost of the subsidies on new investment would amount to only a small fraction of the wage bill.

To approximate these costs and benefits suppose that, in the absence of an employment bonus, investment would occur at a constant rate I_0, with a capital-labor ratio of k_0, resulting in the creation of $N_0 = I_0/k_0$ new jobs per period. In contrast, suppose that with an employment bonus equal to a fraction λ of the initial wage, new investment occurs at the constant rate I_1, with a capital-labor ratio k_1, so that $N_1 = I_1/k_1$ jobs per period are created. (In actuality the optimal investment rates and capital-labor ratios will vary over time.) The net budgetary cost of the bonuses paid on these new jobs in a given period, t, is the difference between the direct cost of the program and the savings due to decreased payments for unemployment benefits and increased tax and social insurance payments. The net budgetary cost is $[\lambda - .791 + .791(N_0/N_1)]w_0N_1t$. With the slightly optimistic assumption that both investment and the capital-labor intensity are unit elastic with respect to the wage, a 75 percent wage subsidy would cost 0.84 percent of the wage bill on new investment in each period. With the less optimistic assumption that each of these elasticities is one half, the 75-percent bonus to workers on new capital would have a net cost of 15.7 percent of the wage bill of these workers. With both elasticities equal to unity, a 60 percent bonus would generate a 6.4 percent surplus. With both elasticities equal to one half, the 60 percent bonus to these workers would cost 12.5 percent of their total wage bill.[143]

In evaluating the overall budgetary impact of an employment bonus program, the budgetary effects of the program on new and existing capital must be aggregated. Because private investment is proceeding so slowly at present, deep subsidies to labor could provide significant incentives to invest and to intensify the usage of labor, yielding budgetary savings on new investment. But, even if subsidies on new investment are costly, the cost is

likely to be relatively small and will be partially or perhaps even fully offset by the savings from the bonuses paid to Treuhandanstalt workers.

The Impact of EBs on Wages. A *second* objection that can be levelled against a wage subsidy program is that the beneficial incentive effects of wage subsidies to hire workers who would be otherwise unemployed may be vitiated if the program induces wages to rise by more than would occur in its absence. Continuing the analogy, the hardware store owner loses money in offering a subsidy if his brother-in-law uses the existence of the subsidy to bargain for a yet higher wage. For example, if the brother-in-law bargains for a wage increase of 400 DM when the EB is instituted, the purchasers of the shovel, who would have hired the brother-in-law in the absence of the EB will now be willing to pay only 600 DM more for the shovel. The hardware store owner, in this case, has lost 400 DM. By analogy, subsidies given by the Treuhandanstalt should ideally not cause resultant wage hikes.

Figure 4 illustrates the argument. It shows that the budgetary benefits from an EB to workers on existing Treuhand capital will be significantly lower, and perhaps even ambiguous in sign, if the EB results in wage increases. A larger subsidy must be offered to achieve the same employment gain (within existing Treuhand firms) as in Figure 3. In Figure 4, the wage rises from its initial value, w_0, to w_1 because of the subsidy. The size of the required subsidy is CN. (When wages remain unchanged the size is merely CJ.) The gain to the workers is JKGIQN. This program has exactly the same effect on the revenues of the Treuhand as before (it realizes additional revenue equal to the discounted value of CFKJ from the sale of its properties); the program also results in the same budgetary savings from lower unemployment as before (ABIG). Finally, the social benefits of the

program are also unchanged, amounting to the trapezoid ABFK. But the direct cost of the bonus program is higher than before by the amount JLQN. The overall budgetary cost to the government is now KHIQPNJ - ABFHG, which is higher than before by the amount of the pay hike--JLQN. In this case the government does not necessarily make budgetary gains.

EB-induced wage increases will, similarly, increase the budgetary costs of increased employment on new investment. If unions are sufficiently powerful, it is conceivable that the subsidy could simply raise the wages of workers at the expense of the government budget without generating any additional employment at all. This is an extreme and unlikely possibility; but the basic problem is serious.

It is possible, however, to design an employment bonus scheme which eliminates unions' incentives to raise wages while preserving employer incentives to hire more labor. This is accomplished by linking the value of the bonus inversely to the wage. Such a linkage serves as a union-disciplinary device because it raises the elasticity of labor demand, making wage hikes more costly in terms of reduced employment.

A *third* objection to wage subsidies is that there is no natural time for the program to be terminated and thus it becomes self-perpetuating. But subsidies can be designed which automatically phase themselves out when they are no longer needed.

The SEFEB Program.

The goals of the Treuhandanstalt should be to privatize its properties with simple contracts that: 1) induce employers to hire workers who would otherwise be unemployed; 2) speed new investment; 3) do not cause budgetary loss to the government; 4) do not trigger union behavior which will offset the beneficial implications of the contracts; and 5)

are self terminating when no longer useful.

The SEFEB (Self-Eliminating Flexible Employment Bonus) Program accomplishes these objectives. Under this program, a bonus would be offered for the private employment of all workers in East Germany. The bonus is a specified fraction of initial compensation. But the bonus is *flexible* because its value is governed by a formula which depends linearly on the gap between Eastern and Western compensation. And the bonus is *self-eliminating* because its value falls to zero as wages in East Germany approach those in West Germany. With the plan in place, further wage increases should occur only as the economy recovers; the bonus will be self-terminating as it ceases to be useful. More specifically, the bonus, b, would be determined by the formula: $b = \lambda w_0[(w^*-w)/(w^*-w_0)]$, where w denotes Eastern compensation per worker at time t, w_0 denotes initial Eastern compensation, w^* denotes Western compensation at time t and λ is the desired percentage reduction in compensation costs.

These SEFEBs would serve five major purposes: *First,* by changing the value of most East German properties from negative to positive, they will permit sale without scrappage. With the SEFEB plan in place, the Trust would simply sell its properties to the highest bidder and liquidate those which still cannot be sold. The scheme eliminates the need for detailed evaluations by the Trust of the employment and investment plans of prospective purchasers. It would speed the process of privatization, thereby encouraging restructuring and the introduction of market incentives. *Second,* SEFEBs will provide the appropriate incentives for firms to preserve existing jobs and to create new ones, lowering unemployment substantially. *Third*, by taking workers off the unemployment rolls, payments for unemployment compensation will fall and revenues from income tax and

social insurance contributions and the sales of Treuhand firms will rise. *Fourth*, SEFEBs will reduce politically undesired migration and lower the level of social unrest. *Fifth*, SEFEBs will control excessive wage demands above and beyond the effect of introducing market incentives. Unions will have less reason to raise wages than with the usual form of wage subsidy because the SEFEBs will make labor demand more elastic; the beneficial incentive effects for hiring are less likely to be dissipated in demands for higher wages and the bonuses are also less likely to result in a budgetary drain.

In simple maximizing models of union behavior, the SEFEB plan usually makes wages sticky while unemployment prevails. Unions which consider employment as well as wages have an added incentive to keep wages low. If unions maximize the income of their employed members, and labor demand is linear, a SEFEB will usually not result in any change in wages. Unions seeking to raise wages above their initial level encounter a kink in the labor demand schedule at this point. Wage increases above this level cause the bonuses to diminish and thus the tradeoff of wages for employment suddenly worsens. Consequently, the initial wage is usually a corner solution to the income maximization problem. The SEFEB plan makes it difficult for the union to appropriate the quasi-rents which the EBs create. As a consequence, these rents can be recouped by the Trust from the sale of its property. This makes the plan attractive from a budgetary perspective. Wages will rise eventually in this model when demand and labor productivity grow to the point that there is full employment: once that has occurred, unions have nothing to gain by keeping wages low because employment is limited by the supply, and not the demand for workers.[144]

The SEFEB plan takes advantage of the unions' concern about the disappearance of

jobs. In effect, it offers them a trade: the unions can push for wage parity and forego the bonuses which will keep jobs in East Germany; or, they can forego the wage increases and keep the jobs. The SEFEB makes the tradeoff between jobs and wages stark, while it simultaneously creates incentives for management to create and to continue those jobs.

In the current wage round unions are bargaining for rapid achievement of wage parity. In February, as we noted above, IG Metall signed a pattern-setting contract granting wage parity in just four years. These contracts represent an absence of any social contract between government and workers. Any employment bonus plan, SEFEB or otherwise, must be made with the understanding, implicit or explicit, that the government is giving bonuses to protect jobs, and that unions in turn should show wage restraint to maintain the viability of those jobs. We endorse any plan with such an understanding. We offer the SEFEB as a suggestion because, relative to simpler employment bonus schemes, it makes the loss in employment due to higher wages clearer and more automatic. Thus unions have greater incentive to abide by their part of the social contract than with simple employment bonuses. Thus far, management associations of, as yet unprivatized firms, have staged little resistance to demands for wage parity. By allowing privatization, SEFEB will install profit-oriented owners with an interest in resisting unrealistic wage increases.

Two precedents for an employment bonus plan already exists in East Germany. First, the Bundesanstalt für Arbeit has allocated 5.3 billion DM in its 1991 budget for a job creation program. The money will be used to pay the wages of previously unemployed workers--typically for a year--and is expected to create temporary jobs for at least 260,000 workers. Second, the German government is currently subsidizing new jobs in R&D in East German companies. Firms that create new R&D jobs can get 60 percent of gross

wages for these employees for the first 15 months and 50 percent thereafter. Thirty million DM is available for such subsidies in 1991.[145]

The SEFEB plan will *not* save every job in East German industry. The 75 percent SEFEB lowers the short-run variable cost of production for Kombinate employing 77.2 percent of the workers below the price which these Kombinate were receiving for the share of their output sold in Western markets. But it will take time and knowledge of Western markets before such firms will be able to sell all of their output at these prices. For viable firms, the SEFEB shifts down the short-run supply curve so that their short-run average variable cost, $\hat{p}$, is less than the world price, p^* in Figure 1. It thus eliminates the price-cost squeeze for these firms. But it does not affect that part of the output reduction due to the demand shift.

We intend SEFEBs to apply to all private, non-agricultural employment. Using 1989 figures for employment, this would not include the over 2 million government and transport workers. These workers' jobs must be protected by adequate subsidies from the Federal budget to the Eastern Länder and municipalities. Nor does it protect most of the 0.9 million jobs in agriculture.[146] Under the EC, agriculture has its own forms of protection and support.

The SEFEB plan will not eliminate incentives for firms to lay off workers who are not needed to produce output; through its effect on privatization, the plan maintains incentives for adopting productivity raising measures, including those which come about through cuts in the work force. With SEFEBs, activities which have very low (or conceivably negative) value added at world prices *should* and *will* be discontinued. A rational means is created to allow market forces to decide which activities should continue in the East: activities

should continue as long as they are profitable when labor is appropriately priced--at the social opportunity cost of labor, rather than at the current wage. In the absence of such a plan, the Trust will find itself with insufficient funds to subsidize everything; and decisions will be made on an ad hoc basis about which firms to subsidize and which to shut down.[147] Such decisions should be made by profit-maximizing entrepreneurs; instead they will be made by the Trust. The old socialist system under the Central Planning Commission of the GDR will have been replaced by a new system of central planning, under the Treuhandanstalt. Indeed one of the strongest advantages of the SEFEB program is that it breaks the unsatisfactory status quo by allowing fast and easy privatization, thereby speeding restructuring and the introduction of market incentives.

We add three cautionary notes about SEFEBs and our calculations. In our budgetary calculations, we projected the unemployment compensation for the typical worker at 68 percent for the indefinite future. This is based on the potentially false prediction that it will be difficult politically to cut off benefits to Eastern workers because of the severity of the recession. A husband-wife-two-child family under current law would have a 53.6 percent replacement ratio after two years of joint unemployment, rather than 79.1 percent.[148]

A second assumption which yields optimistic estimates of *budgetary* costs is that the SEFEB plan leaves migration unaltered. The SEFEB plan will lower migration by creating more jobs in the East. Unemployed Eastern workers impose budgetary costs on the German government, whereas Easterners who work in the West impose no such costs as long as they do not displace Western workers from jobs. But, given West German fears about migration and East German reluctance to move, the benefits from decreased

migration are likely to be of the same order of magnitude, if not greater than, the offsetting increased budgetary cost. Our calculations therefore understate the budgetary costs of the SEFEB plan but they also ignore the perceived benefits from decreased migration to the West.

