The German Wage Structure, 1992–2001: Lessons from Censored Quantile Regressions

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Abstract: Using data from the IAB employment sample 1975–2001, this paper studies the wage structure in the German labor market throughout the years 1992–2001. The focus is on differences between East and West Germany and changes of inequality over time. Looking at separate wage distributions for different labor market groups, I find that wage inequality has generally been rising, and the increase was more pronounced in East Germany. Convergence of wage levels in East and West Germany was not achieved. The estimation of censored quantile regressions reveals diverse differences in the remuneration of age and skill across groups. Applying Machado/Mata (2005)-type decompositions I conclude that differences in the composition of the work force only had a small impact on the observed wage differentials between East and West Germany, but changes in the characteristics captured better parts of the observed wage changes over time.

Key Words: Wage function, wage gap, censored quantile regression, Machado/Mata decomposition, IABS, East Germany, West Germany.

JEL-Classification: J31, C24.

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1 Introduction

The structure of wages has been found a key aspect for the evolution of employment and economic performance in general; see the handbook article of Katz and Autor (1999) and the more recent survey of Autor, Katz, and Kearney (2005). With the growing availability of large micro data sets not only the wage level, but also the degree of wage dispersion or compression has received increasing attention. The evolution of the West German wage structure between the mid-1970s and the mid-1990s has been extensively studied; see, e. g., Fitzenberger (1999) and Prasad (2000). By and large, the wage structure has been found to be relatively compressed in international comparison and rather stable over time. Studies of the East German wage structure report an even higher degree of wage compression in the late years of the GDR and during the early years after the German reunification; see, e. g., Krueger and Pischke (1995) and Franz and Steiner (2000).

More up-to-date administrative data for both East and West Germany have only recently been made available with the regional file of the IAB employment sample (IABS) 1975–2001. Möller (2005) uses the years 1992–2001 of the IABS for a descriptive study of wage dispersion in East and West Germany. He finds that wage inequality has generally been rising between 1992 and 2001 and that the rise in equality has been more pronounced for low-skilled compared to skilled workers and for women compared to men. Starting out at a lower level in 1992, wage inequality in East Germany has largely caught up with the level of inequality in West Germany by 2001.

In this paper I also employ the years 1992–2001 of the IABS in order to study the structure of wages for different labor market groups in the first decade after the German reunification. I consider separate distributions in East and West Germany in each of the years 1992–2001 for full-time working men and women working full-time or part-time, respectively. Looking at mean wages and raw quantiles of the log wage distributions generally supports the existing descriptive evidence on the trends towards increasing wage inequality and on persistent East-West wage differentials. What is more, the analysis in this paper extends the existing literature in two directions.

First, I estimate extended Mincer (1974)-type wage equations in order to shed light on the determinants of observed wages. The large sample size allows the application of quantile regression techniques, which are more flexible than the least squares estimations employed by existing studies. Due to censoring of the wage data at the social security taxation threshold, I use censored quantile regressions (CQR). The bottom line of the regression results meet a-priori expectations. For example, age-earnings profiles not only are the steeper the higher the skill level, but they are also relatively flat in East Germany in 1992. As discussed by Franz and Steiner (2000), among others, the reunification shock led to a depreciation of human capital in the East. However, this effect wears out with the aging of post-unification labor market cohorts, and differences in the profiles have lessened by the year 2001. The quantile regression approach further captures differences across the respective wage distributions. It thus draws a much more informative picture than standard least squares wage regressions.

Second, I employ the decomposition technique introduced by Machado and Mata (MM, 2005), which builds on the estimation of quantile regressions, in order to shed light on (1) differences of the wage distributions between East and West Germany and (2) changes of the wage structure across time. The framework decomposes observed differences or changes in the wage structure into a characteristics effect, which captures differences in the characteristics of the work force, and a coefficients effect, which captures different returns associated with the characteristics. In line with the results of Steiner and Wagner (1997), who employ the decomposition technique introduced by Juhn, Murphy, and Pierce (1993) for an East-West comparison in the early 1990s, I find that the coefficients effect is in most cases negligible for explaining East-West wage differentials.

However, with respect to the evolution of wages over time, characteristics effects capture major parts of the respective wage increases in the upper halves of the wage distributions for West Germany. This finding reflects a skill upgrading in the work force, which is observed for both East and—to a comparably higher degree—West Germany. Restructuring and skill upgrading yet played only a minor role in explaining the wage increases in East Germany, and again the MM framework reveals differences across the respective wage scales.

The course of the paper is organized as follows. Section 2 starts out from related analyses of the German wage structure in the literature and introduces the data used in this paper and the notation for Tobit and censored quantile regressions. It then discusses the results of the estimated wage regressions. Section 3 first introduces decomposition techniques for the setting at hand. The successive presentation of results interprets patterns in the respective wage distributions and discusses effects underlying the wage differentials between East and West Germany as well as the changes of the wage structure over time. Section 4 concludes.

2 Approaching the German Wage Structure

This chapter briefly touches on existing evidence in the empirical literature on the wage structure in West and East Germany (section 2.1). It then introduces the data I use and the framework for Tobit and censored quantile regressions (section 2.2). Results of the corresponding estimations are discussed (section 2.3).

2.1 Data and Related Literature

The evolution of the West German wage structure between the mid-1970s and the mid-1990s has been extensively studied since large micro data sets became available. Studies used the survey data provided by the German Socio-Economic Panel (GSOEP) or the administrative IAB employment samples (IABS). By and large, the wage structure has been found to be relatively compressed in international comparison and rather stable over time; see Fitzenberger (1999) and Prasad (2000) and the literature cited therein. Returns to education and experience showed only little variation. In face of ongoing skill biased technical change (Acemoglu, 2002) the "unbearable stability" (Prasad, 2000) is considered a key aspect for the growing unemployment among low skilled workers. Prasad concludes that the stability of the returns to human capital components is attributable to institutional factors. When looking separately at different age groups in Fitzenberger and Kohn (2005) we find that there was quite some variation in the skill premia for different age groups: cohort effects differently affected the different skill groups. We show that this result is consistent with a market framework which also accounts for steady skill biased technical change.

In their early study of the East German wage structure Krueger and Pischke (1995)) use the 1988 Survey on Income of Blue and White Collar Households in the GDR (*Einkommensstichprobe in Arbeiter- und Angestelltenhaushalten*) and the retrospective 1989 information of the 1990 GSOEP-East to find an even more compressed wage structure in the late years of the GDR, expressing the egalitarian doctrine of the socialist system. Follow-up comparative studies using different GSOEP waves[1] confirm this effect for the

[1] Schwarze and Wagner (1992), Schwarze (1993), and Bird, Schwarze, and Wagner (1994) also use the retrospective information for 1989 in addition to waves up to 1991. Burda and Schmidt (1997) employ the waves 1990–1993. Steiner and Wagner (1997), Franz and Steiner (2000), as well as Steiner and Hölzle (2000) estimate wage regressions based on the waves 1990–1995 or 1990–1997, respectively. Hunt (2001) studies wage growth and job mobility in East Germany based on the waves 1990–1996. Here, wage growth patterns provided insufficient incentives for worker mobility, which impeded efficient restructuring and

first years after the German reunification. In particular, they report flat age-earnings or experience-earnings profiles in the East. The findings suggest that experience accumulated under the old system is poorly remunerated afterwards. The unification shock led to a massive depreciation of human capital. However, as post-unification labor market cohorts start to age, increasing wage dispersion is observed in East Germany until the mid-1990s.

More up-to-date administrative data for both parts of the country have only recently been made available with the regional file of the IABS 1975–2001. This version of the IABS is a 2% random sample of German social security accounts; see Hamann, Krug, Köhler, Ludwig-Mayerhofer, and Hacket (2004) for a description of the data set.[2] While excluding mainly self-employed workers and civil servants, the IABS covers about 80% of all employed persons. Employment in East Germany is included from 1992 onwards. The IABS offers a large sample size and—due to its administrative character—a reliable quality of data. In particular, the wage data are very accurate compared to survey data. On the downside, the data set provides relatively few covariates and no information on working time except from a distinction between full-timers and part-timers. Besides, the wage data are censored from above at the social security taxation threshold.

Möller (2005) uses the years 1992–2001 of the IABS 1975–2001 for a descriptive study of wage dispersion in East and West Germany. To study the evolution of wage inequality he compares decile ratios—especially D5/D1 and D9/D5—of log wage distributions for different labor market groups in 1992 to the respective ratios in 2001. The main findings are that wage inequality has generally been rising between 1992 and 2001 and that the rise in equality has been more pronounced for low-skilled compared to skilled workers and for women compared to men. Starting out at a lower level in 1992, wage inequality in East Germany has largely caught up with the level of inequality in West Germany by 2001.

Within-group quantile ratios are a convenient tool to describe wage inequality irrespective of different wage levels. Yet the approach provides no information about the levels and the respective differences between groups, and it does not reveal determinants of the observed distributions. Finally, looking solely at raw quantile measures cannot cope with the censoring problem. Möller's analysis thus excludes employees with a university degree.

In this paper I also employ the years 1992–2001 of the IABS. In order to give a compre-

employment recovery.

[2]For further information (on antecedent versions of the IABS) see also Bender, Hilzendegen, Rohwer, and Rudolph (1996) and Bender, Haas, and Klose (2000).

hensive description for different labor market segments I consider separate distributions for three labor market groups—women working full-time or part-time and full-time working men—in East and West Germany in each of the years 1992–2001. Raw deciles of the different log nominal daily wage distributions are displayed in figure 1. Overall, wages have increased over the period 1992–2001. They are generally higher in West Germany than in East Germany, except for part-time working women. Full-time working women earn less than their male counterparts in the West, but not in the East. As measured by quantile differences Q80–Q20, wage inequality also increased and the increase was more pronounced in East Germany than in the West.

Figure 1 shows only a coarse picture. In what follows, I estimate extended Mincer (1974) type wage equations in order to shed light on the determinants of the observed distributions and to set the stage for the detailed decomposition analyses in section 3.

2.2 Tobit and Censored Quantile Regressions

Let $Y_{s,i} \equiv \ln W_{s,i}$ denote log wages for individuals i, drawn from a distribution $F_s(Y_s)$ in an adequately defined labor market segment s. Given the focus of this paper one might think of segments as regions (East and West Germany) or different points in time (years).

Since the wage data at use are censored form above at the social security taxation threshold c_s, one observes only $\tilde{Y}_{s,i} = \min\{Y_{s,i}, c_s\}$. One thus might apply Tobit regression (after Tobin, 1956) to estimate the conditional expected value $E(Y_s|X_s)$ based on covariates X_s, assuming normality of the error term u_s in

$$Y_s = E(Y_s|X_s) + u_s = X_s\beta_s + u_s. \quad (1)$$

A more informative approach is to employ quantile regressions, which do not only capture the expected value, but the entire distribution. As introduced by Koenker and Bassett (1978) and generalized by Powell (1984, 1986), conditional quantiles

$$Q_\theta(Y_s|X_s) = X_s\beta_s(\theta) \quad (2)$$

in the case of censoring from above can be estimated for a given quantile $\theta \in (0, 1)$ by minimizing over β_s the objective function

$$N_s^{-1} \sum_{i=1}^{N_s} \rho_\theta(\tilde{Y}_{s,i} - \min\{X_{s,i}\beta_s, c_s\}), \quad (3)$$

where the residuals $u_{s,i}$ are weighted in an asymmetric way by the check function

$$\rho_\theta(u_{s,i}) = \begin{cases} \theta u_{s,i} & \text{for} \quad u_{s,i} \geq 0 \\ (\theta - 1)u_{s,i} & \text{for} \quad u_{s,i} < 0 \end{cases} . \tag{4}$$

There are different algorithms to solve this non-convex optimization problem in the literature; see, e. g., Buchinsky (1994), Fitzenberger (1997a, 1997b), and Koenker and Park (1996). In the following applications, I apply the Buchinsky algorithm as well as the Fitzenberger algorithm for different starting values and choose the respective best estimator in terms of the objective function (3). Heteroscedasticity consistent standard errors can be obtained by means of design matrix bootstraps. Here, it suffices to draw on observations for which predicted values are not censored; see Bilias, Chen, and Ying (2000).

2.3 Estimated Wage Functions and Age-Earnings Profiles

In each of the described subsamples, I select individuals aged between 25 and 55 years who are not currently in education. To deal with measurement error in the education information when defining skill groups, I correct the skill information such that formal degrees an individual has once obtained are not lost later on.

When specifying the wage functions, I examine log nominal daily wages in order to facilitate East-West comparisons. It is not clear a priori which price deflator and which base year to choose when comparing East and West Germany in real terms; see the discussion in Franz and Steiner (2000).

The log wage equations include a set of formal skill dummies (low-skilled: workers without vocational training and without university degree, medium-skilled: those with vocational training and no university degree, and high-skilled: employees with either university or technical college degree), (normalized) age, age^2, a set of industry dummies (16 industries as provided with the IABS 1975–2001), and a dummy for individuals working in Berlin. In order to allow for different age-earnings profiles across skill groups I further include interaction terms of skill and age as well as skill and age^2. Summary statistics of the covariates are displayed in tables 1 and 2 in the appendix. In all estimations, observations are weighted by the length of the respective employment spells.

Figures 2 to 7 show the coefficients of human capital variables estimated from censored quantile regressions (CQR) at different deciles of the distributions as well as the corresponding Tobit coefficients. The results are grouped by labor market groups (women working full-time and part-time and full-time working men) and years (1992 and 2001), and each of the figures shows coefficients for West (left panel) and East Germany (middle panel) as well as differences between the two parts of the country (right panel).

In general, the estimated effects are significantly different from zero. Merely some age×skill interactions in East Germany prove insignificant in single parts of the distributions. Moreover, most CQR coefficients vary significantly across the distribution and differ from the more restrictive Tobit estimates, with the only exception of part-time working women, for whom the confidence bands are relatively wide. The censoring problem is most severe for older high-skilled employees. The interaction terms of age and high skill thus are somewhat sensitive. For example, the median coefficient of age×high skill for full-time working men in West Germany 2001 is extraordinarily low, whereas the median effect of age^2×high skill jumps up. At the 60% quantile, things are the other way round. This result might affect the shape of single age-earnings profiles (see this section below), but its impact on predictions (as used for the decomposition analyses in the next section) can be expected to be small.

Due to the inclusion of the interaction effects, the interpretation of ceteris paribus effects is complex, and we resort to looking at age-earnings profiles further below. Nevertheless, there are some notable differences of coefficients across quantiles. For example, the effect of age is found to become more concave at higher quantiles for full-timers. The (negative) base effect of low skill tends to be smallest at low quantiles, and so does the (positive) base effect of high skill.

Looking at West-East differences in the coefficients, it comes as no surprise that the difference between the intercepts is positive. It is also increasing over the distribution in 1992. Differences in the base effects of skill are relatively small, though. The base effect of age is steeper and slightly more concave for men in West Germany, but it is reversed for full-time working women in the lower half of the distribution. Differences in the returns to skill among women working part-time in East Germany are relatively large in the lower half of the distribution. In 2001 the difference between the intercepts is still positive, but it is decreasing at higher quantiles. The differences in the age effects are basically the same as in 1992, but now low-skilled men are particularly worse off in East Germany in the lower half of the distribution. On the other hand, the base return to high skill in East Germany has increased disproportionately at the upper end of the distribution so that one finds a negative difference there.

