

**"LABOR AND PRODUCT MARKETS IN  
CZECHOSLOVAKIA AND THE EX-GDR.  
A TWIN STUDY"**

by

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Labor and Product Markets in Czechoslovakia and the ex-GDR:  
A Twin Study

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## 1. Introduction

The revolution in Eastern Europe has provided economists with an experimental crucible for testing economic propositions on real data in real time. The different paths taken by Eastern European economies in the direction of a market economy provides a rich variety of *in situ* observations on how well the market works. Moreover it has yielded a wealth of experiences on which policy makers can base more informed judgments on the merits of various reform strategies. This study compares recent and prospective experiences of the ex-German Democratic Republic (GDR), now part of the Federal Republic of Germany, with the Czechoslovakian Federal Republic (CSFR), to evaluate the merits and the costs of two very different approaches to market-style liberalization, with particular attention to the functioning of labor market. Because these two particular economies are similar in size, industrial structure, labor force composition and worker productivity, they make ideal candidates for such a "twin study."

The comparison begins by drawing some tentative lessons from the GDR experience of monetary and economic union for Czechoslovakia, which had a second mover advantage with respect to its northern neighbor. The GDR has taken the shock therapy of adopting monetary union with a much wealthier stable economy, open borders to the European Community, and labor market policies normally only found in the most advanced countries. In contrast, Czechoslovakia had been more cautious, allowing only restricted exchange convertibility, slow steps towards privatization, and limited foreign ownership. Which outcomes in the GDR can be avoided in the CSFR? Which aspects of adjustment witnessed in the

GDR are inevitable? What is the option to devalue worth in terms of enhancing the competitiveness of Czech exports? Can one draw conclusions from the GDR experience about the sequencing of reforms that causes least discomfort?

The most important market in all economies, however, the labor market, has been less studied in the Eastern European context. Since labor is the most important factor in producing value-added in modern economies, its market -- comprised of demanders suppliers and the institutions that bring them together -- ultimately determines the competitiveness of an economy's output. The labor market is the mediator of structural change as it moves this factor of production to more productive uses. It is also labor market which efficiently manages turnover-- up to 25% of employment up to 100% of unemployment stocks in capitalist economies annually even at stable unemployment rates. Yet at the same time it is well recognized that imperfect information, endogeneity of effort, and mobility make labor markets different from fish or fruit markets. It is also the labor market which produces unemployment and potential dissatisfaction with capitalism. It is thus crucial to investigate the infant workings of the labor market in the reforming Eastern European economies.

Not enough has been said about labor markets in Eastern Europe and how they interact with the product market in the marketization process. Having established the similarities between Czechoslovakia and the GDR (pre GEMU), it is easy to conclude that, as with the GDR, considerable relocation of labor will be necessary in Czechoslovakia. Open unemployment in the ex-GDR is close now over 750,000, to which at least as much hidden

unemployment can be safely added. Crude calculations suggest a necessary labor reallocation on the order of 30-40% of the labor force in the CSFR. The severity of this adjustment will depend on supportive macroeconomic policies pursued. Will labor markets be able to manage such a reallocation?

The rest of the paper is organized as follows. In Section 2 the similarities of the ex-GDR and the CSFR are reviewed. These similarities make the two countries' experiences all the more interesting, as they have been subjected to radically different economic reform packages. They also suggest that considerable adjustment may be expected in Czechoslovakia. Section 3 proposes a modified disequilibrium economic framework of Barro and Grossman (1971) as a simple vehicle for analyzing the transition of repressed inflation economies to market economies. Section 4 discusses the soft budget constraint and how it has survived in the ex-GDR and how it may evolve in the CSFR. Section 5 expands on the labor market institutions that will affect macroeconomic adjustment, and Section 6 concludes.

## **2. The ex-GDR and CSFR: A preliminary comparison**

The industrial history of Czechoslovakia and East Germany, both before and after the Second World War, is primarily responsible for their striking similarity. Both had attained high levels of economic development in the 1920s, and were counted among the richest regions of the world. Much of this can be attributed to economic geography at the crossroads of central Europe, as well as a common tradition. Both were subjected to similar degrees of overindustrialization in the 1950s and 1960s,

reflecting Marxist emphasis on manufacturing industry. Most value-added was generated in large combines after successive waves of nationalization of small and medium sized firms. Before the watershed year 1989, both economies were estimated to have comparable levels of GNP per capita.<sup>1</sup>

The case for comparability is supported by data on employment and industrial structure of the CSFR and the ex-GDR. Table 1, which displays sectoral employment, reveals an identical focus on industry at the expense of the services as well as large (labor intensive) agricultural sector. Table 2 displays the distribution of gross productive activity and production workers in industry. At the outset of the reform period, economic activity in the old CSSR was more strongly concentrated in machinery and metal working, whereas the GDR had larger extractive and chemical sectors.

Table 1 also reveals a striking similarity of both the GDR and the CSFR with West Germany of the early 1970s. If these regions are to reach West European levels of development, the structure of production and employment must shift radically from agriculture and manufacturing to tertiary sector activities, especially personal services. At the very crude level of disaggregation in Table 1, the implied employment reallocation is 25.6% for the ex-GDR and 37.7% for the CSFR. This can only be interpreted as a lower bound to the extent that sectoral, occupational, and regional restructuring is ignored. For the CSFR most reallocation "bad news" comes from its bloated agricultural

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<sup>1</sup>See Begg, et al (1990), Table 2.2.

and underdeveloped service sectors. According to some estimates, job loss among East German workers will reach 45%.<sup>2</sup>

**Table 1**  
**Structure of Employment in the GDR, Czechoslovakia and FRG<sup>3</sup>**

	CSSR (1987)	GDR (1989)	FRG (1988)	FRG (1974)
Agriculture	973 (12.0%)	920 (10.3%)	1271 (4.9%)	1842 (7.0%)
Industry	3848 (47.5%)	4026 (45.2%)	10469 (40.1%)	12311 (46.5%)
Manufacturing, Energy, Mining	3039 (37.5%)	3460 (38.8%)	8752 (33.6%)	10135 (38.2%)
Construction	809 (10.0%)	563 (6.3%)	1717 (6.6%)	2176 (8.2%)
Trade, Transport and Communication	1316 (16.2%)	1349 (15.1%)	4870 (18.7%)	4968 (18.7%)
Other Services <sup>4</sup>	1969 (24.3%)	2615 (29.3%)	9469 (36.3%)	7376 (27.8%)
<b>TOTAL</b>	<b>8106</b>	<b>8910</b>	<b>26079</b>	<b>26497</b>

Sources: Deutsches Institut für Wirtschaftsforschung, Staatliche Zentralverwaltung für Statistik der DDR, Sachverständigenrat (1989), "Structure de la population active par Branches," UN Economic Commission on Europe 1989.

<sup>2</sup> As the President of the Bundesanstalt für Arbeit, Franke, noted, little else could be expected in an economy in which roughly a million East Germans were employed merely to maintain the power apparatus (AP December 30, 1990).

<sup>3</sup> Includes self employment.

<sup>4</sup> Housing, state administration, research, arts and education, health and social welfare, finance.