With any successful bonus program there will be incentives to locate activities just across the border to take advantage of the subsidies.[149] We do not see how this is avoidable. Of course few West German workers will want to work at SEFEB wages, which will begin much lower than West German wages, so there will be no incentive for West German labor to cross-migrate to take advantage of the wage subsidies. Still, there will be incentive for new investment to locate just across the border. The main border between East and West Germany is, for the most part, relatively unpopulated. The major problem occurs in West Berlin, which has 2 million people. Until now Berliners have managed to be competitive with West Germany with the help of subsidies from the Federal Government. West Berlin is now a boom area because of Unification, so the problems caused by the introduction of a deep SEFEB may not be severe. If they turn out to be serious, the special subsidies to West Berlin and the border areas, which were recently discontinued, can be reinstated. We view the border area problem as an unpleasant side effect of the SEFEB plan--but, given the severe distress caused by the depression in East Germany, we consider it better to take the medicine than to avoid its side effects.

Subsidies to Capital. Many subsidy programs for East Germany have already taken effect. Most of these are subsidies for *investment*--not for the use of labor. (See Klodt (1990b) for a valuable summary of these programs) The most important of them are an

investment grant for equipment of 12 percent; accelerated depreciation for equipment; European Recovery Program (ERP) loans for new enterprises and modernization of enterprises; and subsidized financing for new enterprises.[150] Except in instances where the subsidies are for the modernization of existing capital which makes existing jobs more productive, such policies fail to address the problem that *existing* firms with *existing* capital cannot meet expenses at current wages. These subsidies fail to solve the fundamental problems both of privatization (how can firms with continuing losses be sold?) and labor usage (who wants to use labor when the wage exceeds the value of its marginal product?)

Furthermore, subsidies to capital give large incentives to activities which create relatively few jobs. The classic example of the failure of capital subsidies to create jobs is in the Italian Mezzogiorno, where the bulk of expenditures were taken up by the capital intensive metallurgical and chemical industries, with relatively few backward linkages. An EEC report concluded in 1979: "What *has become* blatantly obvious is the illogicality of financing labor-saving undertakings in a region like *the Mezzogiorno*, where it is precisely *labor* which is the overwhelmingly abundant factor of production."[151] The same statement is equally true substituting *will become* for *has become*, and *East Germany* for *The Mezzogiorno*.

VI. Conclusion.

This paper has analyzed the great depression which is occurring in East Germany. There are two reasons for this depression. First, at the wages paid to East German workers there is a price-cost squeeze. East German firms are unable to sell their goods at world prices and pay their short-run variable costs. Thus wages are too high for most

firms to remain profitably in business. Second, Economic Union was accompanied by reductions in demand and shifts away from Eastern goods toward Western goods.

The two ultimate solutions to the problems in East Germany will be the in-migration of capital with new technology and the out-migration of labor. Capital is coming in--slowly. Similarly, labor is going out--slowly. In our survey we found a significant number of people who will move--enough to make a great migration when cumulated over, say a decade. But, still, the vast majority of East Germans want jobs in East Germany and are willing to make sacrifices to get those jobs. Thus most will wait in East Germany for those jobs--unemployed. The view that wages must be high to prevent migration is unfounded. Rather, the higher are wages, the greater is the price-cost squeeze, the more layoffs there will be, and the fewer new jobs from investment; thus the higher will be unemployment. This unemployment will be the real cause of most out-migration.

The high wages, and the price-cost squeeze, also make it difficult for the Treuhandanstalt to perform its major function (which is to privatize the East German economy) unless it sells its properties for their scrap or real estate value. Few people want to own and operate firms whose short-run variable costs exceed their revenues.

This analysis suggests that there is one variable which can and ought to be changed: the effective price for using labor. In East Germany, wages are above the market-clearing level and rising--toward parity with those in the West. A social contract is needed to keep wages from increasing futher. In return for wage restraint, employment bonuses should be given to save existing jobs and speed the creation of new ones. We propose a plan for SEFEBs--Self-Eliminating Flexible Employment Bonuses--which will accomplish this aim. A 75 percent SEFEB plan would make Kombinate employing three quarters of the

industrial workforce viable. The budgetary cost will be low--possibly even negative.

Finally, we have emphasized the interdependence of different governmental budgets: the attempt to cut one budget--for example, the budget of the Treuhandanstalt--has spillovers to other budgets--for example, the budget for unemployment insurance. In fact we found that because of these spillovers, the additional output which results from the financing of an additional DM of budgetary deficit is large. Expansionary governmental programs, and infrastructure programs will have a very high payoff and can be carried out at low cost now.

Seldom have the causes of such a great economic event or the desirability of policy responses to it been more clear.

1. For an excellent survey of such issues see Lipschitz and McDonald (1990).

2. Monatszahlen, December 1990, 3. Folge, pp. 30-34.

3. German labor laws allow firms with temporary difficulties to introduce a program referred to as "short time"; Eastern firms have special leeway in placing employees on short-time for longer periods of time until the end of 1991. See Süddeutsche Zeitung, January 10, 1991, p. 26. Workers on short time are paid two-thirds of previous net wages (68% for workers with children, 63% for those without) by the State. Many wage contracts in East Germany stipulate that the firm must also pay an additional 22% of the wage. Unemployed individuals who participate in training programs for at least 25 hours a week get 73% of previous net wages if they have children and 65% if they don't. It is commonly assumed that most short-time workers will ultimately become unemployed.

4. The increase in real labor cost per manhour was even larger because employer contributions to social insurance rose from 12.5% of gross wages to 18.25% of gross wages in July.

5. This increase may be somewhat misleading because nominal wages do not include various wage premia and fringe benefits which may be very different after Currency Union.

6. No data is yet available on net wages after Currency Union. We estimate, however, that net wages, as of October, had risen about 22%. The adoption of the FRG tax code and social insurance system lead to higher payroll tax deductions for Eastern workers: average income tax payments fell, but by less than social security taxes rose. A gross wage increase of roughly 10% was required to "compensate" Eastern workers for these changes. In addition, the marginal rate of taxation of approximately 20 percent is now considerably greater than the average rate of taxation of about 4.5 percent. Thus, percentage increases in net wages are considerably less than percentage increases in gross wages. Our estimate assumes identical treatment of Eastern and Western workers under the German income tax code. New tax allowances were granted in East Germany in February 1991 which raise net income slightly relative to these calculations.

7. Collier (1986) estimated the magnitude of these gains at 13% of nominal income for a family of four in the GDR in 1977. Collier used household budget data, and assumed identical preferences in the two Germanies, in order to quantify the gap between effective and notional purchasing power caused by quantity constraints in the GDR.

8. Throughout this paper we rely on data collected in the former GDR, the accuracy of which might be questioned. In many cases, secrecy in the former GDR led to sins of omission rather than of commission in GDR statistics. For a discussion see Collier (1985), pp. 134-40. Since March 1990, much previously unobtainable information has become available.

9. This is the model which has been applied to unemployment in the United States by Lilien (1982) and Davis (1987). The fraction of the labor force in various sectors in East Germany is quite different from West Germany. The proportions of employment in agriculture, manufacturing, construction, transportation and communication, and trade in East Germany in 1989 were 10.8%, 43.7%, 6.7%, 7.6% and 10.2% respectively, compared to 3.9%, 33.1%, 6.6%, 5.6% and 13.0% in West Germany. See Schnabel (1990), Table 2. It is likely that the shares in various sectors will ultimately approach those in West Germany as the technology gap is eliminated, due to the similarity in factor endowments. Restructuring industry in the East will also be necessary because employment is currently concentrated in extremely large firms; 88% of GDR employees in industry in 1989 worked in firms with at least 500 employees, compared to only 38% of FRG employees in 1987. See Statistisches Bundesamt (1990) pp. 118-119 and Statistisches Amt der DDR (1990) p. 161.

10. Assuming that different firms have different values of $\hat{p}$, the economy's aggregate supply curve is upward sloping rather than horizontal.

11. With exports evaluated at the Richtungskoeffizient of 4.4 Mark per DM exports amount to 21.5 percent of GNP. This coefficient is a shadow exchange rate used to value nonsocialist imports and exports in the GDR. For further explanation see the discussion on page 16 below. With exports evaluated at their export-weighted average domestic resource cost of 3.77 Mark per DM, nonsocialist exports amounted to 18.4 percent of GNP. See Statistisches Amt der DDR (1990) pp. 107 and 277.

12. The Kombinat level data are unpublished data compiled by the East German planning ministry. Data on the domestic resource costs of individual firms exporting at least 10 million Valutamark of goods to nonsocialist countries is contained in Schreiber, Hendzlik and Schmolinsky (1990). The numbers from these two sources are in approximate agreement. The domestic resource cost figures for each sector use weights based on employment shares in 1989. Figures on employment by Kombinat were obtained from the Staatliche Zentralverwaltung für Statistik, "Wichtige Kennziffern der Industrie Arbeitsökonomische Kennziffern, Berichtszeitraum: 1.1 -31.12.1989."

13. In order to make up for lost domestic sales, Eastern firms will have to find new customers in these markets.

14. This figure is the employment-weighted average of the domestic resource costs of each Kombinat; the export weighted average is slightly different--3.77. Expense is measured as the value of output at producer prices (Betriebspreise) which are exclusive of product specific taxes (Betriebspreise rather than IAP prices) and the trade margins of the foreign trade companies. Industrieabgabepreise (IAP) include product specific taxes.

15. In early 1990, the GDR publicly revealed, for the first time, the "shadow exchange rates" (Richtungskoeffizienten) used internally to convert DM, dollars, and transfer ruble into Mark (also called Mark Valutagegenwert or "mark value equivalents".) See, for example, Haendcke-Hoppe (1990). These conversion rates were Ministry "forecasts" of the expenses that East German firms would actually incur, on average, per DM (dollar/ transfer ruble) earned in foreign trade. In contrast, our data measures the *actual* costs of earning foreign exchange. Firms with domestic resource costs in excess of the Richtungskoeffizient received export subsidies. It was not expected that all firms would cover their costs in producing for foreign markets. The official conversion rates in 1989 were 1 DM = 4.4 Mark Valutagegenwert; 1 US Dollar = 8.14 Mark Valutagegenwert; and 1 transfer ruble = 4.67 Mark Valutagegenwert. See Statistisches Amt der DDR (1990) p. 275. The publication of these numbers enabled many riddles concerning East German trade to be solved and led to a reassessment of the magnitude of GDR trade with the West; it is now understood to be much larger than was previously thought. The availability of these conversion rates led Horst Siebert among others, in the months preceding Currency Union to a relatively pessimistic assessment of the viability of East German industry with conversion of wage contracts at par. Siebert argued for conversion of wages at 2:1 with a subsequent adjustment to compensate for the rise in prices of subsidized products and for higher social insurance contributions. See Siebert (1990). Similarly, Renate Filip-Köhn and Ludwig Udo (1990) used the newly available conversion rates to estimate the DM value of East German GNP by input-output methods. Their assessment was by far the most pessimistic on record. Under the most optimistic set of adjustments, they estimated East German GNP at 230 billion DM in 1988. The value of East German GNP, calculated according to National Income Accounting conventions for 1988, (reported in Statistisches Amt der DDR (1990) p. 107) is 345 billion Mark. Implicit in this calculation is an estimate of the overall level of East German relative to West German prices of 1.5. In contrast, the Deutsches Institut für Wirtschaftsforschung estimated 1989 GNP at 286 billion DM. (See Wochenbericht 46/90, 15 November 1990, p. 653.) In performing their calculation, Köhn and Ludwig assumed that exports were "dumped" so that the relative prices of East German exports to the West were far lower than the relative prices of East German goods in the aggregate. Alternatively, they assumed that the relative productivity of East versus

West Germany in exports--which they computed to be at most one-third--was lower than elsewhere in the economy. In contrast, we assume that export prices adequately reflect the world market value of tradeable industrial goods.

16. This Kombinat is losing 5 million DM every month and will have to lay off 70% of its workers. Süddeutsche Zeitung, November 8, 1990, p. 33.

17. "Stillegung bei Pentacon," press Release of the Treuhandanstalt, Berlin, October 2, 1990. On the other hand, Meissen Porcelain has orders for more than 2 years worth of output and Mitsubishi made an offer to buy this firm which was rejected by the Trust. It was decided that the government of Saxony should retain ownership of Meissen Porcelain because of its cultural significance.

18. The box represents the interquartile range (that is, the box encompasses from 25-75% of the data); the line across the middle of the box denotes the median; the whiskers extend to 150% of the interquartile range rolled back to the first available data point; observations beyond the whiskers are considered outliers and are each marked by bubbles individually.

