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Heiko Peters

Development of Wage Inequality for Natives and Immigrants in Germany – Evidence from Quantile Regression and Decomposition

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Development of Wage Inequality for Natives and Immigrants in Germany – Evidence from Quantile Regression and Decomposition[*]

June 24, 2008

Author
Heiko Peters

Abstract

To study the development of wage inequality is important for the economic performance as well as for the development of employment. First, I estimate the remuneration to personal characteristics for Germans and immigrants across the wage distribution using quantile regression. My database is the German socio-economic panel for the period 1984-2006. I find a higher inequality between skill groups for Germans relative to immigrants. The returns to skill for the highest educational attainment are higher for Germans across the wage distribution compared to immigrants. But within-group inequality for the group with the highest educational attainment is higher for immigrants. Both groups have concave experience-earnings profiles. One more year of work experience increases the wage more for Germans. Secondly I use the decomposition method of Melly (2006). Decomposition methods are suitable to get further insights into the question as to whether or not the observable differences in the distribution are caused by the difference in the composition or differences in the estimated coefficients. Immigrants have a negative wage gap relative to Germans. The wage gap rises across the distribution and is due to a rising discrimination of immigrants across the wage distribution for the years 1992 and 2006. For the year 1984 the characteristic effect is responsible for the wage gap. Inequality rises for both groups between the year 1992 and 2006. The increase is much stronger for Immigrants. The coefficient effect is mainly responsible for the wage increase across time for both groups.

Keywords: wage inequality, immigrants, Germany, decomposition, quantile regression

JEL Classification: C2, D30, J31

Author

Heiko Peters,   University of Muenster, Institute for Economic Education, Scharnhorststr. 100, 48151 Muenster, Email: heiko.peters@wiwi.uni-muenster.de, phone: +49 251 8324308.

1.   Introduction

On the one hand Germany faces high unemployment rates for low qualified workers. On the other hand the labor demand for highly qualified labor exceeds the supply in some industries. This is caused by the rising demand for highly skilled workers mainly because of globalization and skill biased technical change. Additionally Germany faces the problem of demographic change. Attracting highly qualified immigrants is therefore important for Germany to soften the ageing of the population in the prime working age as well as to reduce the excess demand of highly qualified workers in several industries. But even highly qualified immigrants are worse integrated into the labor market than Germans with the same individual characteristics (see OECD (2007)). Further it is necessary to increase the educational attainment of natives to reduce the demand gap of highly qualified labor.

The investment of individuals into their human capital is crucial for a perpetual and successful integration into the labor market. In the last decades not only the returns to skill for highly qualified workers relative to not highly qualified workers increased in Germany but also the fraction of the highly skilled persons. This rise of returns to skill leads to a widening of the wage distribution. For the period 1970-1990 the wage distribution in West Germany has been extensively studied (see Fitzenberger (1999) and Prasad (2000) and the cited literature therein).[2] They find a relatively compressed wage distribution compared to other countries as well as a stable pattern over time. Since then the dispersion of the wage distribution widens in West Germany. Gernandt and Pfeiffer (2007) use the German socio-economic panel (GSOEP) for the period 1984-2004. They find rising wage inequality since the mid 1990ies for West

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[2] Studies for East Germany are not cited here. For East Germany the wage inequality was very compressed relative to West Germany at the beginning of the 1990ies, because of the egalitarian doctrine of the socialist system. Since then the dispersion of the wage distribution widens faster than in West Germany. Today the dispersion is comparable to West Germany (see Krueger and Pischke (1995), Gernandt and Pfeiffer (2007) and Moeller (2005)).

Germany. The expanding inequality occurred mainly among the lower parts of the wage distribution. Using the decomposition method of Juhn, Murphy and Pierce (1993) they find that residual wage inequality explains approximately two thirds of inequality. Composition and price effect account to roughly one third of inequality. One shortcoming of the analysis of Gernandt and Pfeiffer (2007) is that they concentrate on the mean effect and not on changes across the whole wage distribution. Dustmann, Ludsteck and Schönberg (2007) use the IAB employment sample (IABS) for the period 1975-2001 and find that wage inequality started to increase in the 1980ies mainly at the top of the wage distribution. Since the beginning of the 1990ies, wage inequality started to rise at the lower part of the wage distribution too. Dustmann, Ludsteck and Schönberg (2007) use the decomposition method of Melly (2006) to estimate the coefficient and composition effect. The composition effect plays a dominant role in explaining changes in the wage structure. Kohn (2006) uses the IABS for the period 1975-2001 and finds rising wage inequality in West Germany in the 1990ies. The change in the wage distribution in West Germany over time is mainly due to the characteristic effect calculated with the Machado and Mata (2005) decomposition method.[3]

The comparison of differing wage structures for immigrants and natives is rarely dealt within the literature. Riphahn (2003) uses the GSOEP data for the period 1984-1999. She finds rising wage dispersion in West Germany since the beginning of the 1990ies. The rise in the wage dispersion of immigrants is much stronger than that of Germans. As possible determinants she identifies changing characteristics of the immigrants as well as an increase in the mean returns on higher education. One shortcoming of this analysis is that it focuses on the mean effect and does not use decomposition methods to determine whether the increase in inequality is due to coefficient or composition effect.

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[3] See the related literature overview in Gernandt and Pfeiffer (2007), Dustmann, Ludsteck and Schönberg (2007) and Kohn (2006) for more literature on the evolution of the wage distribution in West Germany.

Since Germany is an immigration country and the share of immigrants in the year 2006 is 8.8%,[4] the development of wage inequality is important. For the economic performance on the one hand and for the development of employment for both Germans and immigrants on the other hand (see Autor, Katz and Kearney (2005)). To the best of my knowledge this is the first study for Germany that uses quantile regression to disentangle differences between Germans and immigrants regarding the remuneration of observable characteristics across the wage distribution. Additionally the decomposition method of Melly (2006) is performed to get insights into the question as to whether the differences in the observable characteristics are due to a difference in the estimated coefficients or because of a differing composition of the workforce. I focus on the differences between Germans and immigrants in West Germany as well as on the changes over time for each group. I compare the changes between 2006 and 1984 as well as between the two sub periods 1984-1992 and 1992-2006.

The remainder of the paper is organized as follows: The next section describes the data and provides some summary statistics. The subsequent section presents the empirical framework used for estimation and the empirical results of the regression. The final section concludes.

2.   Data and Summary Statistics

I use the latest GSOEP data for the period 1984-2006. The GSOEP is an annually conducted household survey for Germany.[5] The data is limited to men, aged 18-65, not in education, working at least 35 hours per week and living in West Germany[6]. The individual real hourly

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[4] 18.6% of the population are persons with migration background in the year 2006.

[5] See Wagner, Frick and Schupp (2007) and Haisken-DeNew and Frick (2005) for a detailed description of the GSOEP.