**Table 2**  
**Industrial Structure by Gross Output and Employees, 1987**

**By Gross output:**

	ČSSR		GDR	
	kčs bil.	%	OM bil.	%
Coal mining and electrical generation	37.69	4.2	39.5	7.4
Food beverages tobacco	143.5	16.0	82.1	15.3
Textiles	40.02	4.5	32.4	6.1
Wood products apparel, glass, ceramics	117.66	13.0	64.1	12.0
Chemicals and Related Products	176.6	19.7	107.3	20.1
Metal products	111.6	12.4	50.3	9.4
Mechanical Machinery	221.7	24.7	107.8	20.2
Electrical Machinery	46.23	5.2	46.8	8.8
<b>ALL INDUSTRY</b>	<b>895.0</b>	<b>100</b>	<b>533.4</b>	<b>100</b>

**By Employees (operatives):**

	ČSSR		GDR	
	000s	%	000s	%
Coal mining and electrical generation	121	5.9	143	7.2
Food beverages tobacco	158	7.7	171	8.6
Textiles	167	8.1	155	7.8
Wood products apparel, glass, ceramics	492	23.8	404	20.2
Chemicals and Related Products	177	8.6	196	9.8
Metal products	158	7.7	88	4.4
Mechanical Machinery	656	31.9	590	28.0
Electrical Machinery	127	6.2	262	13.1
<b>ALL INDUSTRY</b>	<b>2056</b>	<b>100</b>	<b>1994</b>	<b>100</b>

Source: United Nations Economic Commission on Europe (1989).  
Totals may not sum due to rounding.



### 3. Approaches to Reform: A Tale of Two Sequences

#### A. An Analytical Framework

It is difficult to assess the macroeconomic effects of reform policies without the guidance of an economic model. While few models exist of economies in transition from state socialism to capitalism, a large older literature on disequilibrium macroeconomics, of which Barro and Grossman (1971) or Malinvaud (1977) are the most salient examples, is especially suitable for the treatment of planned economies in a state of repressed inflation. They assume fixed prices and real wages relative to market clearing levels. Ironically, the attractiveness of these models in the context of centrally planned economies is the uncontroversial source of wage and price rigidity; they were in fact fixed administratively. Given the determinants of the Walrasian or market-clearing equilibrium implied by the model, one can ascertain "where the economy is and where it's going" after market reforms are put into place, without specifying exact dynamics.<sup>5</sup>

The core of the model is depicted in Figure 1; the formal aspects of the model can be found in the Appendix. Real wages  $\omega$  and nominal price level  $p$  are depicted on the vertical and horizontal axes, respectively. Briefly, the dotted curves GG and LL trace out loci of goods and labor market equilibrium when wages

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<sup>5</sup>Dynamics are complicated by expectations formation and the predeterminacy of the capital stock and accumulated inventories. Short run dynamics may be important for assessing the relative merits of competing stabilization programs, especially those involving fixed exchange rate regimes.

and prices are flexible and clear their respective markets. Solid lines represent equilibrium in goods and labor markets when firms and/or workers perceive constraints in either or both of the markets in which they operate. Each of the three regions correspond to such constrained regimes: the region C contains  $(w,p)$  combinations in which workers are constrained in the amount of labor service they can sell and goods they may buy, but firms are unconstrained in both markets. K corresponds to Keynesian unemployment, in which sellers of both goods and labor services are rationed. The region R is the repressed inflation regime, in which buyers are constrained in both goods and labor markets.<sup>6</sup>

The starting position of both economies is assumed to be point P (for "planned"), in the repressed inflation regime. Point W (for "Walrasian") is the real wage/price level constellation the economy will reach when price level flexibility obtains in market economies. That point P is above the market clearing  $(\omega,p)$  indicates that "restructuring" is necessary; ie a drop in the real wage is to be expected in the course of adjustment to the Walrasian equilibrium. Such an assessment is consistent with the pessimistic assessments of effective productive capital stock in East European countries (see for example Begg et al 1990). At the same time the point P is considerably to the left of point W, reflecting excess demand (repressed inflation) due to high levels of real wealth at fixed low prices (the monetary overhang), the cumulation of long periods of deficit finance by the state or

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<sup>6</sup>The absence of an "underconsumption" region, found for example in Muellbauer and Portes (1978), implies that firms cannot be constrained in both markets.

excessive subsidies in a shortage economy.

The usefulness of this model is predicting, given information on policy, which point the economy will move to after liberalization: will it move from point P to W in Figure 1, or can policy select an alternative W to which the market forces will push ( $\omega, p$ )? In what follows we will consider the reforms taken by both the GDR and CSFR in this light.

#### B. The GDR: Lessons in the first year of GEMU

First we consider the reform sequence "chosen" by the ex-GDR as well as its consequences following the opening of the border in November 1989, economic monetary and social union in July 1990, and culminating with political unification in October of the same year. This sequence of events is noted in Table 3.<sup>8</sup>

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Table 3  
The GDR "Sequence"

1. Opening of borders in November 1990, leading to considerable trade in grey "offshore" Ostmark market. Enforcement of restrictions on DM curb market trade ended in Spring 1990
2. Relatively free trade in goods and services at an pre-unification curb market exchange rate of roughly 3:1

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<sup>7</sup> It should be stressed that real wealth and real wages in disequilibrium models contain little or no information about individual welfare, as goods for which prices are quoted are often in short supply or unavailable. See Lipton and Sachs (1990).

<sup>8</sup> It is tempting to conclude that other sequences might have been more effective in integrating the two Germanies, especially with respect to avoiding large-scale unemployment. Yet as discussed below, the policy sequence adopted in the GDR was the outcome of idiosyncratic constraints, including the policies of the old Federal Republic of Germany with respect to citizenship rights of East Germans.

3. Monetary and economic union (July 1 1990) which
    - replaced the old GDR currency (Ostmark) as legal tender with DM at roughly a 1.4:1 rate
    - converted most Ostmark liabilities into DM liabilities at a 2:1 rate
    - imposed a 1:1 unified exchange rate on all current transactions
    - eliminated confiscatory taxes on East German enterprises
    - liberated price setting on output produced in the GDR
  4. Firm managers are allowed to hire and fire employees, set wages etc
  5. Privatization and break-up of combines via the state trust agency (*Treuhandanstalt*)
  6. Vigorous efforts to control government budget (applies both to local gov'ts, Länder as well as new unified FRG) including tax increases, subsidy cuts and diversion of spending from West to East Germany
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Although political union had been completed by the time of elections in December 1990, unified Germany currently finds itself somewhere between steps 5 and 6. In most goods and services there is now as open for trade as West Germany. Privatization of larger enterprises had proceeded slowly (400 of 8000 enterprises sold by January 1991) with far greater progress with retail and eating establishments, with 9000 sold in January, 90% to East Germans.<sup>9</sup> A second auction procedure of 33,000 businesses of larger surface area was oversubscribed by a factor of ten. In order to accelerate investment and entrepreneurial activity, the land itself will not be sold, but leased until ownership issues are resolved. As a consequence however, local authorities may now represent the

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<sup>9</sup>One twist introduced recently allows West German retailers to buy blocks of properties with the proviso that a proportion of these be sold within a specified time period. For example, Spar has agreed to sell half of its recently acquired interest (2400 stores with 36000 employees) by Spring 1992.

largest obstacle to the privatization process.

The impact of "returning to the prewar parity" is well known, and represents the best evidence available to date that the nominal exchange rate matters.<sup>10</sup> Import demand for products of better quality (mostly from West Germany) has reached massive proportions, and measured East German industrial production has since declined by roughly 50%.<sup>11</sup> Tax revenues have collapsed, as value-added taxation is currently raising little to replace the firm-based taxes previously in place. The budget shortfall in the GDR is catastrophic, reaching DM 30 billion (30% of the consolidated budget). The all-German budget deficit has risen from roughly 0.5% of GNP in 1989 to more than 5% estimated for 1991.

Despite the striking collapse of reported economic activity, open unemployment in eastern Germany was only about 750,000 in January 1991, or 8.7% of the official East German labor force, and probably 10% when migration and discouraged workers are accounted for. Layoffs are only expected to begin in earnest in mid-1991. The postponement of mass layoffs has been made possible by widespread use of short-time work (*Kurzarbeit*), a West German

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<sup>10</sup> This reference to Churchill's return to the gold standard in the 1920s was borrowed from Roland Vaubel.