19. Available time series data on the Richtungskoeffizient and the domestic resource cost of earning foreign exchange in the GDR suggest a significant deterioration in the competitiveness of the East German economy during the 1980's. The "Richtungskoeffizient" rose from 2.4 in 1980-84 to 2.9 in 1985, 3.6 in 1986, 4.3 in 1987, and 4.4 in 1988 and 89. See Siebert (1990). Available data for 1985-89 shows the actual evolution of the overall domestic resource cost ratio: 1.87 in 1985; 3.42 in 1986; 3.87 in 1987; 4.06 in 1988 and 3.7 in 1989. This substantial change in the domestic resource cost ratio and the Richtungskoeffizient reflects changes in the world price of petroleum, a significant GDR export, and Soviet oil, a major imported input. The cost of imported oil from the Soviet Union was a five year moving average of the world price. Between 1980 and 1984, the ratio of the price paid by the GDR to the Soviet Union divided by the world market price of oil doubled. In 1986 it doubled again, as Soviet prices peaked while world prices plummeted. In 1989 and 1990, this price ratio declined by 46 percent relative to its 1986 peak, permitting some decline in the domestic resource cost ratio of the GDR. These series are based on unpublished GDR data.

20. Statistisches Amt der DDR (1990) pp. 108-109.

21. The domestic resource cost numbers measure the value of GDR exports at producer prices per DM of foreign exchange earned. Because foreign exchange earnings in the former GDR were *exclusive* of any VAT taxes paid abroad, short run variable costs should also be computed exclusive of VAT. GDR firms which export abroad now are exempt from VAT; for sales within Germany now, both revenue and cost will be higher by the amount of the VAT. Because the corporate income tax is a levy on profits it should not be included in short run variable cost. Interest does not enter short-run variable cost. These debts could lead to bankruptcy, however, unless they are forgiven. Debts of GDR firms were converted into DM at a 2 to 1 rate; the Treuhandanstalt is making the interest payments on all old debt and in some instances the Treuhandanstalt has agreed to forgive the principal as well. See, for example, Frankfurter Allgemeine Zeitung, March 7, 1991, p. 16 and March 8, 1991, p. 15.

22. See Statistisches Amt der DDR (1990) pp. 108-109. While a precise geographical breakdown of the sources of these inputs is unobtainable, it is known that 54 percent of all imports into the GDR came from nonsocialist countries and the remaining 46 percent were from socialist countries. Since 70 percent of all imports into the GDR were used as inputs in industry it is reasonable to assume that these same percentages approximately characterize the sources of imported inputs as well. In performing the input-output calculations reported in Table 7, we have estimated the fraction of imported inputs in each sector from the CMEA and nonCMEA countries through a variety of indirect means, since this breakdown is unavailable in East German data.

23. We have made use of the recently published East German input-output table for 1987 to estimate the percentage difference between total cost before Currency Union and short-run variable cost after Currency Union. See Statistisches Amt der DDR (1990), pp. 108-109. Our analysis is modelled on the work of the Deutsches Institut für Wirtschaftsforschung, which has emphasized and estimated the scope for price cutting due to these cost reductions. In Deutsches Institut für Wirtschaftsforschung (1990), DIW presented a detailed analysis, estimating the percent by which gross *value added* would be able to fall in each sector as a consequence of the fiscal reforms at Currency Union. In unpublished work DIW used input-output methodology comparable to our own to estimate the potential reduction in producer prices which could occur in each sector. We are indebted to Bernd Görzig of DIW for providing us with the results of that analysis. The analysis which we report below makes use of similar methodology but takes account also of reductions in the costs of imported inputs due to Currency Union, which were not included in the DIW analysis. Michael Burda (1990) has also emphasized the importance of the scope for price cutting.

24. One shortcoming of the analysis is that we assume that GDR enterprises will continue sourcing their inputs domestically after Currency Union to the same extent as previously--an assumption that is undoubtedly unwarranted if the prices of those inputs do not fall to competitive levels. A further limitation of our analysis is that it assumes that firms will cut prices by the maximum amount possible, whereas, in fact, there is no incentive for further price cutting once prices have fallen to world levels.

25. It should be emphasized that the numbers in column 6 are the amount by which *producer*, and not *consumer* prices can decline. In the GDR, enormous subsidies were given to transportation and basic food, and some subsidies were provided in light industry, which caused consumer and producer prices to diverge. The imposition of the value added tax will raise consumer prices in all sectors by 14%. Finally, a variety of new taxes imposed on alcohol, tobacco and petrol will raise consumer prices in these sectors. Taking these factors into account, consumer prices should increase, not decrease, in several important sectors including food and transportation.

26. The adjusted resource cost figures actually provide an *underestimate* of short-run variable costs per DM earned. The reason is a technical one. The raw domestic resource cost figures measure producer prices at Betriebspreise, which are exclusive of any product specific taxes levied at the firm level. But the East German input output table values goods at producer prices (IAP prices) which are inclusive of such taxes. Table 7 measures the percentage by which these IAP prices can fall. This is an overestimate of the percentage by which the Betriebspreise can decline. Thus, the picture which emerges of the viability of East German industry here is slightly too optimistic.

27. We have adjusted each Kombinat's domestic resource cost ratio by the relevant sectoral adjustment factor from Table 7. Ideally, a separate adjustment factor should be computed for each enterprise and conglomerate based on the relevant details of its own cost structure. Such an approach could be attempted using the more detailed (e.g., 131 sector) input output table for East Germany which is now available.

28. See Vogler-Ludwig (1990). p. 7. These estimates of hidden unemployment take as given the age of the GDR capital stock, state of technology, extent of vertical integration, product mix and so on.

29. Prior to Currency Union, the picture of conditions in the GDR from available information led most analysts to nervously optimistic forecasts concerning the viability of East German industry. The most influential study comparing East and West German productivity prior to Currency Union was conducted by DIW for the Bundestag in 1987. Productivity--output per *employee*--in the East as of 1983 was judged to be approximately 52 percent that in the West while wages per employee in the GDR were 35 percent of those in the FRG. See Bundesministerium (1987), pp. 390 and 718. In 1989, average gross monthly wages and salaries per employee in the whole economy in West Germany amounted to 3192 DM; the comparable GDR figure for industry in the first half of 1990 was 1110 Mark. See Statistisches Bundesamt (1990) p. 566; the East German wage figure is based on unpublished data provided to us by the Statistical Office in East

Berlin. These figures implied that, at a one-to-one exchange rate, unit labor costs in East Germany would average 67 percent of the West German level. Given the similarity of relative productivity across sectors, even the sectors with lowest relative productivity--construction materials and agriculture and forestry--would have unit labor costs in the GDR approximately 15 percent below those in the FRG. Moreover, even the most pessimistic assessments before Union placed Eastern per capita GNP at 45 percent that of the West. For a survey of estimates, see Bundesministerium (1987) p. 480. (However, two days prior to Currency Union DIW published a revised estimate of GDR per capita income relative to the FRG of 40%. See Wochenbericht, 26/90, June 28, 1990.) Western estimates of prices in the GDR relative to those in the FRG indicated that the purchasing power parity exchange rate of the Mark relative to the DM was close to unity: the cost of the consumption bundle of the typical East German household was judged to be slightly lower in Mark in the GDR than in DM in West Germany. It was estimated that in 1985, an East German consumer in a typical four person employee household would pay 24% more in DM to buy its consumption basket in the FRG than that same basket cost in Mark in the GDR. See Bundesministerium (1987), pp. 516 and 732-3. Similarly, the Bundestag's estimates of the price parities for industrial goods suggested that producer prices in Mark in the GDR exceeded comparable DM prices by roughly 31 percent. Bundesministerium (1987) pp. 390 and 717-718. As we have shown, there was ample scope for prices to fall by this amount following Union, even with wage contracts converted into DM at parity. With the benefit of hindsight, it is apparent that the market values of the outputs of centrally planned economies have been overestimated, in our view, for one fundamental reason. Because socialist planning based targets on economic indicators, it was biased toward high values of those indicators and against unobservable characteristics such as product quality and variety which Western consumers value. In most methods of Western evaluation, those characteristics were just as unobservable to Western analysts as to the socialist planners, if not more so. In addition, Western evaluation faced the problem that socialist economies made products which were not produced in the West with techniques not current in the West. The Western production cost of these goods, which was the method used to evaluate Eastern versus Western quality in the most careful studies, frequently would far exceed their market value. See, for example, Peter Sturm (1974) and Thad Alton (1990).

30. Konjunktur Aktuell, January 1991, Anhang II, p. 68. Sales to the CMEA bloc, denominated in transfer ruble, are converted into DM using the exchange rate of 2.34 DM per transfer ruble both before and after Currency Union. Available data suggests that most of the decline which occurred, at least through September, was mainly in exports to nonsocialist countries. A breakdown of exports by region is available for July, August and September in Monatszahlen, December 1990. During these three months, exports to the socialist countries rose by 8.5% in comparison with the first six months of 1990. During this same period, exports to the industrialized western countries were at 76% and exports to developing countries at 62% of their level during the first six months of 1990.

31. Frankfurter Allgemeine Zeitung, January 22, 1991, p. 15.

32. One estimate places the total losses of the shipyards since devaluation of the transfer ruble at 4.5 billion DM. Die Zeit, No. 46, November 16, p. 10.

33. In 1990, 1500 firms received export subsidies for exports to socialist countries. These subsidies totalled 3.5 billion DM. In 1991, it is expected that only 149 firms will get subsidies and the government expects to spend no more than 1 billion DM. Süddeutsche Zeitung, November 13, 1990. For example, the Treuhandanstalt has announced that the production of Wartburg cars will be discontinued at the end of March since it would cost DM 200 million to subsidize their production. Frankfurter Allgemeine Zeitung, January 22, 1991, p. 15 and Süddeutsche Zeitung, January 31, 1991, p. 37. In February, strikes hit all of the key shipbuilding centers, including Schwerin, Rostock and Stralsund, as thousands of workers demanded that subsidies continue rather than shutting down money-losing companies. The Wall Street Journal, February 21, 1991.

34. Immediately after Currency Union, East Germany cancelled many orders from Poland, Czechoslovakia, Hungary and Bulgaria. Frankfurter Allgemeine Zeitung, September 10 and 12, 1990. This made it difficult for these countries to make payments to East Germany for exports. It is anticipated that when trade is denominated in hard currency, the DM revenue will fall below the rate implicit in the current transfer ruble/DM exchange rate of 2.34. For example, in shipbuilding, it is estimated that one transfer ruble's worth of sales will be worth 1.56 DM in 1991, as compared with 2.34 DM prior to January 1, 1991 and 4.67 before Currency Union. Frankfurter Allgemeine Zeitung, November 19, 1990, p. 18.

35. For example, the foreign trade Ministry of the Soviet Union was unwilling to sign contracts with East German firms after January 1 and a special negotiation involving the Soviet Prime Minister and the German Economics Minister resulted in the authorization of Soviet orders totalling only 9 billion DM for 1991. Frankfurter Allgemeine Zeitung, February 13, 1991, p. 17.

36. Frankfurter Allgemeine Zeitung, December 7, 1990.

37. Süddeutsche Zeitung, February 5, p. 26.

38. Plan Econ (1990) p. 19.

39. See Alton (1990) p. 27.

40. The most widely cited East German GNP statistics are those produced by the Deutsches Institut für Wirtschaftsforschung. The East German Statistical Office estimated GNP in 1989 as 353.2 billion Mark. Statistisches Amt der DDR (1990) p. 107. DIW estimated that the value of East German GNP in DM prior to Currency Union was 285.7, using an implicit exchange rate derived from the productivity estimates in the Bundestag report. See, Wochenbericht, 7/91, February 14, 1991, p.55. As we discussed above, this exchange rate gives a very high value of GNP in comparison with what is obtained from considering domestic resource cost figures.

41. In June, 1990, the month before unification, there was a surge in household saving: it amounted to 1235 DM or 39.5% of net income per household. Dissaving occurred in both July and August. Nevertheless, the savings rate for the three months of June, July and August amounted to 9.6% of net income. Monatszahlen, December 1990, pp. 54-55.

42. Monatszahlen, December 1990, p. 55.

43. Aggressive Western retailers rapidly set up distribution outlets in the East after July 1. An alternative hypothesis as to why there are so few goods of Eastern origin in the stores is not that Eastern residents don't want them but rather that these Western retail chains are not sourcing from the East.

44. Süddeutsche Zeitung, September 25, 1990. According to a recent report, however, the food industry has begun to recover and East German products are making it back onto the shelves. Süddeutsche Zeitung, January 31, 1991, p. 31. The disappearance of East German products was not confined to foodstuffs. For example, it was reported that in the Centrum Department Store in East Berlin almost no East German products were on the shelves. A salesperson interviewed in a toy store indicated that Eastern products are simply too expensive. Frankfurter Allgemeine Zeitung, December 10, 1990. A poll of Eastern firms found broad agreement with this conclusion: 75% thought that the quality and prices of their products make it difficult to sell them. Süddeutsche Zeitung, October 22, 1990.

