

# East-West German Wage Convergence after Unification: Migration or Institutions?

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## **Abstract**

One of the most remarkable economic consequences of German unification was a rise by more than 100% in DM wages paid to Eastern German workers over the period 1990-1995, despite sharply rising unemployment and persistently low labor productivity. While wage convergence is consistent with economic integration, the evidence suggests that it was substantially accelerated by the West German collective bargaining system and supported by generous transfers from the richer West. Recent cutbacks in subsidies have not only arrested this process, but also have created pressure on the (west) German collective bargaining system, as many Eastern enterprises are unable to pay western wage levels and have begun to opt out of and challenge the credibility of industry wage agreements. These developments have ramifications for the future pattern of collective bargaining in the European monetary union as well as the eastward expansion of the European Union.

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## 1. Introduction

The most striking aspect of German unification was the rapid merging of its two labor markets. This was accomplished via economic monetary and social union in June 1990, in which the political entity called the German Democratic Republic essentially adopted the legal and institutional structure of the Federal Republic of Germany *carte blanche* and largely without reservation. Most importantly, freedom of residence meant that German households in both parts of the country had access to a common labor market, while culture and language similarities remained largely intact, despite more than four decades of division.

A visible consequence of the integration of East and West German labor markets was an unprecedented rise in nominal and real wages in the East. Average gross monthly earnings at the time of monetary union represented about one-third of west German levels at the 1:1 parity; by 1998 they had reached three-quarters.<sup>1</sup> This increase is difficult if not impossible to justify on the basis of labor demand or productivity in the East at the time and can most readily be explained by appealing to labor supply at the individual or collective level. It was not observed in any of the other transition economies, even in the Czech Republic, which had initial conditions quite similar to the German Democratic Republic (Burda 1991).

At least four explanations can be offered for rapid wage convergence. First, the integration of the two labor markets enhanced mobility – here spatial mobility – and raised the supply price of labor in the East. Second, accelerated investment by eastern Germans in new human capital and an adaptation of market hedonic prices for human capital attributes could induce wage convergence. Third, labor market institutions such as industry-wide collective agreements imposed a common price for labor which was inconsistent with market clearing. In particular, there was a strong interest in concluding wage agreements in the

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<sup>1</sup> This sharp increase in money wages must be added to the real increase engineered by the appreciation of the Ostmark by more than 400% on the basis of purchasing power parity or similar calculations; see Akerlof et al (1991).

tradition of western German wage bargaining; that is, wide-ranging, broad-coverage agreements which put lower bounds on contract wages. While these contracts may help "take the market out of wages" and insure workers against idiosyncratic and uninsurable circumstances, they also inhibit if not prevent the type of downward wage adjustment observed in the US, UK and more recently Holland and some Scandinavian countries. These agreements seemed particularly ill-suited for Eastern Germany, which was in the throes of fundamental structural change.<sup>2</sup> Fourth, Eastern Germany received large subsidies from the West in a number of forms. Economic support was available from "big brother" in the form of pensions, unemployment insurance and other forms of support for nonwork.

This paper surveys the path of wage convergence over the decade after unification in terms of its causes and effects. We find limited support for an "organic" view of wage convergence, although migration in Germany does react in the usual way to regional disparities and evidence exists for spatial wage gradients within eastern Germany. In retrospect, it is widely held that this increase was engineered in the interests of the West German collective bargaining system; claims that bargaining parties had the best interests of Eastern German workers and capital owners (i.e. taxpayers) in mind are hardly credible. Subsidies (both actual and expected) played an important role in forcing a rise of productivity through new investment, labor shedding and widespread unemployment.

## **2. The Facts**

### **2.1. Overall Convergence**

The path of earnings in Eastern Germany following unification are displayed in Table 1. Nominal weekly wages are deflated by producer or consumer prices, to give a picture of the rapid wage gains which occurred, and especially how different they appear when

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<sup>2</sup> It is often claimed that roughly half of all employed individuals experienced some change of

adjusted for differences in East and West German inflation rates.<sup>3</sup> In what follows I will focus on earnings, since these data are more readily available; it should be stressed that earnings *overstate* the degree of convergence of hourly compensation due to longer workweeks and shorter vacations in the East.

<Table 1 here>

## 2.2. Industrial Wage Convergence

Another second fact of note is that convergence of aggregate indexes has been largely uniform. Table 2 displays a breakdown by industry and shows that the variation of the differential across sectors is rather small. Unlike earnings at the individual level, the inter-industry variance of monthly earnings in Eastern Germany was much greater at the outset of unification than at the end.

<Table 2 here>

Deviations are easily explained by reference to unusual circumstances. The initial 3-4 years following unification was characterized by a substantial construction boom with two-digit growth rates; in 1992 a construction worker was already earning 72% of western levels compared with 62% on average and 53% in primary goods production. After five years, the construction boom had gone bust: the same construction worker's earnings had stagnated in relative terms at 77% of the west German average, compared with 76% in industry overall and 83% in mining and quarrying.