<sup>11</sup> There are well-known reasons for not attaching too much weight to these figures. First, reliable GNP data are still unavailable, and the available data concerns the state industrial sector, which will shrink in any case. Second, care must be taken in evaluating the value of reported production, some of which represented negative value-added; that is cessation of production would increase actual GNP, properly measured. Finally, the older numbers on which the dramatic production collapse is predicated were biased upwards by the practice of "Pripiski," or overstating production (Klodt 1990b).

institution extended to East German territory under the terms of the unification treaty. Short-time work allows troubled firms to reduce their wage bill without firing their workers, who continue to receive roughly 90% of previous net wage, subsidized by the Federal Employment Agency (*Bundesanstalt für Arbeit*). Conceived as a means of preventing personnel loss during cyclical or seasonal fluctuations, the program has been generously extended to liquidity-strapped or even insolvent East German enterprises. In the first six months of monetary union, short-time work was invoked for more than 1.5 million employees, and roughly 65% of these have been in the program since October; by yearend 1990, 1.8 million workers were enrolled in the program. A substantial amount of this represents hidden unemployment, especially in heavy industry such as chemicals, textiles, industrial and electrical machinery. By official accounts, 50% of short time workers are working less than half time, and a substantial fraction are not working at all.

The short-time work program has thus assumed a key subsidy and support role for enterprises in the ex-GDR and is now one of the most expensive subsidy programs for the new Länder (Klodt 1990b). It is the largest contributor to the DM 22 billion deficit in the budget of the Federal Employment Agency.<sup>12</sup> Short-time is available to East German enterprises in principle until mid-1991 regardless of the enterprise's financial state, and is thus

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<sup>12</sup> As a result of recent coalition negotiations, this deficit will be closed by a 2.5 percentage point increase in wage taxes for unemployment insurance programs. Since West German wages represent roughly 90% of total wages in Germany, short time work represents a prospective transfer from West to East in 1991 of roughly DM 16 billion.

considerably more generous than in West Germany. It is widely considered among bureaucrats as the price for maintaining social peace; a more critical evaluation is that it postpones structural change by locking resources in inefficient uses.<sup>13</sup>

Other financial commitments have burdened the German unification program. The all-German government promised to honor contracts with COMECON countries entered into before monetary and economic union.<sup>14</sup> The state property agency (*Treuhandanstalt*), has also provided support for troubled companies in the form of guaranteeing short-term credits from commercial banks.<sup>15</sup> These "liquidity credits" summing to DM 25 billion have been since exhausted, some of which may never be repaid. Over time the *Treuhandanstalt* may increasingly represent a governmental liability rather than an asset. Like any large mutual fund or holding company, its financial result is a mix of good and bad companies' profits. However, because it is pursuing a goal of rapid liquidation rather than profit maximization, it will sell assets with best prospects first and at low prices, and will be

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<sup>13</sup> It is instructive that some enterprises in the ex-GDR, such as the electronics and computer manufacturer Robotron, has begun hiring out its employees to Western companies. This line of business is no doubt more profitable than the manufacture of obsolete computers.

<sup>14</sup> The consequences of this provision can be seen in the example of the Trabant, the two-stroke engine car produced in the old GDR. As a result of contractual obligations to Poland and other East European economies, manufacture of the Trabant will continue until July 1991, subsidized at an estimated cost of DM 80 million (ECU 38 million) or about DM 8000 per unit. ("Neue Verhandlungen über den 'Trabi'," *Frankfurter Allgemeine Zeitung*, December 3 1990).

<sup>15</sup> The collateral for these guarantees are assets of the *Treuhand*, of which in practice are compensation claims forced upon East German enterprises which had, due to good luck, underleveraged balance sheets.

left with restructuring costs requiring further infusion of funds from the general budget.

In the disequilibrium model discussed in the previous section, the German approach to the transition chose policies that moved  $W$  to  $W'$  close to  $P$ , thereby maintaining real wages and removing the risk of inflation. This policy, shown in Figure 2, is shown in three steps. First, with complete trade liberalization, the GDR inherited the price level of West Germany, fixing the  $GG$  locus effectively as a near-vertical line, rotating around point  $W$ .<sup>16</sup> Second, the money overhang (savings deposits including those of enterprises were over 200 billion OM, or about 60% of NNP in 1989) was eliminated in the exchange of Ostmarks for noninflationary wealth (DM) at an effective rate of around 1.4:1. In Figure 2, this would move the  $LL$  and  $GG$  loci leftwards.

Third, the "restructuring" requirement of the economy (the vertical distance  $PW'$ ) implied a drop in real wages which was politically infeasible. In order to prevent this development, or to push them in DM terms even higher, the German program anticipates massive investment (rising effective capital stock), reduced labor supply driven by higher worker expectations of future wages capitalized in a higher permanent income (a wealth effect) and an increase in noninflationary wealth through additional transfers, and penalties on labor force participation for certain groups (ie women).<sup>17</sup> All of these policies will lead to

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<sup>16</sup>Technically, the  $nx$  function became perfectly elastic in its second argument, the real exchange rate.

<sup>17</sup>It is widely recognized that the old GDR subsidized female labor



higher market clearing wages today for reasons discussed above, by shifting LL out. In all cases, real wages are higher, and employment and output lower, than an outcome under economic autonomy of the GDR. In return, the ex-GDR obtains price stability by tying its hands in the most credible way possible. When corrected for quality of goods and queuing costs, East German prices have fallen significantly since July 1990.

### C. CSFR: What can be learned?

It should be stressed that German authorities had little choice in designing a reform "sequence." Monetary union at a 3:1 rate (or a much lower free market rate) would have provoked the migration of hundreds of thousands of East Germans to the West. On the other hand, this "reform sequence" was precisely the inverse of that often suggested in the burgeoning but still underdeveloped literature on the topic.<sup>18</sup> In this view, macroeconomic reforms receive first priority: the elimination of the deficit and its automatic finance by the central bank, cutting expenditures, developing and valorizing alternative tax sources to replace enterprise charges, which often accounted for half of government revenues. At the same time measures should be taken to neutralize any liquidity overhang, including privatization of state property and convertibility should be introduced. Privatization of

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force participation by offering free child care and generous maternity leave. For evidence on the comparative effects of these programs on labor force participation of German women, see Ott and Wagner (1990).

<sup>18</sup> See for example, the January 1990 issue of the *European Economy*, Lipton and Sachs (1990), and Charap and Dyba (1991).

enterprises should follow, with owners assuming responsibility and accountability for management; barring this, some form of corporate governance should be introduced to discipline the behavior of managers (currently "agents without principals") and prevent further haemorrhaging of state resources to finance enterprise losses. Tax relief for firms which paid punitive if not confiscatory taxes in the old regime would afford firms some flexibility, either to pay higher nominal wages or to engage in price cutting and enhance export competitiveness. The Polish policy of opening up to foreign trade as quickly as possible would increase chances of the latter outcome.<sup>19</sup>

This "ideal" sequence is operationally impossible for many reasons. Priorities are often cyclical, so there is no clear order to implement some components parts of the macroeconomic reform. The sheer complexity of privatizing the capital stock is made more daunting by claims by previous owners and by uncooperative bureaucracies. Already the success of the Czech program, which explicitly attempts to incorporate this sequence of reforms, is threatened by several factors. The race to privatize ahead of the the scheduled liberalization of all but essential goods prices on January 1 seems to have been lost. The "small privatization" of small shops and service enterprises is underway, but the "large" privatization of most of the CSFR industrial capacity has been stalled in the legislature for several reasons, including conflict over restitution and prior claimants as well as nationalist interests. In addition to the internal disturbances 1991 hold for

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<sup>19</sup> See Lipton and Sachs (1990).

the CSFR, external demand has dropped substantially as contracts with COMECON countries are terminated.