45. Data from the Statistisches Bundesamt shows that shipments of food rose to 651 million DM; investment goods to 971.8 million DM, and consumer goods to 224 million DM. Data for October through December 1990 show shipments at roughly the same level as in September.

46. Deutsche Bundesbank (1990), September, pp. 5 and 30 and October, p. 15.

47. Statistisches Amt der DDR (1990) pp. 110 and 112. The investment figure is in constant 1985 prices. 1989 GNP at constant 1985 prices was 353.2 billion Mark.

48. Quartals Bericht (1990), December.

49. It is likely that the investment price index fell by less than 51 percent, so that real investment fell. Although the producer price index fell by 50.6 percent, investment is labor intensive and, as Table 7 shows, the scope for price reductions in construction was lower--38.6 percent.

50. This data was provided by the Statistisches Bundesamt.

51. Monatszahlen, December 1990, 3. Folge, pp. 30 and 38.

52. Ifo-Institut für Wirtschaftsforschung (1991).

53. For example, the possibility that new technologies imported from the West will become available following privatization gives Eastern managers good reason to wait rather than to make new investments. Suppose that an old technology could earn a positive return but a new technology could make a return which is a multiple, β, of that return. At discount rate r, it would pay to wait to invest if the new technology is expected to be available in less than $\ln \beta / r$ years. If $\beta = 1.5$ and $r = .06$, it would pay to wait rather than to invest now if the new technology will be available in 6 3/4 years.

54. Neumann (1990) p. 10.

55. Volkswagen is investing 4.2 billion DM in East Germany (with 33% financed with government subsidies.) The whole project is expected to create 35,000 jobs (including jobs at various parts suppliers). Süddeutsche Zeitung, October 20/21. Siemens already employs 15,000 workers in East Germany and plans to increase employment to about 25,000 to 30,000 while investing 1 billion DM. Frankfurter Allgemeine Zeitung, November 29, 1990. Mercedes is planning to spend 1 billion DM in building a new production site which will be finished in 1994/95. Frankfurter Allgemeine Zeitung, February 9, 1991, p. 14. IBM Germany is planning to invest 200 million DM in East Germany and create between 2000 and 3000 jobs. Frankfurter Allgemeine Zeitung, December 17, 1990. Opel has invested 27 million DM in a new assembly line which will produce 10,000 cars per year and employ 200 persons. It plans expansion to production of 150,000 cars per year. There is considerable backward linkage to this project since Opel has signed contracts with 350 East German firms to supply parts. Frankfurter Allgemeine Zeitung, October 6, 1990.

56. Ferdinand Protzman, "Germans Lower Expectations on East's Economic Recovery," The New York Times, 140, February 13, 1991, p. C2.

57. Plan Econ (1990) p. 2.

58. See Süddeutsche Zeitung, March 2-3, 1991, p. 13. Frankfurter Allgemeine Zeitung, March 2, 1991, pp. 1-2 and March 6, p.1.

59. Neumann (1990) p. 10.

60. Frankfurter Allgemeine Zeitung, February 8, 1991, p. 13.

61. Frankfurter Allgemeine Zeitung, March 2, 1991, p.1. The state and local governments may add to this from their own revenue sources.

62. Wochenbericht, 10/91, Table 1, p. 92. We have added to DIW's estimates of 35 billion from the Unity Fund and 10 billion contribution from "other" governments, 5 billion from VAT tax collections and 12 billion from recently announced Federal subsidies to municipal governments. The VAT collections were included in tax collections but the 12 billion in subsidies were not. Although the subsidies are earmarked for special programs, we have not altered the 97 billion DM of expenditure because it is likely that the Länder and municipalities will use these funds for programs which are already budgeted in light of their anticipated deficit.

63. We are grateful to Rudolf Zwiener of DIW for making available these projections as well as for clarifying the budgetary data.

64. Frankfurter Allgemeine Zeitung, September 25, 1991. In 1989, total civilian employment in the state sector, including health, schools, culture, communal activities and social services amounted to about 1.8 million workers. Statistisches Amt der DDR (1990) p. 125. This does not include workers in local transportation and waterworks.

65. Terence Roth, "Most East German Soldiers are Fading Away as Reunification with a Former Enemy Nears," The Wall Street Journal, September 10, 1990, p. A10.

66. The Bundesbank has been particularly concerned about the likely magnitude of the public sector borrowing requirement. By early November, forecasts of the 1991 PSBR reached 140-150 billion DM, or 4.5-5% of GNP. During the Fall, the Bundesbank began to put strong pressure on the government to limit deficit financing by raising interest rates. See, for example, Financial Times, November 5, 1990, p. 16.

67. Alternatively stated, West German financing of the Eastern budget deficit provides a capital inflow, permitting the East to run a current account deficit. If the West insists that East German budget deficits be cut, thus reducing the capital inflow into the East, the East's current account deficit must correspondingly decline. This implies that output must fall until the induced decline in imports due to lower East German income and government expenditure matches the decline in permissible deficit spending. Large output declines are likely to be necessary for such deficit spending targets to be achieved.

68. There has been great concern in Germany that large fiscal deficits incurred on behalf of the East will lead to higher German interest rates and an appreciation of the DM. The legitimacy of this concern depends on the cause of the deficit. For example, if CMEA orders from East Germany decline in 1991, Eastern output will fall further and unemployment will rise. Additional unemployment of 100,000 workers for a year would automatically raise unemployment compensation benefits by about 946 million DM, assuming an average wage of 1500 DM per month. Income tax recipts and contributions to social security would fall by about 738 million DM. At fixed Eastern expenditure levels, the Eastern deficit would rise. Such "passive" deficits, however, (unlike those resulting from deliberately stimulative "active" fiscal policy) do not result in any demand stimulus (rightward shift of the IS curve) which would cause interest rates to rise.

69. Three sources accounted for most of the decline in employment since the Fall of 1989. First, unemployment (as a fraction of the labor force) rose from zero to 7.3% in December; second, migration flows (mostly to the FRG) reduced the labor force by about 6%; third, about half a million workers (6% of the labor force) accepted an early retirement option offered to workers at least 57 years of age (Klodt, 1990). The GDR labor force was also reduced by the discharge of 270,000 working old age pensioners and 100,000 foreign workers (mainly Vietnamese). See Deutsche Bank (1991).

70. The dramatic decline in productivity was unexpected, at least in part because labor productivity increased following the West German currency reforms of 1948.

71. In 1989, average gross monthly wages and salaries per employee in the entire economy in West Germany amounted to 3192 DM. The comparable figure in the GDR in the first half of 1990 was 1110 DM--34.8%. Wage increases during 1990 have reduced this differential to approximately 50%. However, the gross wage differential overstates the real wage gap between East and West Germany because rent is highly subsidized in the East. In July 1990, the typical four person household in East Germany spent 55 DM per month on rent; in contrast, the typical four person household in West Germany spent 694 DM per month in 1989. See Statistisches Amt der DDR (1990) pp. 319 and 479. It is estimated that living space per inhabitant in the GDR was 25 square meters in comparison with 35 square meters in the FRG. See Melzer (1989). p. 95. East German rent per worker would rise by 441 DM per month for a family of four if rentals per square meter are adjusted to Western levels. For a two-worker household earning 1500 DM per earner per month (assuming a *marginal* payroll tax rate of .3825), gross wages would have to rise by 23.8% to compensate Eastern workers for higher rents.

72. The personal surveys were conducted by Helga Hessenius, Daniel Gross, and Thorsten Wassermeyer. Mail surveys were distributed in housing blocks in Dresden, Leipzig, Magdeburg, Rostock, Jena, Chemnitz, Gera, Erfurt and Eisenach. Participants were asked to respond only if the household contained a member of the labor force who had worked during the previous year. 327 responses were received by March 23, of which 301 were admissible. The mail survey was identical to the personal (nonstudent) survey in all respects but one: In the personal survey, respondents were asked to "agree, partially agree/partially disagree, or disagree" with a number of statements. In the corresponding questions in the mail survey, respondents were given the additional option of agreeing or disagreeing strongly. A trial version of our survey was conducted in late January; the data from this initial attempt was used to revise the survey and has not been directly used as data.

73. Our nonstudent survey was not a random sample of the East German labor force. For example, we under-sampled: rural residents and women and oversampled individuals with higher than average education and training. We intentionally oversampled unemployed individuals. The following numbers provide a comparison of the incidence of various demographic characteristics in the actual GDR labor force in 1988 and in our sample (actual/sample): % male: (51.1/62.1); % under 25 (12.9/13.5); % 25-34 (26.2/22.8); %35-44 (21.5/28.6); %45-59 (33.1/32.7); %60-64 (4.6/2.2); %65+ (1.7/0.0). Education: % college or university (Hochschule) (7.3/14.6); % with vocational/technical training/occupational certificate (Meister/Fachschule) (16.4/28.3); % apprenticeship (Abgeschlossene Lehre) (55.3/45.0);% with no apprenticeship (keine Berufausbildung) (20.9/11.6). Source: Statistisches Amt der DDR (1990) pp. 128-9 and Institut der deutschen Wirtschaft (1990) p. 116.

74. Migrants from the East in 1988 (the last year for which the relevant data is available) were younger than the West German populace, with fewer housewives (1.3% vs. 23.9%) and retirees (14.2% vs 21.6%). See Bundesanstalt für Arbeit (1991).

75. Wirtschaft und Statistik, November 1989, pp. 582-590.

76. This was the actual percentage in 1988. See Bundesanstalt für Arbeit (1991) Table 1.

77. Commuting will also contribute to the solution of the unemployment problem. Estimates of the number of 1990 commuters vary from 100,000 to 300,000. Commuting is especially concentrated around Berlin and areas like Eisenach and Magdeburg which are relatively close to the border. Commuting is likely to rise as Eastern unemployment continues and closer ties with the West are attained. It is of interest to record the number of workers who live within relatively easy commuting distance of the West. In 1989, 697,100 people worked in East Berlin; 548,700 worked in Potsdam (close to Berlin); and 293,900 worked in Schwerin (at the Western end of Mecklenburg-Western Pomerania); 654,100 in the Magdeburg region and 648,400 in the Erfurt region, which includes Eisenach. See Statistisches Amt der DDR (1990) pp. 67, 85, 89 and 93.

78. The survey statistics reported in the text pertain to the merged sample of 556 observations consisting of the 255 personal interviews and the 301 admissible mail surveys and pertain to nonstudents unless otherwise specified.

79. The standard deviation of this estimate is .1. The existence of non-trivial sample selection bias probably means that this figure overstates mobility, since women (who are under-represented) gave lower scores than men and we have excluded non-labor market participants (who have tended not to migrate).

80. Our results are broadly consistent with the findings of a recent poll carried out by the Emnid Institute for Der Spiegel. In that poll, 71% of East Germans indicated that they would stay in East Germany no matter what; 22% said they would probably stay; 5% would probably go West; and 1% would definitely migrate. "Hunderttausende ab in den Westen" Der Spiegel 12, March 18, 1991, pp. 50-57.

81. Of the fifteen percent of respondents who said they would not wait for a job identical to their old one at their old wages, only 21 percent rated their chance of migrating as 7 or higher. The unemployed individuals who said they would not wait gave a mean migration score of 4.3.

82. Students may be impatient to find jobs because they do not have financial resources in the form of savings or access to unemployment benefits.

83. The wage gap is larger for more skilled members of the labor force since the wage distribution in East Germany was highly compressed. For example those with college degrees (Hochschulabschluß) in the East earn wages 54% more than those with no professional training (Ohne Berufsausbildung), while, in the West, they earn double. Similarly, the average wage of managers and consultants in the East with college degrees is 85% higher than the average wages of those without special training in retail trade; the comparable wage gap in the West is 182%. See Wochenbericht, 32/90, 9 August 1990, Table 1, p. 443.

84. Deutsche Bank (1990) p. 50.

85. Participation rates were higher in the GDR (around 53% of the GDR populace is employed, versus 48% in the FRG), especially for women (50% for the GDR vs 40% for the FRG).

86. We calculated the exit rates from unemployment by cohort of entry using Salant's method. See Salant (1977) pp. 39-57. We assumed 64.4 percent of migrants would be seeking jobs. This is the rate of prior employment of those who migrated in 1988. Conservatively for the estimate of unemployment, we assumed that no migrants who entered training would seek jobs before June 1990. We assumed that 16.0 percent would enter training. This is the ratio of those who entered training in 1990 (see Bundesanstalt für Arbeit (1991), Table 23) relative to an estimate of all migrants for 1990 which extrapolates the March to June rate for the rest of the year.