[6] The immigration sample D for the period 1984-1993 is restricted to West Germany due to few observations in the eastern states of Germany (see Pannenberg (2005), p. 180).

wage is calculated by deflating the nominal monthly gross labor earnings with the harmonized consumer price index based on the year 2000 and divided by monthly hours worked. I dropped all observation below the first percentile and above the ninety-ninths percentile of the real log hourly wage to correct for outliers. After correction for missing values the data set contains 3188 Germans (1992: 2120; 1984: 2650) and 460 immigrants (1992: 831; 1984: 1294) in the year 2006. Using the cross section weights, number of observations are 11m Germans (1992: 13.3m; 1984: 12.8m) and 1.25m immigrants (1992: 1.95m; 1984: 1.26m) in the year 2006 for West Germany.[7]

Table 1 displays the summary statistics for Germans and immigrants. Since I focus on the changes in the wage distribution between the years 1984 and 2006 as well as the two sub periods 1984-1992 and 1992-2006 the descriptive statistics are displayed for 1984, 1992 and 2006. The age composition for Germans is quite stable between 1984 and 1992 but increases in the last period. For immigrants the average age increases in each period.

[Table 1 about here]

Formal education is a crucial determinant for the wage level. According to years of education, in 2006 Germans were 1.57 years longer in education than immigrants. Since 1984 the years of education increased by approximately 10 percent for both groups, but in absolute values the increase is higher for Germans. To get a closer insight into the structure of formal education I turn to the ISCED-1997 classification of educational attainment. Since higher education yields higher returns to skill, the highest educational categories are critical. The share of Germans who hold the two highest educational attainments is 36 percent in the year 2006. For

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7 According to the official statistics of the federal statistic office in Germany the full-time employed population (working 32 hours per week or more) of men aged 20-65 in West Germany is 12.49m in the year 2006 and 15.31m in the year 1992 (no data available for the year 1984). The difference between the value of the official statistics and my observations using cross section weights is 0.24m in the year 2006 and 0.06m in the year 1992 and is due to the slightly different definition of full time employment and age structure. Therefore the sample is representative.

immigrants it is 12 percent less. Since 1984 the share for Germans increased by 10 percentage points, the share for immigrants by 14 percent points. The mean real log hourly wage is higher for Germans compared to immigrants. This negative wage gap could be caused by the higher share of immigrants with a lower educational attainment relative to Germans or to a differing remuneration of skill for immigrants and Germans. For Germans, the real monthly gross labor income is higher at the fifth and ninth decile in every year. For both Germans and immigrants the wage at the fifth and ninth decile increases in the period 1984-2006. At the first decile average labor income is the same for Germans and immigrants for the years 1984 and 1992. Additionally, it increases for both groups in this period. For the period 1992-2006 the labor income decreases for both groups, but stronger for immigrants. The interdecile range is reduced by 0.1 between 1984 and 1992 for Germans and increases by 0.39 until 2006. The upper part of the wage distribution is rather stable for Germans, but the dispersion in the lower part of the distribution increases between 1992 and 2006 after a small decline. Immigrants are characterised by a strong increase in the upper part and a rise in the lower part of the distribution. The interdecile range for immigrants exceeds that of Germans in the year 2006 by 0.33. In the year 1984 it was 0.6 higher for Germans. Immigrants reside 14.76 years in Germany in the year 1984. The time since immigration rises to 23.70 years in the year 2006. Immigrants coming to Germany are 3.66 years younger in the year 2006 compared to 1984.

To get more insights into the dispersion of the distribution, the kernel density estimations of the real log hourly wage corrected by the median real log hourly wage are plotted in figure 1 for the years 1984, 1992 and 2006 for Germans on the left side and immigrants on the right side.

[Figure 1 about here]

The dispersion of the log real hourly wage distribution increases for Germans between the years 1992 and 2006. For the first period the compression of the wage distribution increases slightly. The wage distribution for immigrants is more compressed in the years 1984 and 1992 relative to Germans, moreover the compression increases slightly for immigrants. Since 1992 there is a sharp increase of the dispersion of the real hourly wage distribution for immigrants.

3.   Empirical Methodology and Results

3.1   Econometric Specification

I now turn to my regression framework to shed light on the determinants of the observed real log hourly wages. The estimation of the following earnings function (equation 1) is performed.

(1) $y_i = x_i^{'} \beta_q + u_i$

i is the person index and q the quantile. The qth quantile regression estimator $\hat{\beta}_q$ minimizes over β_q (equation 2).

(2) $Q_N(\beta_q) = \sum_{i:y_i \geq x_i^{'}\beta_q}^{N} q \mid y_i - x_i^{'}\beta_q \mid + \sum_{i:y_i < x_i^{'}\beta_q}^{N} (1-q) \mid y_i - x_i^{'}\beta_q \mid$

If the observations are above or equal to the regression line they are weighted with (q) or (1-q), respectively. The optimization problem is solved using linear programming methods since the function is not differentiable (see Koenker (2005)).

I estimate the quantile regression separately for different labor market segments. The segments will be immigrants[8] and Germans as well as different points in time. For all segments I estimate the following econometric specification (equation (3) separately.[9]

$$
\begin{aligned}
(3) \quad lhwage_{i,s} = {} & \beta_{0,q} + \beta_{1,q} isced1_{i,s} + \beta_{2,q} isced2_{i,s} + \beta_{3,q} isced4_{i,s} + \beta_{4,q} isced5_{i,s} + \\
& \beta_{5,q} isced6_{i.s} + \beta_{6,q} emp\exp_{i,s} + \beta_{7,q} emp\exp^2_{i,s} + \beta_{8,q} region_{i,s} + u_{i,s}
\end{aligned}
$$

i is the index for an individual in the labor market segment s and q is the quantile. The dependent variable is the real log hourly wage and the independent variables are a set of personal characteristics that determine the real log hourly wage. Educational attainment according to the ISCED-1997 classification, potential labor market experience[10], the second order polynomial of potential labor market experience and the geographic region are the independent variables. $u_{i,s}$ is the error term. Reference categories for educational attainment are middle vocational (ISCED-3) and the base group for the region dummy is north Germany.

After the regression framework to analyze the remuneration of observable individual characteristics of the real log hourly wage in different segments and across the wage distribution, I turn to decomposition. Decomposition methods are suitable to get further

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[8] Since the risk to be unemployed is higher for immigrants than for Germans with the same individual characteristics (see OECD (2007)) there could be a selectivity problem. Immigrants in my sample could be a positively selected group. Therefore there could be an upward bias in my estimation.

[9] Additionally I estimated specifications with industry dummies, definition of other skill groups (low skilled, medium skilled and high skilled) as well as age groups instead of potential work experience. Since the explanatory power of the regression is reduced when using industry dummies and they are mainly insignificant I did not use them in my specification. My results are robust to the other specification with three skill groups and age groups. I also performed regressions with immigrant specific variables like years since migration, age at immigration or language proficiency. Because I cannot use immigrant specific variables when decomposing the log real hourly wage difference between immigrants and Germans, I did not use them also in the estimation for immigrants. Without the immigrant specific variables the estimation results of the exogenous variables of equation 1 for immigrants are qualitatively the same and therefore robust. To check the robustness of my estimates I also used slightly different periods (1985 (1986) – 1991 (1993) – 2004 (2005)) for the estimations. The results are qualitatively the same.