The CSFR government budget deficit, never excessive on paper, has been tightened further by cuts in military spending, subsidies and "capital transfers to enterprises. The surplus planned for 1990 was not achieved, primarily due to increased spending on the social net. The real value of tax revenues will be susceptible to the effects of high inflation (the Tanzi effect), now projected at 20-30% in 1991 from an official inflation already at 15%. The government's ability to carry out the privatization program may be impeded by growing nationalist tensions in Slovakia, which with its declining armament and other heavy industry appears structurally worse off than the Czech Republic. The prospect of paying for Soviet oil imports in dollars after January 1991 may have crippling consequences for the budget. Prices have already been raised for energy between 40 and 80% for industrial users, with private citizens facing similar increases soon.

The key lesson of the GDR experience is the importance of the exchange rate in supporting aggregate demand. At the stroke of a pen, monetary union at 1:1 for current transactions between the two Germanies rendered a large chunk of industrial activity in the ex-GDR hopelessly noncompetitive (Siebert 1990, Burda 1990a). Price rigidity in the old regime may enhance the effectiveness of a devaluation in the short run, assuming that the Marshall-Lerner conditions hold.<sup>20</sup> This lesson has not been lost on Czechoslovak

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<sup>20</sup>This also presumes that value-added is positive at world prices. See Hare and Hughes (1991) for evidence on negative value-added in

authorities, who pursued deep devaluations of the exchange rate by nearly 100% in 1990 (see Hrnčir and Kláček 1991). As of January 1991, current account convertibility exists for legitimate businesses, and tight monetary policy seems to have controlled the spread between official and black markets rates.

Figure 3 depicts the likely outcome for the CSFR after price liberalization. The economy moves from P to W, as a result of both the money overhang (deposits of Kčs 340 billion or roughly 70% of national income in 1989, somewhat less than the GDR at the outset of monetary union) is not neutralized by the monetary authorities as in East Germany but is simply inflated away. The dramatic absolute decline in the savings of Czechoslovak households in late 1990 (Hrnčir and Kláček 1991), which is mostly in the form of deposits, indicates that this process has already begun.

Two other factors could push the market clearing equilibrium farther to point W'. First, sharp devaluations cause the GG curve to shift rightwards.<sup>21</sup> Second, a rise in inflation may lead to loss of budgetary control, leading to further inflationary finance, with a shift rightwards of both loci. Whether this outcome can be avoided will depend crucially on policy and the outcome in labor markets, ie wage setting and its impact on the budget.

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CSFR Industry.

<sup>21</sup> Note that until prices are liberalized, a devaluation only pushes the economy further into the repressed inflation region. This analysis presumes that trade is not restricted by quotas and that labor supply is independent of the exchange rate. With completely free capital flows a devaluation could only be accomplished by a domestic monetary expansion and thus an equidistant outward shift of both curves.

#### 4. Trade Unions, Collective Bargaining, and the Soft Budget Constraint

A wealth of experience in the ex-GDR and the CSFR supports the sometimes contested view that institutions are important for macroeconomic outcomes. Most importantly, these include institutions of wage setting and the incentive structures of parties to the collective bargaining process. These will influence both the underlying fundamentals of inflation (the budget deficit and other sources of money supply growth) as well as the dynamics by which an economy reaches the steady state determined by those fundamentals. It is to these institutions that we now turn.

##### Collective Bargaining

The political credibility of the trade union movement will be a key factor in the macroeconomic success of the leap to the market economy. In the GDR, West German unions moved quickly into the virgin territory left by the discredited communist trade unions and, within months after monetary union, concluded new wage agreements in virtually every major sector. Wage increases of 25-50% have been the norm. The public sector wage sector remains the most crucial of all. In late 1990 East German government workers reached a provisional settlement reducing the workweek from 42 to 40 hours and adding a thirteenth month pay bonus. East German postal workers have recently reached a similar agreement. Recent statements by the leadership of both the umbrella organization (Deutscher Gewerkschaftsbund) and the public sector workers' union (ÖTV) endorse a convergence of East and West German

public sector wage and salaries within three years. Such an outcome will have clear effects on private sector wage setting in East Germany.<sup>22</sup>

At the same time it is likely that wage agreements reached in East Germany will become minimum wages, via "extension" by Labor Ministers of the new Länder or by court decision. In West Germany roughly 20% of employment contracts were covered by some form of extension in recent years (Burda and Sachs 1988), many of which are national wage agreements (banking and insurance, for example). Furthermore, the mere threat of extension encourages management to pay the going wage.

In the CSFR, such an outcome seems less likely. Unions enjoy little popularity, especially at the national level (2% of recent survey respondents support fully the national labor organization). The tripartite approach along the lines of Austria or Sweden has been adopted as a collective bargaining model. A centralized agreement will form the basis for nationwide wage developments. The current relative strength of government as well as the weakness of unions and employers should allow the government to engineer a significant real wage reduction. At the same time, the support for the government in its role will be crucial. A lack of support for the government in its role will be crucial. A lack of support for the upcoming real wage cuts may lead to wildcat strikes and a devolution of collective bargaining to the local

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<sup>22</sup> It is hard to deny that perverse situations have arisen, especially in Berlin, where garbage collectors in the East earn a third of their counterparts' salaries a few kilometers away. Yet doubling their wages would make them the best paid blue collar workers in East Germany.

level. It should also be noted that enterprises with 25 or fewer employees are exempt from the tripartite agreements in any case.

Local labor unions have more credibility, a development which might later lead to a decentralized system of collective bargaining, with the works councils at the enterprise level filling the leadership void. Such a system has the advantage that wage settlements will more likely reflect the financial condition of enterprises, and the disadvantage of ignoring external effects of own wage settlements on aggregate supply.<sup>23</sup> Decentralized wage setting will also allow some less profitable enterprises to buy time via more moderate wage policies, while allowing successful firms to attract higher quality labor.

#### Soft Budget Constraints

The fear of mass migration and depression of Western wages is the likely motivation for the strategy of West German labor. Yet the financial condition of most East German enterprises cannot justify such wage increases. Ironically, the "soft budget constraint" so characteristic of planned economies seems to have been operative across East and West Germany in 1990. The East German government was not represented at pay negotiations in the summer and fall, nor did it have particular interest in the budgetary effects of hefty pay settlements. More important, there was little or no incentive for management, eager to purchase goodwill of workers, to resist wage increases inconsistent with

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<sup>23</sup> See Calmfors and Driffill (1987).

the solvency of enterprises. Until the enterprises are privatized or placed under more corporate forms of control, the (now all-German) government will continue to subsidize enterprises deficits, first through credits collateralized by the assets of the Treuhand, then by short-time work support, and in the future possibly from the general budget.

The soft budget constraint observed in the GDR seems less likely in the CSFR, since there is no obvious financier besides the central bank. Subsidies received by one industry comes at the expense of another or at the expense of price stability if enterprise deficits are financed by cheap central bank credit. A pivotal step towards controlling the consolidated budget would be the credible removal of enterprise deficits from the financing requirements of the consolidated government. While Finance Minister Klaus's restrictive policy of slow credit and money growth will stem such a tendency, pressures to make exceptions to such a policy will grow, especially since the CSFR has yet to implement a bankruptcy law.<sup>24</sup> Recent reports of high credit growth in late 1990 may reflect a weakening of the will in this regard.

### **Wage Setting and Incomes Policies**

While East Germany inherits the price level of the West as well as the credibility of the Bundesbank, the CSFR will rely on incomes policies to control the dynamics of inflation. The Czechoslovak policy currently envisioned will be a partial

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<sup>24</sup> A law on bankruptcy is expected to be considered by Parliament in May 1991.



indexation system that foresees a decline of 12% in real wages before activation.<sup>25</sup> A tax-based incomes (TIP) program with a 100% tax on excess over a baseline will enforce this incomes policy. Whether this will survive in its current form is doubtful, since enterprises will probably circumvent it by phony promotions and payments in kind. Foreign companies and joint ventures are also exempted in any case. One interesting aspect is the potential distortion created by the TIP program in favor of profit sharing, since it applies only to "cost wages" (salaries) and not to bonus or profit related pay.