87. It is also likely that migrants moved to areas of West Germany where jobs were relatively plentiful rather than to regions with high unemployment.

88. See Klodt (1990a), p. 83.

89. Our survey takers interviewed counselors at the employment service of the Bundesanstalt für Arbeit in Dresden, Leipzig and Magdeburg. These counselors reiterated that the specific skills of East German workers often fail to match the requirements of Western jobs giving examples similar to those noted in the text. They believed that significant numbers of East Germans in the West had failed to pass an initial three week trial employment period. A substantial number of workers arriving from the East have sought additional training to upgrade their skills.

90. Schelling (1971).

91. We inquired about a number of factors that might influence mobility: Respondents were asked "Do you have many friends and/or relatives in the West?" 53% said yes and 47% no. Respondents were asked to agree,partially agree-partially disagree or disagree with several statements. The percentages who agree/disagree were as follows. "Higher rents deter me from working in the West."(17/72); "It is important for me to continue living close to my family and friends here in East Germany." (78/11); "Pollution in East Germany significantly lowers my quality of life." (50/26); "I very much like the neighborhood in which I live." (63/10); "I believe that the quality of life is better in East Germany than in West Germany." (11/63); "My family wouldn't like living in West Germany." (48/27); "I can easily imagine living in West Germany." (39/39); "I think that I should help rebuild the East German economy." (86/4).

92. See Eichengreen (1990), p. 11.

93. Only 27 percent disagree.

94. Prior to January 1990 unemployment benefits were calculated on the basis of FRG remuneration. Such generous unemployment benefits explain why a study of migrants published in 1985 found a rather relaxed attitude about taking jobs. At 68% of FRG wages, an Eastern migrant was typically earning double his/her previous wages if unemployed in the West. See Ronge (1985). Shortly before Union, a number of other special social benefits which had previously been granted to GDR immigrants by the FRG were also eliminated. These included special official assistance in finding jobs and housing as well as settling-in grants and the celebrated "welcome money". East Germans also had full access to the West German social security system as if they had paid regular contributions. A delay of three months was introduced, before which immigrants from the GDR were not entitled to receive social benefits; this delay is comparable to that for FRG citizens who voluntarily give up a job (OECD (1990)).

95. See Begg et. al. (1990).

96. The West German labor force in 1989 was 27,742,000. See Statistisches Bundesamt (1990) p. 20.

97. Labor's share of net social product at factor cost in West Germany in 1989 was 67.2%. See Statistisches Bundesamt (1990) p. 566. Burda and Sachs estimate the elasticity of output with respect to labor input as .64; Burda and Sachs (1987), Table A1, p. 35.

98. A further factor mitigates the negative impact of Unification on West German wages. An important consequence of Currency Union was a switch in demand of East German residents toward West German goods. This switch in consumer demand, coupled with the market's expectation of large future investment in the United Germany, should in principle lead to an appreciation of the DM, raising real consumption wages. This issue has spurred a large debate concerning the desirability of a realignment in the EMS; see e.g., Begg et. al. (1990) and Lipschitz and McDonald (1990).

99. Konjunktur Aktuell, Anhang II, January 1991, p. 69. A full description of the provisions of contracts negotiated in East Germany since Currency Union is contained in Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1990), pp. 70-75.

100. These calculations are based on Deutsches Institut für Wirtschaftsforschung (1990) pp. 3 and 5, and Genser (1990), pp. 20-22 and 75.

101. See Statistisches Amt der DDR (1990) p. 144.

102. Rents are scheduled to rise by 1 DM per square meter on October 1, 1991. Süddeutsche Zeitung, January 30, 1991, p. 25. This is equivalent to a 4.3 percent decline in net real wages for a typical worker in a four person-two earner household who earns 1500 DM per month.

103. These calculations do not take account of changes in bonuses and fringe payments, which amounted to 19 percent of East German compensation in 1989. No information is currently available on how these benefits have changed since Currency Union. In 1989, total compensation of full time employees amounted to 1324 Mark per month in industry, while gross wages amounted to 1072 per month. See Table 5 and Statistisches Amt der DDR (1990) p. 144. The difference consists of premia and bonuses, spousal and child allowances, Christmas money and other miscellaneous payments.

104. This comment was made in a conversation with the authors.

105. In a poll taken by Infratest Kommunikationsforschung in Munich, people in both East and West Germany were asked to list their priorities for East Germany; for East Germans, the equality of wages ranked as fourth highest priority out of ten, whereas for West Germans it was ranked last. Frankfurter Allgemeine Zeitung, December 13, 1990, p. 19.

106. Eighty percent disagreed with the statement "Wages rose in East Germany because productivity increased."

107. Frankfurter Allgemeine Zeitung, September 19, 1990, p. 19.

108. See Lawrence and Lawrence (1985).

109. Western unions probably perceived large wage hikes in the East to be in their interest. Anecdotal evidence suggests concern on the part of Western unions that firms would switch jobs away from the West toward the East in response to lower wages. For example, the auto workers' union expressed concern that the situation of workers in West Germany would deteriorate because of Volkswagen's new production sites in East Germany and other countries. Süddeutsche Zeitung, November 8, 1990. Western unions also may have thought, as did the West German government, that higher wages in the East would prevent migration to the West and downward pressure on Western wages. Since unemployment benefits are linked to terminal wages, such hikes might also reduce migration by raising the incomes of unemployed Easterners.

110. For example, a spokesman for IG Chemie, the union for the chemical industry, was quoted as saying that "the unions want wages to reach West German levels as soon as possible" but would not object if up to 40% of the jobs were destroyed. Frankfurter Allgemeine Zeitung, November 16, 1990, p. 19.

111. The Union also argued that a big differential between East and West Germany would lead to migration of qualified workers which would jeopardize the economic development in East Germany. Frankfurter Allgemeine Zeitung November 16, 1990, p. 19.

112. Frankfurter Allgemeine Zeitung, February 7, 1991, p. 15; Süddeutsche Zeitung, February 7, 1991, p. 23.

113. "Tarifpolitik: Die Einheitsklemme," Die Quelle, January 1991, p. 16.

114. See Flanagan, Soskice and Ulman (1983), p. 234.

115. At the end of 1990 only 12 percent of all people in management or supervisory positions had not been there before the "Wende." Süddeutsche Zeitung, January 17, 1991, p. 32.

116. Frankfurter Allgemeine Zeitung, January 29, 1991, p. 18.

117. See Schinasi, Lipschitz, and McDonald (1990), p. 148.

118. This figure does not include stores, restaurants and hotels. The responsibility for the privatization of these entities is being handled by a subsidiary of the Treuhandanstalt--the Gesellschaft zur Privatisierung des Handels. Treuhandanstalt Pressestelle, 10/11/1990 and 10/15/1990.

119. 1900 of these companies are utilities which are expected to be transferred to local communities. See Cornelsen (1990). In the industrial sector, in 1985 there were about eleven establishments (individual production sites) per enterprise. See Cornelsen (1989) p. 22. For the number of employees in the trustfund's enterprises see, Süddeutsche Zeitung, February 21, 1991, p. 29.

120. Handelsblatt, February 26, 1991. As of late January, 70% of the 11,000 restaurants and small stores had also been sold. Frankfurter Allgemeine Zeitung, February 23, 1991, p.14.

121. We do not include in this list Section 613a of the German Labor Law, which prevents dismissals of workers *because of* takeovers within one year of the date of sale. In the case of most layoffs after sale of East German firms, sufficient other reasons can usually be given so that this law is not a binding constraint on employment. Large scale layoffs, however, must be accompanied by a social plan between the firms and the workers. In East Germany these social plans have typically involved severance pay, especially for long-term workers.

122. Under German law, each firm incorporated as an "Aktiengesellschaft" (AG) must have separate supervisory and management boards typically with 5 and 10 members respectively.

123. See Sinn (1990) and John Tagliabue, "Germany Returning Property in East to Pre-War Owners," The New York Times, February 3, 1991, p. 8.

124. See Cornelsen (1990).

125. See Sinn (1990), p. 26.

126. Ferdinand Protzman, "Rebuilding East German Industry," The New York Times, February 14, 1991, p. C5.

127. Frankfurter Allgemeine Zeitung, December 20, 1990, p. 19. The property rights issue has had a serious impact on the ability of the Trust to sell or lease the 1.7 million hectares of agricultural land that it owns. The unity treaty states that land can only be sold or leased if there are no property rights by old owners. Frankfurter Allgemeine Zeitung, November 20, 1990.

128. The Wall Street Journal, March 19, 1991, p. A21.

129. See Marlise Simons,"New Taint on East German Pollution," The New York Times, September 9, 1990, p.6.

130. See Streibel (1990).

131. See Cornelsen (1989), pp. 21-23.

132. This conclusion is based on personal conversations with officials of the Treuhandanstalt. Jens Odewald, a spokesman for the Trust said in an interview "it is not the only goal to sell the firms as quickly as possible to the highest bidder. Instead, we also have to help to create jobs, encourage investment, and let a sound economic structure develop." Frankfurter Allgemeine Zeitung, November 19, 1990, p. 29.

133. See, for example, Frankfurter Allgemeine Zeitung, January 25, 1991, p. 14 and February 20, 1991, p. 21; and Der Spiegel, No. 6, February 4, 1991, p. 112 for several examples.

134. Recently, the Trust has indicated that it is unlikely to close a firm because of the impact that this would have on its community. Detlev Rohwedder, Managing Director of the Treuhandanstalt, said that even though the situation of Zeiss Jena was incredibly bad it was in the interest of the region to prevent the collapse of the firm. Frankfurter Allgemeine Zeitung, February 22, 1991, p. 15.

135. For example, some of the cuts that were announced in February: Interflug is to be liquidated (Frankfurter Allgemeine Zeitung, February 11, p. 16.); Robotron will cut their workforce from 10,600 to 7600; SKET Magdeburg with 30,000 employees reduced its workforce to 16,700 at the end of 1990 and plans to lay off 10,000 more workers by the end of September 1991 (Frankfurter Allgemeine Zeitung, February 23, 1991, p. 15); Zeiss Jena plans to cut employment from 29,000 to 10,000 by the summer of 1991 (Frankfurter Allgemeine Zeitung, February 28, 1991, p. 18.); A Swiss consulting firm estimated that 17 firms in the microelectronics could survive but employment would have to be cut from 35,00 to 5,000-7,000. (Frankfurter Allgemeine Zeitung, February 8, 1991, p. 15.) In March the Treuhand estimated that 100,000 jobs in the textile industry will disappear in 1991 and 25 firms will be closed down (Frankfurter Allgemeine Zeitung, March 2, 1991, p. 12) and that half of the 46,000 jobs in the shipyards will be cut by 1994-95 (Frankfurter Allgemeine Zeitung, March 5, p. 15.) The former Kombinat Takraf announced that it would reduce employment from 27,000 to 7,000 workers by the end of 1993. (Frankfurter Allgemeine Zeitung, March 5, p. 15.)

136. Süddeutsche Zeitung, February 21, 1991, p. 29.

137. Two early proponents of such a wage subsidy plan were George L. Perry, "Managing Economic Reunification," Los Angeles Times, March 18, 1990 and Peter Passell, "East Germany's Morning After," New York Times, August 1, 1990. Klodt (1990b) has also discussed the merits of such schemes.

138. Although subsidies to business are not ordinarily allowed under the Treaty of Rome, they probably would be allowed in East Germany. Under Part II, Chapter 1, Section 3, Article 92, Subsection 2, Part c of the Treaty, special assistance is allowed to "promote the economic development of areas where the standard of living is abnormally low or where there is serious underemployment." In response to our inquiry concerning the SEFEB plan the office of the Director-General for Economic and Financial Affairs of the European Communities has offered the following opinion: "There are precedents for Commission approval of labor subsidies in the least developed regions of the Community, notably the Mezzogiorno in Italy. As Eastern Germany, with the possible exception of East Berlin, almost certainly qualifies as one of the least developed regions, the Commission is likely to have a favorable attitude towards a labor subsidy scheme, provided that the amount of aid per worker is not excessive and that the scheme covers a limited period, as you envisage. Non-discrimination between sectors would also be an essential requirement, although the Commission could impose restrictions on sectors where there is serious over-capacity at the Community level (e.g. steel, shipbuilding)."

139. We define worker compensation as the gross wage plus employer's contribution to social insurance. This calculation assumes that the wage the worker will receive when employed is the same wage which is used as the basis for the worker's unemployment compensation. Because unemployment benefits decline to 58 or 53 percent after one year of unemployment, the savings declines from 79.1 percent to 72.6 percent for a typical worker in the second year of unemployment.