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employment in the years following unification. In the SOEP this is confirmed:

<sup>3</sup> This regional inflation was a product of the deregulation of deeply distorted housing, transport, energy and basic foodstuff prices.

### **2.3. Regional Wage Convergence**

A similar picture emerges for *regional* wage convergence. Table 3 shows monthly earnings in the new states relative to the overall West German earnings. Remarkably, variation in regional earnings is very low, lower than industry variation, with the key exception of East Berlin (Table 4). Wages in the eastern half of Berlin have reached virtual parity for one obvious and another not-so-obvious reason: first, labor mobility within the city-limits of Berlin is, owing to an extensive mass-transit system in the city-state, extremely high, allowing east Berliners to commute to the West and return again in the evening. Second, Berlin withdrew from a cartel arrangement binding Eastern states to a common (East-West) pay structures for civil servants and state employees, and has gone for near parity in a number of public employment settlements. This rapid pace of pay convergence has contributed to Berlin's worsening fiscal position and hemorrhaging of its industry to the surrounding state of Brandenburg, which free-rides from Berlin in a number of ways.<sup>4</sup>

<Table 3 here>

<Table 4 here>

### **2.4. Convergence of Returns to Human Capital**

One interpretation of rapid wage growth in Eastern Germany is convergence of hedonic prices for attributes that workers can obtain in the labor market. On this metric, younger workers earning valuable new skills should exhibit faster wage earnings growth and

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<sup>4</sup> Indeed the emergence of a "beltway" (*Speckgürtel*) around Berlin seems to be an inevitable consequence of the failure to merge the states and coordinate tax and subsidy policies.

convergence with the West than older workers whose human capital is obsolete and depreciated.

While a number of papers have confirmed this prediction for other transforming economies, this has generally not been the case for Eastern Germany. Burda and Schmidt (1997) Hunt (1998) and Franz and Steiner (1999) have assessed this aspect of convergence. Most work on wages in Eastern Germany has focused on remuneration to human capital attributes and the consequences of unification on the eastern German wage structure.<sup>5</sup> In one of the earliest and most comprehensive papers on the subject, Krueger and Pischke (1992) examined wages in a large cross section of households in the German Democratic Republic taken under the communist regime. Although not representative of the GDR population, their results show (1) less wage inequality in the East before unification 2) an increase in dispersion afterwards. They also find that East Germans working in the West earn similar payoffs to their characteristics with the major exception of work experience. Most interestingly, experience-earnings profiles for eastern Germans seem to have flattened out as a consequence of unification. Geib et al. (1992) and Bird, Schwarze, and Wagner (1994) confirm Krueger and Pischke's findings that experience accumulated under the old system was poorly remunerated afterwards. Similar evidence has been provided for other economies in transition.<sup>6</sup> To date, few if any researchers have focused on quantitatively attributing the East-West German wage gap to these factors. Moreover, it remains to be investigated how not only the discounting of old-system work experience, but also the relative post-unification wage dynamics have varied across different age groups.

In a study of earnings equations in eastern and western Germany, Burda and Schmidt (1997) find 1) uniform convergence for age/potential experience, tenure, education and industry

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<sup>5</sup> Some researchers have looked at returns to schooling and other attributes before unification. Schwarze (1992) found that preunification returns to schooling in the GDR and Federal Republic were similar although a smaller percentage of overall variation of GDR wages could be explained by a traditional earnings equation.

affiliation 2) some evidence that new jobs in the east are less well paid (slight rise in the tenure profile) and not that low tenure workers are earning much more than longer tenure counterparts. Most striking, there is no evidence that the West German experience-earnings profile or the determinants of earnings in general have been affected at all by unification; they remain remarkably flat, although the precision with which these earnings equations are estimated has declined considerably. This evidence seems to favor the institutional interpretation, which also squares with the fact that the *West* German earnings function has been remarkably stable throughout the 1990s, despite the massive wave of influx of workers in the early part of the decade.

### **3. One Interpretation: Labor Mobility and Migration**

#### **3.1. Was it "organic" (migration)?**

A natural interpretation for economists of rapid wage convergence follows from basic neoclassical economics. Migration is the expression of spatial mobility which, from the work of Sjaastad (1962) onwards, can be thought of as investment in human capital. To the extent that economic fundamentals would matter for the migration decision, they should also play a role in wage convergence. The greater the mobility, the more extensive wage convergence should be observed.<sup>7</sup> This line of thought leads us to conclude that the mere possibility of mass migration by some subset of eastern German agents would be sufficient to do the trick.. This process has been dubbed "organic convergence" (Sinn 1991).

