1 Introduction

At the start of the German unification process it was a commonly held view that east German living conditions will converge to west Geman levels within a few years. This view was not only held by notoriously optimistic politicians but also by a great many of professional economists. With hindsight, this optimism turned out as unfounded. Although living standards have improved substantially for the great majority of east Germans, this is more related to the huge west German transfers than productivity improvements of the east German economy. For political reasons, wage increases stipulated in collective bargaining agreements were detached from economic factors, which the majority of economists considers the main culprit for the dramatic decline in employment and the unprecedented increase in unemployment in the east German economy.

Right from the start of the transition process, in most industries collectively bargained wages were set to reach parity with prevailing levels in the western German states within a few years. Actual wage settlements were not related to economic conditions and productivity developments, but simple were set to catch–up to this pre–specified target. The resulting employment losses were either viewed as inevitable by those who saw the future of the east German economy in a high productivity, high wage strategy or not related to wages at all, a view held publicly by west German union leaders who, at least in the beginning, dominated the collective bargaining game. However, with sky–rocketing unemployment and the virtual breakdown of the manufacturing sector the adjustment of east German contract wages to west German levels was postponed early on. In 1997, when according to intermittently revised contracts full wage convergence should have been achieved, effective wages in the eastern states are still considerably lower in most industries, and even more so if higher levels of fringe benefits and shorter working hours in west Germany are taken into account.

There has so far been surprisingly little empirical research on the east–west German wage convergence process.[1] Most empirical accounts rely on the comparison of the development of either average effective wages at the sectoral level or contract wages laid down in collective bargaining agreements in various economic sectors of the eastern and western German states (see, e.g., Bispinck 1995). Several studies based on micro data have analyzed the east German wage structure (see, e.g., Bird, Schwarze and Wagner 1994, Krueger and Pischke 1995, Steiner and Bellmann 1995, Steiner and Puhani 1997). Typically, these studies have related estimated wage differentials for skills and other structural factors to those observed for the

[1] Hauser and Fabig (1997) analyze the convergence of household incomes.

western German states in an informal way. The recent study by Burda and Schmidt (1997) is apparently the first attempt to directly compare the development of effective wages in east and west Germany after unification and to identify the factors which drive the observed wage convergence process. However, their study only covers the period 1990 to 1993, is restricted to males, and focuses on a particular aspect of the east–west German wage convergence process, namely the extent to which wage convergence differs between age groups. It seems therefore fair to say that we still know little about the more recent development and the economic factors driving the wage convergence process between the eastern and western German states.

This paper tries to partially fill this gap. To this end, we provide an empirical analysis of the extent of wage convergence between the eastern and western German states in the period 1990 to 1995 on the basis of the German Socio–Economic Panel. An important advantage of this data is that the first survey took place just before Currency, Economic and Social union came into effect on July 1, 1990. Hence a comparison between the wage structure of the former German Democratic Republic with the one having developed over the subsequent 5 years' period is possible. In the next section, we briefly describe this data base and provide some descriptive evidence on the process of east–west wage convergence. Determinants of the wage distributions in the two regions and their development over time are analyzed in section 3 on the basis of empirical wage equations. In section 4, these estimated wage equations are then used to decompose the east–west wage differential and its development over time into a component explained by regional differences in human capital endowments and the employment structure, and a component related to differences in the wage structure, i.e. returns to human capital and industry rents. We find that the wage convergence process in the period 1990 to 1995 significantly differs by gender and that regional differences in returns to human capital rather than differences in the structure of the labor force explains most of the persisting east and west wage differential, especially for males. In the concluding section we summarize our main results and draw some conclusions.

2 Data and Descriptive Analysis

2.1 Data

Our analysis of wage convergence between the eastern and western German states is based on the German Socio–Economic Panel (GSOEP) for the period 1990 to 1995. The GSOEP is a representative household survey for the German population conducted on a yearly basis. For the western German states, the GSOEP–west has been conducted since 1984, when about 12,000 individuals in 6,000 households were interviewed. In the subsequent waves of the panel, the same people where

followed up. Sample attrition was partly compensated for by including new interviewees. In each survey detailed information on, *inter alia*, earnings and hours worked in the previous month, an individual's human capital endowment, place of residence, industry affiliation and firm size as well as household composition was collected. The first survey for the eastern states (GSOEP–east) was conducted in June 1990, just before Currency, Economic and Social Union came into effect on July 1, 1990. Then, about 4,000 persons living in 2,000 households were interviewed and comparable information as for the western states was also collected in the GSOEP–east.[2] As for the GSOEP–west, sample attrition was partly compensated for by including new interviewees related to the sample population initially included in the panel.

Since average hours worked differ substantially between the eastern and western German states, we analyze hourly wages rather than (monthly) earnings.[3] Hourly wages are derived from the information on individual gross earnings and hours actually worked in the previous month collected in each wave of both the GSOEP–west and the GSOEP–east. Fringe benefits like 13th monthly pay, holiday or Christmas bonuses are not taken into account, because the information on fringe benefits collected retrospectively in the GSOEP cannot consistently be combined with the information on hourly wages used here.[4] As we are interested in market determinants of wage convergence, we focus on gross hourly wages, *i.e.* direct taxes and transfers are not taken into account here. Furthermore, we define wage convergence in terms of nominal rather than real wages, as in Burda and Schmidt (1997). The main reason for the use of nominal wages is that, because east German consumer and producer prices have deviated considerably in the observation period, the choice of a particular price deflator would have affected results substantially and that there is no economically compelling argument to use the one or the other.[5]

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[2] Details on the GSOEP can be obtained from the webserver of the German Institute of Economic Research (DIW) in Berlin (http://www.diw–berlin.de/soep/).

[3] Due to the persistently high level of overtime work in the western German states, hours actually worked deviate substantially from "normal" hours defined in collective bargaining agreements. On the other hand, female permanent part–time work is much more common in the western than the eastern states, while temporary short–time work ("Kurzarbeit") was extensively used as a means of employment adjustment in the early stage of the transition process in east Germany.

[4] Retrospectively collected information on fringe benefits could be sliced together with the earnings information contained in the so–called calendar data also collected retrospectively for the previous calendar year. However, information on hours actually worked does not correspond to the calendar information.

[5] Obviously, nominal wages are not a good indicator for the welfare position of east German households, which is not the focus of this study, though (see Hauser and Fabig (1997) for an analysis of the convergence of household incomes).

For our empirical analysis we selected the following subsamples. Since the GSOEP–west contains a disproportionately large number of foreigners (former "guest–workers") whereas there are hardly any foreigners in the GSOEP–east, we have removed them from the samples for the sake of comparability. Previous research for west Germany has shown that wage determination between foreigners and natives differs substantially (see, e.g., Steiner and Wagner 1996). Given that foreigners are on average less qualified than natives and earn less even for similar formal qualification, their exclusion from the west German sample understates the wage differential between the eastern and western states. Second, the self–employed, military servants and those who are on an apprenticeship training were also removed from the samples. So were irregularly employed people and persons who are employed in a public works program ("Arbeitsbeschaffungsmaßnahme“). This is motivated by the fact that wages in these activities are determined by other factors than the wage for employees in regular jobs. Third, we excluded men (women) younger than 18 years and older than 65 (60) years because these age groups are only rather loosely related to the labor force nowadays. Finally, east German residents working in the western German states were removed from the data set, because their wages do not represent the east German wage structure.

For the subsequent empirical analysis we also dropped observations with missing or probably false earnings and/or hours information as well as missings on the explanatory variables in the wage regressions estimated in section 3. In Table A1 in the appendix the number of observations remaining after these stepwise selections in the GSOEP–east and GSOEP–west are shown for the years 1990, 1992 and 1995, which will also be the reference years for the more detailed analysis in section 3 and 4 below.

2.2 The Development of the East–West German Wage Differential 1990 to 1995

Just prior to Currency, Economic and Social Union, east German males earned on average about DM 7 an hour, while the average hourly wage of west German males was about DM 23 in 1990. For females, the east–west wage ratio was about DM 6 to DM 17 per hour. It may be noted that the substantial gender wage differential in west Germany had no counterpart in the former GDR; males and females earned almost the same per hour worked. Between 1990 and 1995, the average wage differential declined substantially from about DM 16 to DM 10.8 for males and from DM 11.5 to DM 5.3 for females (see Figure 1). Hence, east German females fared considerably better than males in the transition process in terms of wage convergence.