140. Frankfurter Allgemeine Zeitung, November 16, 1990, p. 19.

141. This analysis treats the scrap value of the Treuhand's firms as zero. The demand curve DD represents the aggregate demand for labor across all firms. As compensation per worker rises, employment may fall for two reasons: each firm hires less labor and some firms become unviable and are shut. In the putty-clay model, only this second effect is at work. When firms are shut, their assets may be sold for scrap generating revenues for the Trust which we have not included in the analysis. If the scrap value of firms is high, our analysis overstates the budgetary savings of the bonus program. In an early sale by the Treuhandanstalt, textile machines from one factory were sold to an industrial museum in West Germany. The real estate may be of more significant value.

142. Such a scheme would apply to private, non agricultural employment. In order to avoid creating windfall gains for firms and establishments which have been privatized during the last year, it would be appropriate to offer such enterprises a bonus only for employment which exceeds the present or agreed upon levels. The number of nonTreuhand, non governmental, nonagricultural workers is quite small. Based upon 1989 employment figures fewer than .5 million workers would obtain subsidies at present who are not in Treuhand firms. See Statistisches Amt der DDR (1990) p. 127. Most uncovered workers are in trade and crafts.

143. We propose below a plan which gradually phases out employment bonuses once full employment has been achieved, and terminates bonus payments when Eastern wages have reached the West German level. Assuming that the bonuses are fully eliminated by the time that full employment would be reached in the absence of the plan, the budgetary cost, if any, of the bonus program attains a maximum when full employment is reached. If there are budgetary savings before full employment is reached, these continue until the bonuses are fully eliminated.

144. In this case, the availability of labor becomes the condition which determines labor usage. At each level of demand, the union compares the maximum value of labor income with and without the subsidy. Eventually when the wage has risen sufficiently, they find that labor income is maximized by foregoing the bonuses. At this point wages are raised beyond the point where employment bonuses are paid and employment falls to what it would be in the absence of the program. At no time, however, is employment decreased by the payment of the SEFEBs; as long as bonuses are paid, employment is always larger.

145. See Süddeutsche Zeitung, March 18, p. 24 and Frankfurter Allgemeine Zeitung, January 5, 1991, p. 9.

146. See Statistisches Amt der DDR (1990) p. 125.

147. For example, the shipyards in Schwerin and Rostock have orders from the Soviet Union which, if filled, will show losses. Should these orders be accepted? A rational way to decide is by seeing whether these sales are profitable when the costs are evaluated using wage costs, net of the SEFEB bonus.

148. After one year of unemployment, benefits decline from 68 to 58 percent for a worker with children and the overall "replacement ratio" falls from 79.1 to 72.6 percent.

149. We are most grateful to Christopher Sims for pointing out this problem to us.

150. Accelerated depreciation on investment in Eastern Germany is an important aspect of the tax revisions announced in February, 1991. Department of State Telegram on Financial and Economic Developments in Germany: February 1-7, 1991.

151. Commission of the European Communities (1980), p.22.

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Table 1. Output, Employment, and Labor Productivity in East Germany

Time Period	Industrial Output (1989=100)	Labor Productivity (Sept. '89=100)	Employment[a] (in thousands)			
			Industry	Constr-uction	Transport & Commun.	Trade
1986	92.1		3224	475	608	784
1987	94.8		3212	470	613	786
1988	97.7		3214	467	617	788
1989	100.0		3193	460	619	784
1989:						
Qtr 4			3153	454	615	783
Oct	100.6	101.2				
Nov	98.6	100.2				
Dec	97.6	99.7				
1990:						
Qtr 1			3086	439	613	760
Jan	94.4	98.1				
Feb	96.6	100.3				
Mar	97.8	101.7				
Qtr 2			2961	371	580	722
Apr	97.0	101.6				
May	92.1	97.1				
June	86.0	93.5				
Qtr 3			2690	359	554	654
July	56.0	64.9	2777	361	553	671
Aug	47.9	56.8	2710	367	558	661
Sept	48.9		2584	350	552	634
Qtr 4						
Oct	49.5		2452	343	525	582
Nov	50.9		2388	337	512	554
Dec	45.5					

Source: Gemeinsames Statistisches Amt, Monatszahlen, November 1990, pp. 16-18 and December 1990, 3. Folge, pp. 9-11 and 18.

a. Number of wage and salary workers.

Table 2. Sectoral Changes in Output and Producer Prices Following Currency Union

	Index of Industrial Output (1989=100)				Index of Producer Prices[a] (1989=100)		
Sector	5/90	7/90	10/90	12/90	5/90	7/90	8/90
Total Industry	92.1	56.0	49.5	45.5	98.4	51.7	48.8
Energy[b]	85.9	52.9	58.9	71.8	105.1	97.6	98.1
Water Supply[b]	101.0	93.2	91.1	96.4	122.2	122.8	126.2
Chemicals	85.5	61.8	47.3	46.3	99.0	31.3	31.9
Metallurgy	91.9	39.8	30.1	23.7	99.9	44.1	41.2
Building Materials	102.8	61.8	33.9	22.6	100.6	80.1	78.5
Machinery & Trans. Equipment	101.3	70.7	61.8	60.0	103.5	66.1	61.8
Electronics	100.5	68.6	56.0	41.3	71.7	40.6	43.3
Light Industry (excl. textiles)	88.4	48.9	47.7	39.4	102.9	51.2	52.0
Textiles	81.8	47.8	44.2	29.1	100.7	31.7	31.1
Food	90.0	40.8	45.1	43.4	91.4	60.4	53.9

Source: Industrial Output: Gemeinsames Statistisches Amt, Monatszahlen, December 1990, 3. Folge. p. 22. Producer Prices: Statistisches Amt Der DDR, "Indizes der Erzeugerpreise gewerblicher industrieller Produkte," Heft 6, Juli 1990 and Heft 8, August 1990.

a. Prices prior to 7/1/90 are Industrieabgabepreise (IAP) which include product specific taxes and subsidies levied at the producer level, in Mark of the GDR. Prices after 7/1/90 are in Deutsche Mark.

b. Prices in these sectors continued to be officially set after unification.

Table 3. Unemployment, Short-Time Work and Vacancies in East Germany

in thousands

Month	Unemployment[a] Number	Rate	Short Time[a] Number	Rate	Vacancies
1990					
January	7.4	--			158.6
February	11.0	--			141.4
March	38.3	--			105.9
April	64.8	--			73.6
May	94.8	--			54.3
June	142.1	1.6			41.4
July	272.0	3.1	656.3	7.4	27.7
August	361.3	4.1	1,499.9	16.9	20.4
September	444.9	5.0	1,728.7	19.3	24.3
October	536.8	6.1	1,703.8	19.1	24.7
November	589.2	6.7	1,709.9	20.1	23.8
December	642.2	7.3	1,795.4	20.5	22.6
1991					
January	757.2	8.6	1,856.0	21.1	23.0
February	787.0	8.9	1,900.0	21.5	

Source: Gemeinsames Statistisches Amt, Monatszahlen, December 3. Folge 1990, p. 12. Bundesanstalt für Arbeit, Arbeitsmarkt in Zahlen: Aktuelle Eckdaten für das Beitrittsgebiet, January 1991, Nürnberg, p. 2. Statistisches Amt, Konjunktur Aktuell, January 1991, Anhang II: p 72.

a. Rates are as a percent of the civilian workforce.

Table 4. An Index of The Cost of Living for All Private Households in East Germany, Before and After Currency Union

Month	All Items	Food, Drink & Tobacco	Clothing & Shoes	Rent & Energy	Furniture & Hsehold Goods	Health Care Products	Transport & Commun.	Education & Recreation	Other Goods
			(1989 = 100)						
1990									
May	98.3	100.9	89.0	100.0	96.0	92.3	100.2	106.4	90.5
June	87.9	97.4	51.7	100.0	84.8	88.5	93.4	88.3	92.6
July	94.5	115.4	57.5	100.0	74.5	119.4	85.2	88.5	99.0
August	94.9	111.9	59.9	100.0	74.9	121.4	89.2	90.9	102.0
Sept	96.6	111.4	64.4	100.0	76.3	122.6	89.8	95.2	105.1
Oct	98.2	112.2	66.9	100.0	76.6	123.4	92.5	99.6	105.3
Nov	98.1	112.4	68.1	100.0	76.6	123.7	90.3	99.2	104.6
Dec	99.1	113.8	69.5	100.0	77.5	126.6	89.1	100.2	105.3
1991									
Jan	106.4	114.9	69.3	157.8	78.8	127.5	96.2	102.6	154.9

Source: Gemeinsames Statistisches Amt, Monatszahlen, December 1990, pp. 52-53; January 1990, pp. 24-25. Statistisches Bundesamt, Mitteilung für die Presse, February 26, 1991.

Table 5. Average Gross Monthly Wages per Full Time Employee by Industry Before and After Currency Union[a]

Sector	1988	1989	I:1990	II:1990	7/90	10/90
	(in Mark of the GDR before 7/90; in DM thereafter)					
Total Industry	1041	1072	1089	1205	1335	1545
Energy	1202	1229	1228	1385	1454	1798
Water Supply	985	1020	1051	1228	1238	1579
Chemicals	1075	1112	1115	1283	1494	1582
Metallurgy	1116	1140	1132	1335	1352	1547
Building Materials	1012	1045	1081	1230	1307	1593
Machinery & Transport Equip.	1073	1101	1124	1229	1410	1574
Electronics	1045	1069	1091	1195	1367	1502
Light Industry (excl. textiles)	946	978	994	1062	1117	1415
Textiles	943	978	994	1048	1069	1401
Food	965	1003	1032	1142	1187	1482

Source: 1988 and 1989: Statistisches Amt der DDR, Jahrbuch, Arbeitskräfte und Löhne, 1989, pp. 74-78; I:1990 and II: 1990: Statistisches Amt der DDR, "Arbeiter und Angestellte und deren Bruttolöhne nach Wirtschaftsbereichen und Sektoren im 1. Halbsjahr 1990," Berlin, August 24, 1990, p.6.; July 1990 and October 1990: Gemeinsames Statistiches Amt, unpublished data.

a. Data for July and October 1990 are reported according to the sectoral classification used in the former GDR. Data for these same months reported according to the West German sectoral classifications is available in Konjunktur Aktuell, January 1991, Anhang II, p. 69.

Table 6. Prices and Costs in East Germany Before and After Currency Union: The Domestic Resource Cost of Earning Foreign Exchange in Trade with Nonsocialist and Socialist Countries

Sector	Employment Share	Expense of earning one: Deutsche Mark		Transfer Ruble	
		Unadjusted[a]	*Adjusted*[b]	*Unadjusted*[a]	*Adjusted*[b]
Total Industry	1.00	3.73	1.84	4.65	2.30
Energy	0.11	2.08	0.85	3.16	1.29
Chemicals	0.12	4.11	1.50	5.93	2.16
Metallurgy	0.07	3.22	1.35	7.43	3.11
Mach./Trans. Eqip.	0.26	3.54	1.83	3.51	1.81
Machinery	0.15	3.59	1.85	3.62	1.87
Trans. Equip.	0.10	3.46	1.79	3.35	1.73
Electronics	0.18	4.82	2.42	3.44	1.73
Light Industry	0.24	3.74	1.72	5.69	2.62
Textiles	0.14	3.70	1.71	6.45	2.97
Furniture, Toys etc.	0.05	4.22	1.95	4.55	2.10
Glass, Ceramics, Paper	0.05	3.33	1.54	4.65	2.14
Food, Bevs., Tobacco	0.02	4.09	2.93	8.00	5.73

Source: Unpublished data from the East German government and the authors' calculations.
a. Sectoral unadjusted expense in Mark of earning a DM in nonsocialist trade and transfer ruble in socialist trade. These numbers are averages of Kombinate level data by sector, weighted by each Kombinat's share of sectoral employment.
b. Adjusted expense is estimated average short-run variable cost in DM of earning a DM, obtained by multiplying unadjusted expense by 1 - the adjustment factors given in column 6 of Table 7.