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<sup>6</sup> Blanchflower and Freeman (1995) who assess wage determination in several transition economies. For work on specific countries see Chase (1995) for the Czech Republic and Slovakia, and Orazem and Vodopivec (1995) for Slovenia.

<sup>7</sup> For a formal model in a general equilibrium setting with forward looking agents, see Topel (1986).

Migration following unification was indeed quantitatively significant, especially against the backdrop of typical European immobility. Table 5 gives some aggregate details, and show that more 1.2 million East Germans had come over by 1998. At the same time, the net migration rate has dwindled to insignificant proportions, as East Germans return home or highly skilled West Germans assume management positions in industry or the public administration. .

<Table 5 here >

At the same time, Figure 1 shows that the pure "organic" view of wage convergence is unlikely to explain rapid East-West convergence, since mobility within East Germany is presumably less costly for East Germans, yet there remains a considerable wage gradient between Berlin and the rest of Eastern German, and even Brandenburg, which completely surrounds high-wage Berlin. The propensity to migrate among East Germans has been studied extensively by Hunt (1999) in a recent paper using the German Socioeconomic Panel. She concludes that East Germans are a lot *less* mobile than their attributes would predict.

<Figure 1 here>

### **3.2. Econometric Specification of a Migration Model**

In this section, I evaluate the strength of the migration effect using German data and use this evidence to evaluate of the competing hypotheses of migration and institutions. The data for the econometric analysis is the annual population movement statistics for the German states (*Länder*) based on civil registry data. Due

to limitations on available data, the econometrics are not ambitious but can be taken as suggestive of the directions of future research in this area. The unit of observation is a pair of states, a source and a target.

I will estimate variants of an econometric specification modeling gross *outmigration* rate of source Land  $i$  (normalized by population at the end of the previous year) to some target Land  $j$  as a function of log GDP per capita of the target and source (SENDYCAP AND TARGYCAP), of unemployment of the target and source (SENDURAT and TARGURAT), of log population density in the target and source (TARGDENS and SENDDENS). My specification is inspired by recent work of Hunt (1999) who has examined related questions with both micro data (GSOEP) as well with aggregate gross flow data, which I examine here. After testing I concluded however, as Hunt (1999) does, that the data reject a specification in which source and target state effects are constrained to be equal in size and opposite in sign. I also included a dummy for state-pairs involving neighbors (having contiguous borders), a dummy indicating whether the Land was a city source or city target, or whether the Land was Berlin as a source or a target. I included dummies indicating East-to-West, East-to-East, and West-to-East (so that the reference group is the set of West-to-West state-pairs). I estimated the specifications with and without time dummies (YEAR92, YEAR93,...). Most important, the analysis was conducted on the entire sample and subsamples West-to-West and East-to-East, to conduct heterogeneity tests on these groups.

### **3.3. Results**

The regression results, which are simple OLS estimates with robust standard errors, are presented in Table 6. The first two columns (I and II) show the

results for the pooled sample, which largely confirm existing migration evidence. For the most part, the estimates correspond to effects estimated in the literature: target income per capita exerts a pull on migration while the sender income also exerts a positive effect. Surprisingly unemployment is insignificant in most specifications, which may indicate that registered unemployment rates are a weak indicator of the "involuntary" extent of joblessness. Density in the receiving state has the predicted negative sign, but it is also negative for the sending country, perhaps indicating agglomeration effects. Most striking are the city-state and flow specific dummies, especially as regards their ability to change the results. As expected, the contiguous dummy was highly significant. I cannot reject the joint irrelevance of the time dummies in the pooled specification.

The most important finding in Table 6 involves the homogeneity of the equations across the East-West distinction. Columns III-VI present these estimates. At a visual level it is evident that source income in the East exerts a strong "push" effect, perhaps providing liquidity for covering moving expenses, where it is ordinarily not a factor in the West. I confirm Hunt's puzzling finding that East-West migration is on average lower than overall, *ceteris paribus*, and that East-to-East migration even more so. Rather than being very mobile the regression results suggest the opposite: East Germans are slowly learning about mobility (as the pattern of time dummies suggests). Alternatively, younger cohorts entering adult age are more mobile than their predecessors, contributing to a catch-up effect of mobility.

**<Table 6 here >**

#### **4. An Institutional Explanation**

An interpretation of the events commonly heard in Germany is that collective bargaining institutions had interests which are certainly "European" in the interest of fairness and equity, but which in the end had severe consequences for labor markets. A key component of this interpretation is the role of the government, which negotiated vis-a-vis labor unions at the time. Promises were made of wage parity by 1995; Sinn spoke of "Japanese wage levels" in Eastern Germany. These wages were paid in a large part by West German taxpayers, initially as financial transfers to firms, then as short-time work, early retirement, and unemployment benefits, followed by "active labor market policies." These subsidies of all sorts contributed to a ballooning fiscal problem; in 1994 subsidies came under increasing political criticism and have been reduced substantially since then. Figure 2 shows the trajectory of gross and net wages for east German employees since 1990 and shows that the termination of subsidies has coincided with a dramatic slowdown in wage growth across the board.