While not examined here, the Polish experience has confirmed that incomes policies do not only provide a nominal anchor for the economy, but if credibly implemented may accelerated the real wage reduction that must eventually come about after stabilization is achieved.<sup>26</sup>

## **5. Can Labor Markets Manage High Unemployment?**

### **A. Labor Market Dynamics and Mobility**

Of all markets, the labor market in Eastern Europe is often considered the least developed. Not only is often feared that workers lack discipline characteristic of market economies, and will be unable to adjust to the rigors of unemployment, but doubts are often expressed that labor is sufficiently mobile across regions, industries and occupations.

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<sup>25</sup> A detailed description is provided by Hrnčič and Klacek (1991).

<sup>26</sup> See Lipton and Sachs (1990).

These fears may be unwarranted. It appears, for example, that a high degree of labor mobility was characteristic of enterprises under centrally planned regimes, at least in the CSFR. According to the Czechoslovak Statistical Yearbook, annual employment turnover in industry was about 17.5% (compare with about 25% for France). In 1989, roughly 580,000 workers (9.1% of the labor force) changed jobs (Janaček et al 1990). As Table 4 shows, much of this mobility corresponded to voluntary job changes. In comparison, quits into other jobs represent 4-5% roughly of the labor force annually in France.<sup>27</sup>

These statistics do not address the behavior of households entering open unemployment, a new phenomenon in East European countries. The ex-GDR has the advantage of assuming a well-organized and experienced system of employment offices. In the CSFR, the "national committees" have been converted into employment offices, but have little experience in facilitating exchange of labor market information such that regarding job vacancies, training opportunities, etc. Despite this, initial data on outflows from unemployment into work are encouraging: in October 1990, the Czech authorities registered 15794 new cases of unemployment; in the same month, 10149 cases left the unemployment rolls, or 41.3% of the unemployment stock. Of these roughly 60% actually found another job, a rate comparable to those of Western economies (Burda and Wyplosz 1990). A bleaker picture can be

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<sup>27</sup> See Burda and Wyplosz (1990). Evidence on voluntary job changes in Poland (Lipton and Sachs 1990) suggests that voluntary turnover will be linked to wage-setting flexibility in the private sector. In the CSFR, small enterprises will be exempt from the national wage bargain.

painted in the ex-GDR, where in the same month of October 1990, only 30,000 left unemployment (an exit rate of only 5.6%, excluding short-time work). Unemployment in Czechoslovakia was only about 1% by yearend 1990, but is expected to rise to 5-7% in 1991, especially since firms have free reign to fire workers. Congestion in the labor market will contribute to higher unemployment rates in the CSFR as job losers spend longer periods in unemployment. As a result, institutions are being developed to deal with labor market issues, such as job exchanges or information services.<sup>28</sup>

**Table 4**  
**Movements of Employment in Industry, CSSR 1988**

	(000s)
Total employees in industry	2610
Total movements into employment	448
of which:	
School and apprenticeship leavers, women returning from maternity leave, other functions	149
Planned transfers	29
Changing jobs	190
Other	80
Total movements out (exits)	482
of which:	
-Death and retirements, return to school or apprenticeship, military service, maternity leaves, other function, planned transfers	261
-Changing jobs	221

Source: Statistical Bureau (Prum PZ-04 1988)

<sup>28</sup> In this regard however it should be noted that data indicate that job exchanges actually may be less important in facilitating job matches in Western economies than informal methods. For example, in the 1989 wave of the German Socioeconomic Panel, only 11.3% of West German employed in the panel report finding their job through the state employment agency, compared with 34.4% through personal contacts and 16% through the newspaper.

## Occupational Mismatch

Despite a high average level of education in the CSFR and Eastern Europe in general (see Hamilton, et al. 1990), it is often claimed that the skill mix is wrong. In the CSFR an excess supply of low-skilled blue collar workers and university educated is often cited, plus a surfeit of unqualified new labor market entrants, overqualified university graduates, and party bureaucrats. Data supporting these assertions from CSFR are adduced in Table 5.

Table 5  
Distribution of Unemployment in CSFR Regions, by Occupation  
October 1990<sup>29</sup> (%)

	Blue collar	Graduates <sup>30</sup>	Other <sup>31</sup>
Total CSFR	44.97	16.73	38.28
Czech regions	48.86	15.15	35.98
Bohemia			
Prague	19.85	13.53	66.61
Central Bohemia	50.80	14.40	34.79
Southern Bohemia	44.77	17.08	38.14
Western Bohemia	49.26	15.11	35.62
Northern Bohemia	68.72	10.65	20.61
Eastern Bohemia	47.54	15.05	37.40
Moravia			
Southern Moravia	38.72	20.31	40.95
Northern Moravia	59.44	14.00	26.55
Slovakia	40.64	18.49	40.85
Bratislava	6.379	11.43	82.18
Western Slovakia	29.08	22.27	48.64
Central Slovakia	36.59	19.67	43.72
Eastern Slovakia	56.67	16.27	27.05

<sup>29</sup> Using 1989 labor force statistics (Czech Statistical Yearbook 1990).

<sup>30</sup> High school and university.

<sup>31</sup> Administrative low skilled employment, workers without qualifications, and new labor market entrants.

Due to budgetary constraints, the CSFR government is unlikely to provide retraining for displaced workers, relying instead on private, firm-based initiatives. The suggestion in the GDR of requalification within the enterprise is unlikely to be implemented, as most firms are incapable of organizing such programs; the new East German employment offices are currently overwhelmed and understaffed. A voucher program for retraining would seem to be a sensible alternative under these conditions, but support for this proposal has faded. Ironically, the practical experience gained by East German workers commuting to the West, now estimated at 200,000, will serve as an important substitute for direct training: workers acquire human capital yet are bound to their home region.

Training of new labor force entrants is a dramatic problem in the CSFR, with school leavers facing a collapsing state apprenticeship program (Janacek et al. 1990). In contrast, the firm-based system of apprenticeships in East Germany has been reinforced, and extensively subsidized. Klodt (1990b) describes a variety of measures for promoting qualification of workers and self-employment.

### **Regional Mismatch**

Regional mobility may pose a more important issue than occupational mobility. Table 6 displays regional unemployment and official vacancy rates in the CSFR. Roughly half of total unemployment can be found in Slovakia, where only a third of the nation's population resides. More than two-thirds of current unemployment is concentrated in Northern Moravia and Eastern

Slovakia, where substantial layoffs are associated with the dismantling of smokestack and armament industries. In contrast, initial signs indicate that Bohemia and southern Moravia are faring considerably better. The relative concentration of vacancies in these regions as well as the cities suggests that adjustment will coincide with emergence of significant mismatch employment.

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**Table 6a**  
**CSFR Regional Unemployment Rates,**  
**October 1990<sup>32</sup>**

	Unemployment rate (%)	Total Vacancies(%)
Total CSFR	0.75	1.14
Czech regions	0.58	1.28
Bohemia		
Prague	0.46	1.84
Central Bohemia	0.40	1.12
Southern Bohemia	0.55	1.17
Western Bohemia	0.41	1.56
Northern Bohemia	0.45	1.63
Eastern Bohemia	0.51	1.21
Moravia		
Southern Moravia	0.53	1.09
Northern Moravia	0.98	0.78
Slovakia	1.11	0.84
Bratislava	0.60	2.24
Western Slovakia	1.02	0.43
Central Slovakia	0.93	0.95
Eastern Slovakia	1.64	0.56

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In the ex-GDR the situation is considerably worse, with unemployment as high as 11% in the northern regions. Short-time work may have an undesired effect on intra-East German mobility; dispersion of rates within the Länder has already reached levels

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<sup>32</sup> Percent of labor force.

characteristic of West Germany.