Aside from the development of average wages in east and west Germany, differences across the wage distribution are also of interest here. We use the 10% and 90% percentiles, respectively, to characterize the lower and upper part of the wage distribution (see Figure 2). While the west German wage distribution has remained fairly stable in the 1990's, east German wages in the upper part of the distribution increased somewhat faster than average hourly wages, which in turn increased faster than wages in the lower part of the distribution. This divergence in the east German wage distribution only occurred after 1992. As to gender differences, the figure shows that wage inequality in the lower part of the distribution increased more for females than for males.

The rate of east–west wage convergence defined as the yearly relative change in regional wages at the mean as well as the lower and upper part of the wage distribution is shown for males and females in Figure 3.[6] With almost 50%, the rate of wage convergence was very high at the beginning of the transition process. For males, this rate was similar across the wage distribution, whereas wage convergence in the lower part of the distribution was considerably slower then. After the year 1991, the rate of wage convergence has slowed down markedly, and this happened across the wage distribution. Both for males and females, the rate of wage convergence has reached a value of zero by the year 1995. That is, the adjustment process seems to have come to a standstill, although substantial east–west wage differentials still exist, especially for males. Furthermore, differences in the rate of wage convergence between the lower and upper part of the wage distribution have disappeared by the year 1995.

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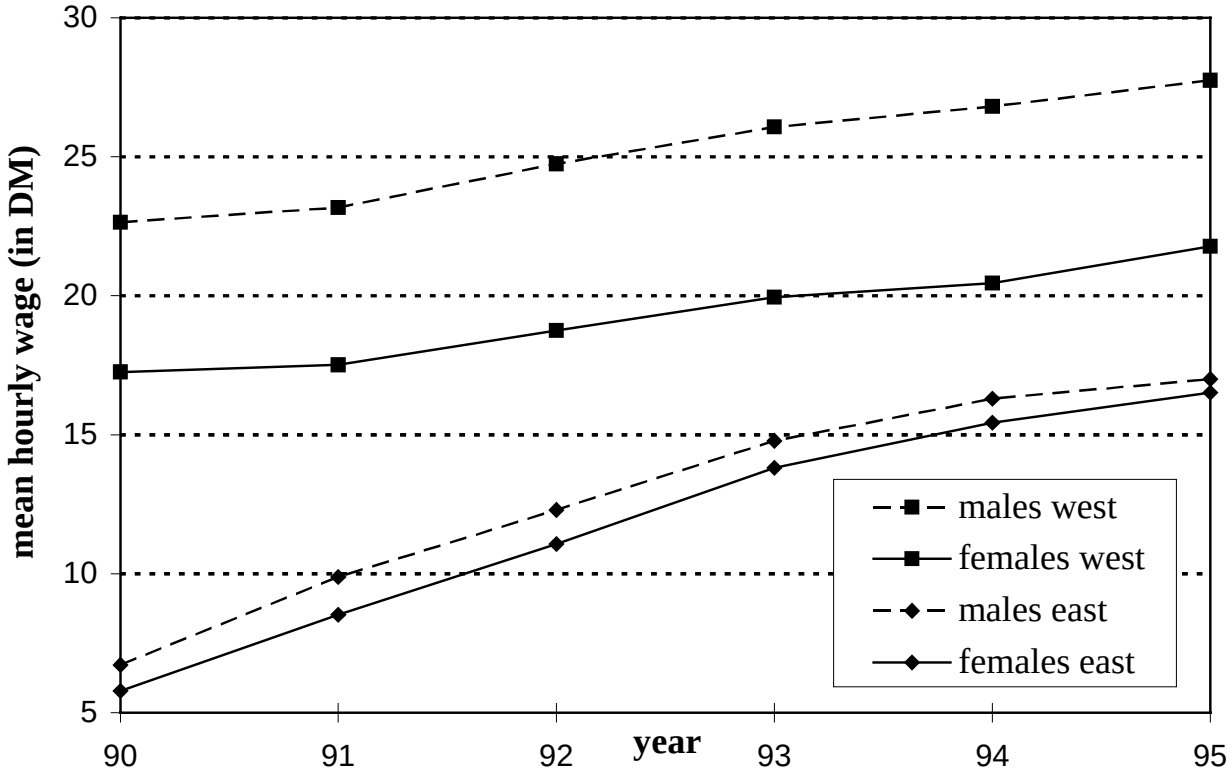
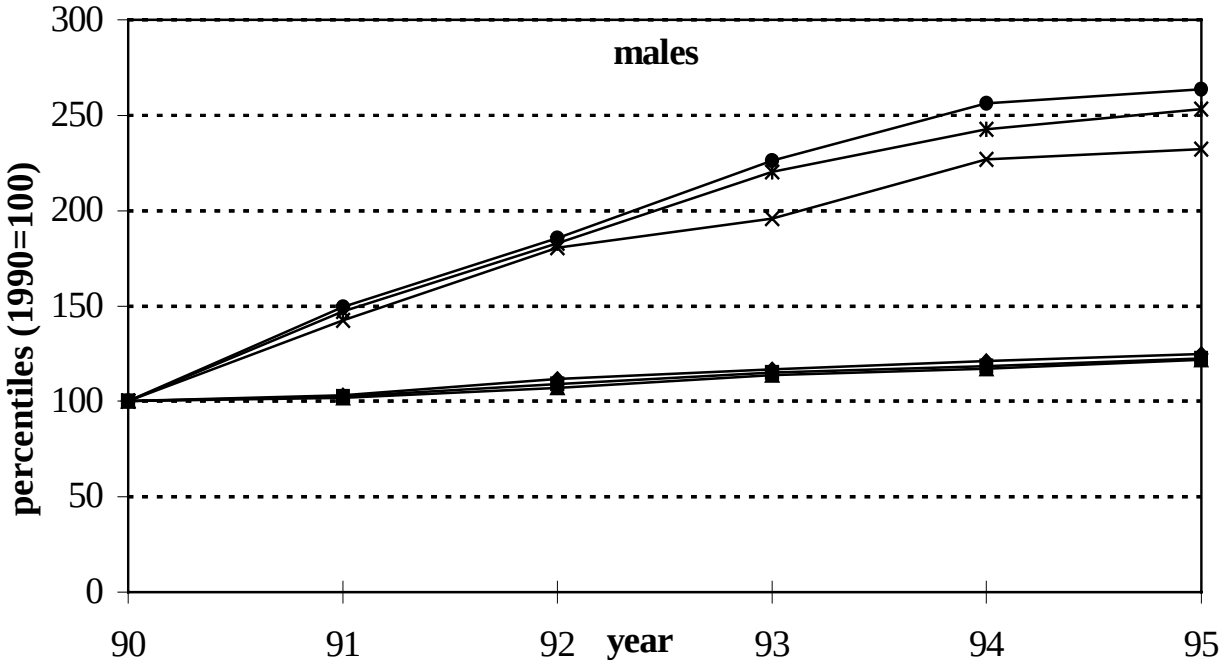
[6] Annual wage convergence is defined as $\left[\left(y_t^w / y_t^e\right) - \left(y_{t+1}^w / y_{t+1}^e\right)\right] / \left(y_{t+1}^w / y_{t+1}^e\right)$, where y is the nominal hourly wage in west (w) and east (e) Germany, respectively, and t refers to a particular year, t = 1990, 1991 ... 1995.