With the party now over, contradictions in the (west) German collective bargaining system are beginning to show. Unit labor costs remain in Eastern Germany 15-30% higher than in the West, despite drastic shedding of labor. Unemployment in East Germany remains between 15 and 20% of the labor force depending on how it is measured. While labor force participation remains part of the problem – especially eastern German women show high participation rates – the problem remains one of labor costs.

**<Figure 2 here>**

This has become an important source of tension. Organized labor in Eastern Germany is on the defensive and losing members in droves. Table 7 shows the

precipitous drop in the rank-and-file since 1991. Part of this is simple the fact that promises were made which were not kept; East German workers were not happy with DGB chief Schulte's promise of a high unemployment benefit as the result of the rapid increase of wages in the early years.<sup>8</sup> The punishment for the rise in unemployment and incomplete wage convergence was a massive decline in union membership in the East. Just as rapidly as it had risen, the onset of unemployment and the inability of unions to secure employment for its members has resulted in a backlash in the membership rolls and a dramatic loss of union influence in the new eastern states.

<Table 7 here>

This decline in influence has resulted in an increased readiness on the part of workers and works councils to engage in US-style "concession bargaining," i.e. accepting wages below minimum (industry-wide) contract-determined wage levels to save enterprises from bankruptcy. Kohaut and Schnabel (1999) estimate that this type of bargaining is becoming more and more important over time.

Under West German collective bargaining rules, this development would have been unthinkable, as members of employers' associations are joint signatories to collective wage agreements (*Flächentarifvertrag*) and thus bound to pay at least minimum wages specified in the contract. Yet an increasing number of firms, no longer able to pay wages decided on in the West, have implicitly or explicitly

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<sup>8</sup> Akerlof et al. (1991), Burda and Funke (1995).

defected from collective bargaining agreements have abandoned their employers' associations in the East, leaving open the possibility of enterprise level bargaining.<sup>9</sup>

Employer associations function as a bargaining intermediary for large industrial collective wage agreements; low and declining membership severely vitiates the credibility of wage agreements and the collective bargaining system. Even firms which remain – one third of all east German enterprises by most guesses – have the option of invoking an opt-out clause (*Öffnungsklausel*), although this was originally conceived as an escape valve for rare and dramatic cases in the West. Their widespread dissatisfaction by 1995 can be inferred from Table 8.

<Table 8 here>

The result has been a schism in collective bargaining between East and West which is largely undiscussed in public due to the extreme tensions it will raise. In the West, all seems to function as before, but Western workers and firms observe with concern the rapid increase in East German establishments which disregard collective agreements or conduct decentralized wage bargaining on their own. It remains to be seen how these contradictory developments can be reconciled without major structural reforms of the German collective bargaining system.<sup>10</sup> The recent state bailout of the construction firm Holzmann AG contained provisions for an employee "contribution" to the rescue plan, involving unpaid hours and wage moderation, which were clearly the equivalent to an "exit clause" at the expense of the credibility of the nationwide wage agreement in the building sector.

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<sup>9</sup> This situation can be changed only to the extent that the Minister of Labor declares a contract binding for all firms and worker in a particular sector, should he deem this in the "public interest." The possibility of such an action seems particularly remote at the present time.

<sup>10</sup> This is exemplified by the urgency with which labor unions regarded metalworkers and public service rounds in 1999 as well as their uniform application in all union districts. Despite the rhetoric, it is not clear how the recent metalworking agreement has been implemented in Eastern German enterprises. The legal survival of the "Phoenix" agreement concluded with the relatively insignificant Christian Metalworkers Union however shows the current weakness of the union position even with an SPD government at the helm.

#### **4. Conclusions and Policy implications: A Trojan Horse?**

The ambitious aim of wage equality across eastern and western Germany by 1995 has succeeded only in Berlin, and convergence there has been incomplete in sectors where mobility is low or the concentration of specific human capital is high. Despite widely heralded wage agreements guaranteeing parity of wages within a limited time horizon, monthly earnings for workers in Eastern Germany remain on average three-quarters of that in the West (see Table 1) and hourly earnings are more likely in the range of 65-70%. It seems that while real consumption and especially product wages have risen dramatically, they are still far from "Japanese levels" predicted by Sinn and Sinn (1991). At the same time, the objective of imposing uniform wages *within* East Germany (across regions as well as sectors) must also be considered. To the extent that the goal of "equal pay for equal work" receives a large weight relative to economic efficiency, the German outcome could even be judged to be a success (again, excepting Berlin). One must always keep the tyranny of averages in mind, since averages often mask large variation in enterprise level compensation and at finer levels of sectoral disaggregation.