**Table 6b**  
**Regional Unemployment Rates in Eastern Germany**  
**January 1991<sup>33</sup>**

	Unemployment rate (%)
<b>Total ex-GDR</b>	<b>8.6</b>
Mecklenburg Vorpommern	
Neubrandenburg	10.3
Rostock	11.9
Schwerin	10.7
Stralsund	10.2
Brandenburg	
Cottbus	6.4
Eberswalde	9.3
Frankfurt (Oder)	9.6
Neuruppin	10.2
Potsdam	8.2
Sachsen-Anhalt	
Dessau	7.0
Halberstadt	8.8
Halle	7.4
Magdeburg	8.0
Merseburg	6.4
Sangerhausen	11.3
Stendal	9.7
Wittenberg	7.7
Sachsen	
Annaberg	8.3
Bautzen	8.2
Chemnitz	6.6
Dresden	6.3
Leipzig	7.9
Oschatz	8.4
Pirna	7.7
Plauen	7.2
Riesa	6.5
Zwickau	8.8
Thüringen	
Altenburg	9.7
Erfurt	7.9
Gera	8.3
Gotha	9.5
Jena	6.6
Nordhausen	10.4
Suhl	9.4
East Berlin*	10.3

\*Author's estimates based on East Berlin labor force in 1989;

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<sup>33</sup> I am grateful for the speedy assistance of Herr Rebohl at the Bundesanstalt für Arbeit for providing me with these data.

likely to be biased downwards.

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### Wage Dispersion: Can the Market Respond?

In the near future the wage structure of Eastern Germany will largely assume the attributes of the West, in a process that will no doubt be accelerated by West German organized labor and differential migration patterns among skilled and unskilled workers. In the CSFR, currently industry wage structure is "set" to compensate skill as well as unpleasantness. A decentralization of wage setting has been proposed in 1992, with individual enterprises accorded more freedom to link pay to profit, labor scarcity, etc.

Industry wages and their uneventful evolution in the period 1983-1987 for the GDR and CSSR are shown in Tables 7 and 8. Relative wage structure is similar to that found in Western economies, while wage dispersion in both economies is lower than in the West. More importantly, wage differentiation appears to be higher in Czechoslovakia than in the ex-GDR, and is comparable to the lower end of industrialized countries (Bell and Freeman 1985). If there are costs to increasing wage dispersion to achieve reallocation of labor across occupations, the CSFR is in a much better position than the GDR to accommodate structural change with less unemployment.

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Table 7

Average wages and salaries of operatives in GDR Industry 1987  
(Ostmark/month)

Industry	Year				
	1983	1984	1985	1986	1987



Extractive industries	1205	1217	1241	1277	1381
Food, Beverages, Tobacco	1048	1070	1097	1128	1186
Textiles and Clothing	950	974	993	1042	1112
Wood paper and Furniture	978	1002	1025	1063	1124
Chemical/related products	1096	1114	1139	1179	1258
Glass, Pottery Ceramics	1078	1091	1111	1142	1209
Metal Products	1183	1193	1211	1265	1329
Mechanical Machinery	1111	1133	1155	1194	1259
Electrical Machinery	1063	1085	1106	1138	1193
Water works & supply	950	981	998	1028	1095
ALL INDUSTRY	1072	1093	1116	1155	1222

Unwgt'd Coefficient of variation      0.079 0.072 0.072 0.071 0.073

Source: United Nations Economic Commission on Europe

**Table 8**  
**Average wage of operatives in CSFR Industry, 1987**  
**(kcs/hour)**

Industry	1983	1984	1985	1986	1987
210 Coal mining	29.26	29.63	30.04	30.69	31.13
220 Petroleum and Gas	17.50	20.00	20.00	22.50	17.50
230 Metal ore mining	22.06	22.41	22.75	23.92	23.79
290 Other mining	18.14	19.23	18.51	19.61	20.38
2 TOTAL MINING	27.26	27.76	28.02	28.83	29.17
3112 Food products	15.11	15.52	15.91	16.31	16.60
313 Beverages	15.80	16.20	16.73	17.29	16.87
314 Tobacco	15.00	15.00	15.00	15.00	16.66
321 Textiles	14.93	15.26	15.60	15.94	16.38
3211 Spinning weaving	15.24	15.51	15.90	16.22	16.72
323 Wearing apparel	14.29	14.64	14.93	15.32	15.55
323 Leather products	15.38	15.89	16.15	16.41	16.92
324 Footwear	16.66	17.47	17.57	17.74	18.20
331 Wood products	15.80	16.10	16.63	17.08	17.47
332 Furniture	15.25	15.52	16.00	16.38	16.48
341 Paper and products	15.77	16.28	16.57	16.95	17.35
342 Printing, publishing	15.81	16.75	16.75	17.43	17.69
351 Industrial chemical	18.86	19.59	20.00	20.50	21.02
352 Other chemical products	15.66	16.33	17.00	17.33	17.09
3522     Drugs/medicines	18.57	16.87	17.50	18.12	18.12
353 Petroleum refineries	21.42	22.14	22.50	22.25	23.22
354 Petroleum, coal prods	19.23	19.23	19.23	20.00	21.66
355 Rubber products	18.42	18.68	19.47	19.73	20.27

356 Plastic products nec	16.00	17.00	17.00	17.00	17.00
361 Pottery china	14.61	15.38	15.38	16.15	15.38
362 Glass and prods	15.71	16.16	16.42	16.78	17.29
369 Non-metal prods	17.59	18.03	18.41	19.10	19.18
371 Iron and steel	21.50	21.79	22.13	22.87	23.26
372 non-ferrous metals	20.00	20.00	20.26	20.78	21.31
381 Metal prods	16.47	16.76	17.14	17.65	18.04
382 Machinery, nec	18.42	18.89	19.27	19.75	20.07
383 Electrical machinery	15.56	15.98	16.61	16.99	17.25
384 Transport equipment	18.16	18.46	18.76	19.08	19.26
385 Professional goods	16.95	17.82	18.57	19.04	19.20
390 Other industries	14.63	14.78	15.07	15.57	15.44
3 TOTAL MANUFACTURING	17.01	17.26	17.81	18.25	18.56
4:0 Elect/gas/steam	19.75	20.24	20.68	21.49	21.93
ALL INDUSTRY	17.78	18.22	18.59	19.06	19.39
Unwgt coeff of variation	0.186	0.182	0.179	0.181	0.181

Source: United Nations Economic Commission on Europe computed from total hours and annual wages of operatives.

### The Role of Unemployment Benefits and Severance Payments

A crucial issue for labor market adjustment is posed by the system of transfers to the unemployed. Theoretically, unemployment benefits and severance payments are designed to protect workers' human capital from occupational regional, or industry change in bad states of the world. In times of massive structural change, unemployment benefits may retard worker mobility and may impede wage flexibility, if benefit levels act as a floor for wages. This is especially true in Czechoslovakia, where a decline in measured real wages is a central element of the reform package. Severance benefits and job protection will certainly affect job mobility, but pose less of a risk, since they represent one-off payments.<sup>34</sup>

<sup>34</sup> In theory, severance payments can be undone by workers and firms by an appropriate cuts in wages. There is evidence from Western

In East Germany, the unification treaty provided for the assumption of the West German system of unemployment insurance. Some of salient aspects of the two countries' programs are described in Table 9. At the moment the UI system in the CSFR looks quite generous: the current insured unemployment rate is roughly 80% with little variation across regions, and higher than that in the ex-GDR. Furthermore average disbursements are quite high: the average payment in October 1990 was roughly Kčs 3950 or 120% the average gross wage, and nearly twice the gross minimum wage! This is explained by the incidence of job loss thus far, which has been concentrated in high-wage industries (mining, metallurgy, and ordnance, for example). Under such conditions the program seems both economically and politically unsustainable as unemployment rises. It is thus important for Czechoslovak authorities to consider carefully the design of a system that does not prolong "wait unemployment" in declining industries.<sup>35</sup> Several lessons are available from the Swedish experience, which virtually forces workers to accept public works jobs or participate in retraining programs after roughly a year of uninterrupted unemployment (Björklund 1990).