Changes of the coefficients between 1992 and 2001 within the regions can be inferred from figures 8 to 13, which repeat the estimation results of figures 2 to 7 in the left two panels, but show the changes between 1992 and 2001 explicitly in the right panel. In West Germany, the base wage has increased, and for full-timers this effect was stronger at higher quantiles. Base skill differentials for both men and women (except for high-skilled part-timers at the top of the distribution) have increased, indicating a source of the growing wage inequality. The base returns to age only changed little. In East Germany, the baseline increased even more distinctively over time and the difference across quantiles is also more pronounced. The (negative) base wage premium for low skill has grown especially at the lower end of the distribution. As in West Germany, however, the base effect of age has not changed much in East Germany, either.

Figures 14 to 17 present age-earnings profiles used to judge differences in the remunerations of formal skill and age. The respective left and right panels show results for West and East Germany. In most cases, the profiles have got the familiar concave form. However, some profiles for high-skilled employees, for whom the censoring problem is most severe, should be interpreted with caution; see the discussion above.

Figure 14 gives account of median regression results for different skill groups. Profiles are generally the steeper (in early years) the higher the skill level. The only exception is the group of low-skilled women working part-time in East Germany in 2001 which exhibits an exceptionally steep profile. In West Germany, the profiles for women are usually flatter than those for men, but men and women do not differ much in East Germany. In East-West comparison, the profiles in the East are flatter and decrease more pronouncedly for older workers in the year 1992. This finding mirrors the low returns to age or experience as human capital component in East Germany in the aftermath of the reunification. Yet the difference has lessened by 2001, indicating some recovery of returns. Whereas the profiles for West Germany are rather similar between 1992 and 2001, differences occurred in the East: the profile for high-skilled men became particularly concave and the situation of low-skilled women deteriorated for full-timers, but improved for part-timers.

The general picture is also reflected in figures 15 to 17 which display profiles at different quantiles (20%, 50%, and 80%). Standard profiles with steeper increases (at young age) in higher regions of the distribution are primarily observed for the core labor market group of male full-timers with an apprenticeship degree. When looking at (full-time as well as part-time working) women in West Germany in the year 2001, one finds an analogous standard ordering of the profiles for the high-skilled, but a reversed ordering for the low-skilled: Women with low formal qualification gain most from accumulating experience at the lower end of the pay scale. In East Germany, the profiles decrease for older workers across all quantiles. Again, this finding supports the depreciation-of-human-capital story.

The results so far show a complex and diverse picture. A more compact pattern of differences between the regions and changes over time is drawn by applying decomposition analyses in the next section.

3 Decomposing Differences Across Wage Distributions

Originating from the discrimination literature (gender wage differences, differences between ethnic groups), decomposition analyses are well suited to shed light on differences between the observed wage distributions. This chapter first introduces decomposition techniques for the setting at hand (section 3.1). It then focusses on two objects of interest: on differences between East and West Germany (section 3.2) and on changes of the wage structure over time (section 3.3).

3.1 Decomposition Techniques

A Blinder (1973)-Oaxaca (1973)-type decomposition for the difference between the expected wages in two segments s and $\tilde{s}$ is:

$$E(Y_s|X_s) - E(Y_{\tilde{s}}|X_{\tilde{s}}) = (X_s - X_{\tilde{s}})\beta_s + X_{\tilde{s}}(\beta_s - \beta_{\tilde{s}}). \tag{5}$$

To apply the Blinder-Oaxaca (B/O) decomposition in case of censored data, I evaluate equation (5) at mean values of the characteristics and use the coefficients estimated by means of Tobit regressions.[3]

The first summand on the right hand side of equation (5) captures the part of the difference that is attributable to differences in the covariates across the two segments. It is traditionally labeled “characteristics effect”. The second summand known as “returns” or “coefficients effect” captures the part of the difference that is attributed to differences in the returns to the covariates. It is well known that the partition depends on the ordering of the effects and that the decomposition results may not be invariant with respect to the choice of the involved counterfactual $X_{\tilde{s}}\beta_s$; see the surveys of Oaxaca and Ransom (1994)

[3] In contrast to the traditional OLS case, however, the predicted conditional difference does not necessarily coincide with the observed mean difference. “Observed” mean wages in the censoring case have to be estimated by means of Tobit regressions on a constant.

and Silber and Weber (1999). Therefore, the choice of a counterfactual should be guided by the question of economic interest. When decomposing West-East wage gaps in the next section, I choose $X_e\beta_w$ to answer the question what would have been the expected log wage, had a population with the same distribution of characteristics as East Germany faced returns to characteristics as in the West. In case of the comparison across time in section 3.3 the counterfactual $X_{1992}\beta_{2001}$ hypothesizes what the expected wage would have been in face of returns in the year 2001, had the distribution of characteristics not changed since 1992.

There are alternative methodologies to the standard B/O decompositions in the literature. In light of the present focus on differences in two dimensions, techniques to decompose changes of wage gaps over time in one single exercise—as proposed by Smith and Welch (1989) or Wellington (1993)—would be of particular interest. However, I opt to consider both decompositions separately for two reasons. First, any combination of involved counterfactuals—be it with or without interaction terms between the differences in characteristics and differences in coefficients—bears an even higher degree of arbitrariness; compare the review of Le and Miller (2004). Second, and most importantly, each of the two comparisons, the differences between East and West Germany as well as the changes of the wage distributions within the two regions over time, is interesting of its own.

A further method introduced by Juhn, Murphy, and Pierce (1991) and adopted in a series of papers by Blau and Kahn (1992, 1994, 1997) also decomposes the change of a wage gap over time. This approach has got the additional merit that it also decomposes residual effects into a quantity and a price effect. However, it suffers from the shortcoming that it assumes unique coefficients across segments s and $\tilde{s}$. What is more, the decomposition of the residual terms is inapplicable in the case of censored data, in which residuals can only be used for uncensored observations.

The main disadvantage of all techniques discussed so far is that all of them consider only mean effects. In contrast, Machado and Mata (2005) build on quantile regressions to decompose differences across entire distributions. They propose an estimator $F_s^*(Y_s)$ of the marginal distribution of wages which conforms to the linear conditional model (2) as follows:

1. Draw M numbers, $\theta^1, ..., \theta^M$, at random from a uniform distribution $U(0, 1)$.
2. For each θ^m, estimate the conditional quantile (2), using the sample $\{Y_{s,i}, X_{s,i}\}_{i=1}^{N_s}$. This yields coefficient estimates $\hat{\beta}_s(\theta^1), ..., \hat{\beta}_s(\theta^M)$.
3. Draw M resamples, $X_s^1, ..., X_s^M$, from the sample $\{X_{s,i}\}_{i=1}^{N_s}$.

4. Then, the set $\{Y_s^{*m} \equiv X_s^m \hat{\beta}_s(\theta^m)\}_{m=1}^M$ constitutes a random sample from $F_s^*(Y_s)$.

An estimator of the counterfactual marginal distribution, $F_s^*(Y_s(X_{\tilde{s}}))$, can be estimated in an analogous way by drawing resamples from $X_{\tilde{s}}$ rather than from X_s in the third step. The Machado/Mata (MM) decomposition based on the estimated densities therefore writes

$$\begin{aligned}\hat{F}_s(Y_s) - \hat{F}_{\tilde{s}}(Y_{\tilde{s}}) &= F_s^*(Y_s(X_s)) - F_{\tilde{s}}^*(Y_{\tilde{s}}(X_{\tilde{s}})) + \epsilon \\ &= [F_s^*(Y_s(X_s)) - F_s^*(Y_s(X_{\tilde{s}}))] + [F_s^*(Y_s(X_{\tilde{s}})) - F_{\tilde{s}}^*(Y_{\tilde{s}})] + \epsilon,\end{aligned} \tag{6}$$

where $\hat{F}_s(\cdot)$ denotes an estimator of the distribution based on the observed sample. Similar to the B/O decomposition, the term in the first brackets of (6) is a characteristics effect, and the one in the second brackets a returns effect. Given that the linear specification (2) is reasonable the residual term ϵ will be negligible. With respect to the choice of a hypothetical distribution the same caveat as in the B/O case applies.

I adopt the MM technique, resorting to quantile measures for the involved distributions in order to gage the elements of the decompositions. However, a couple of adaptations are undertaken. First, I estimate CQR as explained above. Second, I follow Albrecht, Björklund, and Vroman (2001) to save computation time: Rather than drawing M random numbers for θ^m and then estimating M (censored) quantile regressions, I estimate CQR for each single percentile and then draw $M = 1000$ resamples from the distributions of the covariates for each $\hat{\beta}_s(\cdot)$. Third, and finally, it is well-known that the estimation of CQR at extreme quantiles can be rather poorly behaved; see Fitzenberger (1997a, 1997b). The quantiles should thus be restricted to a range $\theta \in [\theta_l; \theta_u]$. In face of the censoring at hand, I choose a lower bound $\theta_l = 0.1$ and an upper bound $\theta_u = 0.9$. Consequently, when inferring the quantiles of interest from the estimated marginal distributions, the following adjustment is in order:

$$F_s^*(Y_s) = F_s^*(Y_s | Q_{\theta_l}(Y_s) < Y_s < Q_{\theta_u}(Y_s))(\theta_u - \theta_l) + \theta_l. \tag{7}$$

There are also alternative approaches in the literature for decomposing differences across entire distributions. The decomposition introduced by Juhn, Murphy, and Pierce (JMP, 1993) and also used by Blau and Kahn (1996) for cross-country comparisons and by Steiner and Wagner (1997, 1998) for Germany employs the distribution of residuals resulting from wage regressions to rank observations. It therefore takes a closer look at residual inequality. Yet the approach faces two shortcomings. First, its focus on the distribution of residuals renders the approach as inapplicable in the case of censored data as the related (1991) approach. Second, even without censored data, the JMP (1993) decomposition is more restrictive than the MM technique: Whereas the former approach assumes a single linear model to hold for the entire wage distribution, the latter approach based on quantile regressions allows for flexibility across the distribution.

DiNardo, Fortin, and Lemieux (1996) exploit kernel density estimations to decompose differences in a nonparametric setting. Compared to this approach, the parametric MM framework is restrictive by nature. Yet by quantifying differences in the coefficients it sheds light on that part of a difference which would be left unexplained in the nonparametric framework.

3.2 Differences between East and West Germany

"It seems possible, if not likely that a wage gap on the order of 20–30% could persist between East and West Germany for some time to come." Does this conjecture of Burda and Schmidt (1997, p. 195) which is based on data from the years 1990 to 1993 still hold at the beginning of the twenty-first century? Figure 18 shows the levels of West-East wage differentials for the years 1992 and 2001 in nominal and real (consumer prices of 1992 or 2001, differentiated by regions) terms. Starting out at 58%, 34%, and 17% in 1992, the respective nominal differences for men, full-time working women, and part-time working women all shrunk by 7 to 10 real percentage points (ppoints) until 2001. However, convergence had in all groups faded away by 1996, so that only little variation is observed from then on. Nominal differences of 38–40% and 18–20% remain for full-time working men and women, but there is virtually no more difference for part-time working women.

Table 3 reports observed and predicted West-East differences in log wages across quantiles for the years 1992 and 2001.[4] The predictions based on the censored quantile regressions discussed above are generally very similar to the observed differences. Only at very low and high quantiles predictions are essentially hard. The Tobit results reported in the last column are usually close to the values at the median. Both observed and predicted numbers can be used to assess where in the respective wage distributions differences are most striking.

For the group of full-time working men the difference varies between 57% at the first quintile and 65% at the fourth quintile in 1992, indicating a higher wage dispersion in the West. In 2001, however, the East-West differential does not vary between quantiles any

[4]The analysis in this section is based on nominal numbers; see the discussion in section 2.3.

more: wage dispersion in East Germany has caught up. The picture for women working full-time in 1992 is very similar to that for males (except for the difference in the level). Yet in 2001 the difference is highest at low quantiles—the differential at the first quintile exceeds the differential at the fourth by 11 ppoints. Thus women in the upper parts of the wage distribution gained disproportionately in East Germany. Women working part-time in East Germany in 1992 were relatively well off at the low and at the high end of the distribution, and the West-East differential was highest around the median. Any differential had vanished by 2001, though.

Table 3 further shows the decomposition of the West-East differentials into characteristics and coefficients effects used to judge whether the differentials stem from different decompositions of the work force or employees' characteristics are remunerated differently in the East and in the West. In general, the characteristics effect is rather small and differs little across quantiles of the distribution and over time. The better part of the differentials is captured by differences in the coefficients.

For full-time working men the characteristics effect is negligible in both years 1992 and 2001. In no case it explains more than 2 ppoints of the West-East differential. In the group of women working full-time in 1992, the characteristics effect ranges between –8 ppoints at the first quintile and –6 ppoints at the fourth. It therefore is in favor of higher earnings in East Germany and most pronounced in the lower half of the distribution. In relative terms, women selecting into full-time jobs in East Germany had more preferable characteristics in 1992. This tendency still holds for 2001, but to a lesser degree and mainly in the upper part of the distribution. A similar reasoning also applies for women working part-time in 1992. However, there are no offsetting characteristics and coefficients effects in the year 2001, by which convergence of wages has been achieved for this group.

The conclusion that differences in employees' characteristics only play a minor role in explaining East-West wage differentials is supported by the summary statistics of the covariates in tables 1 and 2. By and large, there are merely marginal differences. Though, in both 1992 and 2001 and for all labor market groups, the level of formal education in East Germany is higher than in the West. Only the proportion of male workers with a university degree is higher in West Germany in 2001.

The finding is also in line with the results of the B/O decompositions in Burda and Schmidt (1997) and the JMP decompositions in Steiner and Wagner (1997) both of which use GSOEP data for the early 1990s and report a minor importance of differences in the characteristics of the work forces. Görzig, Gornig, and Werwatz (2004), using a decomposition based on establishment-level data, compare wages in East and West Germany for the years 1994 and 1998. They stress the importance of differences in establishment types and conclude that the catching-up in the East was in part offset by a move of East German firms into low-wage establishments.

With any of the above comparison arguments, there is a caveat concerning the content of the covariates, which should be comparable between the two parts of the country in order to allow a strict interpretation of the decomposition. This assumption is not beyond dispute. For example, the human capital content of age—if not understood as such, but taken to capture experience—is likely to differ between East and West Germany. Similarly, the skill content captured by the educational attainment variables might differ. For lack of more informative data, it is nevertheless worth taking the results as a reference.

3.3 Changes in the Wage Structure Over Time

Figure 1 gave a first impression of increasing wage inequality throughout the 1990s. This section scrutinizes the developments of the wage structure within regions over time. Rather than showing nominal wages as in figure 1, the distributions and decomposition results in table 4 are presented in real terms (prices of 1992, differentiated by regions). In a setup analogous to that of table 3 in the previous section, the panels in table 4 reproduce the observed and predicted log wage changes between 1992 and 2001. Differences of the numbers across quantiles give account of the evolution of wage inequality.

For the group of men working full-time in West Germany inequality as measured by quantile differences Q80–Q20 has increased by about 9% and this increase was rather symmetrical across the distribution: The fourth quintile gained 5% while the first quintile lost 4%. With a (predicted) inter-quintile range of 16% wage dispersion among men in East Germany went up even more remarkably. Moreover, most of this increase (13 ppoints) took place in the upper half of the distribution.