The imposition of the West German system of wage determination on the East has pointed up just how inappropriate certain collective bargaining institutions can be in the context of transformation. It is therefore relevant for the EU as it contemplates the effects of adopting EU institutions in Eastern Europe. At the same time it is worth noting that integration is two way: like the Trojan Horse, the unprecedented developments in East Germany have introduced flexibility there that is lacking in the West. Due to the striking variation in fortunes of industrial sectors in the East (Pohl 1996) it is likely that this will show up in a broader differentiation of wages across these sectors. Burda and Funke (1995) show that dispersion in wages and productivity has increased across two-digit manufacturing industries. The gap is being closed over time but not for all sectors, nor at the same rate of

speed; in some sectors productivity has increased dramatically while not at all in others, while productivity increases have been achieved by layoffs in some industries and expansion in others.

The real effects of unification – including monetary union – carries implications for the European Monetary Union (see Burda 1999) and for the integration of the new market economies of central and eastern Europe (Boeri, et al 1998). In the former case, the introduction of a common currency will subject national labor unions to increased pressure to decentralize and increase the need to centralized wage bargaining. In the latter case, the German experience can help us understand the longer run effects of integration, since it can be thought of an accelerated version of the usual east-west integration (Burda 1999). As in western Germany, western Europe may end up yielding to competitive pressures of Eastern Europe as mechanisms of collective bargaining, already under duress due to monetary union, face enormous differential pressure from the East.

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**Table 1: East-West German Wage Convergence**

Jahr	East German pre-tax weekly earnings DM	As percent of West weekly earnings	Product wage (1991=100)	Consumption wage (1991=100)
1991	425	50	100	100
1992	571	65	131	118
1993	644	71	145	121
1994	683	72	152	124
1995	726	74	160	129
1996	722	72	157	125
1997	767	76	163	130
1998	782	76*	168	131

Source: Statistisches Bundesamt, BMF (Stand Januar 1999), Statistisches Jahrbuch, Wirtschaft und Statistik, 1/1999.

\* Neue Länder und Berlin Ost

**Table 2. East-West German Earnings Convergence by Sector, 1991-1997**  
**(Total gross monthly earnings as percent of West German counterpart)**

<b>Blue-collar workers (Arbeitnehmer)</b>		<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>
All Industry		62.3	70.8	72.0	73.7			
Power generation, gas, water		60.8	68.0	71.2	75.1			
<i>from 1995: Energy and water</i>					75.0	79.2	79.9	
Mining		68.4	82.3	85.2	76.9			
<i>from 1995: Mining and quarrying</i>					73.4	84.3	83.3	
Manufacturing								
Primary/interm. goods production		52.6	61.4	63.7	67.5			
Investment goods		55.1	65.0	67.2	72.0			
Consumer goods		58.8	63.5	65.2	68.3			
Food and related goods		58.0	63.2	66.4	69.8			
<i>from 1995: All manufacturing</i>					70.2	72.5	73.8	
Construction		72.2	76.0	77.0	76.0			
<i>from 1995: Construction</i>					75.9	76.3	76.9	

**Table 2. Continued**

<b>White-collar workers (kaufmännische und technische Angestellte)</b>								
	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Industry	41.6	52.4	60.0	65.4	69.6			
<i>from 1995: Industry</i>					69.8	72.8	73.9	74.5
Energy and Water	47.3	61.9	67.5	70.8	74.5			
<i>from 1995: Energy and Water</i>					74.5	78.8	80.0	
Mining	37.6	53.4	63.0	70.6	65.1			
<i>from 1995: Mining, quarrying</i>					65.6	78.1	77.2	
Primary and Intermediate Goods	40.8	49.2	56.3	59.6	64.9			
Investment goods	38.1	47.9	56.4	64.0	70.1			
Consumer goods	43.7	53.8	59.7	64.8	69.1			
Food and related goods	39.5	47.8	52.3	56.4	60.6			
<i>from 1995: Manufacturing</i>					67.8	70.6	72.2	
Construction	54.3	64.8	69.7	73.7	75.7			
Trade, Banking, Insurance	46.7	59.7	68.2	72.9	75.6			
<i>from 1995: Trade, Banking and Insurance</i>					71.1	73.6	75.0	75.6
Trade, Maintenance, Banking and Insurance								

Source: Statistisches Bundesamt

**Table 3. East-West German Earnings Convergence by Region, 1991-1997**  
**(total gross monthly earnings as percent of West German average)**