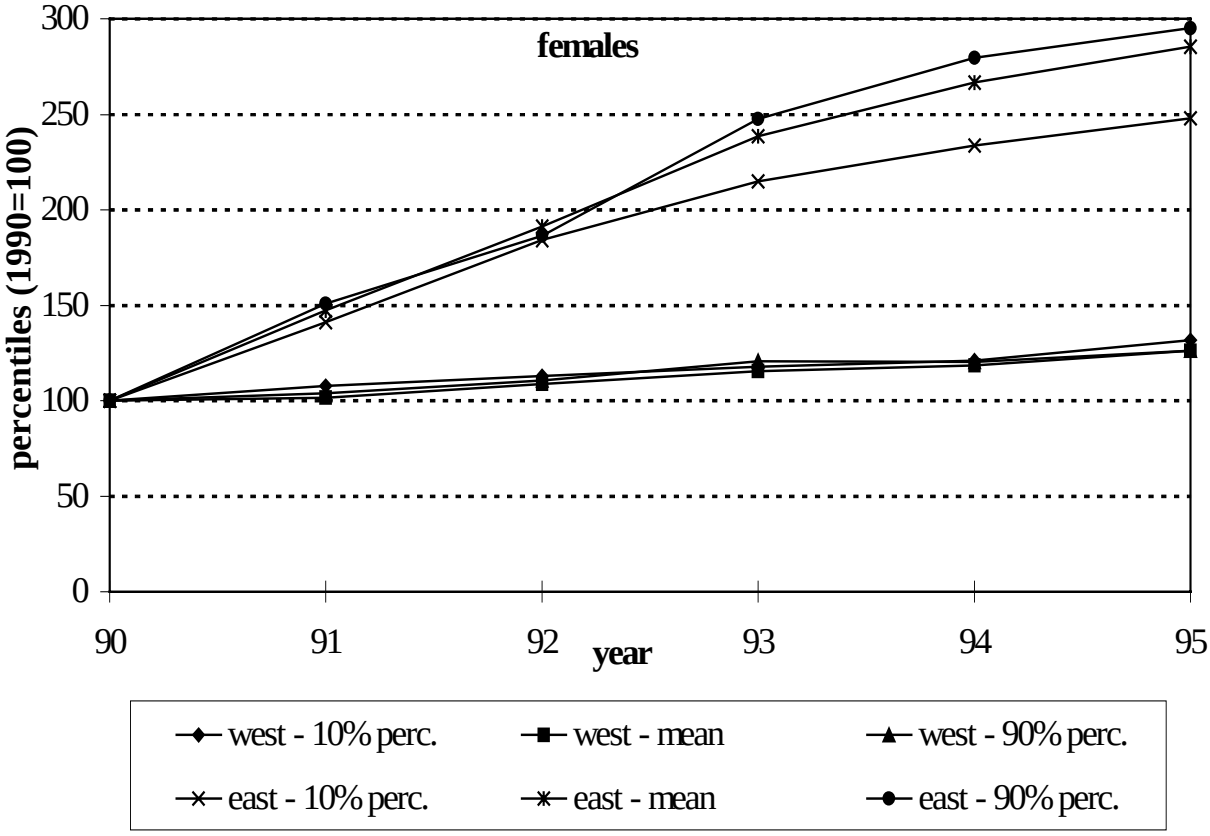
Figure 1—Development of mean hourly wages in east and west Germany, 1990 – 1995.



Source: GSOEP, own calculations

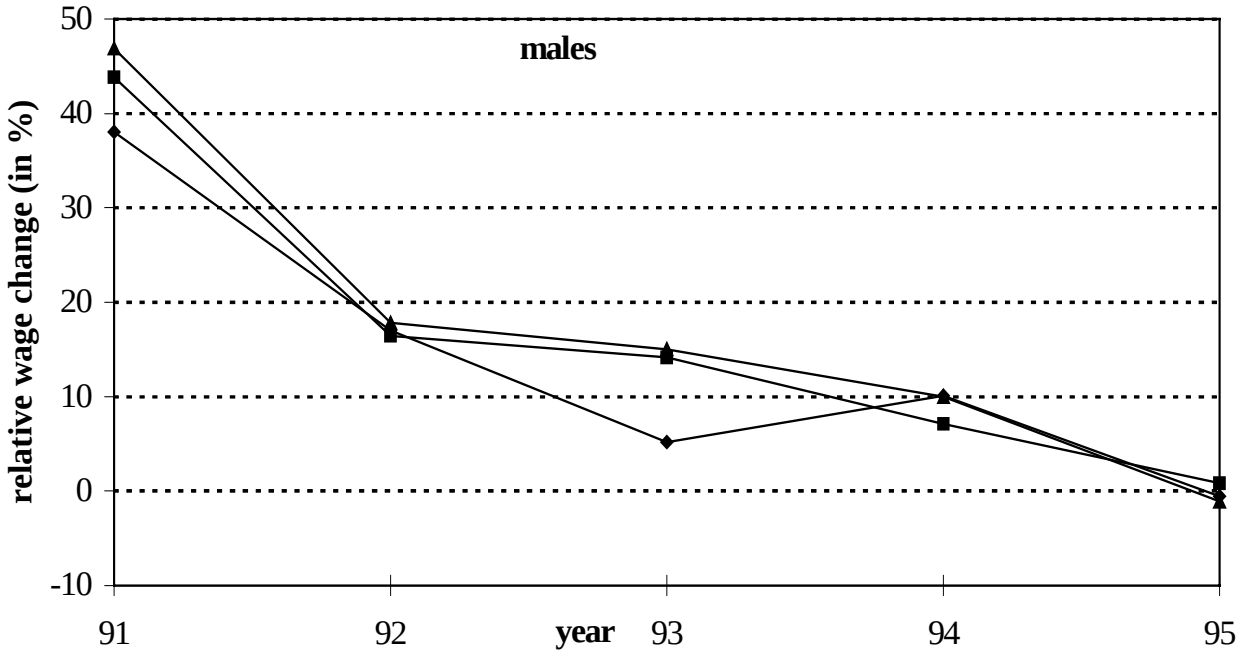
Figure 2—Mean, 10% and 90% percentiles of hourly earnings in East and West Germany, 1990 – 1995 (1990=100), males and females.

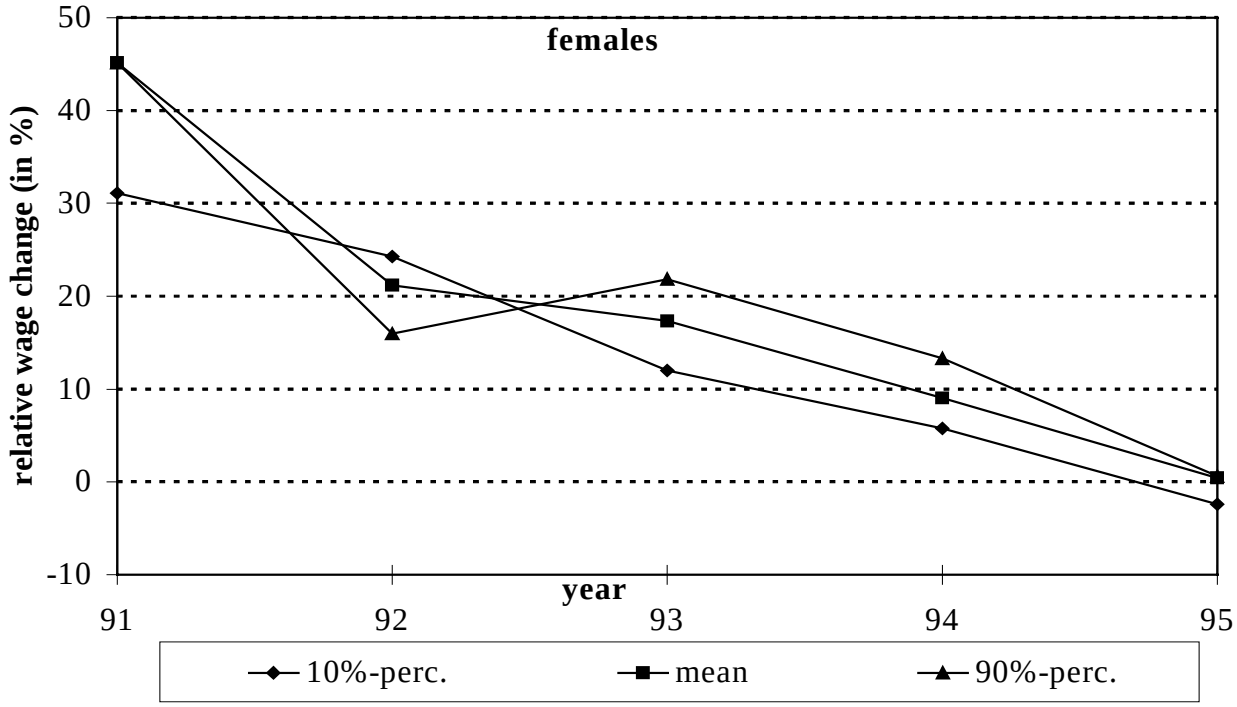




Source: GSOEP, own calculations

Figure 3—Annual wage convergence between east and west Germany, 1991 – 1995.