[10] Potential labor market experience is defined by age-years of education-6 (see Mincer (1974), p. 84). Years of education are calculated as schooling plus occupational training (see Haisken-DeNew and Frick (2005), p. 69).

insights into the question as to whether observable differences in the distribution are caused by the difference in the composition or differences in the estimated coefficients. To decompose the difference of the log hourly wages between two points in time for natives and immigrants as well as the difference between natives and immigrants into a coefficient and characteristics effect, I use the method by Melly (2006).[11] This estimator is numerically identical to that of Machado and Mata (2005) if the number of simulations goes to infinity. One shortcoming of Melly's (2006) decomposition method is that it ignores general equilibrium effects, because changes in quantities do not affect changes in prices.

3.2   Estimation Results

To get insights into the remuneration of the personal characteristics I will first present the results of quantile regression. Secondly, I will present the findings of the decomposition. The quantile slope coefficient[12] and the upper and lower 95% confidence bands are displayed in figures 2-5 separately for Germans and immigrants. The cross section results for the year 1984 are displayed on the left, for the year 1992 in the middle and on the right for the year 2006. In the following I will concentrate on the main differences between immigrants and Germans.

Figure 2 and figure 3 illustrate the quantile regression results for Germans and immigrants for the educational attainment categories according to the ISCED-1997 classification. Immigrants holding ISCED-1 as their highest educational degree earn about 10% less at the first decile than the base group in the year 1984. From the first decile to the median the wage is reduced by 7% and turns insignificant at the upper half of the wage distribution. This pattern changed

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[11] See Melly (2006) for the framework to estimate the characteristics and coefficient effect.

[12] Since I estimated a semi logarithmic regression model I corrected all estimates with $\beta = \exp(\beta) - 1$ before plotting them.

in the following years. The difference turns negative at the upper half of the wage distribution and insignificant at the lower half in the year 1992. There is no significant difference in the year 2006. The negative difference for Germans is approximately 20% to the seventh decile in the year 1984. 1992, only at the lowest and upper deciles the wage gap is negative. The difference is insignificant for Germans in the year 2006. For ISCED-2 education, the wage difference is negative for Germans in the year 1984 at a level around 7% and 1992 at a level of 5% across the wage distribution. It turns insignificant for the year 2006. Immigrants holding the educational degree ISCED-2 earn less in the lower half of the wage distribution in the year 1984. The negative wage gap is reduced from 12% at the first decile to 2% at the median. In the year 1992 the negative gap is about 6% across the whole distribution and there is no significant difference in the year 2006. Germans with the educational attainment of ISCED-4, ISCED-5 and ISCED-6 earn more than the base group. Germans holding ISCED-4 earn about 15% more than the base group across the wage distribution in the year 1984 and 1992.Returns on educational attainment ISCED-4 increased by 10% from 1992 to 2006. For ISCED-5, the wage gap for Germans is 9% at the first decile and increases to 14% at the ninth decile in the year 1984. Because the wage difference at the first decile is 1% and increases to 17% at the ninth decile, within-group dispersion increases in the year 1992 relative to 1984. This within-group dispersion reduces to 2.5% in the year 2006 at a level of 15% across the distribution. Germans with the highest educational attainment have the highest positive wage difference with over 50% in the year 1984 and remain at this level. For this group, within-group inequality decreased between 1984 and 2006 due to the change of the positive sign of the slope of the curve. The interdecile range is 17% in the year 1984 and changed the sign to -6% in the year 2006. For immigrants there is no significant difference between the ISCED-4 category and the base group. Because of the high confidence bands the findings for ISCED-5 are only significant for the year 1984. In the upper part of the distribution and at the lowest

two deciles immigrants earn between 20 and 30% more than immigrants from the base group. The wage gap for immigrants increases across the wage distribution for ISCED-6 at all points in time. In 1984, the wage difference at the first decile is -16% and increases to 74% at the ninth decile, in the year 1992 from 15% to 50% and in the year 2006 from 8% to 51%. The slope of the curve is steep for the highest educational attainment in all three years and therefore increases within-group inequality for this group. But it is reduced from 1984 to 2006 and wage inequality within this group declined. Especially the highest educational attainment categories are crucial for the economic success of an individual. For the highest educational attainments the within-group dispersion is smaller for Germans relative to immigrants and the returns are higher for Germans for the most parts of the wage distribution. Only at the ninth decile in the years 1984 and 2006 returns are higher for immigrants.

[Figure 2 and figure 3 about here]

In figure 4 and figure 5 the quantile regression results for Germans and immigrants for potential labor market experience, being married, living in south Germany and the constant are plotted. The experience-earnings profiles are concave for both groups. On the whole one year of potential work experience raises the wage of Germans more than that of immigrants in every cross section and across the wage distribution. Being married raises the wage for Germans by approximately 10% across the wage distribution in the year 1984 and 2006. In the year 1992 being married raises the wage by 12% at the first decile. This value is reduced across the wage distribution to an insignificant difference of 1% at the ninth decile. Being married increases the wage for immigrants in the years 1984 and 1992 but not in the year 2006. The effect of being married is higher for Germans for all years and across the whole wage distribution. To live in south Germany raises the wage for Germans by approximately 5% in the year 1992 and 2006. This difference is insignificant in the year 1984. For immigrants living in south Germany the wage is about 10% higher from the third until the

seventh decile relative to immigrants residing in North Germany in the year 2006. For the year 1984 and 1992 the wage gap is insignificant. For the base group, according to the constant of the estimation, wage inequality within this group rises for Germans in both periods. For immigrants it is reduced in the first period and stays at this level in the second period.

[Figure 4 and figure 5 about here]

After determining different remunerations of personal characteristics for Germans and immigrants in the years 1984, 1992 and 2006 across the wage distribution, I turn to the decomposition method of Melly (2006) to determine whether the wage difference between Germans and immigrants as well as the differences across time for Germans and Immigrants are due to the coefficient effect or due to a differing composition of the labor force. In figures 6-8 the results of the decomposition of the wage difference between Germans and immigrants and of the difference in time for both groups are plotted. The estimations of the total log wage effect, the log wage effects of coefficients and the log wage effect of characteristics are depicted. In each of the graphs the upper and lower 95% confidence bands are plotted. Figure 6 shows the decomposition of the immigrant-German wage differences across the wage distribution for the years 1984, 1992 and 2006. For the year 2006 the wage gap between immigrants and natives increases only slightly across the wage distribution. At the first and second decile the negative difference is insignificant. From the third to the ninth decile the negative wage gap is between 9 and 12%. The difference between immigrants and natives can be explained by the coefficient effect. The interpretation of the coefficient effect is typically discrimination because the remuneration of personal characteristics is different between the two groups holding the personal characteristics constant. The characteristic effect is insignificant across the whole wage distribution. For the years 1984 and 1992 the negative wage gap between Germans and immigrants increases across the wage distribution. The wage

gap is insignificant for the lower part of the wage distribution for 1992. At the fifth decile it turns significant. The wage gap increases from 7% at the median to 16% at the ninth decile. The coefficient effect is responsible for the wage gap. For the year 1984, immigrants earned 5% more than Germans at the first decile. Across the wage distribution the wage gap turns insignificant negative at the third decile. The negative wage difference increases from 3% at the fourth decile to 14% at the ninth decile. In contrast to the years 1992 and 2006 the wage gap is explained by the characteristic effect. Only at the seventh and eighth decile the effects of coefficient is significant. The wage gap gets more equal across the wage distribution from 1984 to 2006. The wage gap is reduced in the upper part of the wage distribution and increased in the lower half of the wage distribution. This change is mainly because of the effect of coefficients across the wage distribution.