<b>Blue-collar workers*</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>
Brandenburg	n.a.	65	74	75	74	77	77
Mecklenburg-Vorpommern	n.a.	64	70	73	76	78	78
Sachsen	n.a.	61	68	70	72	73	74
Sachsen-Anhalt	n.a.	62	71	72	74	76	76
Thüringen	n.a.	60	69	69	71	71	73
<i>Memo:</i> East Berlin	n.a.	69	79	82	85	90	92
<b>All new Bundesländer</b>	n.a.	62	71	72	74	75	76
<b>White-collar workers**</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>
Brandenburg	45	59	66	70	74	72	72
Mecklenburg-Vorpommern	45	58	64	68	74	70	70
Sachsen	44	56	64	67	74	72	74
Sachsen-Anhalt	46	57	65	67	74	72	73
Thüringen	43	56	63	66	71	70	71
Nachrichtlich: Berlin-Ost	n.a.	61	70	76	85	88	90
<b>All new Bundesländer</b>	45	57	65	68	74	73	74

Source: statistical yearbooks of the Bundesländer

\**Arbeitnehmer* \*\**Kaufmännische und technische Angestellte.*

**Table 4. East-West Berlin Sectoral Blue-Collar Earnings Convergence 1993-1997 (total gross monthly earnings as percent of West Berlin average)**

<i>INDUSTRY</i>	<b>Year</b>		
	<i>1993</i>	<i>1995</i>	<i>1997</i>
<i>Food and kindred products</i>	69.7	77.8	89.8
<i>Printing and Paper</i>	74.3	93.6	98.8
<i>Chemicals</i>	63.2	69.7	81.7
<i>Machinery</i>	71.0	77.8	81.1
<i>Electronic equipment, office machinery, data processing</i>	79.2	89.5	93.2
<i>Electricity Gas Water</i>	74.5	88.3	99.0
<i>Construction</i>	81.3	83.8	85.0

**Table 5 East West Migration flows 1987-1998**

Year	Flow from East to West		Flows from West to East		Cumulated East Germans in West
	absolute	% of total population	absolute	% of total population	
1987	22800	0.03	2400	<0.01	20400
1988	43300	0.06	2500	<0.01	61200
1989	388400	0.50	5100	0.01	444500
1990	395343	0.50	36217	0.05	803626
1991	249743	0.31	80267	0.10	973102
1992	199170	0.25	111345	0.14	1060927
1993	172386	0.21	119100	0.15	1114213
1994	163034	0.20	135774	0.17	1141473
1995	168336	0.20	143063	0.18	1166746
1996	166007	0.20	151973	0.19	1180780
1997	167789	0.20	157348	0.19	1191221
1998	182478	0.22	151750	0.18	1221949

Source. Federal Statistical Office (Statistisches Bundesamt)

**Table 6. Regression Analysis of Gross Intra-German Migration Flows, 1991-1997**

***Dependent Variable: annual gross bilateral migration between Bundesländer***

Indep. Variable	<i>Pooled sample</i>		<i>West-West</i>		<i>East-East</i>	
	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>
TARGYCAP	.001037 (2.0)	.000791 (1.7)	.002749 (2.3)	.001497 (1.4)	.005759 (5.6)	.004464 (5.9)
SENDYCAP	-.000302 (-0.6)	-.00055 (-1.2)	.000012 (0.0)	-.001240 (-1.2)	.004005 (3.9)	.002709 (3.6)
TARGURAT	.000048 (1.2)	.000060 (1.6)	.000259 (2.8)	.000247 (3.1)	.000110 (2.5)	.000044 (1.3)
SENDURAT	.000042 (1.0)	.000054 (1.4)	.00013 (1.4)	.000119 (1.5)	.000093 (2.1)	.000027 (0.8)
TARGDENS	-.000488 (-3.7)	-.000184 (-1.6)	-.001273 (-4.2)	-.000778 (-2.9)	.000683 (7.2)	.000499 (6.9)
SENDDENS	-.000473 (-3.6)	-.000169 (-1.4)	-.000846 (-2.8)	-.000351 (-1.3)	.000148 (1.6)	-.000036 (-0.5)
TARGCITY	-.000565 (-1.4)	-.000665 (-1.9)	-.000332 (-0.5)	-.000135 (-0.2)	—	—
SENDCITY	0.002061 (5.2)	.001962 (5.6)	.002905 (4.2)	.003101 (5.3)	—	—
TARGBERL	0.001058 (3.3)	.000790 (2.8)	.001301 (2.0)	.000931 (1.7)	—	—
SENDBERL	-.000628 (-1.9)	-.000895 (-3.1)	-.00157 (-2.4)	-.001944 (-3.5)	—	—
OST_WEST	-.001064 (-3.4)	-.000735 (-2.7)	—	—	—	—
OST_OST	-.001612 (-3.5)	-.001926 (-4.8)	—	—	—	—
WEST_OST	-.001340 (-4.3)	-.001012 (-3.7)	—	—	—	—
NEIGHBOR	--	.002180 (20.4)	—	.003032 (16.1)	—	.000391 (9.8)
YEAR92	-.000173 (-0.7)	-.000167 (-0.8)	-.000193 (-0.5)	-.000095 (-0.3)	.005525 (5.1)	.003652 (4.5)
YEAR93	-.000419 (-1.5)	-.00041 (-1.7)	-.000874 (-1.9)	-.000732 (-1.8)	.003352 (4.9)	.002144 (4.2)
YEAR94	-.000506 (-1.6)	-.000482 (-1.7)	-.001286 (-2.1)	-.001028 (-2.0)	.002052 (4.4)	.001214 (3.5)
YEAR95	-.000490 (-1.5)	-.000438 (-1.5)	-.001397 (-2.1)	-.001077 (-1.9)	.001612 (3.7)	.000818 (2.5)
YEAR96	-.000638 (-1.6)	-.000605 (-1.7)	-.001872 (-2.4)	-.001499 (-2.2)	.000765 (3.2)	.000353 (2.0)
YEAR97	-.000781 (-1.6)	-.000770 (-1.8)	-.002379 (-2.4)	-.001911 (-2.3)	--	--
CONSTANT	-.002879 (-0.9)	-.001282 (-0.5)	-.013910 (-1.8)	-.004491 (-0.7)	-.03361 (-5.3)	-.023406 (-5.0)
$\bar{R}^2$	0.12	0.31	0.11	0.34	0.44	0.70
p for F-test, year dummies	0.807	0.708	0.362	0.398	0.000	0.000
N	1530	1530	750	750	120	120