Source: GSOEP, own calculations

Having briefly described the development of the east–west German wage differential over time, we now turn to an analysis of the main economic factors which affect the wage distributions in the two regions.

3 Differences in the Wage Structure between East and West Germany

3.1 Empirical Wage Equations

In this section, we analyze the east and west German wage structure and its development over time. The analysis is based on the following empirical wage equations estimated on the GSOEP samples defined in the previous section:

$$
\begin{aligned}
y_{i,r,t} &= \alpha_{0r,t} + \beta'_{1r,t} SKILL_{i,r,t} + \beta_{2r,t} EXP_{i,r,t} + \beta_{3r,t} EXP^2_{i,r,t} \\
&\quad + \beta'_{4r,t} \left(SKILL_{i,r,t} \times EXP_{i,r,t} \right) + \Gamma'_{r,t} Z_{i,r,t} + u_{ir,t} \\
&\equiv \alpha_{0r,t} + B'_{r,t} X_{i,r,t} + \Gamma'_{r,t} Z_{i,r,t} + u_{i,r,t}
\end{aligned} \tag{1}
$$

where $y_{i,r,t}$ = (natural) log of gross hourly wages of individual *i* in region *r* (*r*=east, west) in year *t*

$SKILL$ = vector of educational/vocational dummies

EXP = labor market experience

EXP^2 = labor market experience squared

$X \equiv [SKILL, EXP, EXP^2, SKILL \times EXP]$

Z = vector of firm–size, industry and orthogonalized regional dummies

α_0 = regression constant

B $\equiv [\beta_1, \beta_2, \beta_3, \beta'_4]$ = corresponding (vectors of) parameters of human capital variables

Γ = corresponding vector of parameters of firm–size, industry and orthogonalized regional dummies

u = error term, with $u_{i,r,t} \sim N\left(0, \sigma^2_{r,t}\right)$, $E\left(u_{i,r,t}, X_{i,r,t}\right) = 0$, for all *i*, *r*, *t*.

$N(\bullet)$ is the normal distribution function with zero mean and variance $\sigma^2_{r,t}$, which may vary both between regions and over time. It is assumed that the error term is uncorrelated with the explanatory variables in the model (*E* is the expectation operator).

We proxy the skill structure of the labor force by dummy variables for vocational/educational qualification and years of labor market experience. Rather than using years of schooling, we account for an individual's formal qualification by a set of dummy variables, which provides a more flexible specification of the relationship between earnings and vocational/educational qualification. The data allow us to differentiate between four broad skill groups, namely (1) no vocational degree, no higher education; (2) vocational degree and/or university entry level degree; (3) master craftsman; (4) polytechnical or university degree. Although the schooling and vocational training systems differed somewhat between the former East Germany and the western German states, the skill groups used here seem quite comparable.[7]

Following usual practice, we define labor market experience as *age – years of schooling – 6*, where years of schooling are derived from information on the highest vocational/educational degree a worker has obtained. On the basis of the somewhat

[7] For a description of the educational and vocational training system in the former GDR in comparison to the West German system see, e.g, Krueger and Pischke (1995).

more detailed information in the GSOEP–east we distinguished between two paths which may lead to a polytechnical degree requiring either 13.5 or 16.5 years of schooling; this depends on whether one arrived there directly from secondary education or after having completed an apprenticeship degree before. For west Germany the equivalent degree would be "Fachhochschule", to which we assigned 15 years of schooling. The largest deviation of the number of actual years of schooling from the minimum required years occurs for university graduates in the west German states. For them, the assigned 18 years is likely to be an underestimate, whereas it was rather the norm in the former GDR.

In empirical applications of human capital theory, labor market experience is viewed as a proxy for human capital acquired through training and learning on the job. A basic hypothesis of this theory is that earnings increase with labor market experience with a decreasing rate because the older one gets the less profitable additional investments in human capital become (Mincer 1974). Empirically, this should show up in concave wage–experience profiles implying $\beta_{2,r,t} > 0$ and $\beta_{3,r,t} < 0$ in equation (1). Since it seems likely that the returns to labor market experience depend on the level of vocational/educational qualification, we include interaction terms between these variables and experience as additional explanatory variables in the earnings function.

In addition to human capital variables, we include dummies for firm size as well as industry of employment and region of residence as regressors in the wage equations. Although the reasons for the substantial industry and firm size effects are not well understood, their empirical importance has been established in several econometric studies for Germany (see, e.g., Schmidt and Zimmermann 1991, De New and Schmidt 1994, Gerlach and Hübler 1995, Möller and Bellmann 1995a, b). Due to the relatively small sample size in the GSOEP we had to aggregate industries into 11 categories as defined in Table A4 in the appendix. Since even after controlling for firm size and industry there could be regional effects on wages, regional dummies for the western and eastern states are also included in the wage equations.[8] In the estimation, we have normalized the regional dummies in such a way that their estimated coefficients measure the deviation of wages from the average in east and west Germany, respectively.[9] Hence, setting all respective regional dummies equal

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[8] The recent literature on the "wage curve" hypothesizes an empirical relationship between the wage level and the (regional) unemployment rate (for west Germany see, e.g., Wagner 1994, for east Germany Rendtel and Schwarze 1995).

[9] Technically, the regional dummies are orthogonalized in such a way that the weighted coefficients of the regions sum to zero, and the estimated coefficients measure the deviation of a single region from the average of the west (east) German states (for more details see, e.g., Haisken–DeNew and Schmidt 1997, Fitzenberger and Kurz 1997, pp. 21f.).

to zero gives us the regional averages of the east and west German wage structure which can be compared to each other in the composition analysis in section 4.

3.2 Estimation Results

We have estimated equation (1) by OLS separately for east and west Germany and also separately for males and females to account for expected gender differences in wage determination. Statistical tests show that the west German wage structure has remained fairly stable in the observation period[10], a result also reported by Burda and Schmidt (1997) for the period 1990 to 1993. Hence, the wage equations for west Germany were estimated on the pooled sample for the period 1990 to 1995, where overall wage changes over time are accounted for by yearly time dummies. *We therefore consider the resulting wage structure as a stable reference to which the east German wage structure is expected to converge*. For east Germany, the wage equations were estimated for each year separately to allow for changes in regression coefficients in an unrestricted way. Below, we report estimation results for the years 1990, 1992, and 1995, which provides a parsimonious way to summarize the development in the first and second phase of the transiton process, respectively. For these years, summary statistics of all variables in the wage equation are given in Tables A2 and A3 in the appendix.

As is well known from the literature, selectivity bias due to individual labor force participation decisions may severely affect estimated coefficients in empirical wage equations. Given the dramatic increase of non–employment and the deterioration of employment prospects in the transition process, selectivity effects seem likely to have affected the east German wage structure, especially for females.[11] To test for potential selectivity bias, we applied the two–step Heckman (1979) procedure. As it turned out, there is some indication for the presence of selectivity in the wage equations for west Germany in the years 1992 and 1994 for males and 1993 and 1994 for females (the inverse Mill's ratio turned out marginally significant), but none for east Germany.[12] However, estimated coefficients on the human capital and

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[10] The hypothesis of stability of the regression coefficients could not be rejected at the 5% significance level on the basis of standard F–tests, F(33, 9022) = 1.4 for males and F(27, 6173) = 1.06 for females.

[11] Female labor force participation in the former GDR was one of the highest in the world. Since child–care facilities are no longer provided by firms free of charge and those provided by communities or private institutions are either rationed or expensive, we would expect that only those women with relatively high market wages stay in the labor force.

[12] We used marital status, number of children, age, age squared, age older than 55 years, other household income and other household income squared as exclusion restrictions to identify the parameters of the wage equations. The results of the first–step estimations and the selectivity–corrected wage equations are available on request.

other explanatory variables in the selectivity–corrected wage equations for west Germany differed little from those without selectivity correction. Hence, we only report estimation results without selectivity correction below.