The wages of women working full-time in either West or East Germany did hardly change in the lower thirds of the respective distributions. However, wage growth differed at higher quantiles: Whereas Western wages increased by up to 7%, wages in the East went up by 22% at the fourth quintile.

The group of part-time working women in West Germany experienced wage growth between 5 and 11%, again with higher increases at higher quantiles. In East Germany, the range of differences across quantiles is also 6 ppoints. However, the biggest increase is observed in the middle part of the distribution and—well in line with the observed closing of the West-East gap for this group—the level of changes exceeds that in the West by about 10 ppoints.

Table 4 also shows the MM decomposition of the wage changes into characteristics and coefficients effects. The magnitude of the characteristics effect generally resembles corresponding magnitudes in the West-East differences. However, in some cases in which the wage change is small, changes in the characteristics explain a major part of the wage change.

For all three labor market groups working in West Germany, the characteristics effect ranges between 1 ppoint (in favor of higher earnings in 2001) at the first quintile and 5 ppoints at the fourth quintile. With shares of about one half for women and virtually full coverage for men it captures the better part of the respective wage increases in the upper halves of the distributions and it likely reflects skill upgrading in the prime age work force.

In fact, reconsidering the summary statistics of the covariates in tables 1 and 2, one finds that skill upgrading took place in both East and West Germany between 1992 and 2001. As the proportion of low-skilled workers decreased in all labor market groups, the proportion of high-skilled went up. This increase was slightly more pronounced in West Germany than in the East. With respect to changes in the industry structure of the work force, employment in public and social security system services (sector 16) decreased most remarkably in East Germany.

Restructuring and skill upgrading yet played only a minor role in explaining the striking wage increase (especially in the upper half of the distribution) for men working in East Germany: the characteristics effect does not exceed 2 ppoints. A similar result holds for women working full-time in East Germany, but for this group the characteristics effect goes down up to –7 ppoints in the lower middle of the distribution. The characteristics in that part of the distribution being in favor of higher earnings in 1992, the increasing inequality was driven by more desirable development of characteristics at the upper end. Finally, the contribution of differences in the characteristics is largely negligible across the entire distribution of wage changes for women working part-time in East Germany.

A bottom line of this exercise is that the diverse patterns of changing wage levels and increasing inequality are due to changes in the composition of the respective work forces and changing remunerations of relevant characteristics. This result differs from the findings of Steiner and Wagner (1998), who analyze the evolution of wage inequality among West German males over time by means of JMP (1993) decompositions applied to GSOEP and IABS data for the years 1984–1990.[5] Well in line with the complementary literature (Fitzenberger 1999, Prasad 2000, they find that wage inequality as measured by quantile differences Q50–Q10 and Q90–Q50 did hardly change in the second half of the 1980s. Moreover, this observation was not driven by offsetting characteristics and coefficients effects.

The results obtained in this section rather extend the findings of Möller (2005), who also compares wage inequality between the years 1992 and 2001. Yet his study does not consider shifts in wage levels and it does not undertake decomposition analyses.

4 Conclusions

How has the structure of wages in the German labor market evolved throughout the first decade after German reunification? Did East-West wage differentials as observed for the beginning of the 1990s by Burda and Schmidt (1997), among others, persist or could convergence of the wage levels be observed? Did wage dispersion develop differently in both parts of the country? And if so, do the differences and changes result from composition effects in the respective work forces? In order to answer these questions, this paper describes the evolution of the wage structure within and between different labor market groups, using individual-level data for the years 1992–2001 from the IAB employment sample 1975–2001.

An West-East comparison of year-specific mean log wage differences reveals that convergence took place up to the year 1996, but then had faded away. Until 2001, nominal differences of about 40% and 20% persisted for men and full-time working women, respectively. No more difference is observed in the wages of part-time working women.

Looking at raw quantiles of the respective wage distributions, I find that West-East differences are higher in upper parts of the distributions in 1992, indicating a higher degree of wage inequality in West Germany in that year. Yet inequality in the East caught up during the 1990s: Whereas the interquintile ranges Q80–Q20 of the wage changes over time increased by 7 to 9 percentage points in West Germany, the corresponding ranges reached 16 to 25 percentage points in the East. Wage gains were disproportionately high in the upper parts of the wage scale.

Censored quantile wage regressions for the different groups provide insights into the determinants of the observed distributions and the respective differences. Comparing the

[5] Note that their analysis for the IABS data is problematic because it only studies uncensored wages.

estimated coefficients between East and West Germany, I find that the base effects of skill are rather similar in 1992, while the base effect of age is higher and more concave in West Germany. Compared to 1992, skill wage premia are higher in both parts of the country in the year 2001, but the returns to age changed only little. Low-skilled employees in the East are now particularly worse off at the lower half of the wage scale, whereas high skill yields a disproportionately high remuneration at the upper end. Corresponding age-earnings profiles shed light on the evolution of returns to age and skill over the working life cycle. Profiles not only are the steeper the higher the skill level, but they are also relatively flat in East Germany in 1992. As discussed by Franz and Steiner (2000), among others, the reunification shock led to a depreciation of human capital in the East. However, this effect wears out with the aging of post-unification labor market cohorts—the pattern has become less clear by the year 2001.

Against this background the technique introduced by Machado and Mata (2005) is well suited to decompose the observed differences and changes in the wage structure into a characteristics effect, which captures differences in the characteristics of the work force, and a returns effect, which captures different coefficients related to the characteristics. In line with the results of Steiner and Wagner (1997) for the early 1990s, I find that the coefficients effect is in most cases negligible for explaining East-West wage differences. The distribution of characteristics among women working full-time in 1992 is even in favor of higher wages in the East.

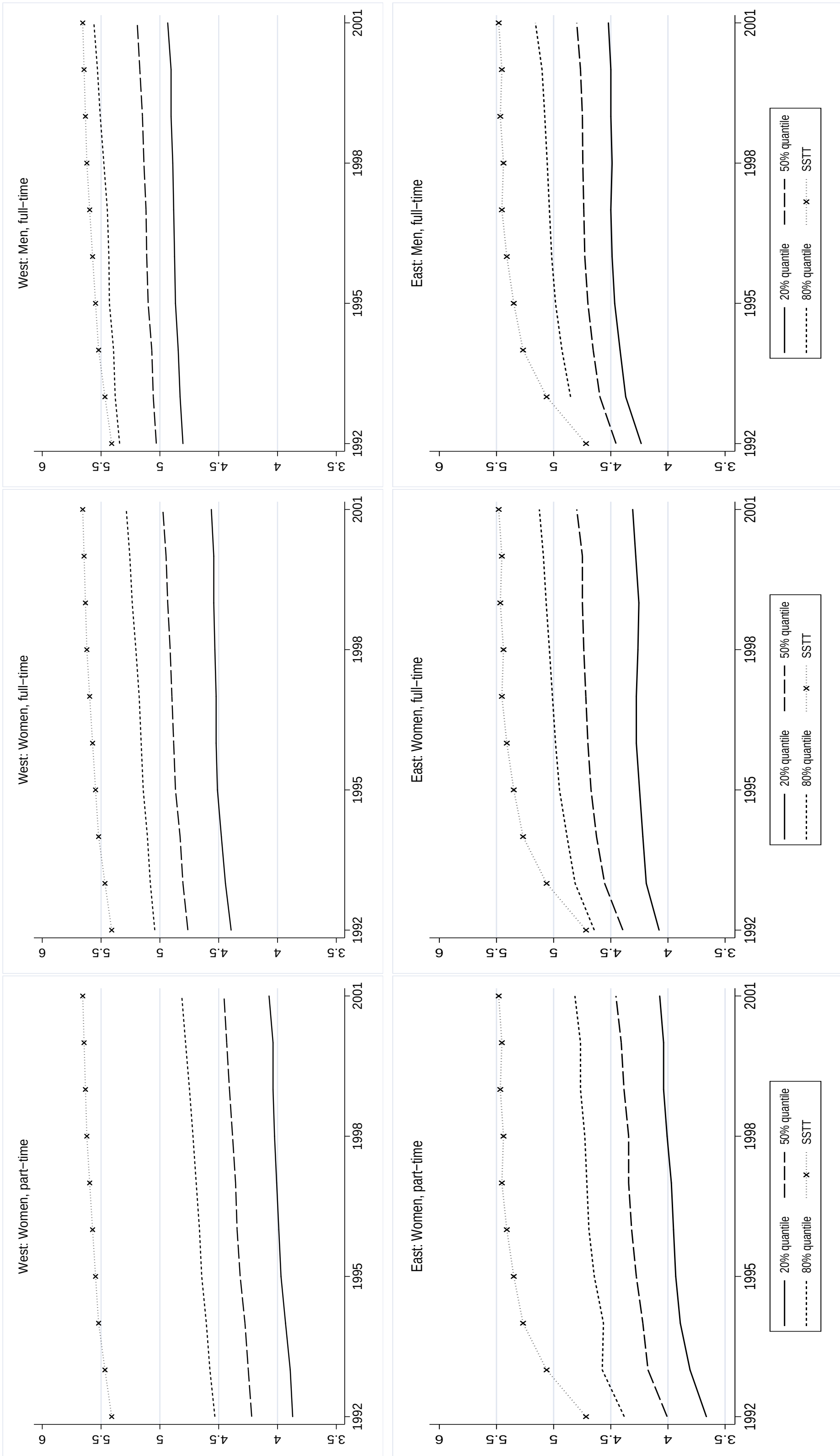
With respect to the evolution of wages over time, characteristics effects capture major parts of the respective wage increases in the upper halves of the wage distributions for West Germany. This finding reflects a skill upgrading in the work force, which is observed for both East and—to a comparably higher degree—West Germany. Restructuring and skill upgrading yet played only a minor role in explaining the wage increases in East Germany. The increasing wage inequality among women working full-time in the East even came along with a characteristics effect towards decreasing wages in lower parts of the wage scale.

All of results discussed in this paper are descriptive by nature. Unfortunately, the IABS provides only relatively few covariates, such that it is impossible to find instruments in order to account for differences in the selection into the labor market or a possible endogeneity of educational attainment. Furthermore, the approach does not model migration between East and West Germany explicitly; see Kirbach and Smolny (2004) for an analysis of East-West wage differentials which incorporates migration.

The framework employed in this paper to study the evolution of the wage structure within labor market groups and corresponding differences between East and West Germany could also be used to analyze differences between labor market groups, such as male-female wage differentials. In future research, it might further prove insightful to take a closer look at the respective characteristics and returns effects and tell apart the effects of single variables. Finally, the current approach provides no information with respect to the economic forces underlying the observed wage structures. Estimates of structural models as, e. g., in Fitzenberger and Kohn (2005) might thus be expected to complement the descriptive evidence.

Appendix: Tables and Figures

Figure 1: Nominal Wage Distributions



Raw quantiles of log nominal daily wage distributions. SSTT: social security taxation threshold. Data source: IABS 1975–2001.

Table 1: Description and Summary Statistics of Covariates, 1992

Covariate	Description	Men f.-t., West		Men f.-t., East		Women f.-t., West		Women f.-t., East		Women p.-t., West		Women p.-t., East	
DL	dummy for low-skilled	0.111	(0.31)	0.054	(0.22)	0.160	(0.36)	0.059	(0.23)	0.181	(0.38)	0.082	(0.27)
DM*	dummy for medium-skilled	0.769	(0.42)	0.810	(0.39)	0.769	(0.42)	0.811	(0.39)	0.759	(0.42)	0.800	(0.39)
DH	dummy for high-skilled	0.119	(0.32)	0.135	(0.34)	0.069	(0.25)	0.128	(0.33)	0.058	(0.23)	0.117	(0.32)
AGE	age (25–55 years)	38.78	(8.60)	39.21	(8.64)	37.39	(8.83)	39.17	(8.50)	40.99	(7.97)	40.12	(8.73)
DSEC1	agriculture & mining	0.035	(0.18)	0.043	(0.20)	0.010	(0.10)	0.024	(0.15)	0.006	(0.08)	0.010	(0.10)
DSEC2	production of basic materials	0.097	(0.29)	0.066	(0.24)	0.042	(0.20)	0.032	(0.17)	0.021	(0.14)	0.015	(0.12)
DESEC3*	metal industry, machinery	0.145	(0.35)	0.095	(0.29)	0.042	(0.20)	0.030	(0.17)	0.021	(0.14)	0.018	(0.13)
DSEC4	vehicles & technical appliances	0.111	(0.31)	0.065	(0.24)	0.085	(0.27)	0.036	(0.18)	0.035	(0.18)	0.020	(0.14)
DSEC5	consumer goods	0.068	(0.25)	0.040	(0.19)	0.071	(0.25)	0.044	(0.20)	0.038	(0.19)	0.027	(0.16)
DSEC6	food, beverages, tobacco	0.027	(0.16)	0.024	(0.15)	0.035	(0.18)	0.030	(0.17)	0.018	(0.13)	0.016	(0.12)
DSEC7	main construction	0.067	(0.25)	0.146	(0.35)	0.009	(0.09)	0.019	(0.13)	0.008	(0.09)	0.011	(0.10)
DSEC8	subconstruction work	0.036	(0.18)	0.061	(0.23)	0.010	(0.10)	0.010	(0.10)	0.010	(0.10)	0.006	(0.08)
DSEC9	wholesale trade	0.067	(0.25)	0.041	(0.20)	0.059	(0.23)	0.032	(0.17)	0.039	(0.19)	0.030	(0.17)
DSEC10	retail trade	0.043	(0.20)	0.035	(0.18)	0.102	(0.30)	0.070	(0.25)	0.184	(0.38)	0.194	(0.39)
DSEC11	transport & communication	0.062	(0.24)	0.106	(0.30)	0.031	(0.17)	0.056	(0.23)	0.047	(0.21)	0.084	(0.27)
DSEC12	business-related services	0.095	(0.29)	0.062	(0.24)	0.139	(0.34)	0.085	(0.28)	0.119	(0.32)	0.060	(0.23)
DSEC13	household-oriented services	0.024	(0.15)	0.020	(0.14)	0.063	(0.24)	0.044	(0.20)	0.036	(0.18)	0.045	(0.20)
DSEC14	medical services	0.043	(0.20)	0.054	(0.22)	0.152	(0.35)	0.153	(0.36)	0.213	(0.40)	0.177	(0.38)
DSEC15	associations & organizations	0.023	(0.15)	0.028	(0.16)	0.069	(0.25)	0.057	(0.23)	0.087	(0.28)	0.060	(0.23)
DSEC16	public services, social security	0.052	(0.22)	0.106	(0.30)	0.072	(0.25)	0.271	(0.44)	0.109	(0.31)	0.220	(0.41)
DBERLIN	dummy for Berlin	0.035	(0.18)	0.078	(0.26)	0.045	(0.20)	0.092	(0.28)	0.041	(0.19)	0.043	(0.20)
N	number of observations	227243		57435		114324		44024		50338		7257	