[Figure 6 about here]

In figure 7 the changes of the wage distribution for Germans between 1984 and 2006 and for the two sub periods 1992-2006 and 1984-1992 are plotted. The positive wage growth increases until the seventh decile from 11% to 30% across the whole distribution between 1984 and 2006. Then the wage growth declines by 4% to 26% at the ninth decile. Approximately two thirds of the wage growth can be explained by a swell of the returns on the personal characteristics. One third of the wage increase is due to the characteristic effect. Splitting the wage growth in the two sub periods yields a different development. In the first period between 1984 and 1992 the wage growth is higher in the lower part of the distribution relative to the upper part. The wage increase can totally be explained by the coefficient effect. Between 1992 and 2006 the wage declined at the first decile by 8% and at the second decile insignificantly by 2%. This decline is due to the coefficient effect. Wage growth turns insignificantly positive at the third decile and increases from the fourth decile on across the distribution from 5% to 11%. This increase is mainly caused by the characteristic effect.

[Figure 7 about here]

The wage growth for immigrants in time across the distribution is plotted in figure 8. The wage difference between the years 1984 and 2006 rises across the wage distribution from no significant difference to 31%. This increase can be explained mainly by the coefficient effect. The characteristic effect is solely significant at the eighth decile. The change in the two sub periods is markedly different. In the first period from 1984 to 1992 the wage growth is higher in the lower part of the wage distribution relative to the upper part. The increase can be explained by the coefficient effect. For the period from the year 1992 to 2006 the wage decreases at two lower deciles. There is no significant change in the middle of the distribution. From the sixth decile on, the wage growth rises from 6% at the sixth decile to 18% at the ninth. At the lower part of the distribution the negative wage change is caused by the coefficient effect. In the middle and the upper part of the wage distribution the characteristic and the coefficient effect are insignificant.

[Figure 8 about here]

From 1984 to 2006 the German wage structure raises more from the first to the seventh decile. Only at the two highest deciles the wage increase is higher for immigrants. For both groups the coefficient effect is the driving force of this development.

4.   Conclusion

Educational attainment rises throughout the period from 1984 to 2006. The rise in educational attainment improves the economic performance for both groups since the wage level is the higher and the unemployment rate the lower the higher is the educational attainment. Performing quantile regression allows to determine the remuneration of personal

characteristics of Germans and immigrants. The spread between different skill groups according to the ISCED-1997 classification is higher for Germans than for immigrants. Especially the return to skill for the highest educational attainment is higher for Germans relative to immigrants. Between-groups inequality is higher for Germans compared to immigrants. But within-group inequality is higher for immigrants relative to Germans. This could be due to the heterogeneity of the immigrants. The experience-earnings profiles are concave for both groups and an additional year of experience raises the wage more for Germans relative to immigrants.

In order to determine whether the changes in the wage distribution are explained by the changing composition of the workforce or by differences in the estimated coefficients, the decomposition method of Melly (2006) is performed. The wage gap between immigrants and Germans rises through the wage distribution from no significant difference at the first decile to a negative gap of 12% in the year 2006. For the years 1984 and 1992 the rise in the wage gap across the distribution was stronger than in the year 2006. For the years 1992 and 2006 the wage growth is explained mainly by the coefficient effect and, therefore, by discrimination – which rises across the wage distribution. The variance in the composition of the workforce has no significant effect on the wage difference. In contrast to the years 2006 and 1992 the variance in the composition of the workforce is responsible for the wage gap in the year 1984. Over time the negative wage gap gets more equal across the wage distribution.

Wage inequality rises for Germans and immigrants between 1984 and 2006. Across the wage distribution the wage rises for Germans and for immigrants, leading to higher inequality. For Germans the coefficient effect explains two third and the characteristic effect one third of the wage increase. Responsible for the wage increase for immigrants is solely the coefficient effect. The development differs in the two sub periods. In the first sub period from 1984 to 1992 the wage increase is higher in the lower part of the wage distribution as compared to the

upper part and leads to a compression of the wage distribution for Germans and immigrants. The coefficient effect explains this change. For the second period up to the year 2006 the wage declines at the lower deciles and rises in the upper deciles for both groups. For immigrants the coefficient effect and for Germans the characteristic effect explains the change in the wage distribution. Inequality rises more for immigrants than for Germans. Today the wage inequality is higher for immigrants than for Germans. 22 years ago wage inequality was higher for Germans. A higher differentiation of the wage distribution raises the economic performance and the integration into the labor market. The higher increase in the dispersion of the wage distribution for immigrants relative to Germans should improve their economic performance especially in the lower part of the wage distribution.

Figures and Tables

Figure 1 Kernel density estimation of the real log hourly wage
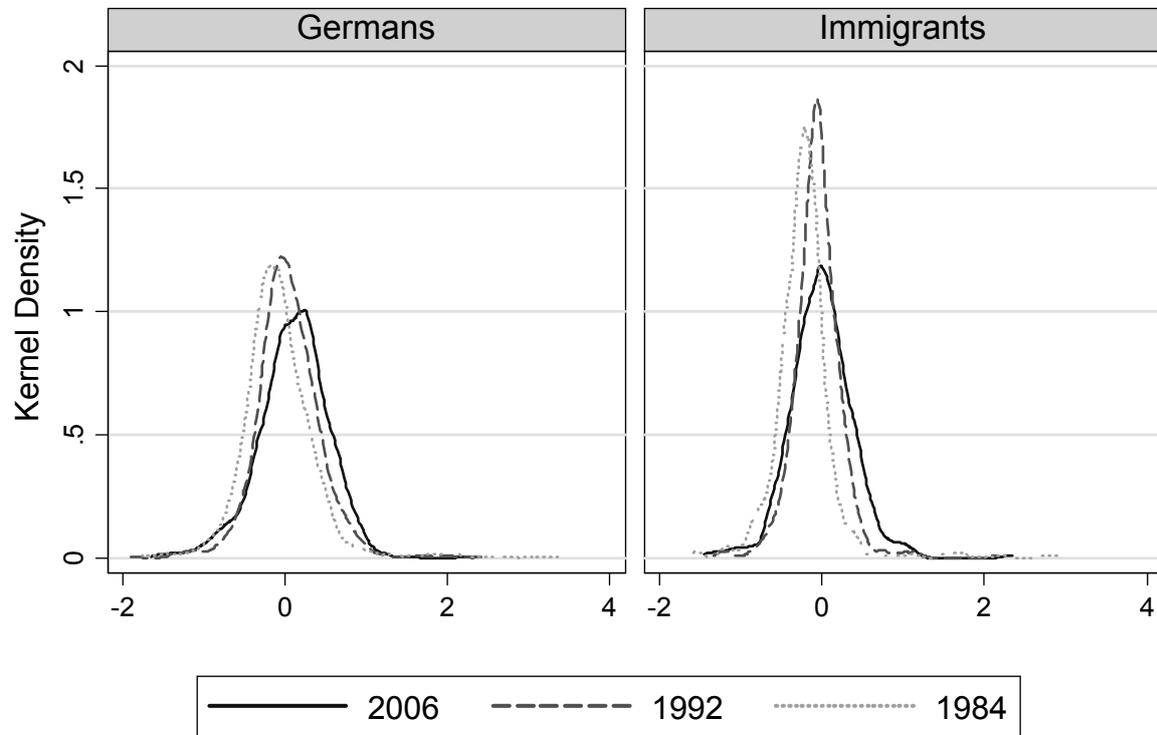
Source: Own calculations with GSOEP data.