For west German males (females), our wage equation explains about 46% (34%) percent of the variance in log nominal hourly wages. Leaving human capital variables out from the estimated wage equation reduces the R^2 to 0.17 for males and 0.20 for females, while dropping industry, firm size and regional dummies instead reduces the R^2 only to 0.38 for males and 0.24 for females. For east Germany, the share of the variance in log male wages explained by the wage equation dropped from 33% in 1990 to 21% in 1995. This is not surprising given that general human capital accumulated over 40 years of socialism was devalued (see below) and the relative importance of unobserved factors has increased in the transition process. For east German females, the explained variance at the beginning of the transition process was somewhat higher (39%) and its decline to 34% in 1995 less pronounced than that for males. As discussed below, this can be explained by the substantial increase in the share of females employed in public services, especially education and social services, where formal vocational/educational qualification and labor market experience are still important determinants of wages.

In the wage equations for east Germany all interaction terms between vocational/educational qualification and labor market experience turned out as statistically insignificant and were thus excluded from the regressions.[13] Estimation results for the year 1990 show that substantial wage differentials with respect to formal vocational/educational qualification existed under socialism. Other things

[13] Of course, interaction terms are tested for joint significance with respect to experience and experience squared.

Table 1—Wage functions for west (pooled) and east Germany (1990, 1992 and 1995); males.

Variable[a)]	West (pooled)	East		
		1990	1992	1995
constant	2.737[b)]	1.660	2.248	2.505
	(0.020)	(0.042)	(0.052)	(0.073)
yearly time dummies (1995)				
1990	–21.741	—	—	—
	(0.983)			
1991	–18.890	—	—	—
	(0.974)			
1992	–12.358	—	—	—
	(0.974)			
1993	–7.351	—	—	—
	(0.966)			
1994	–3.727	—	—	—
	(0.956)			
skill group (skilled)				
unskilled	8.891	–13.807	–4.442	–3.829
	(3.469)	(3.719)	(5.220)	(5.884)
master craftsman	19.267	17.111	13.987	15.018
	(4.326)	(1.567)	(2.104)	(2.846)
graduate	22.800	32.253	32.417	37.539
	(3.662)	(2.403)	(3.845)	(4.424)
experience	3.393	1.171	0.797	0.576
	(0.154)	(0.225)	(0.382)	(0.505)
experience squared	–5.463	–2.395	–1.662	–0.977
	(0.314)	(0.462)	(0.800)	(1.105)
experience × unskilled	–1.517	—	—	—
	(0.374)			
experience sq. × unskilled	2.196	—	—	—
	(0.841)			
experience × master	–0.376	—	—	—
	(0.421)			
experience sq. × master	0.303	—	—	—
	(0.883)			
experience × graduate	1.915	—	—	—
	(0.390)			
experience sq. × graduate	–3.900	—	—	—
	(0.902)			
firm size (<20 employees)				
20 - 199	9.137	4.784	8.549	11.734
	(1.045)	(3.298)	(2.765)	(3.214)
200 - 1999	14.945	6.216	10.250	21.064
	(1.064)	(3.173)	(3.032)	(3.250)
≥ 2000 employees	19.657	8.638	12.675	22.310
	(1.050)	(3.278)	(3.316)	(3.953)

(continued)

Table 1—continued

Variable	West	East		
	(pooled)	1990	1992	1995
industry (mechanic. engin.)				
agriculture	–17.634	–26.072	–22.462	–11.398
	(4.953)	(2.376)	(3.760)	(7.394)
energy, mining	1.377	9.235	13.982	13.842
	(1.543)	(2.629)	(4.035)	(5.549)
chemicals	–2.252	0.002	3.871	–4.297
	(1.124)	(2.486)	(4.024)	(6.378)
stone, clay	–6.760	2.396	15.224	6.303
	(1.130)	(2.396)	(3.749)	(4.785)
metal manufacturing	–4.644	4.813	–6.384	–1.365
	(1.038)	(2.380)	(3.409)	(5.076)
textiles	–14.460	–6.570	0.047	–6.704
	(1.455)	(3.386)	(8.804)	(6.338)
trade	–14.388	–11.241	–9.006	0.984
	(1.334)	(3.268)	(4.876)	(7.599)
transport	–20.931	0.411	–7.637	–2.169
	(1.419)	(2.595)	(3.214)	(5.487)
public services	–12.794	–0.019	–8.477	1.504
	(0.871)	(2.429)	(2.822)	(4.758)
private services	–3.645	–13.952	–7.699	–1.564
	(1.324)	(6.074)	(5.839)	(8.075)
F-tests [c]				
experience, experience sq.	425.54 **	13.67 **	2.19	1.12
5 time dummies	156.88 **	—	—	—
3 firm size dummies	139.97 **	2.92 *	5.40 **	16.42 **
10 industry dummies	48.86 **	21.45 **	12.68 **	2.82 **
9 regional dummies	6.92 **	—	—	—
5 regional dummies	—	0.75	5.04 **	3.30 **
interaction terms				
exp. × unskilled	25.71 **	—	—	—
exp. × master craftsman	4.60 *	—	—	—
exp. × graduate	14.91 **	—	—	—
R^2 adj.	0.456	0.333	0.235	0.214
# observations (N)	9061	1441	977	762

Notes:

a) For dummy variables, the base categories are given in parantheses.

b) Except for the constant term, all parameters are multiplied by the factor 100 (respectively by the factor 10,000 for experience squared and the respective interaction terms). Standard errors are given in parantheses below the coefficients.

c) A star "*" indicates significance at the 5%, two stars at the 1% level. Interactions refer to the respective skills category with experience and experience squared.

Table 2—Wage functions for west (pooled) and east Germany (1990, 1992 and 1995); females.

Variable[a)]	West	East		
	(pooled)	1990	1992	1995
constant	2.577[b)]	1.400	1.948	2.265
	(0.028)	(0.038)	(0.053)	(0.073)
yearly time dummies (1995)				
1990	-22.216	—	—	—
	(1.469)			
1991	-20.141	—	—	—
	(1.431)			
1992	-13.407	—	—	—
	(1.424)			
1993	-8.045	—	—	—
	(1.389)			
1994	-3.615	—	—	—
	(1.373)			
skill group (skilled)				
unskilled	0.343	–18.798	–19.458	–17.280
	(3.593)	(3.038)	(5.415)	(4.533)
master "craftsman"	11.237	29.231	18.194	15.156
	(4.185)	(1.651)	(1.960)	(2.728)
graduate	0.451	44.140	42.425	35.291
	(6.176)	(2.795)	(3.916)	(4.658)
experience	2.211	1.264	1.390	1.246
	(0.210)	(0.241)	(0.427)	(0.551)
experience squared	–3.719	–2.473	–2.730	–2.302
	(0.478)	(0.547)	(0.997)	(1.215)
experience × unskilled	–0.710	—	—	—
	(0.400)			
experience sq. × unskilled	0.399	—	—	—
	(0.893)			
experience × master	0.324	—	—	—
	(0.679)			
experience sq. × master	1.171	—	—	—
	(2.006)			
experience × graduate	4.776	—	—	—
	(0.700)			
experience sq. × graduate	–11.003	—	—	—
	(1.752)			
firm size (<20 employees)				
20 - 199	13.624	9.467	10.349	17.547
	(1.263)	(2.582)	(2.790)	(3.487)
200 - 1999	20.735	10.173	16.781	22.096
	(1.215)	(2.559)	(2.847)	(3.287)
≥ 2000 employees	26.853	13.047	18.800	28.294
	(1.281)	(2.843)	(3.120)	(3.715)

(continued)