Table 7. A Decomposition of the Factors Contributing to the Differences between Domestic Resource Costs Before Currency Union and Short-Run Variable Costs After Currency Union

percent

	Adjustment in Domestic Resource Cost by Reason:						Elasticity of Short-Run Variable Cost with respect to Further Wage Increases:	
	Reduction in Profits, Interest, Taxes	50 Percent Reduction in Depreciation	Lower Costs of Imported Inputs	10% wage hike: net wages constant	Additional 32% wage increase	Total Adjustment	*Across the Board*	*Own Sector Only*
Total Industry	-36.1	-4.8	-19.7	2.4	7.6	-50.6	.66	.51
Energy	-47.3	-10.0	-9.4	1.8	5.8	-59.1	.61	.42
Chemicals	-41.1	-4.3	-23.2	1.2	3.9	-63.5	.46	.24
Metallurgy	-30.9	-4.4	-29.6	1.6	5.2	-58.1	.53	.33
Building Matls	-40.9	-5.1	-16.2	2.4	7.8	-52.0	.69	.47
Machinery & Trans. Equip.	-36.0	-4.2	-19.3	2.6	8.5	-48.4	.70	.54
Electronics	-39.8	-4.1	-17.2	2.7	8.6	-49.8	.73	.56
Light Industry	-43.0	-3.8	-17.0	2.4	7.6	-53.9	.70	.52
Food	-18.4	-5.7	-20.3	3.8	12.3	-28.4	.73	.19
Agriculture & Forestry	-31.6	-5.1	-11.6	4.0	12.8	-31.6	.79	.62
Transportation & Communication	-29.3	-8.2	-12.2	3.5	11.4	-34.7	.74	.54
Construction	-36.6	-4.4	-12.6	3.5	11.4	-38.6	.79	.53

Source: Authors' calculations. See text for a more detailed description.

Table 8. The Viability of East German Conglomerates Under Benchmark and Alternative Assumptions

Adjusted Expenses per DM	Benchmark Case[a]		Cumulative Distribution of Employment by Adjusted Expense: Benchmark Case Plus an Across the Board:			
	Number of Kombinate[b]	Cumulative % of Employment[c]	10% Wage Increase	10% Productivity Increase	50% Labor Cost Subsidy	75% Labor Cost Subsidy
< 0.25	2	0.4	0.4	0.4	1.9	2.5
< 0.5	7	2.5	2.5	2.5	4.9	10.6
< 0.75	10	4.9	4.9	5.2	14.5	36.6
< 1.0	14	8.2	7.5	12.3	36.6	77.2
< 1.25	27	19.9	17.5	26.8	69.3	89.7
< 1.5	46	37.5	33.3	46.7	82.7	96.2
< 1.75	66	55.2	49.9	63.4	90.7	99.5
< 2.0	86	73.9	64.1	78.1	96.1	99.8
< 2.25	96	81.8	77.1	86.7	98.5	99.8
< 2.5	105	87.2	83.9	89.8	99.4	99.8
< 2.75	107	90.8	89.8	91.2	99.8	99.8
< 3.0	108	91.2	90.9	96.3	99.8	100.0
< 3.25	111	96.3	91.3	96.3	99.8	100.0
< 3.5	111	96.3	96.4	99.6	99.8	100.0
< 3.75	114	99.6	96.4	99.6	99.8	100.0
< 4.0	114	99.6	99.6	99.8	99.8	100.0
< ∞	116	100.0	100.0	100.0	100.0	100.0

Source: Authors' calculations as described in the text.

a. The Benchmark Case (as in column 6 of Table 7) assumes elimination of taxes, profits, interest and subsidies to the firm; an increase in employer and employee contributions to social insurance to the West German level of 18.25% apiece; a 50% reduction in depreciation expense; savings on imported inputs as described in the text; and a 42% increase in gross wages.

b. Number of Kombinate: the cumulative number of Kombinate with adjusted domestic resource cost ratios below the level indicated in column 1.

c. Cumulative % of Employment is the percent of wage and salary workers in Kombinate with adjusted domestic resource cost ratios below the level indicated in column one, as a fraction of the total number of wage and salaried workers at all Kombinate in the sample.

Table 9. Migration Between East and West Germany

	Eastern Migration Figures[a]				Western Estimated Inflows[b]	
	1989		1990		1989	1990
	Outflow	Inflow	Outflow	Inflow		
January			41,413	593	4,627	73,729
February			45,062	151	5,008	63,893
March			44,094	71	5,671	46,241
April			24,052	136	5,887	24,615
May			13,940	265	10,642	19,217
June			13,616	437	12,428	10,689
July			27,323	353	11,707	
August			24,537	581	20,959	
September			18,150	688	33,255	
October	34,308	61			57,024	
November	70,868	176			133,429	
December	54,200	494			43,221	

Source: Eastern Measurements: Gemeinsames Statistisches Amt, Monatszahlen, December 1990, p. 4. Western Measurements: Bundesanstalt für Arbeit, Arbeitsmarkt in Zahlen: Zugezogene/Übersiedler, Aussiedler. January 1991, Table 5.

a. Eastern outflow figures give the number individuals from the East who give notice of departure to the West. Eastern inflows are the number of individuals who give notice of their arrival from the West. These figures exclude outflows and inflows to and from foreign countries.

b. Western estimated inflows are the number of individuals from the GDR who registered upon their arrival in the West. Since Currency Union in July 1990, migration has been treated by the West as internal migration.

Table 10. Survey Answers Concerning Migration and Employment Conditions in East and West Germany for Various Subgroups of the East German Population

percent of respondents answering question

			Nonstudents					
		All	Employed	Unemployed	Short-Time	Female	Under 31	Students
Number of Respondents:		556	460	96	99	211	144	107
"Migration Scale"[a]	0	22	21	29	16	32	13	3
	1-2	16	16	15	21	16	9	3
	3-4	19	20	13	19	17	21	25
	5	29	30	24	25	24	32	48
	6-7	7	7	7	11	4	14	13
	8-10	8	7	12	8	7	10	9
Willing to wait for Eastern job paying current wages[b]		85	86	85	91	88	80	75
Median wait time (months)[c]		6	6	6	6	6	6	6
Would then try to work in West[d]		11	11	15	13	7	14	28
Expected percent change in wages if work in West[e]		154	145	199	143	154	151	118
Hard to find a job in the West?[f]	Yes	65	66	61	69	73	55	na
	No	35	34	39	31	27	45	na
Expect to lose my Eastern job[g]	Agree	28	28	na	65	28	38	na
	Disagree	39	39	na	9	37	37	na
Hard to find a new job in the East[h]	Agree	73	73	78	86	73	64	51
	Disagree	15	14	22	4	13	22	12
Expect wages in the East to rise quickly[i]	Agree	46	52	19	37	47	35	44
	Disagree	31	26	59	29	29	42	27
Willing to accept up to a 20% wage cut[j]	Agree	28	32	25	13	30	17	na
	Disagree	59	48	70	75	57	78	na
Wouldn't be welcome in the West[k]	Agree	44	45	40	42	48	35	21
	Disagree	27	26	32	25	22	33	45

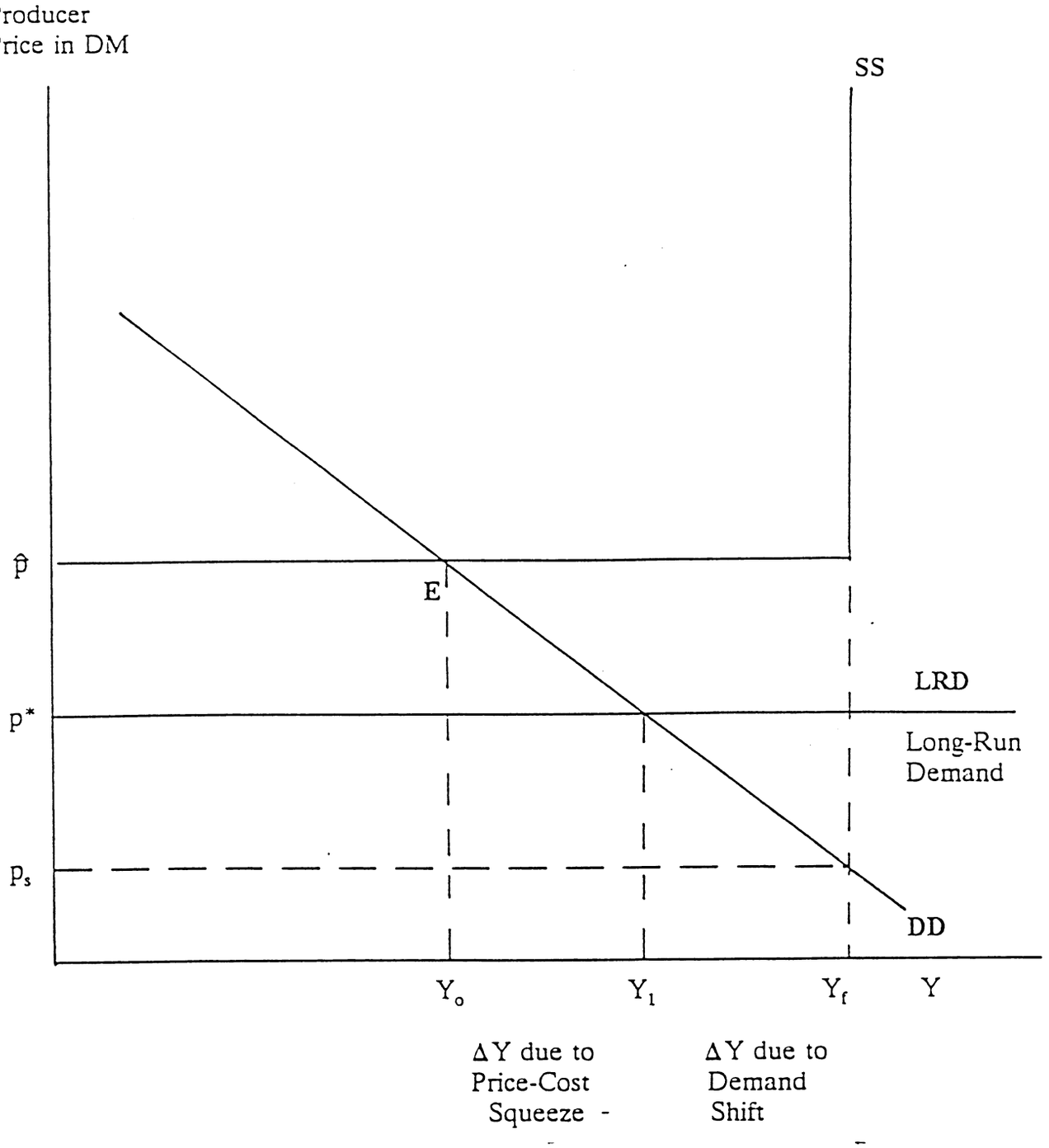
a. "Migration Scale" refers to a scale from 0 to 10, where 0 means "I am not going to work in West Germany under any condition" and 10 means "I am definitely going to work in West Germany." b. "Imagine the following situation: [If employed: You are unemployed and] you learn that new, secure jobs will be created in East Germany which pay wages comparable to your old/current job. If you can be reasonably certain that you will be offered a job, would you be prepared to wait for this job?" c. "How many months would you wait?" d. "What would you do next?" e. "By what percent would your wages change if you work in West Germany?" f."Do you think it would be difficult or easy to find a job in West Germany?" For the following questions respondents were asked if they agree/partly agree-partly disagree/or disagree (in the mail sample, they could also agree and disagree strongly.): g. "If I stay in East Germany I will probably lose my job." h. (If employed: If I lose my current job) "it will be difficult to find a (new) job in East Germany." i. "If I (if employed: keep my current job/if unemployed: find a new job) in East Germany I think that my wages will increase quickly." j. (If employed: If I lose my current job) I would be prepared to accept a new job here in East Germany paying up to 20% less than my old/current job. k."I don't think that I would be welcome in West Germany." The last column reports results for the comparable questions in the special student survey with appropriate changes in wording as described in the text.

Table 11. Survey Responses Concerning the Reasons for Eastern Wage Increases of Employed Individuals Whose Wages had Increased since Currency Union

percent	Agree[a]	Disagree[a]
"My wages rose to compensate for the removal of subsidies (e.g. on food) and higher social insurance contributions."	52	33
"My wages rose because it would have been unfair for them to remain so far below the West German level."	31	57
"It is fair for West German firms that set up enterprises in East Germany to pay lower wages as long as the unemployment rate in East Germany remains high."	14	76
"My wages rose because productivity increased."	12	80
"My wages rose because unions fought hard for wage increases."	64	22
"My employer and/or my union was concerned that my benefits not be too low in case of short-time or unemployment."	28	56
"Unions were restrained in bargaining because they feared that more firms would go out of business."	29	51
"My wage would be lower now if wage contracts had been converted at the rate of 2 Mark to 1 DM (instead of 1 Mark to 1 DM)."	69	25

a. In the personal interviews, individuals could agree, partly agree-partly disagree or disagree. In the mail questionnaire, individuals could, additionally, agree or disagree strongly. Agree (disagree) refers to all those who agree or agree strongly (disagree or disagree strongly.)