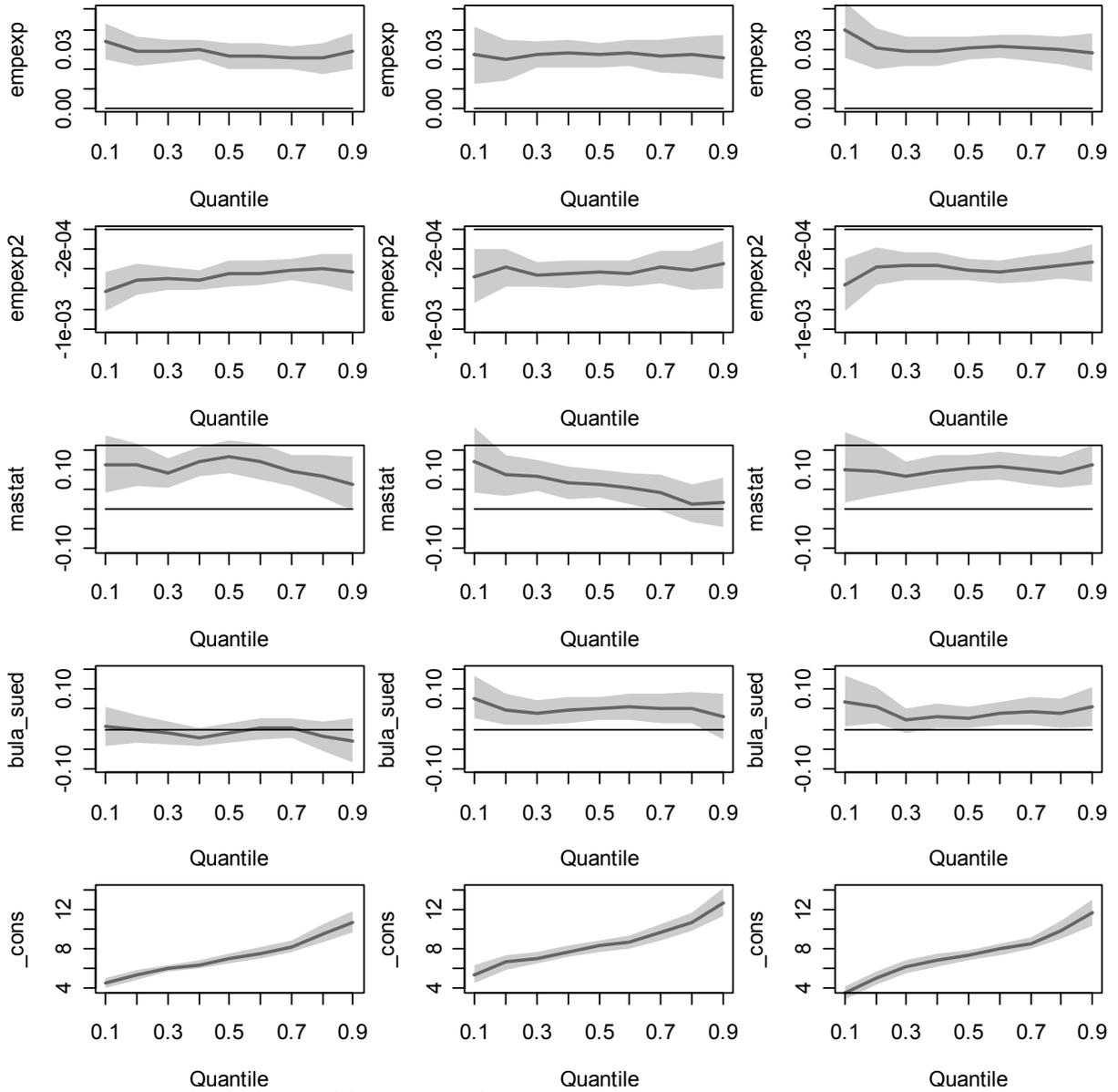**Figure 2 Quantile Regression Results for Germans 1984, 1992 and 2006 (1)**
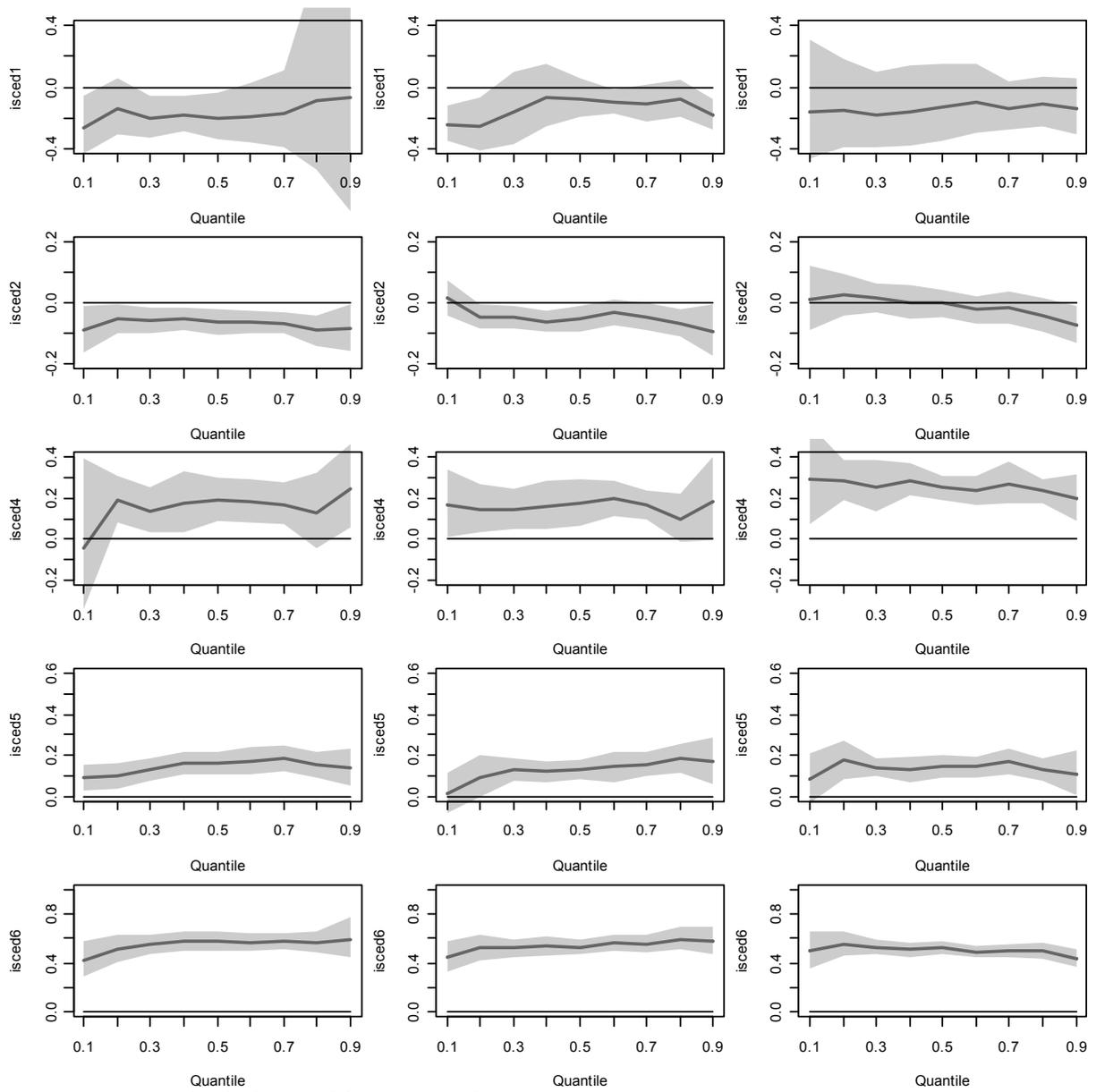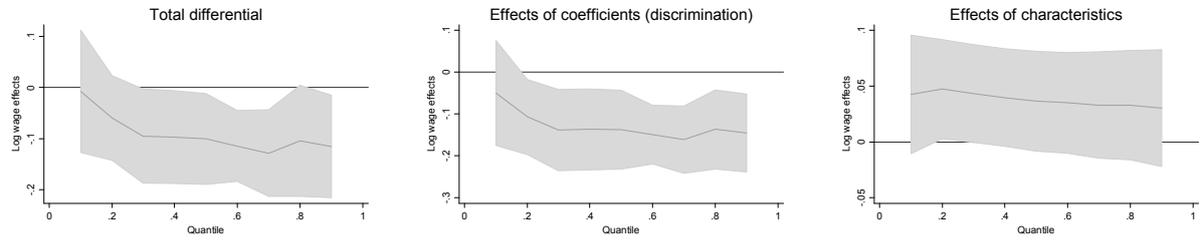