Table 2—continued

Variable	West	East		
	(pooled)	1990	1992	1995
industry (mechanic. engin.)				
agriculture	–9.557 (5.092)	–14.986 (3.359)	-5.998 (6.064)	13.649 (9.780)
energy, mining	7.026 (2.977)	6.834 (3.990)	19.107 (5.417)	31.455 (7.734)
chemicals	2.247 (2.430)	1.887 (3.600)	10.594 (5.609)	3.847 (7.015)
stone, clay	–1.530 (3.938)	5.652 (3.111)	16.109 (7.379)	17.560 (6.863)
metal manufacturing	2.300 (2.550)	–0.898 (3.656)	–0.823 (5.884)	–8.043 (10.592)
textiles	–14.616 (2.270)	–3.339 (3.078)	–8.680 (5.725)	–8.188 (7.963)
trade	–11.385 (1.924)	–0.640 (2.6589	1.050 (4.352)	–6.823 (5.781)
transport	–1.098 (2.750)	1.888 (3.386)	8.020 (4.339)	6.374 (7.449)
public services	5.240 (1.746)	3.122 (2.420)	12.183 (3.491)	20.007 (4.959)
private services	3.139 (2.009)	5.153 (3.854)	4.285 (5.049)	2.626 (6.511)
F-tests [c]				
experience, experience sq.	118.91 **	15.85 **	7.21 **	3.62 *
5 time dummies	77.49 **	—	—	—
10 industry dummies	29.41 **	5.35 **	5.49 **	9.30 **
9 regional dummies	2.81 **	—	—	—
5 regional dummies	—	1.74	1.81	2.06
3 firm size dummies	160.50 **	7.23 **	14.97 **	22.04 **
interaction terms				
exp. × unskilled	20.15 **	—	—	—
exp. × master "craftsman"	0.25			
exp. × graduate	23.90 **	—	—	—
R^2 adj.	0.342	0.386	0.345	0.336
# observations (N)	6210	1293	890	725

Notes:

a) For dummy variables, the base categories are given in parantheses.

b) Except for the constant term, all parameters are multiplied by the factor 100 (respectively by the factor 10,000 for experience squared and the respective interaction terms). Standard errors are given in parantheses below the coefficients.

c) A star "*" indicates significance at the 5%, two stars at the 1% level. Interactions refer to the respective skills category with experience and experience squared.

Figure 4—Wage–experience profiles by vocational/educational qualification for west German males and females.

Source: Own calculations based on wage equations estimated on the pooled sample 1990–1995 (see Tables 1 and 2).

equal, unskilled males earned about 13% [=(exp(–0.138) – 1)×100] less per hour than workers with a completed apprenticeship training ("Facharbeiter"). After unification, this negative wage differential vanished. In contrast, the even larger differential for unskilled females of about –17% [=exp(–0.188) – 1)×100] has apparently not been affected in the transition process. On the other hand, the wage differentials for workers with higher vocational/ educational qualification relative to workers with apprenticeship training apparently already existing under socialism have remained fairly stable both for males and females in the transition process. The only exception refers to female master "craftsman" for whom the very substantial wage differential has been reduced relative to the unskilled comparison group. Estimated wage differentials for employees with a university education reveal that even under socialism some people were more equal than others: in the former GDR the hourly wage of a male (female) worker with a graduate degree exceeded a skilled worker's pay by about 40% (55%). Since unification the higher female graduate wage differential has converged to that estimated for east German males, which was still at about 40% in the year 1995.

Turning to the effects of general human capital on east German wages, statistical tests show that (i) interaction terms between labor market experience and vocational/educational qualification are insignificant both for males and females, and (ii) returns to labor market experience have become insignificant for males after 1990, but not for females (see the F–tests in the lower part of Tables 1 and 2).[14] For shorter observation periods and different specifications, this important result has also been established in previous research by Steiner and Puhani (1997) as well as Burda and Schmidt (1997). Furthermore, a comparision of the estimated female wage–experience profiles for the years 1990, 1992 and 1995 shows that they have not significantly changed in the observation period.

How do these skill differentials compare to those estimated for the western German states? Due to the significant interaction terms with labor market experience[15], estimated coefficients of the skill dummies do not directly translate into skill differentials for west German employees. We have therefore plotted wage–experience profiles for the various vocational/educational groups in Figure 4 for males and females, respectively. The plots show that, both for males and females, wage–experience profiles for graduates are much steeper than for skilled workers

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[14] The F–tests of joint significance of coefficients on the experience and experience squared terms refer to regressions without interaction terms between these variables and vocational/occupational qualification.

[15] For west German females, the insignificance of the interaction terms of experience and experience squared with female master "craftsman" is probably related to their very small number in the sample.

(those with completed apprenticeship training or master "craftsmen"), whose profiles in turn are somewhat steeper than those of unskilled workers. Hence, while wage differentials are relatively compressed for workers with little labor market experience, they widen substantially for more experienced workers. While at five years of labor market experience, say, there is almost no difference between skilled and unskilled workers, at 20 years of experience the wage differential for these groups is about 15% for males and 20% for females. The much steeper wage profile of university graduates results in a substantial wage differential of 80% and 90% at 20 years of labor market experience relative to unskilled male and female workers, respectively. On the other hand, within the group of university graduates the wage differential between those with, say, 20 years of labor market experience and job entrants is of similar magnitude as between experienced graduates and unskilled workers. This clearly shows the great quantitative importance of returns to labor market experience for individual wages in west Germany.

As to the other factors affecting wages, for the western German states we find firm size and industry wage differentials similar in magnitude to those reported in previous studies referred to above. Even within the same industry and region, workers with identical (observable) human capital endowment employed in large firms earn considerably more than in medium–sized firms, which in turn pay higher wages than small firms. In a large firm with more than 2,000 employees a male worker earns about 20% more than a "comparable" worker in a small firm with less than 20 employees, for females this wage differential is even 30%. In medium–sized firms, these wage differentials are smaller, but still substantial. Whatever the reasons for these substantial firm–size differentials might be, they are highly persistent and thus seem to be an equilibrium rather than disequilibrium phenomenon of the west German labor market.

Estimation results for east Germany show that firm–size wage differentials already existed under socialism, although they were markedly smaller than those in the western German states. Between 1990 and 1995 the east German firm–size differentials increased substantially and have reached the levels prevailing in the western German states at the end of the observation period. In 1995, east German males (females) working in large firms earned about 20% (30%) more than comparable workers in the smallest firms, which is almost the same relation as in the western German states. This complete adjustment of firm–size wage differentials to west German levels strikes us as rather surprising given the fact that, on average, neither human capital endowments in large firms nor their competitive conditions in goods markets seem to be any better than for small firms.

As in previous research referred to above, we find large and persistent industry wage differentials for the western German states, especially for males. In contrast, significant industry wage differentials did not exist in the former GDR (except for

the agricultural sector), and industry wage differentials as they are typical for west Germany or other market economies have not developed during the transition process so far, but seem to have changed in an unsystematic way over time, and these changes also differ by gender. At least for males, wages seem to be relatively flexible in competitive industries, especially in the construction sector, trade and private services.[16] In the course of strongly expanding demand in the construction sector, the male wage differential reached about +15% in the year 1992, and subsequently was reduced to its pre–unification level after the demand boom fueled by excessive private and public demand for construction work had petered out. For females, the wage differential in the construction sector also increased substantially between 1990 and 1992, but was not reduced in the subsequent period. This gender difference can be explained by the different nature of work performed by males and females in the construction sector, where shrinking demand for goods affects wages of predominantly female white–collar workers less than those of mostly male blue–collar workers. On the other hand, the continuously expanding demand for goods in trade and private services seems to have eroded the substantial negative male wage differential existing before unification, but has apparently had no significant impact on the female wage differential in this sector.

In east Germany, the most astonishing change in industry wage differentials occurred for females working in public services, mostly education and welfare services. Whereas males working in this sector earned the same as in the reference industry (mechanical engineering), the wage differential of females employed in public services reached a stunning 20% in 1995. This extraordinary rise in the relative sectoral wage occurred at the same time when the share of females employed in this sector increased from about 30% in 1990 to almost 50% in 1995 (see Table A3 in the appendix), a really remarkable achievement in the transition from socialism to a market economy. In contrast, in the western German states the wage differential in public services is negative for males and slightly positive but insignificant for females. It has remained fairly stable in the 1990s, and the shares of, respectively, males and females employed in this sector has changed little.

4 Decomposition Analysis

The described changes of east German wage differentials by formal skills and labor market experience as well as firm size and industry on the one hand, and changes in the structure of the east and west German labor force on the other are closely related

[16] It should be noted, though, that the aggregation of sectors, which is necessary because of too few observations in some sectors, can lead to somewhat vague results. For example, this applies to the category *private services* which includes, amongst others, financial services and window cleaning.

to the process of overall east–west German convergence. In this section, we use the estimated wage equations from the previous section to decompose observed east–west German wage differentials into these two components. We start with the decomposition at sample means and then extend the analysis to different parts of the wage distribution as well.