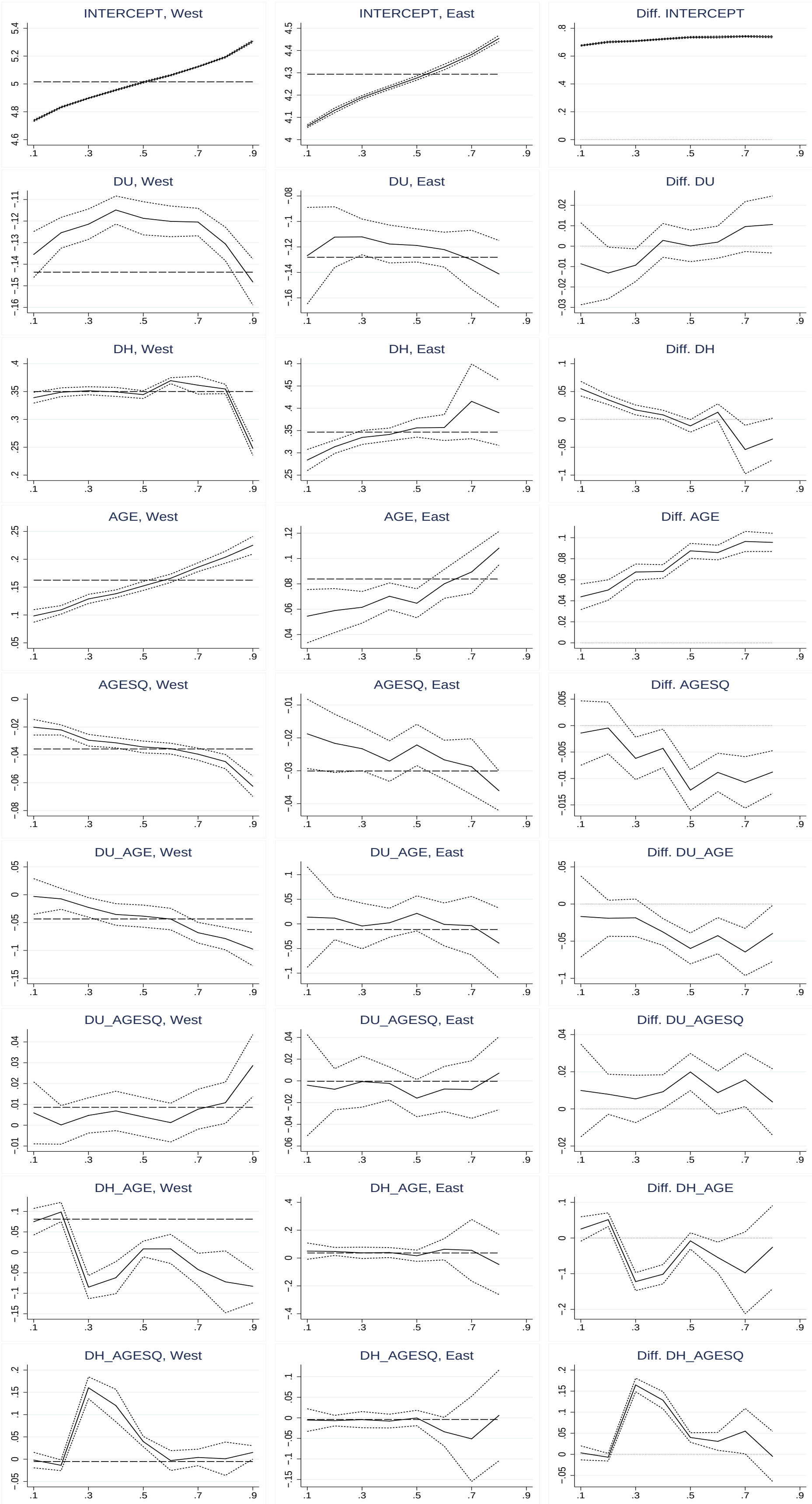
Standard deviations in parentheses. * indicates base categories. Data source: IABS 1975–2001. Observations weighted with length of resp. employment spell.

Table 2: Description and Summary Statistics of Covariates, 2001

Covariate	Description	Men f.-t., West		Men f.-t., East		Women f.-t., West		Women f.-t., East		Women p.-t., West		Women p.-t., East	
DL	dummy for low-skilled	0.087	(0.28)	0.019	(0.13)	0.103	(0.30)	0.019	(0.13)	0.118	(0.32)	0.035	(0.18)
DM*	dummy for medium-skilled	0.753	(0.43)	0.832	(0.37)	0.786	(0.41)	0.818	(0.38)	0.789	(0.40)	0.838	(0.36)
DH	dummy for high-skilled	0.158	(0.36)	0.148	(0.35)	0.110	(0.31)	0.162	(0.36)	0.091	(0.28)	0.125	(0.33)
AGE	age (25–55 years)	39.47	(7.89)	40.10	(7.83)	38.82	(8.34)	40.77	(7.68)	41.57	(7.25)	40.65	(7.51)
DSEC1	agriculture & mining	0.029	(0.17)	0.058	(0.23)	0.011	(0.10)	0.036	(0.18)	0.006	(0.08)	0.016	(0.12)
DSEC2	production of basic materials	0.082	(0.27)	0.054	(0.22)	0.033	(0.18)	0.021	(0.14)	0.015	(0.12)	0.003	(0.06)
DESEC3*	metal industry, machinery	0.134	(0.34)	0.091	(0.28)	0.037	(0.19)	0.021	(0.14)	0.017	(0.13)	0.005	(0.07)
DSEC4	vehicles & technical appliances	0.106	(0.30)	0.059	(0.23)	0.070	(0.25)	0.036	(0.18)	0.025	(0.15)	0.009	(0.09)
DSEC5	consumer goods	0.060	(0.23)	0.044	(0.20)	0.048	(0.21)	0.036	(0.18)	0.021	(0.14)	0.011	(0.10)
DSEC6	food, beverages, tobacco	0.023	(0.15)	0.020	(0.14)	0.031	(0.17)	0.035	(0.18)	0.015	(0.12)	0.017	(0.12)
DSEC7	main construction	0.051	(0.22)	0.119	(0.32)	0.008	(0.09)	0.015	(0.12)	0.005	(0.07)	0.010	(0.10)
DSEC8	subconstruction work	0.035	(0.18)	0.068	(0.25)	0.010	(0.10)	0.012	(0.10)	0.007	(0.08)	0.005	(0.07)
DSEC9	wholesale trade	0.069	(0.25)	0.048	(0.21)	0.059	(0.23)	0.033	(0.17)	0.031	(0.17)	0.018	(0.13)
DSEC10	retail trade	0.046	(0.21)	0.043	(0.20)	0.096	(0.29)	0.078	(0.26)	0.161	(0.36)	0.203	(0.40)
DSEC11	transport & communication	0.067	(0.25)	0.103	(0.30)	0.036	(0.18)	0.048	(0.21)	0.032	(0.17)	0.028	(0.16)
DSEC12	business-related services	0.144	(0.35)	0.113	(0.31)	0.186	(0.38)	0.141	(0.34)	0.141	(0.34)	0.103	(0.30)
DSEC13	household-oriented services	0.027	(0.16)	0.028	(0.16)	0.065	(0.24)	0.067	(0.25)	0.040	(0.19)	0.047	(0.21)
DSEC14	medical services	0.048	(0.21)	0.060	(0.23)	0.157	(0.36)	0.188	(0.39)	0.261	(0.43)	0.245	(0.43)
DSEC15	associations & organizations	0.028	(0.16)	0.034	(0.18)	0.082	(0.27)	0.095	(0.29)	0.108	(0.31)	0.129	(0.33)
DSEC16	public services, social security	0.044	(0.20)	0.049	(0.21)	0.064	(0.24)	0.132	(0.33)	0.107	(0.30)	0.143	(0.35)
DBERLIN	dummy for Berlin	0.027	(0.16)	0.070	(0.25)	0.039	(0.19)	0.077	(0.26)	0.032	(0.17)	0.068	(0.25)
N	number of observations	240974		46845		121960		32593		65083		12982	

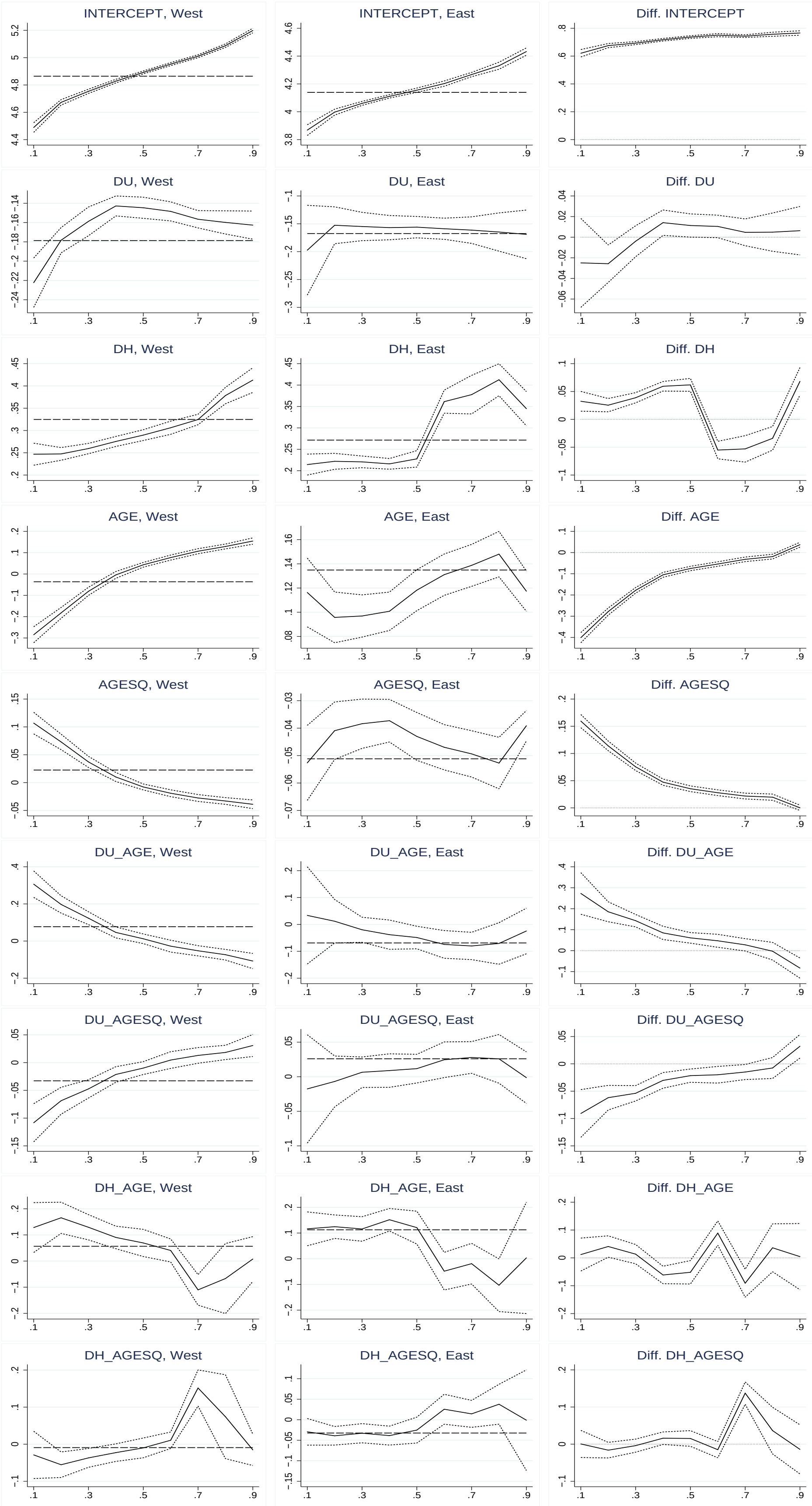
Standard deviations in parentheses. * indicates base categories. Data source: IABS 1975–2001. Observations weighted with length of resp. employment spell.

Figure 2: Regression Coefficients by Deciles: Men Working Full-Time, 1992



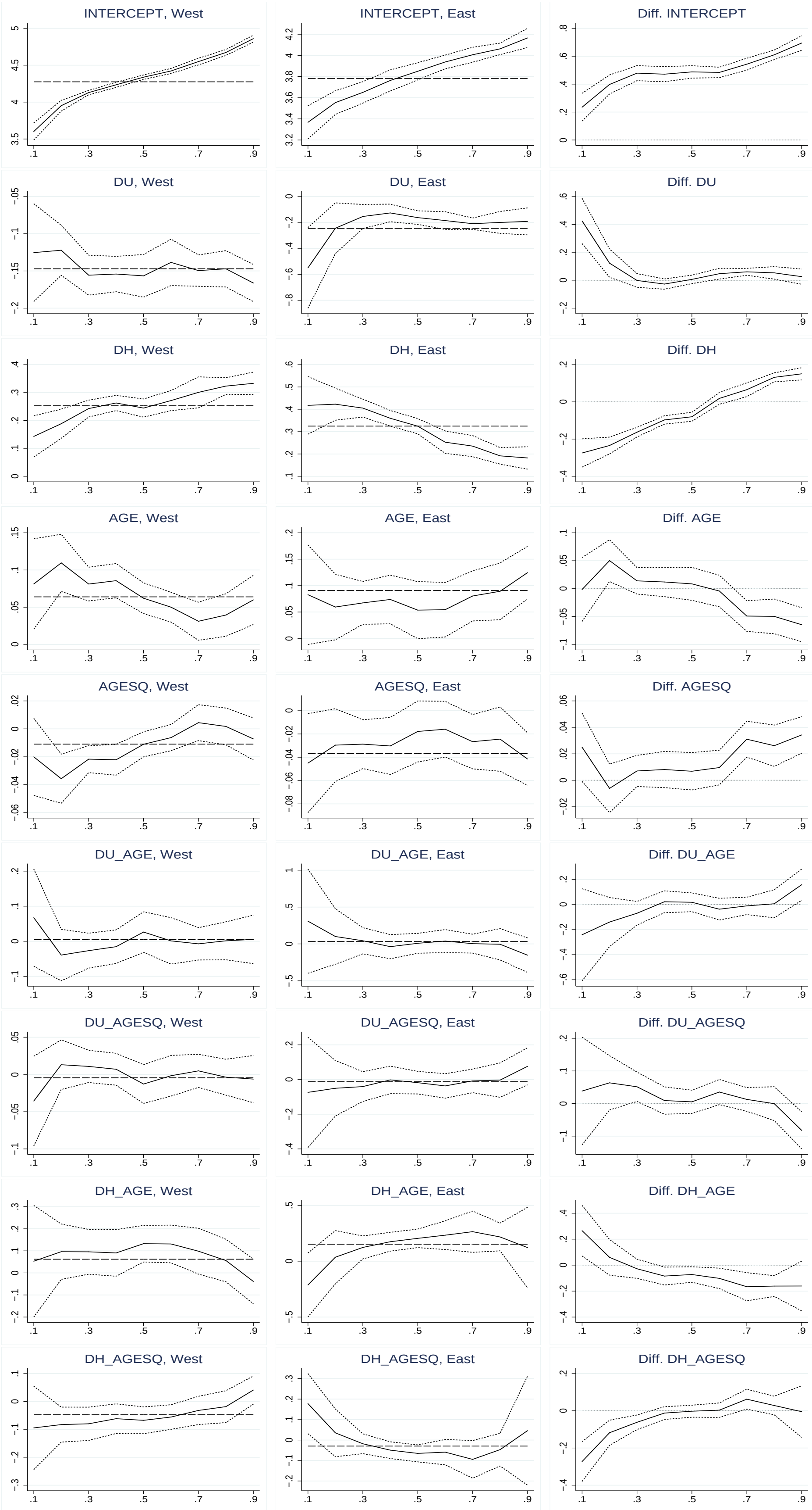
Coefficients from censored quantile regressions. Left panel: West Germany, middle panel: East Germany, right panel: West-East difference. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 3: Regression Coefficients by Deciles: Women Working Full-Time, 1992