t-statistics in parentheses are computed using robust standard errors

**Table 7: Eastern German Membership in DGB (Deutscher Gewerkschaftsbund): 1991-1998**

	Yearend Union Membership (000s)			As percent of total employment*		
	1991	1995	1998	1991	1995	1997
<i>Berlin-Brandenburg</i>	1085	755	608	38.0	36.6	32.3
<i>Sachsen</i>	1342	677	510	59.0	42.0	34.6
<i>Sachsen-Anhalt</i>	727	377	306	52.8	41.4	37.0
<i>Thüringen</i>	613	327	244	50.2	38.5	32.1
<i>Mecklenburg-Vorpommern</i>	439	225	227	48.3	36.7	31.1
<i>All new states</i>	4158	2360	1841	50.6 <sup>a)</sup>	39.0	33.4
<i>Memorandum: West Germany</i>	7643	6994	6470	32.3	31.4	31.8

\*Dependent-status employment.

Source: DGB, Statistisches Bundesamt

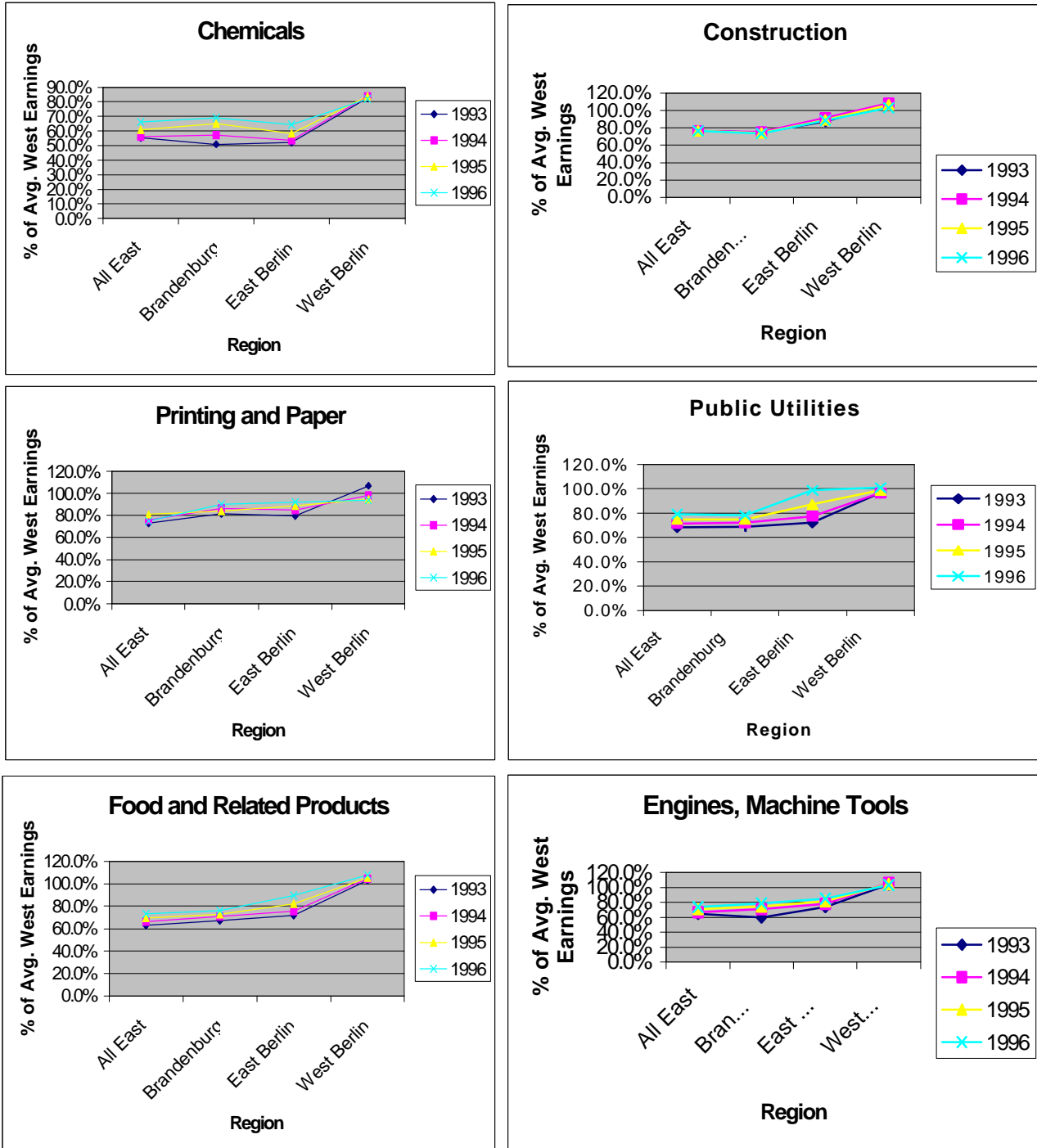
**Table 8: Evolution of Membership in Employers' Associations and Nonunion Wages in Eastern Germany**