Figure 1. The Causes of the Decline in Output of East German Tradeable Goods.



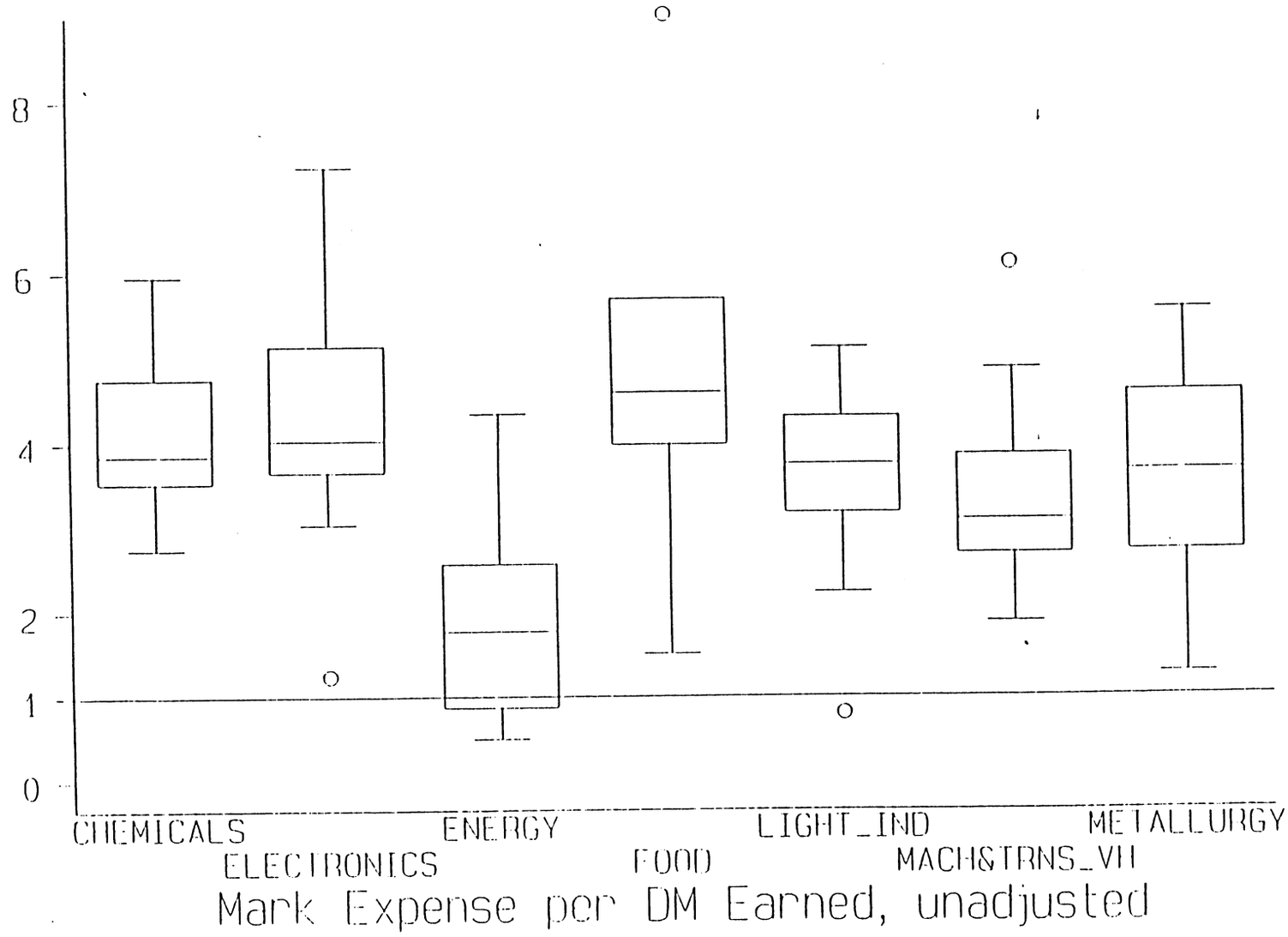
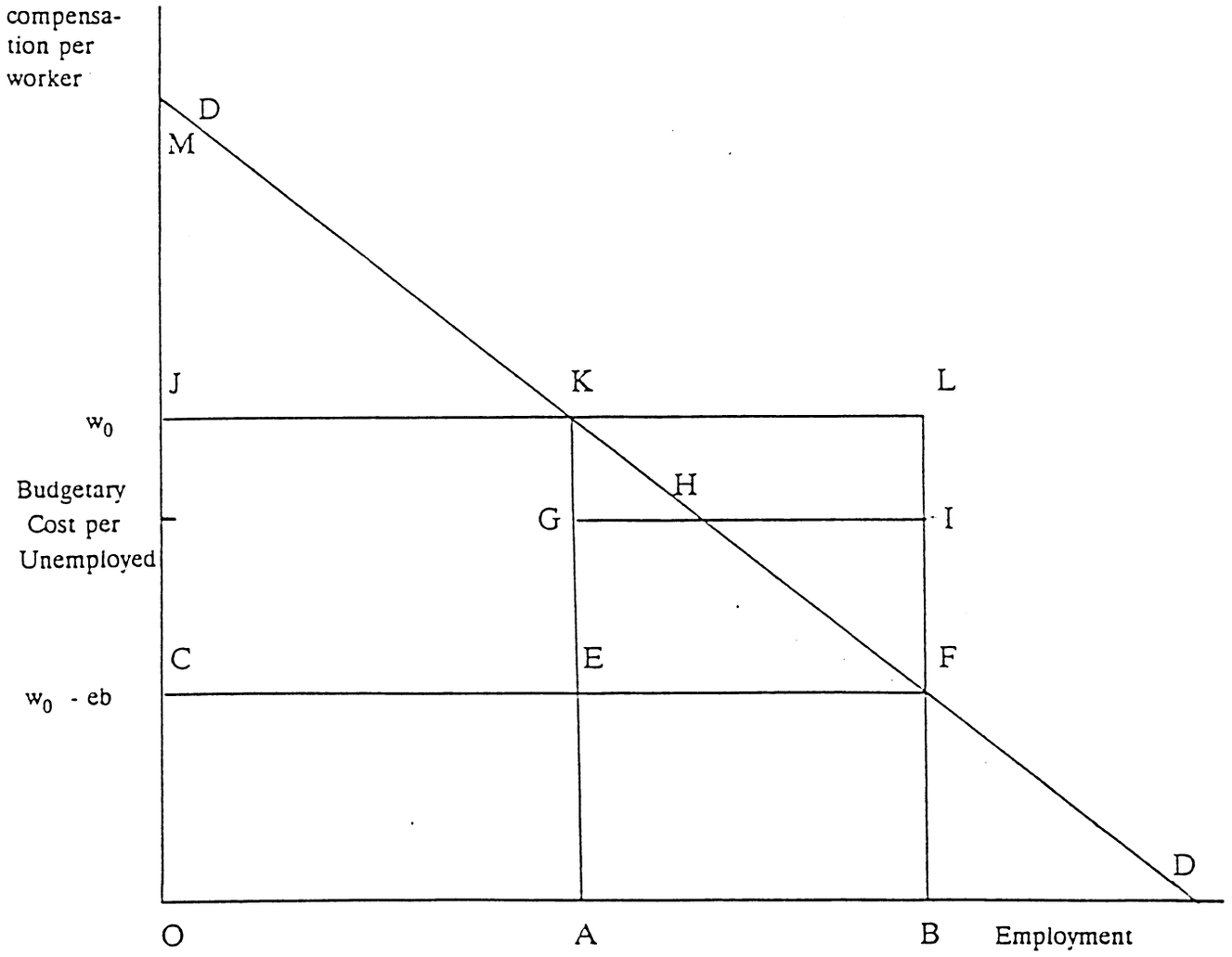

Univariate Distributions, Unadjusted Data; Box is interquartile range
Middle, median; Whiskers, 150% of interquartile range, rolled to data
8
6
4
2
1
0
CHEMICALS
ELECTRONICS
ENERGY
FOOD
LIGHT_IND
MACH&TRNS_VH
METALLURGY
Mark Expense per DM Earned, unadjusted

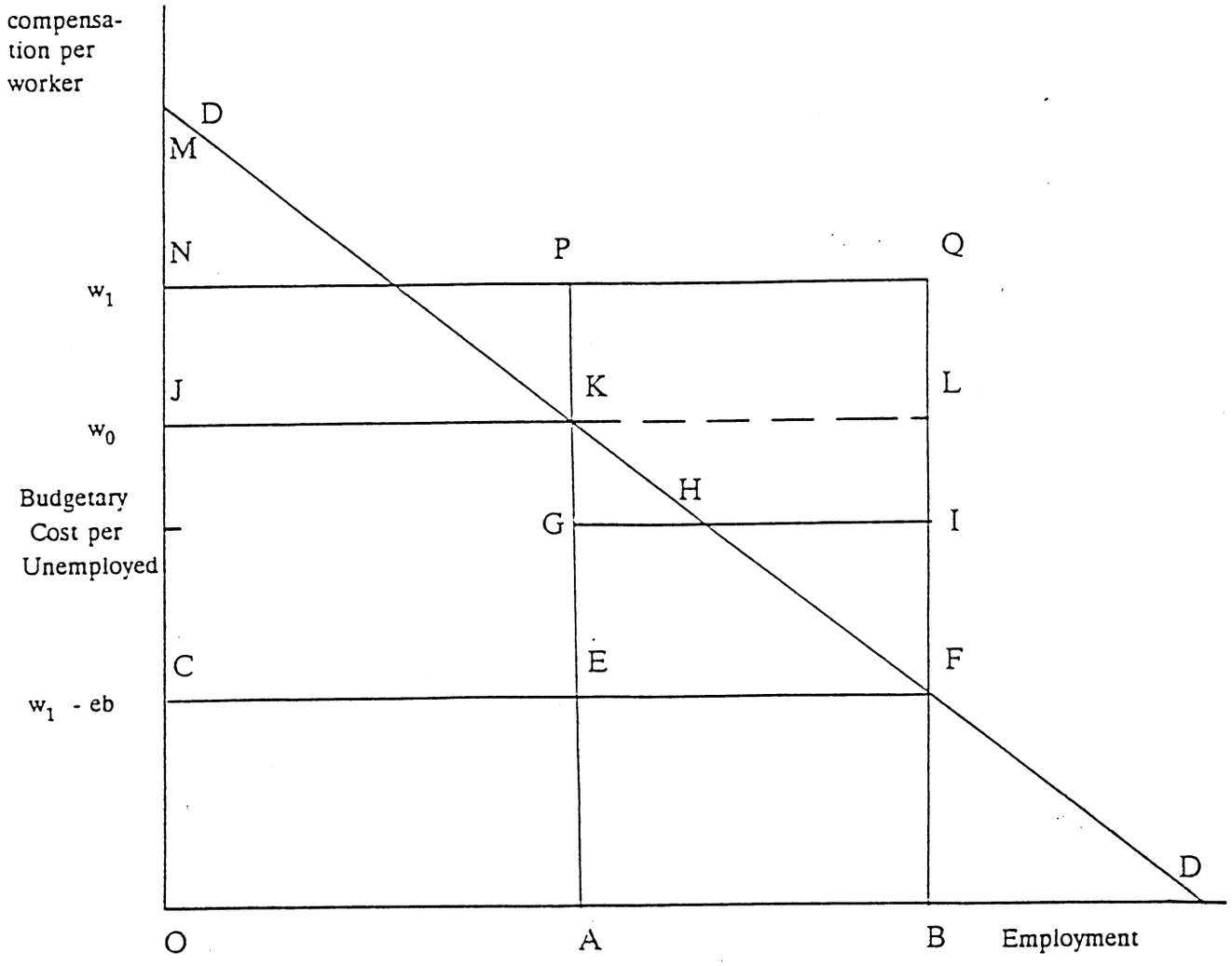
Figure 2

Figure 3. The Effects of Employment Bonuses with Fixed Eastern Wages.



Direct Budgetary Cost of the Subsidies:	CFLJ
- Budgetary Savings from Lower Unemployment:	ABIG
- Additional Treuhand Revenues from Selling Firms:	CFKJ
= Net Budgetary Cost of the EB Program:	KHIL - ABFHG

Figure 4. The Effects of Employment Bonuses when Wages Rise as a Consequence.



Direct Budgetary Cost of the Subsidies:	CFLJ + JLQN
- Budgetary Savings from Lower Unemployment:	ABIG
- Additional Treuhand Revenues from Selling Firms:	CFKJ
= Net Budgetary Cost of the EB Program:	JLQN + KHIL - ABFHG