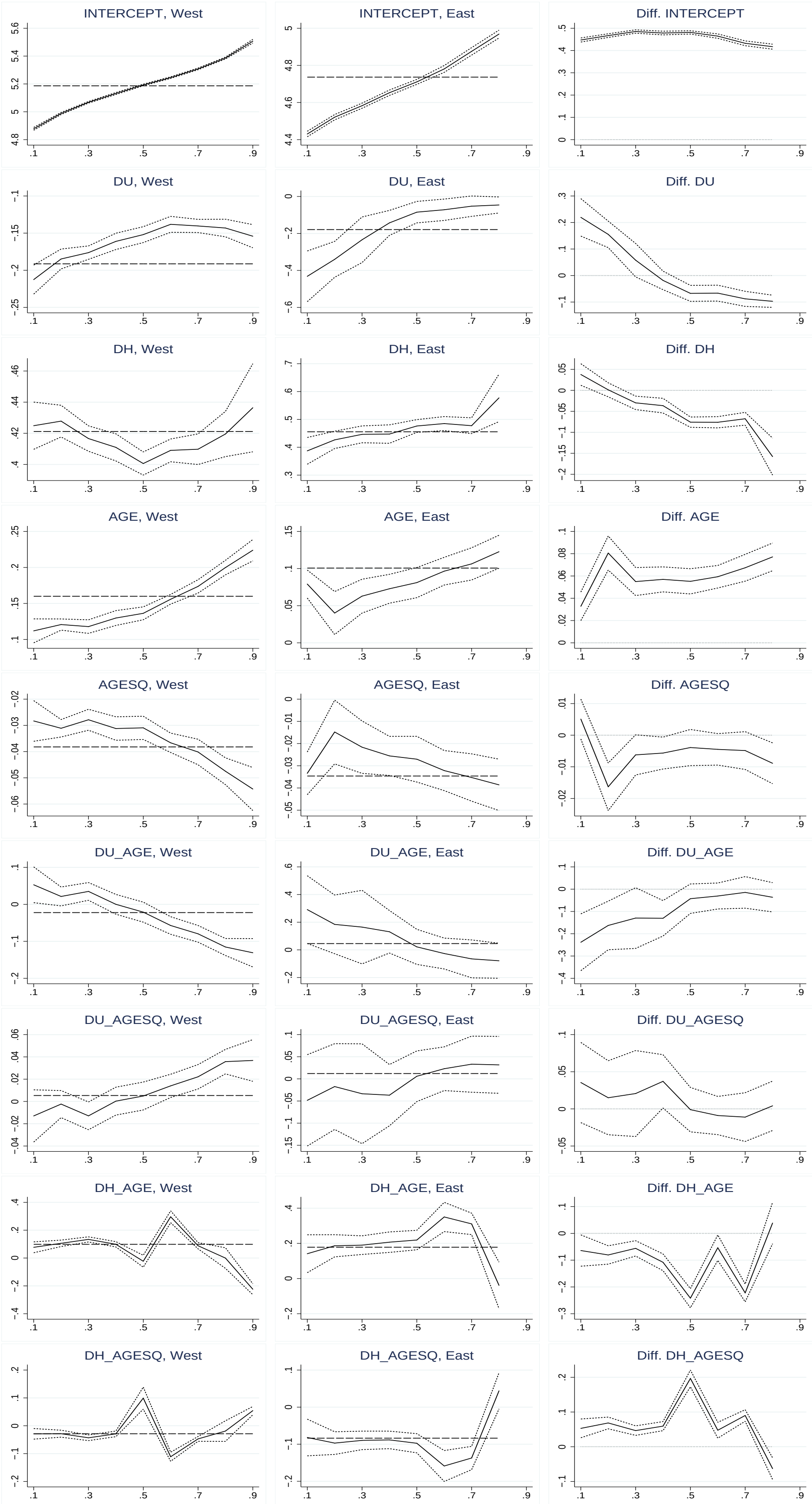
Coefficients from censored quantile regressions. Left panel: West Germany, middle panel: East Germany, right panel: West-East difference. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 4: Regression Coefficients by Deciles: Women Working Part-Time, 1992



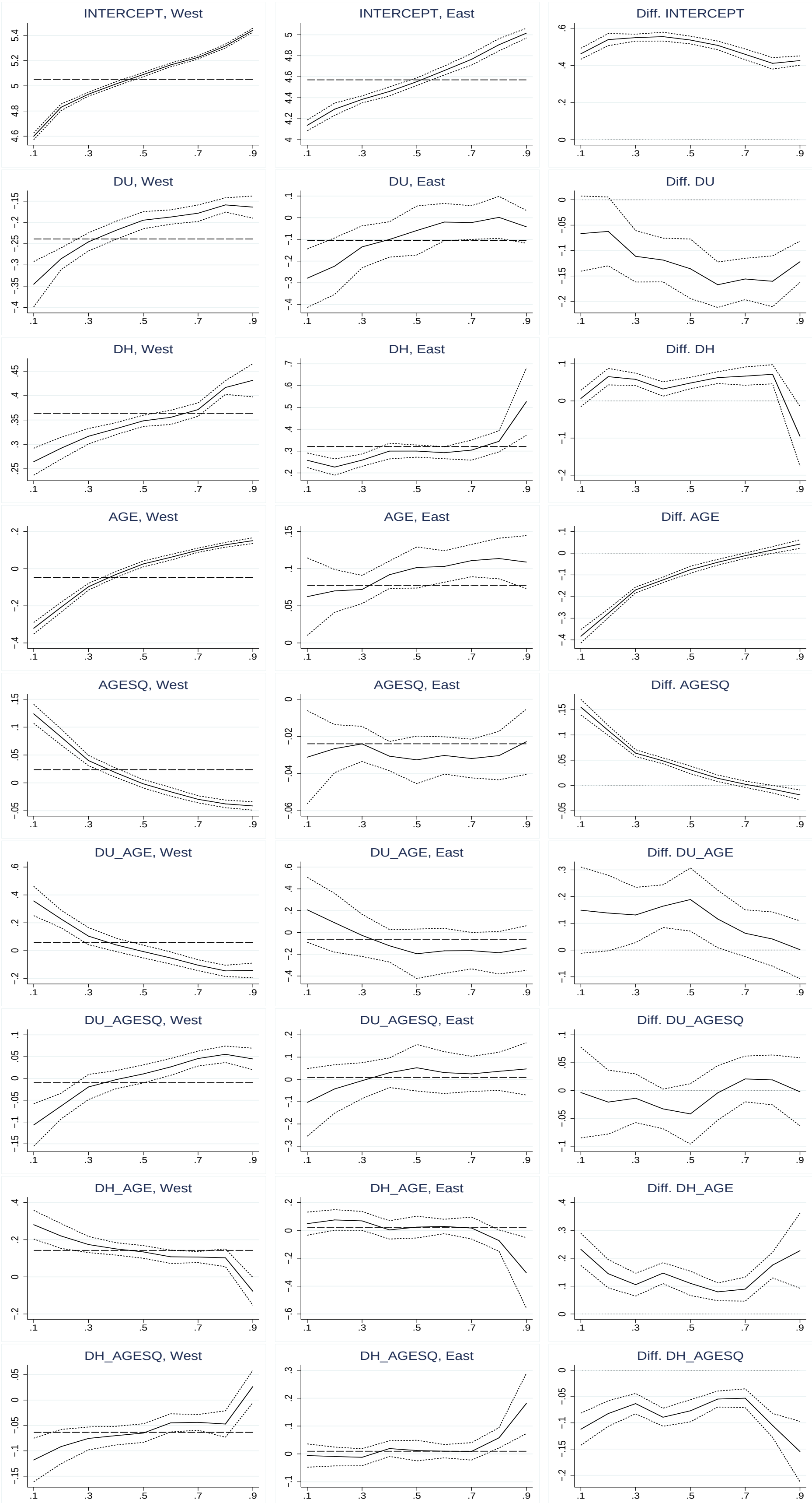
Coefficients from censored quantile regressions. Left panel: West Germany, middle panel: East Germany, right panel: West-East difference. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 5: Regression Coefficients by Deciles: Men Working Full-Time, 2001



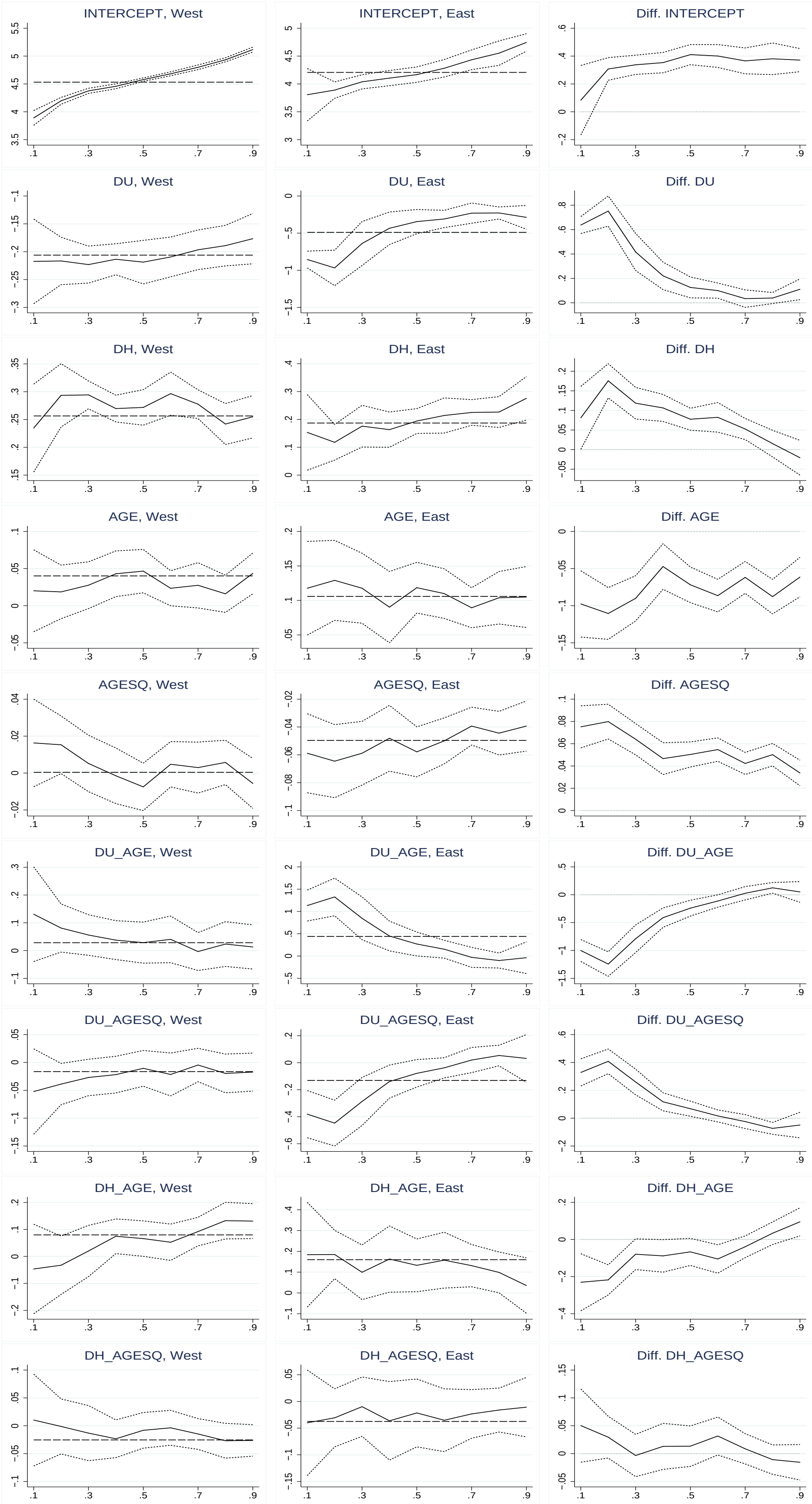
Coefficients from censored quantile regressions. Left panel: West Germany, middle panel: East Germany, right panel: West-East difference. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 6: Regression Coefficients by Deciles: Women Working Full-Time, 2001



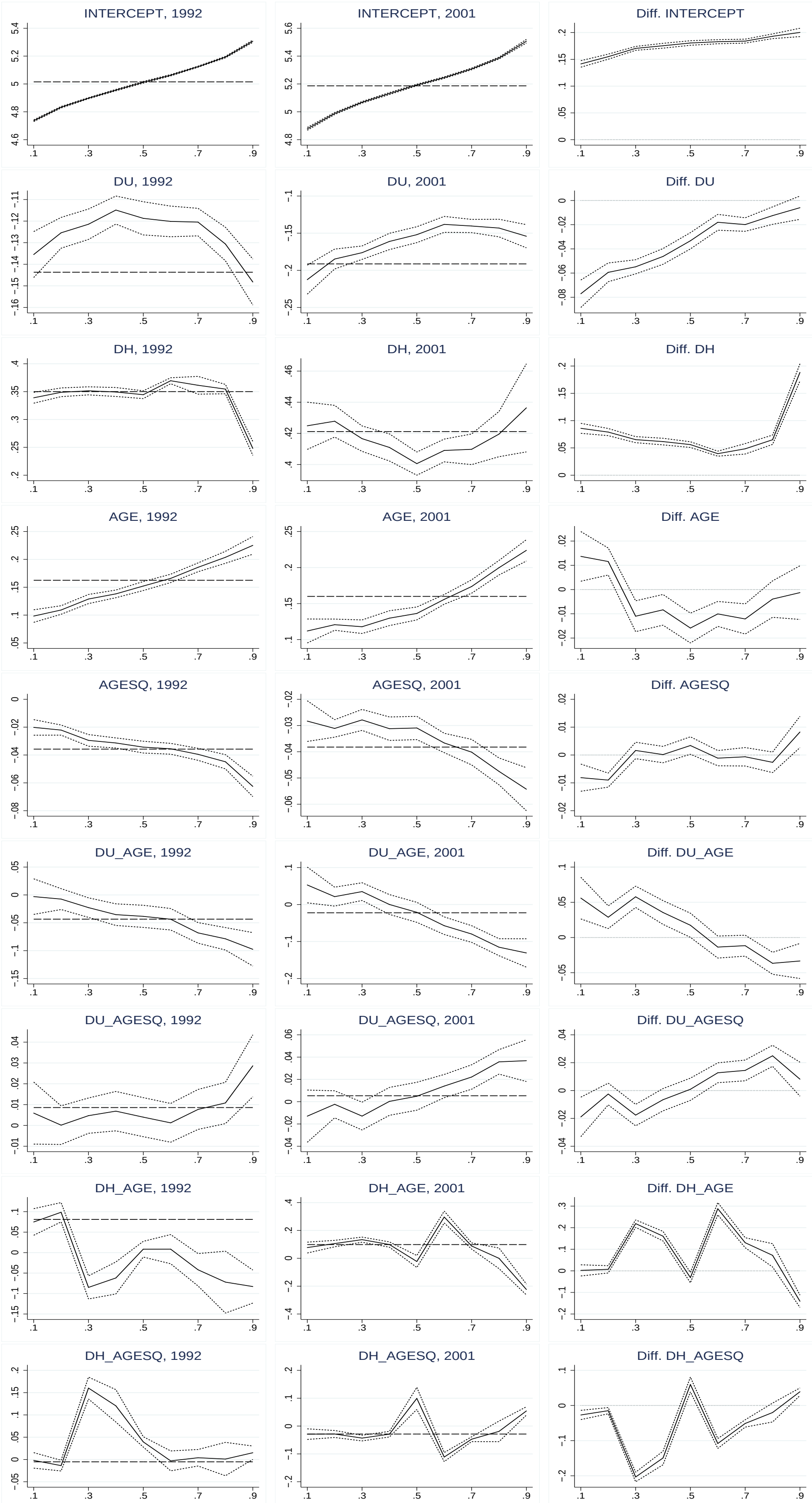
Coefficients from censored quantile regressions. Left panel: West Germany, middle panel: East Germany, right panel: West-East difference. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 7: Regression Coefficients by Deciles: Women Working Part-Time, 2001