4.1 Decomposition of the Wage Differential at Sample Means

The observed wage differential (Δ) between west and east Germany at *sample means* in year *t*, defined as the difference of the respective mean log hourly wage ($\bar{y}$) for this year, can be decomposed in the following way:

$$(2)\quad \Delta_t \equiv \bar{y}_{w,t} - \bar{y}_{e,t} = \left(\hat{\alpha}_{0w,t} + \hat{B}'_w \overline{X}_{w,t} + \hat{\Gamma}'_w \overline{Z}_{w,t}\right) - \left(\hat{\alpha}_{0e,t} + \hat{B}'_{e,t} \overline{X}_{e,t} + \hat{\Gamma}'_{e,t} \overline{Z}_{e,t}\right)$$

$$\equiv \left(\hat{\alpha}_{0w,t} - \hat{\alpha}_{0e,t}\right) + \left(\hat{B}'_w - \hat{B}'_{e,t}\right)\overline{X}_{e,t} + \left(\hat{\Gamma}'_w - \hat{\Gamma}'_{e,t}\right)\overline{Z}_{e,t}$$

$$+ \hat{B}'_w\left(\overline{X}_{w,t} - \overline{X}_{e,t}\right) + \hat{\Gamma}'_w\left(\overline{Z}_{w,t} - \overline{Z}_{e,t}\right),$$

where the parameters and variables are defined as in equation (1) and a carat ("^") above a parameter stands for an OLS estimate. Note that the coefficients for west Germany refer to the pooled sample of all observations in the period 1990 to 1995. Hence, for each of these years the constant term $\hat{\alpha}_{0w,t}$ in equation (2) also includes the estimated coefficient on the corresponding yearly time dummy.

The above decomposition of the wage differential relies on the statistical property that the OLS regression line passes through the sample means, that is the OLS residual is zero at this point. In equation (2) the log wage differential is decomposed into two effects. The second line of this equation evaluates the difference in estimated coefficients from the west and east German wage regressions at the mean values of the human capital and other structural variables in east Germany. It is therefore called the *coefficient* effect, where this effect is split up into differences between the regression constants, returns to human capital and differences in industry and firm–size rents. In the third line of equation (2), the regional differences in the mean values of the human capital and other structural variables are multiplied by the corresponding coefficient vectors estimated for the west German states. It is therefore called the *characteristics* effect; with repect to the human capital variables it is also referred to as the "endowment" effect below.

Equation (2) is just one of several possible decompositions of the mean log wage differential introduced by Oaxaca (1973) and Blinder (1973) in the context of the wage discrimination literature. By definition of the wage differential, differences in coefficients between east and west Germany could also be evaluated at mean values

of characteristics in the western German states (or some overall German average). Fortunately, in the decompositon analysis performed here it does not really matter empirically at which mean characteristics vector differences in coefficients are evaluated because, on average, there is very little difference in observed characteristics between the eastern and western German states. On the other hand, since the east German wage structure is expected to converge to the apparently stable west German one, there is also a convincing economic argument for evaluating differences in characteristics at the apparently stable west German wage structure (coefficients).

The results of the decomposition of observed mean wage differentials are contained in Table 3. For the year 1990 the mean wage differential between the western and eastern German states was about 230% [=(exp(1.202)–1)×100] for males and 190% [=(exp(1.054)–1)×100] for females. These huge wage differentials were almost completely accounted for by the coefficient effect, whereas regional differences in human capital endowments and other structural variables had almost no effect. In fact, for females the characteristics effect was even negative, implying that women in the former GDR would on average have earned even more than west German women if the returns to human capital as well as firm–size and industry wage differentials had been the same in the two regions. To a large extent, this negative characteristics effect can be explained by the higher level of formal vocational/educational qualification of east German females and their considerably higher labor market experience relative to west German females.

However, splitting up the coefficient effect reveals that returns to human capital were of some importance for males only, whereas differences in industry and firm size wage differentials had almost no effect on the wage differential both for males and female. Overall, the coefficient effect is dominated by the constant term, which includes both differences in unobserved characteristics between east and west German employees as well as differences in the regional price levels.

Although the male (female) east–west wage differential declined dramatically after unification to about 100% (67%) by 1992 and to 65% (30%) by 1995, the relative importance of the characteristics and the coefficient effect changed little in the observation period. Since the characteristics effect is of little quantitative importance, wage convergence between the eastern and western German states is mainly related to changes in the coefficient effect, the components of which have changed considerably over time. For males, most of the coefficient effect is now related to regional differences in the returns to human capital, while differences related to firm–size and industry wage differentials contribute relatively little to the mean wage differential. In fact, since 1992 they even have a negative effect on the overall east–west wage differential. On the other hand, the relatively small female

wage differential in the year 1995 is still mainly related to differences in the constant terms in the wage equations estimated for east and west Germany, respectively. Relative to males, regional differences in the returns to human capital only play a modest role for females; in 1995 they make up for about one third of the coefficient effect, compared to 90% for males.

Table 3—Decomposition of the mean log east-west German hourly wage differential (Δ), 1990, 1992 and 1995.

	males		females	
Δ_{1990}	1.202		1.054	
characteristics effect	0.028		–0.049	
human capital variables		0.023		–0.037
structural variables		0.005		–0.013
coefficient effect	1.174		1.103	
constant term		0.859		0.955
human capital variables		0.289		0.081
structural variables		0.025		0.067
Δ_{1992}	0.713		0.513	
characteristics effect	0.046		–0.053	
human capital variables		0.016		–0.051
structural variables		0.030		–0.002
coefficient effect	0.666		0.566	
constant term		0.292		0.495
human capital variables		0.412		0.099
structural variables		–0.038		–0.029
Δ_{1995}	0.504		0.277	
characteristics effect	0.050		–0.047	
human capital variables		0.010		–0.051
structural variables		0.040		0.003
coefficient effect	0.454		0.326	
constant term		0.168		0.313
human capital variables		0.412		0.124
structural variables		–0.125		–0.112

Note:
Due to rounding errors the sum of the components of the characteristics or coefficient effect is not always equal to the whole effect.

The strong decline (in value) of the constant term over time mainly reflects the effect of regional differences in the rate of inflation. The strongest increase of east German prices in the observation period occurred just after currency union when prices increased at a yearly rate of almost 25%. By 1995, the yearly inflation rate in the eastern German states had slowed down to about 3.5%, which was only slightly above the west German rate of 2.7%. Since these price changes are picked up in the constant terms, the price adjustment between the two regions has contributed substantially to the change in the constant term and, hence, the coefficient effect over time. In the period from June 1990 to 1992 about 0.32 log points of the drop in the constant term were due to the much higher inflation rate in the east German states, while in the period 1992 to 1995 this price effect amounted to only 0.078 log points.[17]

4.2 Differences across the Wage Distribution

Given the marked differences in wage convergence in the lower and upper part of the wage distribution described in section 2, it seems of interest to extend our decomposition analysis accordingly. This requires an adjustment of the standard decomposition analysis in order to take into account the residual from the wage equation, the expected value of which is zero at sample means only. Following related work by Juhn, Murphy and Pierce (1993) and Blau and Kahn (1996), this adjustment can be accomplished by writing the estimated wage equations as:

$$(3) \quad \hat{y}_{i,r,t} = \hat{\alpha}_{0r,t} + \hat{B}'_{r,t} X_{i,r,t} + \hat{\Gamma}'_{r,t} Z_{i,r,t} + \hat{\sigma}_{r,t} \hat{\varepsilon}_{i,r,t},$$

where the regression residual $\hat{u}_{i,r,t}$ is written as the product of $\hat{\sigma}_{r,t}$ and $\hat{\theta}_{i,r,t}$ with $\hat{\sigma}_{r,t}$ the standard deviation of the residuals in region *r* in year *t*, and $\hat{\theta}_{i,r,t}$ the *i*–th standardized residual with mean zero and variance one.