Source: Own calculations with GSOEP data.

**Figure 3 Quantile Regression Results for immigrants 1984, 1992 and 2006 (1)**
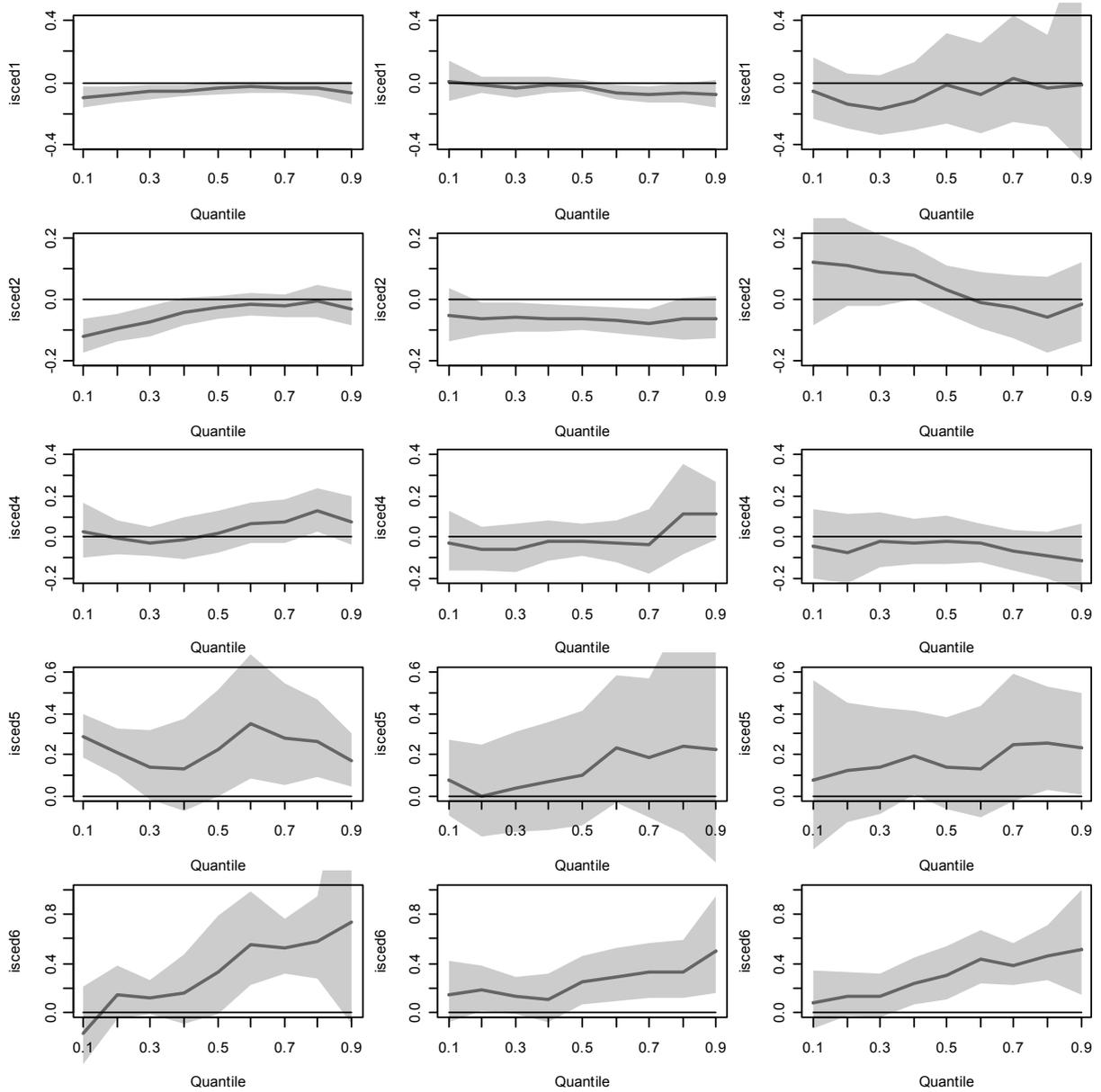
Source: Own calculations with GSOEP data.

Figure 4 Quantile Regression Results for Germans 1984, 1992 and 2006 (2)

Source: Own calculations with GSOEP data.