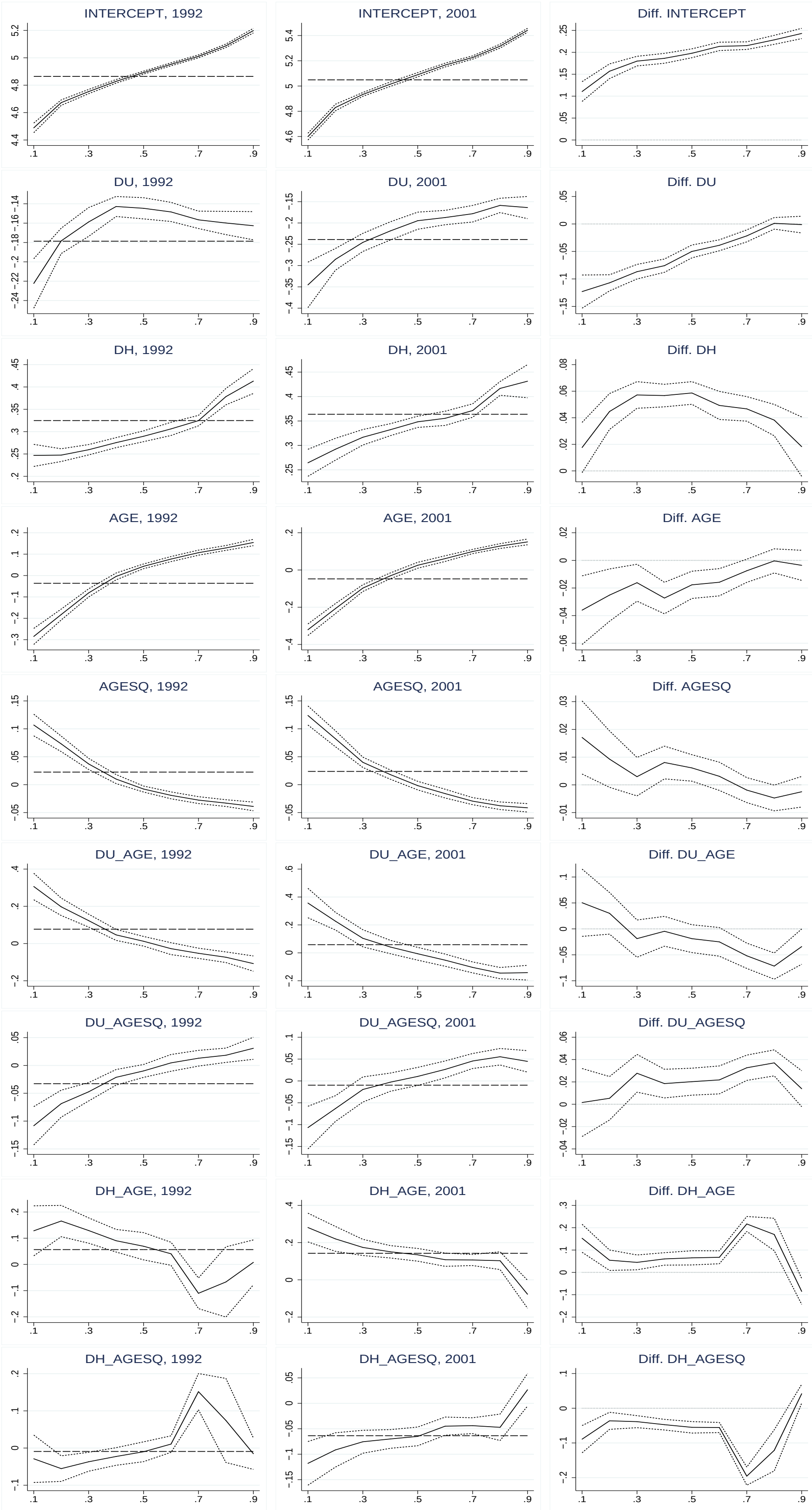
Coefficients from censored quantile regressions. Left panel: West Germany, middle panel: East Germany, right panel: West-East difference. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 8: Regression Coefficients by Deciles: Men Working Full-Time, West



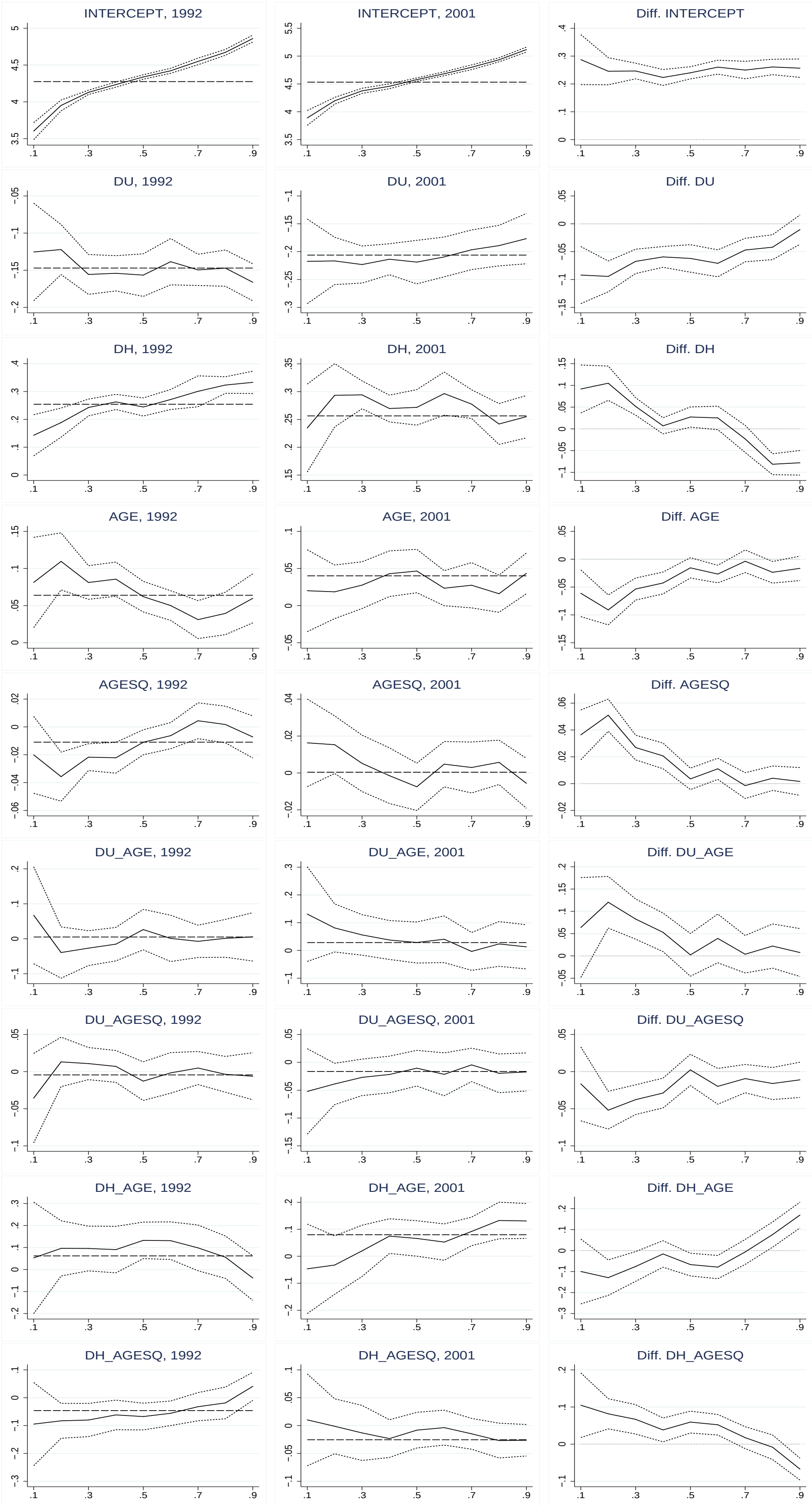
Coefficients from censored quantile regressions. Left panel: 1992, middle panel: 2001, right panel: difference 2001–1992. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 9: Regression Coefficients by Deciles: Women Working Full-Time, West



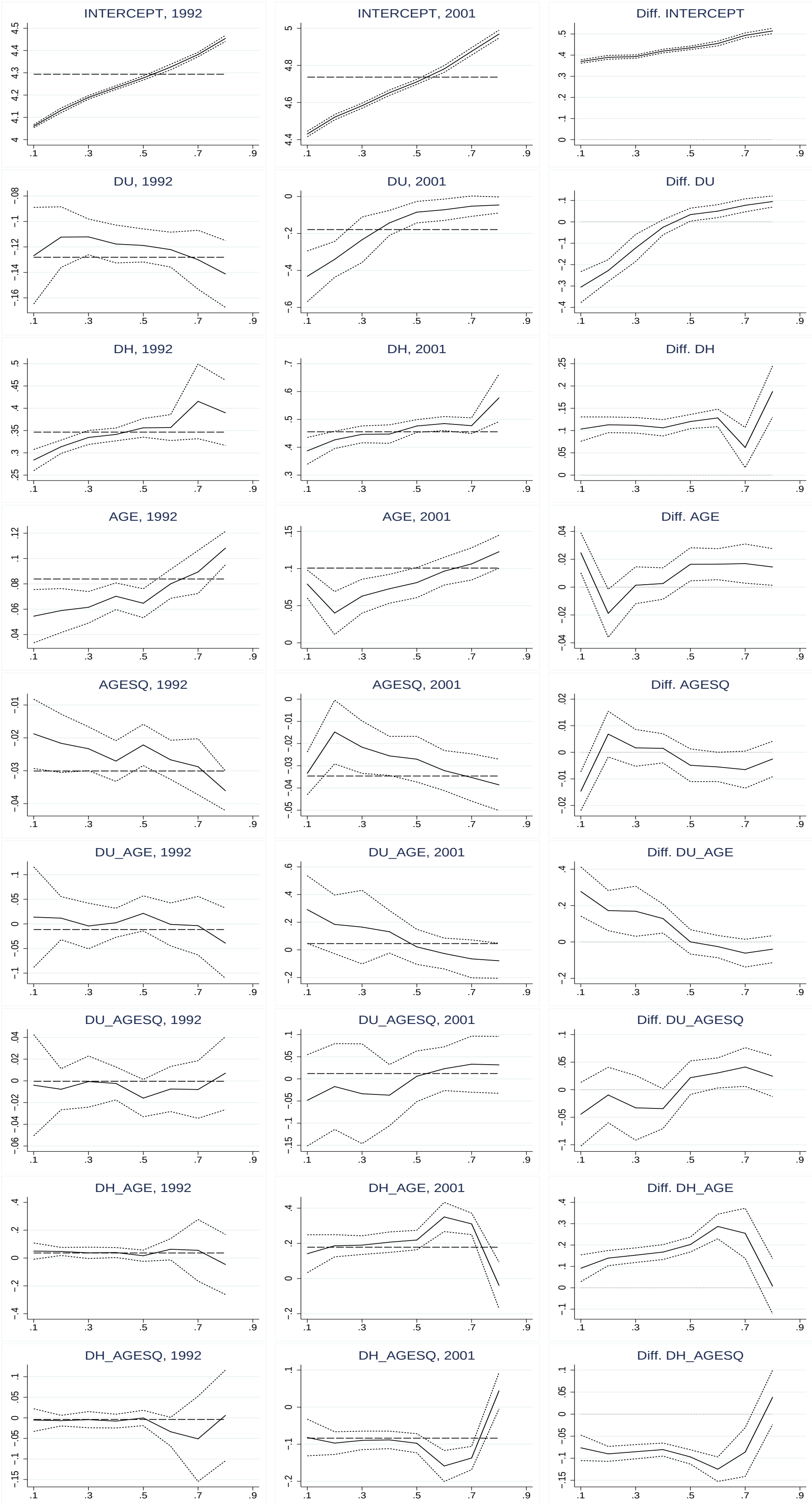
Coefficients from censored quantile regressions. Left panel: 1992, middle panel: 2001, right panel: difference 2001–1992. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 10: Regression Coefficients by Deciles: Women Working Part-Time, West