To decompose the east–west wage differential in year *t*, we define the following auxiliary function

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[17] These numbers are based on the following price indices for the eastern and western German states in the observation period, which were obtained by slicing together information on price indices for consumption goods for average households published by the Federal Statistical Office for east Germany since 1992 (see Statistical Yearbook, various issues) and information on earlier price increases contained in Sinn and Sinn (1992, p. 58):

	June 1990	1991	1992	1993	1994	1995
west	100	103.7	107.9	111.7	114.7	116.7
east	100	130.9	148.6	164.1	170.2	173.7

(4) $$Y_{1,i,t} = \hat{a}_{0w,t} + \hat{B}'_w X_{i,e,t} + \hat{\Gamma}'_w Z_{i,e,t} + \hat{\sigma}_{w,t}\hat{\varepsilon}_{i,e,t}.$$

In this equation, the vector of estimated parameters from the west German wage equation is evaluated at the east German vector of explanatory variables in year *t*, and the standardized residuals from the east German wage regression in that year are transformed in such a way that they obtain their corresponding position in the distribution of residuals as derived from the west German wage equation.

Next, we define another auxilary function, $Y_{2,i,t}$, given by

(5) $$Y_{2,i,t} = \hat{a}_{0e,t} + \hat{B}'_{e,t} X_{i,e,t} + \hat{\Gamma}'_{e,t} Z_{i,e,t} + \hat{\sigma}_{w,t}\hat{\varepsilon}_{i,e,t},$$

where the vector of estimated parameters from the east German wage equation in a particular year is evaluated at the east German vector of characteristics in that year, and the transformed residual is defined as in equation (4).

Then, the difference in the distribution of $\hat{y}_{i,w,t}$ and $Y_{1,i,t}$ measures the east–west wage differential resulting from regional differences in observed individual characteristics. It is thus similar to the *characteristics effect* in the Oaxaca–Blinder decomposition derived above, while the difference between the distribution of $Y_{1,i,t}$ and $Y_{2,i,t}$ measures the *coefficient* effect. The remaining wage equation *residual effect* is given by the difference in the distribution of $\hat{y}_{i,w,t}$ and $Y_{2,i,t}$, which includes the effects of unobserved characteristics and their "prices" on wages as well as measurement errors. In Table 4, we summarize results of this decomposition analysis for, respectively, the 10%– and 90%–percentile of the wage distribution.

Table 4—Decomposition of the east–west German wage differential (Δ) at the 10%– and 90%–percentile of the wage distribution for the years 1990, 1992 and 1995.

	males				females			
	Δ	A	B	C	Δ	A	B	C
				1990				
10%–perc.	+1.151	+0.041	+1.130	–0.020	+0.959	–0.057	+1.095	–0.079
90%–perc.	+1.299	+0.055	+1.231	+0.013	+1.117	–0.061	+1.107	+0.071
				1992				
10%–perc.	+0.679	+0.111	+0.564	+0.004	+0.470	–0.075	+0.567	–0.022
90%–perc.	+0.765	+0.037	+0.746	–0.018	+0.604	–0.011	+0.571	+0.044
				1995				
10%–perc.	+0.527	+0.051	+0.416	+0.060	+0.305	–0.053	+0.353	+0.005

	males				females			
90%–perc.	+0.534	+0.091	+0.488	–0.045	+0.280	–0.035	+0.318	–0.003

Note: Δ = log wage differential at the respective percentile as defined in the text;
A=characteristics effect, B=coefficient effect, C=wage residual effect, as explained in the text.

Before unification, the east–west wage differential in the upper part of the distribution was somewhat higher than in the lower part for both males and females. By 1995, this difference has almost disappeared for males, while for females the wage differential in the lower part of the distribution has even exceeded that in the upper part. The decomposition of these wage differentials shows that the coefficient effect by far outweighs the characteristics effect in both parts of the distribution, and the relative importance of these effects has changed little in the observation period. The coefficient effect is relatively more important in the upper part of the distribution for males, while for females there seems to be no difference across the distribution in this respect. As to the importance of unobserved factors, the wage equation residual effect is always close to zero. Hence, regional differences in unobserved characteristics seem to have no quantitatively important effect on the east–west wage differential.

Overall, the decomposition of the wage differential at different parts of the distribution yields similar results as for average wages. Furthermore, splitting up the characteristics and coefficient effects into the respective contributions of the constant term, human capital and other structural variables at the lower and upper part of the distribution, respectively, shows that the relative importance of these factors is also very similar to those reported above for the decomposition of average wages. The results of these more detailed decompositions are therefore not reported here (but available on request).

5 Summary and Conclusions

We have analyzed the east–west German wage convergence process in the period 1990 to 1995 on the basis of the German Socio–Economic Panel. Just prior to unification the mean east–west hourly wage differential was about 230% for males and 190% for females, by the year 1995 it was reduced to about 65% and 30%, respectively. The rate of wage convergence was very high at the beginning of the transition period but has markedly slowed down since then, where east German females have fared better than males. By the year 1995, the wage covergence process seems to have come to a standstill both for males and females, despite the still existing substantial east–west wage differentials. Our analysis has also shown that wages in the upper part have increased substantially faster than in the lower part of the east German wage distribution.

Estimation results from our empirical wage equations show that the west German wage structure has remained fairly stable in the 1990s, whereas in east Germany it has changed substantially since unification. We consider the west German wage structure as a stable reference to which the east German one is expected to convergence. For west German male and female workers, standard human capital variables account for by far the largest share of the explained variance in hourly wages. Substantial wage differentials with respect to formal vocational/educational qualification also existed under socialism. After unification, the wage differential between unskilled and skilled male workers vanished, while the even larger differential for unskilled females has apparently not been affected in the transition process, while the wage differentials for workers with higher vocational/educational qualification relative to workers with apprenticeship training already existing under socialism have remained fairly stable both for males and females.

As to general human capital acquired on the job, our estimation results show that for east German males labor market experience was devalued completely right after unification, and its value has not appreciated since then. Thus, the result obtained by Burda and Schmidt (1997) for the period 1990 to 1993 is also confirmed for the different specification of the wage equation and the longer observation period of this paper. In contrast, wage–experience profiles of east German females have not significantly changed in the observation period. In west Germany, wages of skilled workers and graduates increase substantially with labor market experience both for males and females, and these wage–experience profiles have changed little in the observation period.

Our decomposition analysis based on the estimated wage equations shows that the mean east–west German wage differential is almost completely accounted for by differences in estimated coefficients (the coefficient effect), whereas regional differences in human capital endowments and the employment structure (the characteristics effect) are quantitatively of little importance. Hence, wage convergence between the eastern and western German states is mainly related to changes in the coefficient effect, the components of which have changed considerably over time. Before unification, the coefficient effect was dominated by differences in unobserved characteristics between east and west German employees as well as differences in the regional price levels. Returns to human capital were of some importance for males only, whereas differences in industry and firm–size wage differentials had almost no effect on the wage differential both for males and female. Six years after unification, most of the coefficient effect for males is related to regional differences in the returns to human capital, while differences related to firm–size and industry rents contribute relatively little to the mean wage differential. For females, regional differences in the returns to human capital still play only a minor role.

To account for differences in the rate of convergence and its determinants across the wage distribution, we have also decomposed the wage differential at different parts of the distribution. Overall, this decomposition analysis yielded similar results as for average hourly wages. The coefficient effect by far outweighs the characteristics effect in both the lower and upper part of the wage distribution, and the relative importance of these effects has changed little in the observation period. As to the importance of unobserved factors, the wage equation residual effect is always close to zero. Hence, regional differences in unobserved characteristics between east and west Germany seem to have no quantitatively import effect on the east west wage differential and its convergence over time.

Given the great importance of general human capital for the determination of effective wages and the fact that for east German men labor market experience acquired under socialism has been completely devalued upon unification we conclude that the still relatively high male wage differential will persist for the forseeable future. Furthermore, there is little labor market policies can do to speed up the convergence process. In terms of wage convergence, east German women have fared better than males. This gender difference can be explained by the stong increase of the female employment share in public services where wages, as in the western German states, are closely linked to the level of formal qualification and labor market experience. However, it seems unlikely that the relatively large share of females employed in this sector, often on so–called subsidized public–works programs, is sustainable. Hence, the female east–west wage differential is expected to persist or even to increase rather than to vanish in the forseeable future.

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