Figure 5 Quantile Regression Results for immigrants 1984, 1992 and 2006 (2)
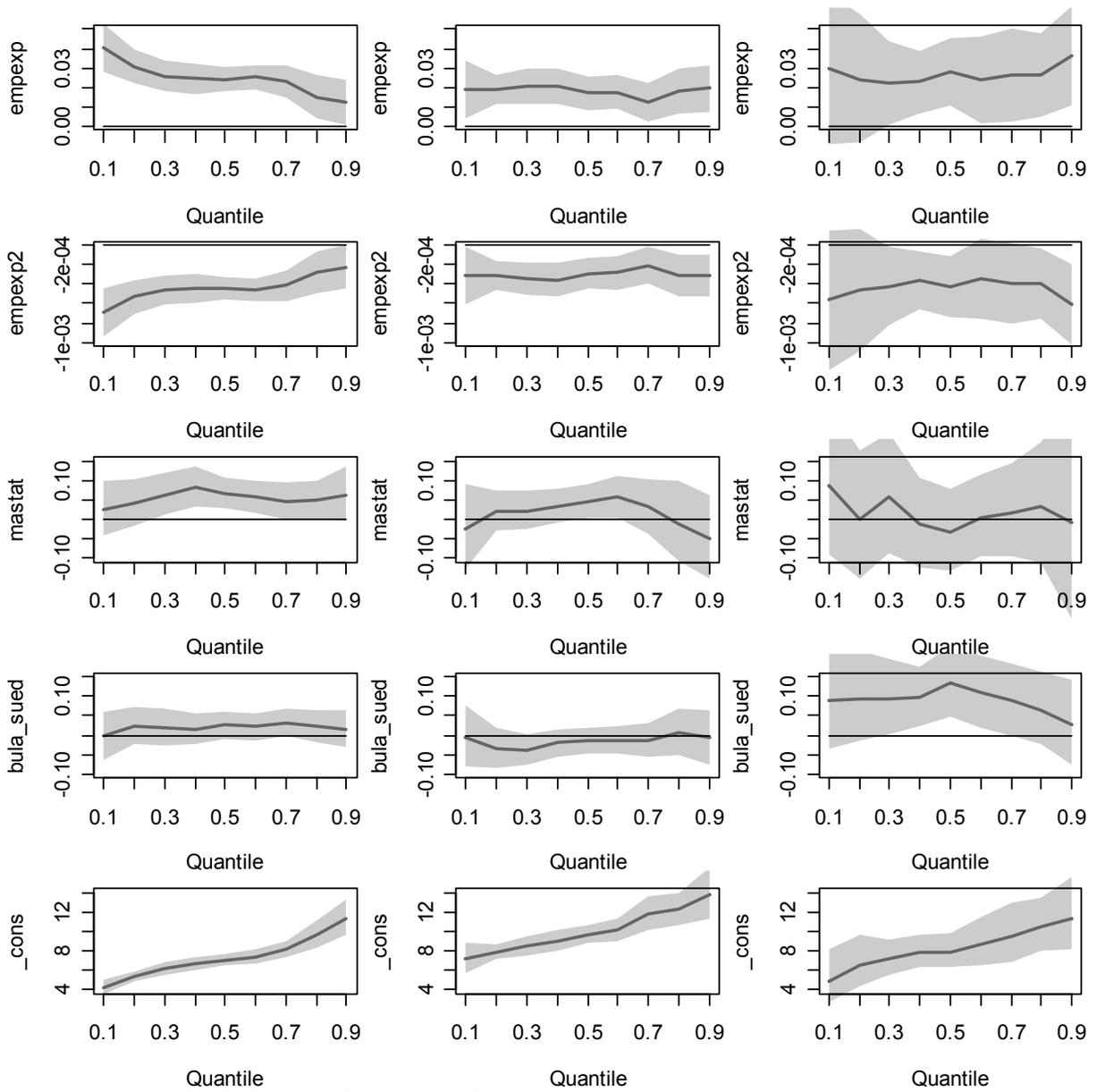
Source: Own calculations with GSOEP data.

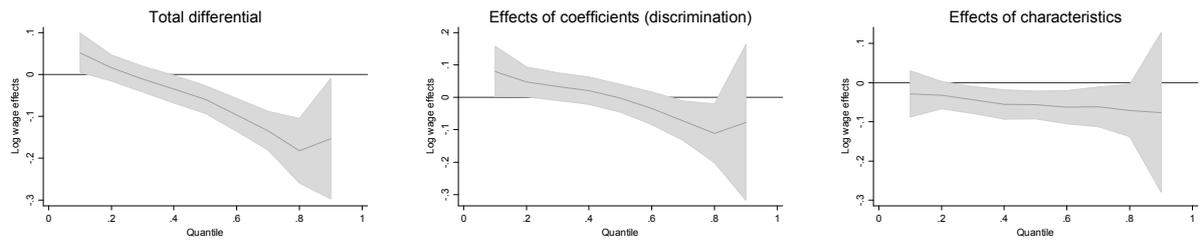**Figure 6 Decomposition: Immigrant-German Wage Differences across the Distribution**

2006 (3483 observations, 3050 Germans, 432 immigrants)

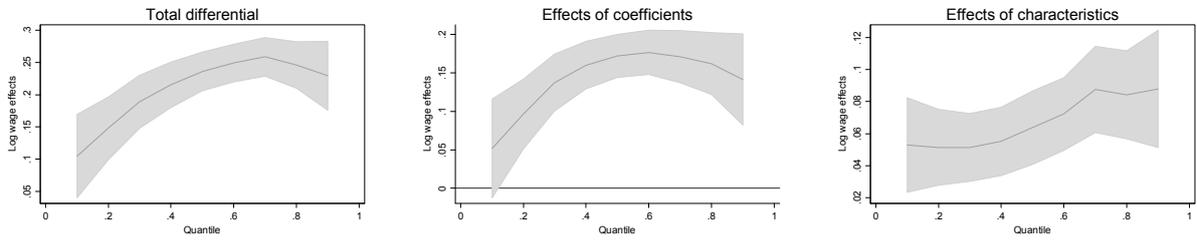**1992 (2790 observations, 2006 Germans, 784 immigrants)**
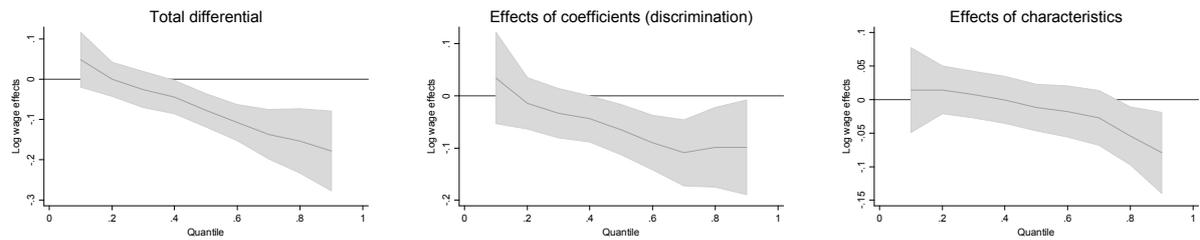
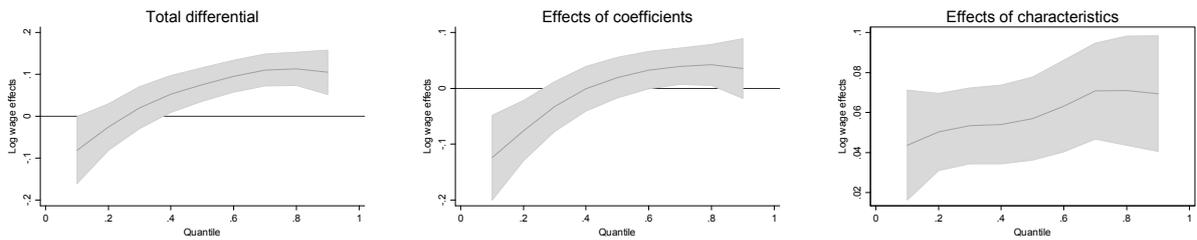**1984 (3653 observations, 2451 Germans, 1202 immigrants)**

Source: Own calculations with GSOEP data based on cross-section weights.