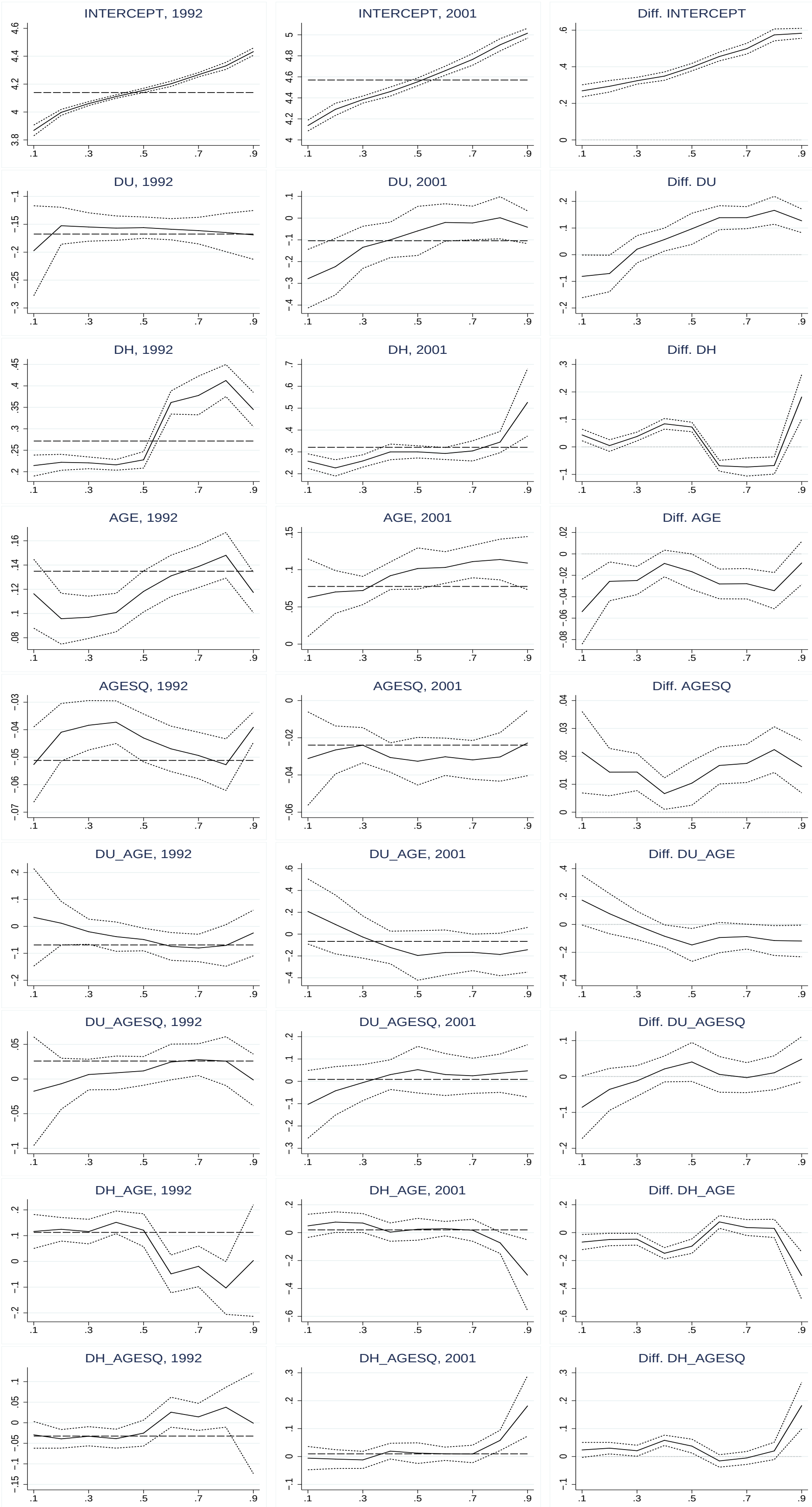
Coefficients from censored quantile regressions. Left panel: 1992, middle panel: 2001, right panel: difference 2001–1992. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 11: Regression Coefficients by Deciles: Men Working Full-Time, East



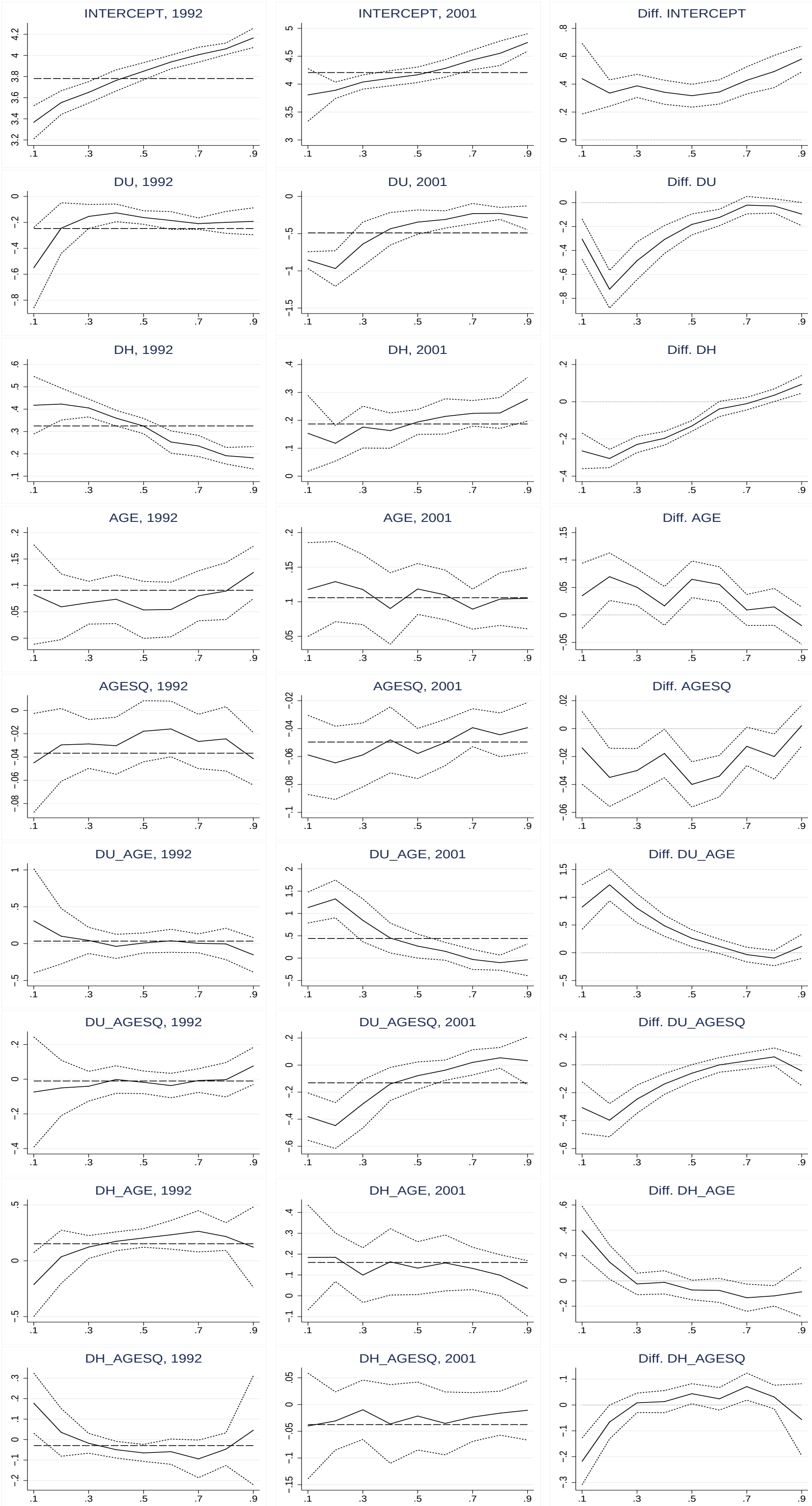
Coefficients from censored quantile regressions. Left panel: 1992, middle panel: 2001, right panel: difference 2001–1992. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 12: Regression Coefficients by Deciles: Women Working Full-Time, East



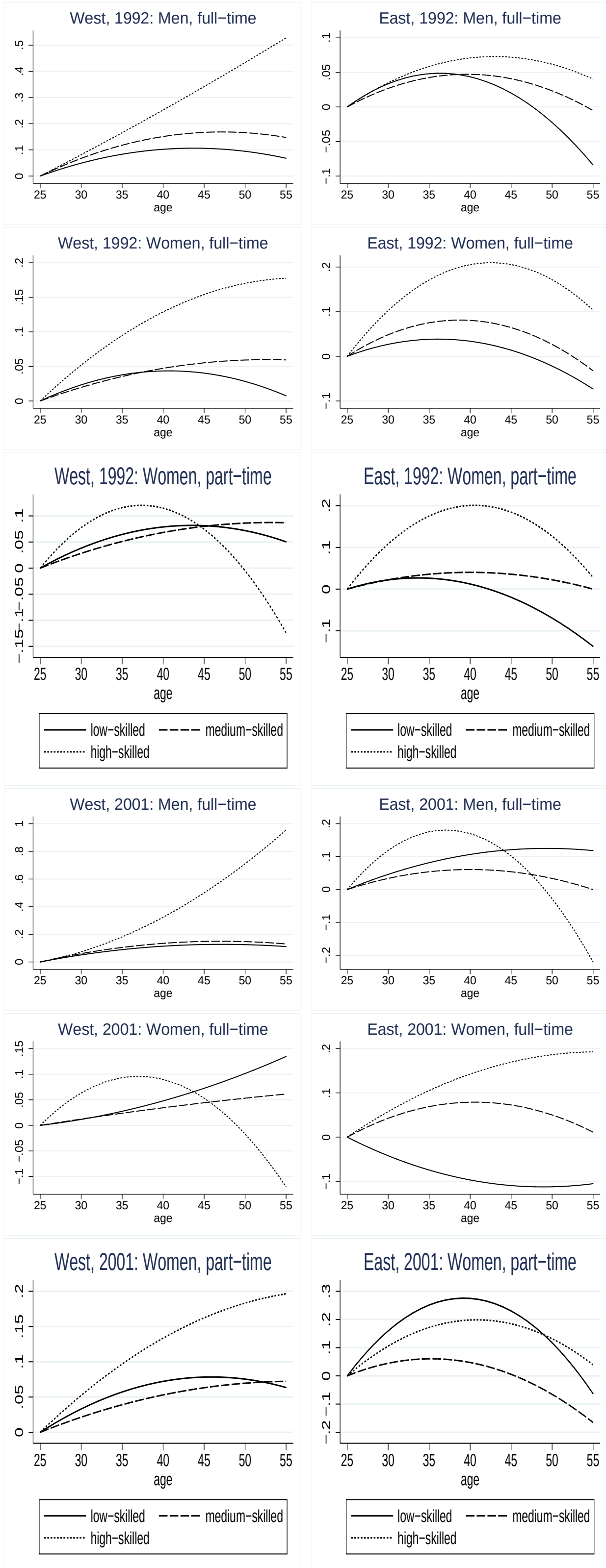
Coefficients from censored quantile regressions. Left panel: 1992, middle panel: 2001, right panel: difference 2001–1992. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 13: Regression Coefficients by Deciles: Women Working Part-Time, East



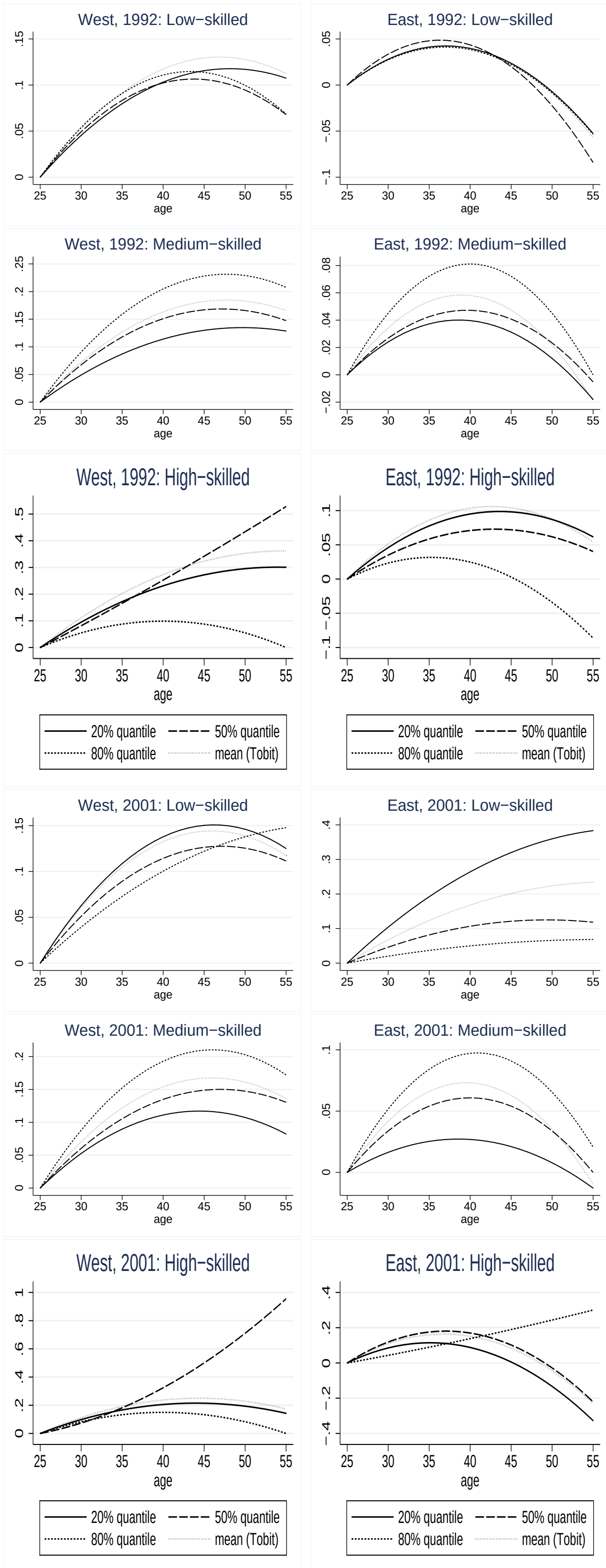
Coefficients from censored quantile regressions. Left panel: 1992, middle panel: 2001, right panel: difference 2001–1992. Dashed lines: 95% confidence bands based on 50 bootstrap resamples. Long dashed lines: Tobit regression coefficients. Data source: IABS 1975–2001.

Figure 14: Age Earnings Profiles for Different Skill Groups



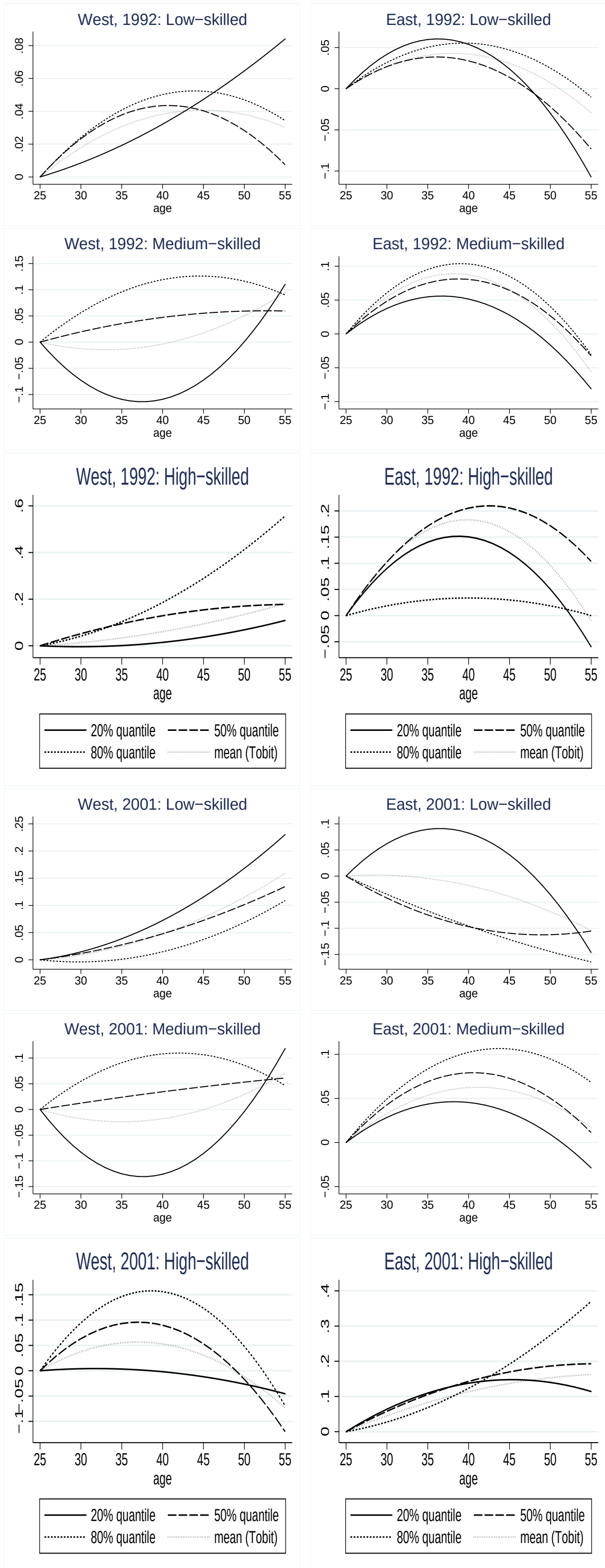
Results of Censored Median Regression. Solid: low-skilled, long dashed: medium-skilled, short dashed: high-skilled. Data source: IABS 1975–2001.