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Europe however that these rules do have effects on both labor force participation (positive) and an on employment (negative). Firms are more reluctant to take on new staff unless they are anticipated as permanent hires. Otherwise, as in France and Germany, firms can use fixed-term contracts to avoid severance pay.

<sup>35</sup> As of April 1991, a new system is to be implemented in the CSFR guaranteeing flat 65% net income replacement for the first six months of an unemployment spell, followed by another six months at 60%. See Burda (1988) for a discussion of this issue and a comparison of Western European unemployment compensation systems. Using the criteria there, the generosity of the proposed CSFR system lies somewhere between those of France and Ireland.

The relevance and importance of unemployment benefits for regional mobility can be inferred from the flow of East German migration, which has fallen dramatically since monetary union despite high unemployment. The generous short-time work program provisions has succeeded in "nailing down" workers in East Germany by requiring physical presence in order to draw short-time pay; in the West they would only qualify for UI benefits. This may prove more feasible than other proposals designed to stemming the further migration of workers to the West, estimated by the Federal Employment Office to reach 200,000 in 1991.<sup>36</sup> The problem will become acute in the summer of 1991, when the special provisions of short-time work for East German enterprises are scheduled to expire and unemployment could increase by as much as 150%.

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Table 9  
UNEMPLOYMENT BENEFITS IN CSFR AND GERMANY<sup>37</sup>

CSFR

**TYPE OF PROGRAM:** general unemployment assistance

**PROGRAM FUNDING:** general budget

**LEVEL OF INCOME REPLACEMENT:** 60-80% with lower limit of kōs1400 per month

**ELIGIBILITY:** universal, conditional on registration at employment office

**BENEFIT DURATION:** one year

**EXPERIENCE RATING:** none

**FOLLOW UP:** locally provided welfare benefits

GERMANY

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<sup>36</sup> Burda (1990a) suggests freezing key nontraded goods prices in the East, such as rents and transport, in order to maintain a cost gap between East and West, similar to that between the north and south of West Germany. The disadvantage of this proposal is that it may postpone necessary refurbishing of the housing stock and transport infrastructure.

<sup>37</sup> April 1991.

TYPE OF PROGRAM: unemployment insurance  
PROGRAM FUNDING: insurance fund  
LEVEL OF INCOME REPLACEMENT: 63-68% of net (after tax) monthly  
income, depending on family status  
ELIGIBILITY: UI: must have worked at least 360 calendar days in  
the last three years in a job during which UI premia were  
paid; UA: must have received UI or have worked 150 days in  
the previous year  
BENEFIT DURATION: UI: one year, up to 2-1/2 years for older  
recipients  
FOLLOW UP: means-tested unemployment assistance benefits (58%/63%  
of net income of indefinite duration; locally provided  
welfare benefits for those who do not qualify  
EXPERIENCE RATING: none

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## 6. Conclusion

Several conclusions emerge from our "twin study." First, the nominal exchange rate matters decisively. The real revaluation of the Ostmark precipitated a collapse of East German industrial activity, which arguably might have been competitive at some price. Second, revealed preference shows that monetary overhang was an important factor in East Germany and will represent one in the CSFR in 1991. The confiscation of wealth implied by monetary union reduced the average per capita wealth of East Germans by roughly 30%, and unless other measures are introduced, inflation will perform a similar task in the CSFR. Finally, the twin experiment highlights the role of unemployment benefits in determining the future of the two regions. While *Kurzarbeit* will certainly contribute to keeping East Germans at home, it will postpone structural adjustment. Under current circumstances, the the Mezzogiorno syndrome seems increasingly likely for East Germany, as migrants with the highest alternative option leave and take their human capital with them. The striking performance of the West German job market in 1990 --695,000 new jobs in 1990, or

about 2.5% annual growth-- will exacerbate this problem. Only the most mobile Czechoslovaks will be able to entertain the migration option.

## Appendix

The following model is similar to those studied by Barro and Grossman (1971) and Malinvaud (1977). We present the simplest static version without dynamics.

### Households

A representative agent maximizes utility  $U(c, 1-l)$  over real consumption  $c$  and leisure  $1-l$  subject to the budget constraint

$$pc = \omega l + m + pW - \tau$$

where  $p$  is the nominal price of goods,  $w$  is the nominal wage, and  $W$  represents real nonmonetary wealth, and  $\tau$  is a lump sum tax.  $l$  may be thought of as the fraction of the day spent working. Note that the wealth constraint does not include profits from enterprises, which is not essential but may be more realistic for the case of Eastern Europe.

Substituting the budget constraint and maximizing yields the first order condition

$$U_1(c, 1-l)\omega = U_2(c, 1-l)$$

where  $\omega$  is the real consumption wage. Total differentiation of this and the budget constraint gives a system of two equations in  $dc$  and  $dl$ , interpreted as small changes in optimal consumption and labor supply at the optimum, as a function of factors the household takes as given. The following comparative statics results can be shown:

$$\begin{aligned} dc/d\omega &= (U_1\omega - U_2\ell)/\Delta > 0 \\ dc/d\mu &= -U_{22}/\Delta > 0 \\ dl/d\omega &= (U_{11}\omega + U_1\ell)/\Delta \text{ sign ambiguous, assume } > 0 \\ dl/d\mu &= U_{11}\omega/\Delta < 0 \end{aligned}$$

where real balances  $\mu \equiv M/P$  and  $\Delta \equiv -\omega^2 U_{11} - U_{22} > 0$ . We then write the consumption and labor supply functions  $c = c(\omega, \mu + W)$  and  $\ell^s = \ell^s(\omega, \mu + W)$ , with  $c_1, c_2, \ell_1 > 0$  and  $\ell_2 < 0$ .

## Firms

The firm maximizes profits  $py - w\ell$  where  $y$  is output produced using the constant returns production function  $f(k, \ell)$  with the usual properties. The capital stock is taken presently as given to the firms. The first order condition when maximizing over labor input  $\ell$  is  $f_2 = w$ , and the resulting labor demand and output supply functions are such that locally

$$\ell^d = \ell^d(\omega, k)$$

$$y^s = y^s(\omega, k)$$

with both responding negatively to  $\omega$  and positively to  $k$ .

## Equilibrium

The market clearing equilibrium is given by the two conditions:

$$\ell^d(\omega, k) = \ell^s(\omega, \mu + W) \quad \text{LL curve}$$

$$y^s(\omega, k) = c(\omega, \mu + W) + nx(y, e/p) + g \quad \text{GG curve}$$

where  $nx$  is the net exports function ( $nx_1 < 0$  and  $nx_2 > 0$ ),  $e$  is the exogenous nominal exchange rate; and  $g$  denotes real government purchases of goods and services. By inspection, the LL locus is downward sloping and the GG locus is upward sloping. Their intersection is the  $(\omega, p)$  consistent with equilibrium in both markets.

To obtain the constrained equilibrium loci (the wishbone locus) it is necessary to fix one of the decision variables and look at behavior of the agents in the other market. It is easy to show that the upper branches of the constrained LL and GG loci will lie above their unconstrained analogues. In addition, ruling out inventory behavior by firms leads to a collapse of the lower branches of the LL and GG loci. We do not show this here, as it is not essential given our focus on liberalization of price and wages.