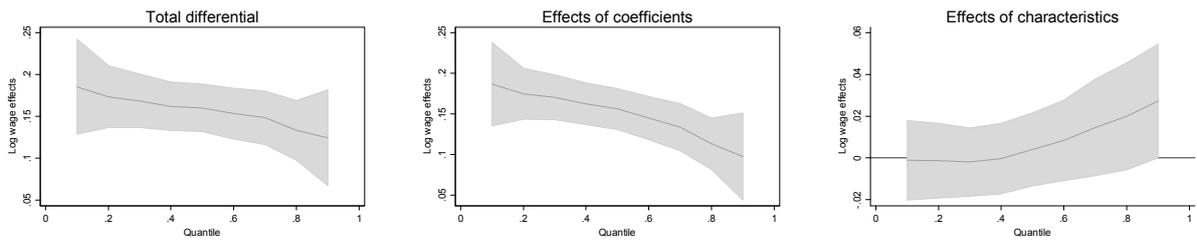**Figure 7 Decomposition: Changes in the Wage Structure, Germans**

Changes between 2006 and 1984 (5501 observations, 3050 2006, 2451 1984)

Changes between 2006 and 1992 (5056 observations,3050 2006, 2006 1992)
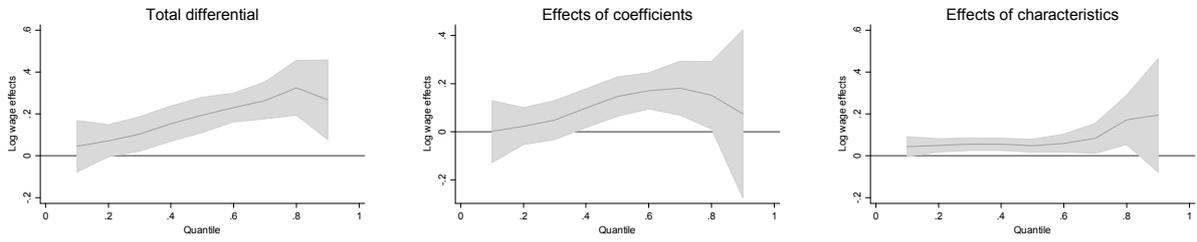

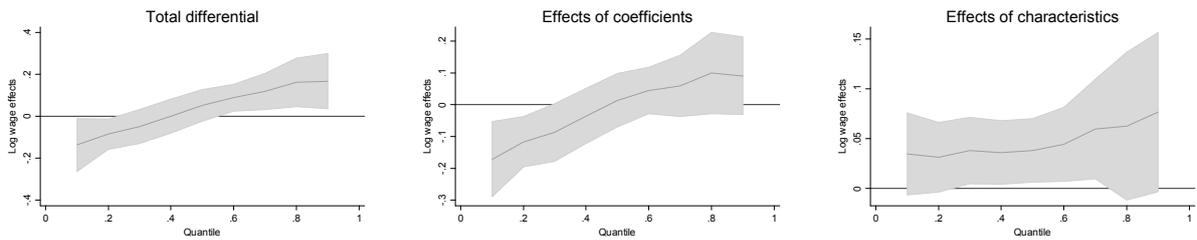**Changes between 1992 and 1984 (4457 observations, 2006 1992, 2451 1984)**

Source: Own calculations with GSOEP data based on cross-section weights.

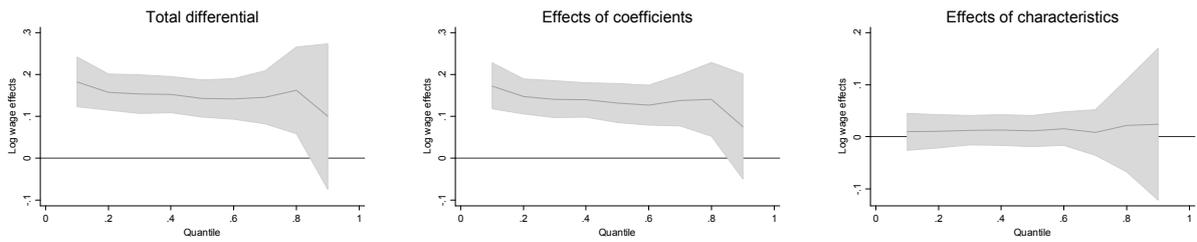**Figure 8 Decomposition: Changes in the Wage Structure, Immigrants**

Changes between 2006 and 1984 (1634 observations, 432 2006, 1202 1984)

Changes between 2006 and 1992 (1216 observations, 432 2006, 784 1992)

Changes between 1992 and 1984 (1986 observations, 784 1992, 1202 1984)

Source: Own calculations with GSOEP data based on cross-section weights.

Table 1 Summary statistics

	Germans			Immigrants		
	1984	1992	2006	1984	1992	2006
Observations (unweighted)	2650	2120	3188	1,294	831	460
Observations (weighted)	12.80m	13.30m	11.00m	1.26m	1.95m	1.25m
Age (mean)	40.58	40.28	42.57	39.97	42.88	45.25
Years of educations (mean)	11.65	11.90	12.77	10.22	10.51	11.25
Inadequately	1%	1%	1%	18%	14%	5%
General elementary	15%	15%	9%	24%	28%	14%
Middle vocational	56%	53%	46%	42%	37%	46%
Vocational plus abi	2%	3%	7%	6%	6%	12%
Higher vocational	12%	11%	11%	2%	6%	7%
Higher education	14%	17%	25%	8%	10%	17%
Real log hourly wage	2.55	2.69	2.73	2.50	2.62	2.64
Monthly gross labor income (d1)	1393	1663	1635	1393	1663	1408
Monthly gross labor income (d5)	2090	2454	2725	1950	2257	2323
Monthly gross labor income (d9)	3622	4157	4723	2786	3559	4541
Monthly gross labor income (d9/d1)	2.60	2.50	2.89	2.00	2.14	3.23
Monthly gross labor income (d9/d5)	1.73	1.69	1.73	1.43	1.58	1.95
Monthly gross labor income (d5/d1)	1.50	1.48	1.67	1.40	1.36	1.65
Years of residence	-	-	-	14.76	19.80	23.70
Age at immigration	-	-	-	25.21	23.08	21.55

The rows "Inadequately" through "Higher education" are grouped under the label **Educational attainment**.

Source: Own calculations with GSOEP data based on cross-section weights.

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