Figure 15: Age Earnings Profiles across the Wage Distribution, by Skill Groups: Men Working Full-Time



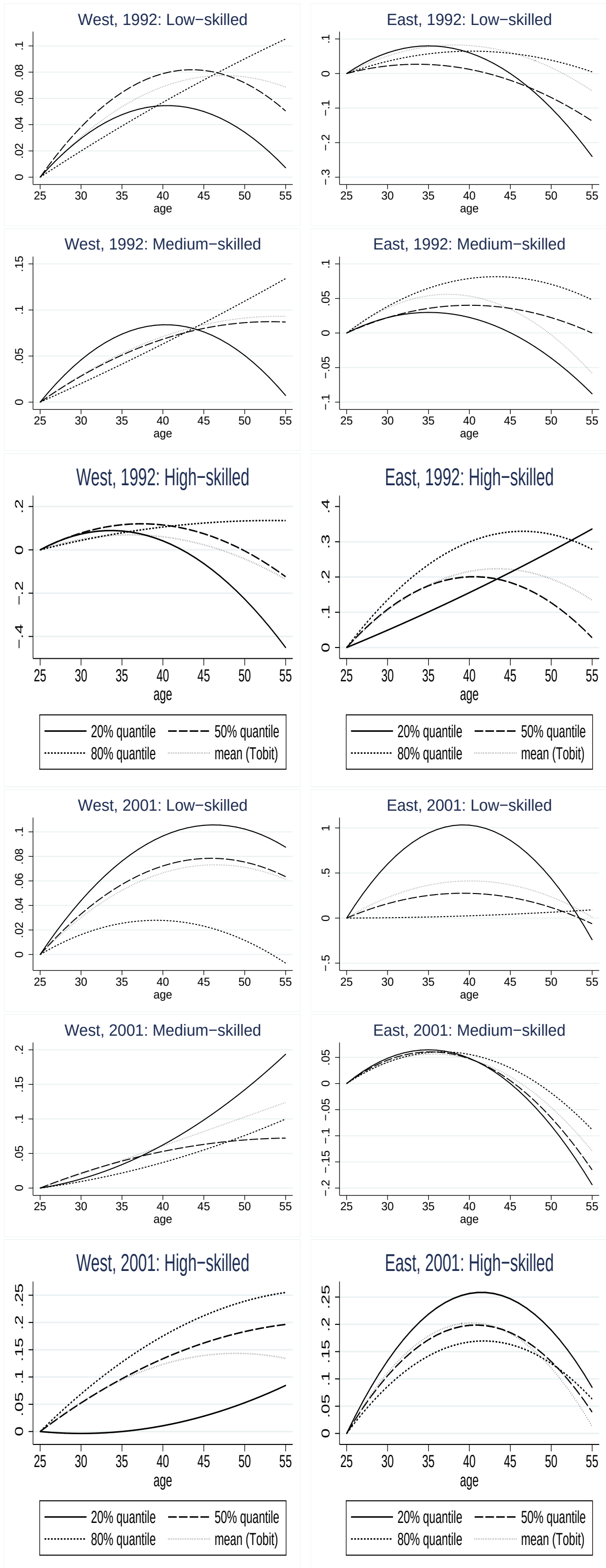
Results of censored quantile regressions. Solid: 20% quantile, long dashed: 50% quantile, short dashed: 80% quantile, dotted: mean (Tobit). Data source: IABS 1975–2001.

Figure 16: Age Earnings Profiles across the Wage Distribution, by Skill Groups: Women Working Full-Time



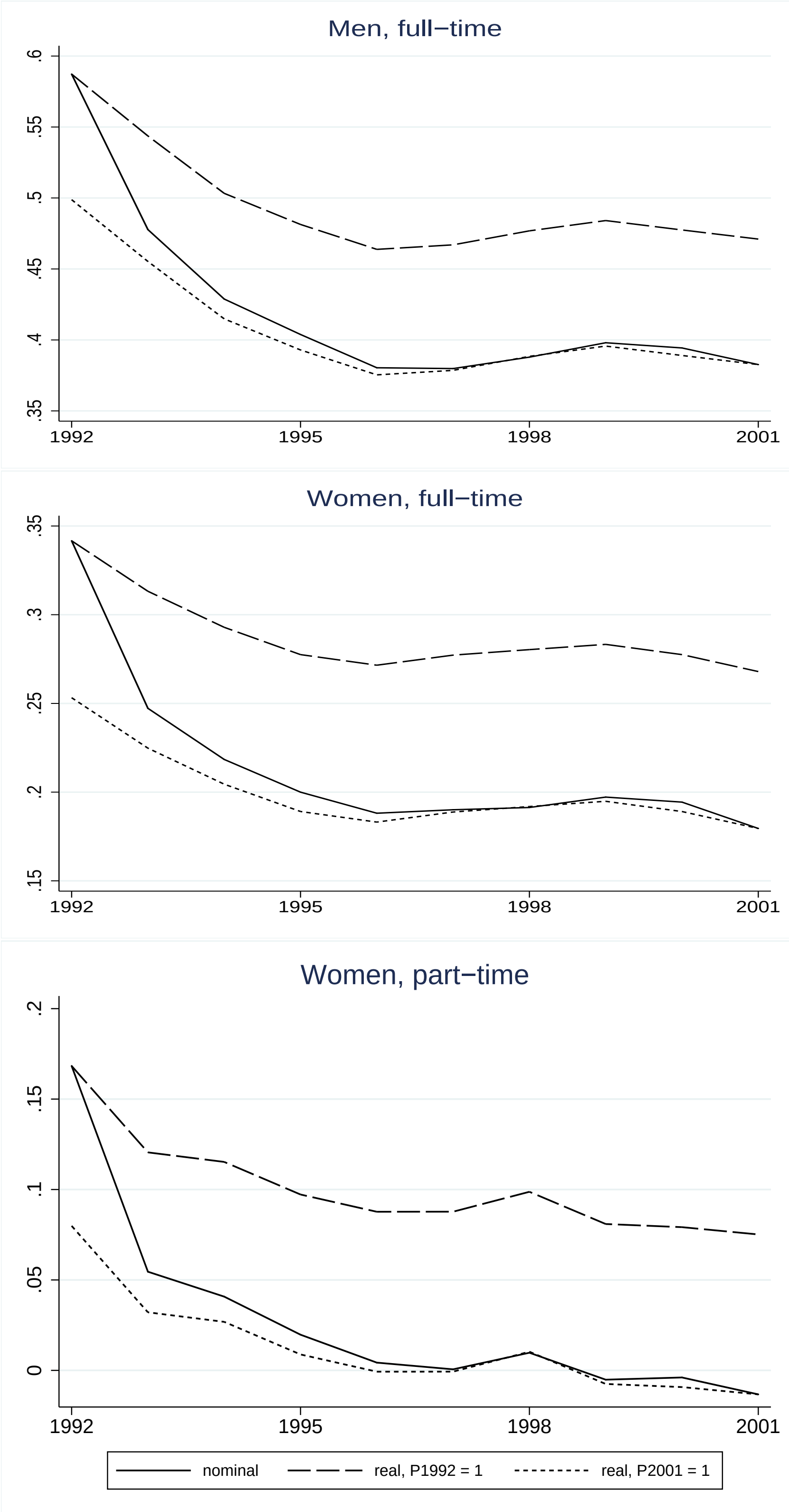
Results of censored quantile regressions. Solid: 20% quantile, long dashed: 50% quantile, short dashed: 80% quantile, dotted: mean (Tobit). Data source: IABS 1975–2001.

Figure 17: Age Earnings Profiles across the Wage Distribution, by Skill Groups: Women Working Part-Time



Results of censored quantile regressions. Solid: 20% quantile, long dashed: 50% quantile, short dashed: 80% quantile, dotted: mean (Tobit). Data source: IABS 1975–2001.

Figure 18: Nominal versus Real West-East Wage Gaps



Differences of mean log wages, estimated by Tobit regressions on a constant. Data source: IABS 1975–2001.

Table 3: Decomposition I: West-East Wage Differences Across the Distribution

	Men Working Full-Time									
1992	10th	20th	30th	40th	50th	60th	70th	80th	90th	Tobit
Observed gap	0.545	0.569	0.578	0.573	0.576	0.590	0.604	·	·	0.587
Predicted gap	0.252	0.571	0.574	0.576	0.582	0.597	0.614	0.647	-0.574	0.598
Char. effect	0.000	-0.002	0.003	0.008	0.010	0.011	0.006	-0.000	0.000	0.015
Coeff. effect	0.252	0.574	0.571	0.568	0.572	0.585	0.607	0.647	-0.574	0.583
2001										
Observed gap	0.380	0.412	0.405	0.417	0.394	0.405	0.405	0.401	·	0.382
Predicted gap	0.291	0.383	0.401	0.409	0.405	0.405	0.414	0.401	0.128	0.384
Char. effect	-0.041	-0.000	0.002	0.010	0.013	0.019	0.022	0.017	0.000	0.013
Coeff. effect	0.332	0.383	0.398	0.398	0.391	0.386	0.391	0.383	0.128	0.371
	Women Working Full-Time									
1992	10th	20th	30th	40th	50th	60th	70th	80th	90th	Tobit
Observed gap	0.219	0.316	0.359	0.368	0.367	0.378	0.380	0.399	·	0.341
Predicted gap	0.322	0.339	0.355	0.372	0.374	0.375	0.373	0.383	0.811	0.348
Char. effect	0.000	-0.084	-0.083	-0.074	-0.066	-0.056	-0.053	-0.063	-0.084	-0.066
Coeff. effect	0.322	0.423	0.439	0.446	0.440	0.432	0.427	0.447	0.895	0.414
2001										
Observed gap	0.149	0.254	0.276	0.234	0.176	0.145	0.143	0.160	0.170	0.179
Predicted gap	0.161	0.280	0.272	0.242	0.188	0.160	0.147	0.145	-0.102	0.178
Char. effect	0.000	-0.014	-0.036	-0.039	-0.044	-0.041	-0.043	-0.049	-0.015	-0.037
Coeff. effect	0.161	0.295	0.309	0.282	0.232	0.201	0.191	0.195	-0.087	0.215
	Women Working Part-Time									
1992	10th	20th	30th	40th	50th	60th	70th	80th	90th	Tobit
Observed gap	0.060	0.186	0.200	0.215	0.212	0.209	0.187	0.150	0.124	0.168
Predicted gap	0.306	0.207	0.215	0.211	0.209	0.196	0.162	0.097	0.106	0.169
Char. effect	-0.008	-0.041	-0.031	-0.019	-0.015	-0.014	-0.019	-0.021	-0.025	-0.026
Coeff. effect	0.314	0.248	0.246	0.231	0.224	0.210	0.182	0.118	0.132	0.196
2001										
Observed gap	-0.042	0.000	0.000	0.000	0.000	0.000	-0.018	0.000	0.013	-0.013
Predicted gap	0.542	0.017	0.005	0.007	-0.003	-0.010	-0.018	-0.021	0.212	-0.009
Char. effect	0.000	-0.018	-0.023	-0.011	-0.009	-0.014	-0.013	-0.012	0.000	-0.010
Coeff. effect	0.542	0.036	0.028	0.018	0.006	0.003	-0.004	-0.008	0.212	0.001

Nominal differences, evaluated at various percentiles. Tobit "observed" gaps estimated by Tobit regressions on a constant. Data source: IABS 1975–2001.

Table 4: Decomposition II: Changes of the Wage Structure, 1992–2001

	Men Working Full-Time									
West Germany	10th	20th	30th	40th	50th	60th	70th	80th	90th	Tobit
Observed change	-0.075	-0.038	-0.023	-0.010	-0.005	0.015	0.029	0.051	·	-0.004
Predicted change	-0.191	-0.048	-0.032	-0.018	-0.005	0.009	0.029	0.055	0.542	-0.005
Char. effect	-0.043	0.012	0.013	0.017	0.024	0.036	0.047	0.054	0.000	0.032
Coeff. effect	-0.148	-0.060	-0.045	-0.035	-0.029	-0.027	-0.017	0.001	0.542	-0.037
East Germany										
Observed change	0.001	0.030	0.061	0.057	0.087	0.112	0.140	·	·	0.111
Predicted change	-0.319	0.051	0.052	0.060	0.083	0.112	0.141	0.212	-0.248	0.120
Char. effect	-0.053	-0.007	-0.008	-0.016	-0.008	0.002	0.002	0.012	0.028	0.006
Coeff. effect	-0.265	0.059	0.061	0.077	0.092	0.110	0.138	0.200	-0.277	0.113
	Women Working Full-Time									
West Germany	10th	20th	30th	40th	50th	60th	70th	80th	90th	Tobit
Observed change	-0.024	0.000	-0.000	0.034	0.044	0.053	0.068	0.074	0.105	0.039
Predicted change	-0.111	-0.001	0.009	0.026	0.040	0.049	0.064	0.091	-0.275	0.031
Char. effect	0.000	0.006	0.013	0.019	0.022	0.026	0.035	0.051	0.034	0.025
Coeff. effect	-0.111	-0.008	-0.004	0.006	0.017	0.023	0.028	0.039	-0.309	0.006
East Germany										
Observed change	-0.043	-0.025	-0.005	0.080	0.147	0.197	0.217	0.224	·	0.113
Predicted change	-0.039	-0.032	0.004	0.067	0.137	0.176	0.202	0.240	0.550	0.113
Char. effect	0.000	-0.033	-0.048	-0.074	-0.033	-0.009	0.008	0.029	0.030	-0.021
Coeff. effect	-0.039	0.001	0.053	0.141	0.170	0.186	0.194	0.210	0.519	0.135
	Women Working Part-Time									
West Germany	10th	20th	30th	40th	50th	60th	70th	80th	90th	Tobit
Observed change	0.112	0.054	0.051	0.064	0.067	0.090	0.103	0.113	0.110	0.079
Predicted change	0.026	0.035	0.046	0.056	0.070	0.087	0.101	0.112	0.101	0.091
Char. effect	0.000	0.015	0.028	0.024	0.022	0.025	0.032	0.040	0.107	0.041
Coeff. effect	0.026	0.020	0.017	0.032	0.047	0.061	0.068	0.071	-0.006	0.049
East Germany										
Observed change	0.126	0.152	0.163	0.191	0.191	0.212	0.220	0.175	0.133	0.172
Predicted change	-0.298	0.136	0.168	0.172	0.194	0.206	0.194	0.143	-0.093	0.182
Char. effect	-0.016	0.008	0.017	0.006	0.007	0.010	0.016	0.015	0.000	0.000
Coeff. effect	-0.282	0.128	0.150	0.166	0.187	0.195	0.177	0.127	-0.093	0.182

Real differences, evaluated at various percentiles. Tobit "observed" gaps estimated by Tobit regressions on a constant. · indicates censored deciles. Data source: IABS 1975–2001.

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