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FIGURE 1

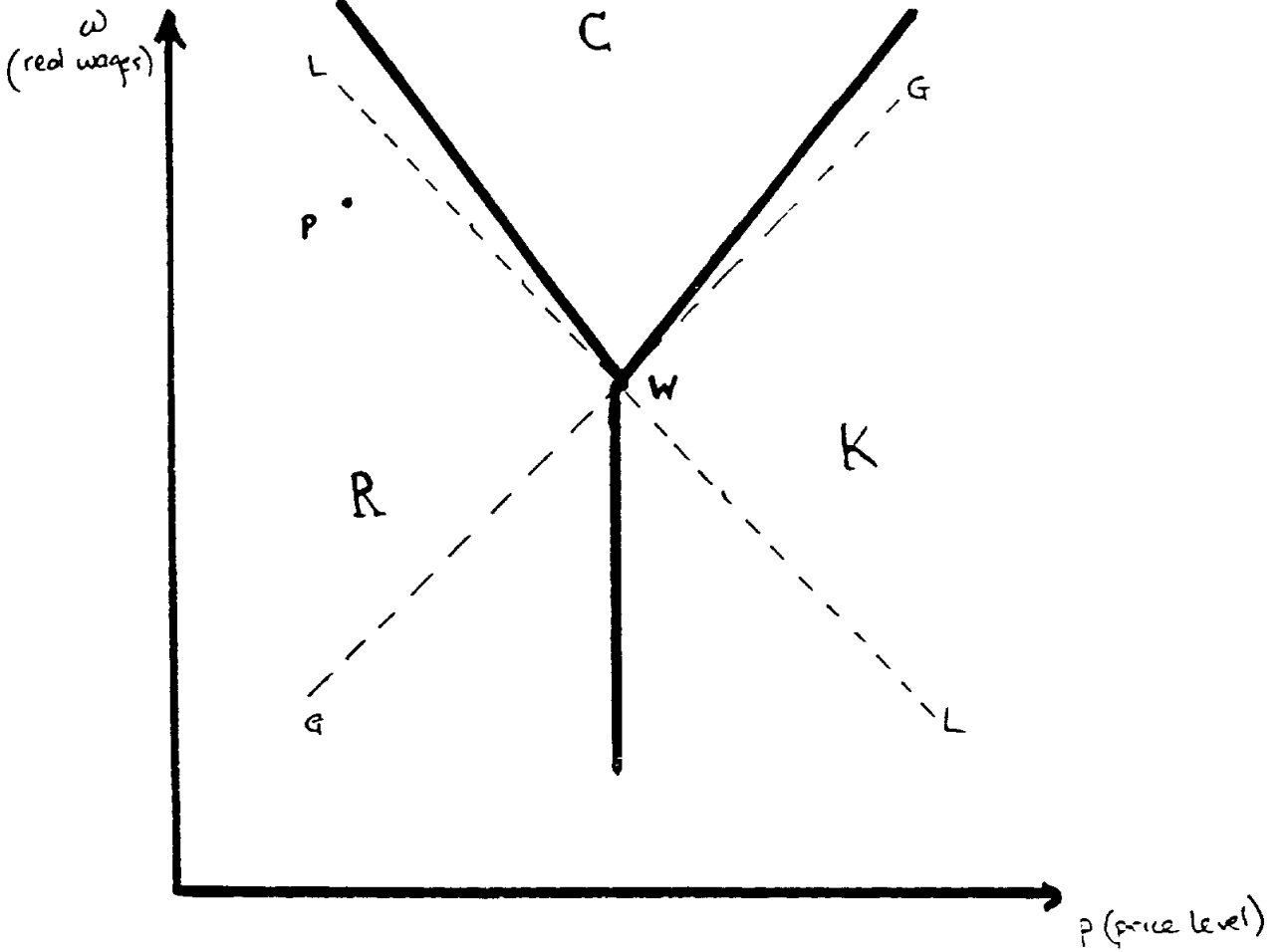


FIGURE 2

THE EAST GERMAN "REFORM"

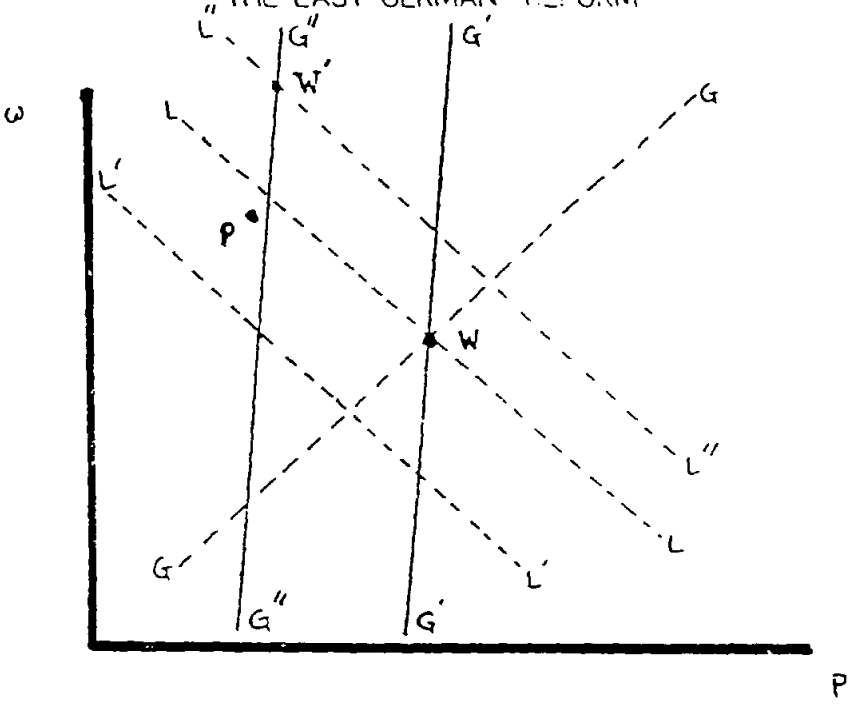
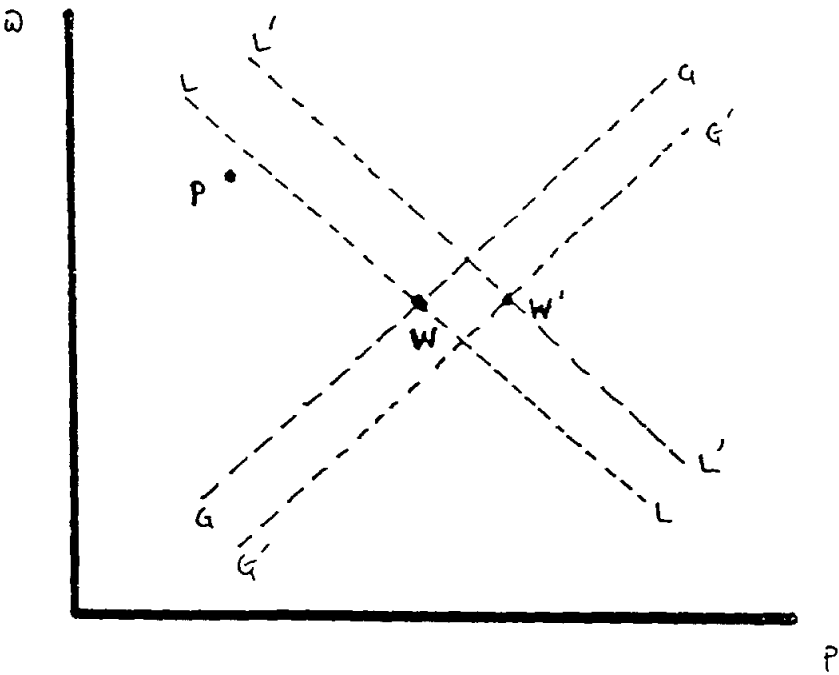


FIGURE 3

THE CSFR "REFORM"



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