	<b>1993</b>	<b>1995</b>	<b>1998</b>
Share of all firms that are members of an employers' association (%)	36	27	21
Share of all employees employed by members of employers' associations (%)	76	64	45
Share of firms which generally pay below the union wage in their sector and region (%)	35	33	41
Share of employees who are paid below union wage (%)	12	16	28

Source: DIW (1999)

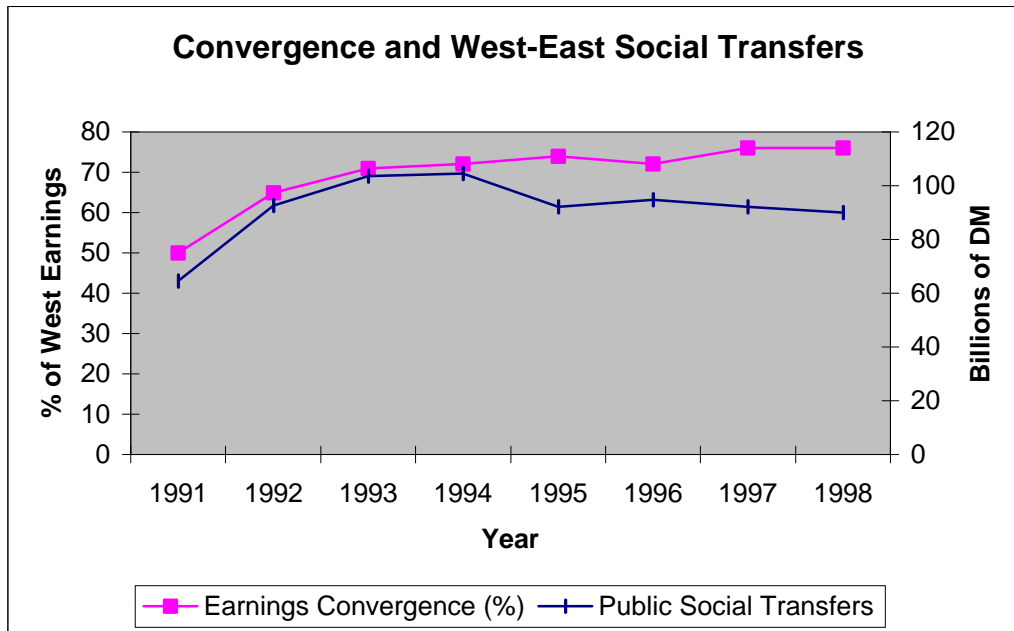
# Figure 1

## Wage Gradients, Berlin and Brandenburg by Industry



## Figure 2

### Earnings Convergence and Transfers



*Source:* Statistisches Bundesamt, BMF (Stand Januar 1999), Statistisches Jahrbuch, Wirtschaft und Statistik, 1/1999. 1998 value for earnings convergence includes East Berlin.