Wage Dispersion in Germany Compared to the US – Is there Evidence for Compression From Below?

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1 Introduction

The reasons behind the opening up of striking differences in labor market performance between the US and (continental) European countries since the seventies are still open to debate.[2] Many observers blame European labor market rigidities for the employment gap. According to the standard view the USA is the shining example of flexibility and freedom of the market, while Germany and France are bulwarks of institutional rigidities, high union coverage and comfortable welfare states floors. With respect to the wage structure it is presumed that continental European countries are characterized by much less differentiation compared to the US. The deformation of the wage distribution is considered to be one of the main reasons for the labor market crisis especially in Germany. A lack of differentiation is mainly diagnosed in the low-wage segment of the wage distribution. Following this line of reasoning, many employment possibilities in low-pay service industries are given away. As a consequence, a high share of low-ability/ low-productivity workers stays unemployed and increasingly becomes a heavy burden on the social security system. The ongoing trends in skill-biased technical progress (Krugman 1994) and/ or globalization (Wood 1994, 1998) tend to deteriorate the position of the low-skilled in the developed countries even further. As an obvious remedy it is recommended to abandon institutional and other regulations such that wage differentiation at the low end of the wage distribution is substantially extended (e.g. Siebert 1997, 2003, Sinn 2005).

Looking more closely at the data, however, reveals that it is by no means clear to what extent the observed employment and pay patterns are compatible with

[2] See, from different perspectives, Bound, Johnson (1992), Juhn et al. (1993), Krugman (1995), Gottschalk, Smeeding (1997), Krueger, Pischke (1998), Fitzenberger (1999), Beaudry, Green (2003), Card, DiNardo (2002), Glyn et al. (2005), Pischke (2005).

explanations building solely on labor market rigidities. Already the discussion of micro-data evidence in Krueger, Pischke (1998) and Card et al. (1999) casts some doubts on explanations of the employment gap stressing the lack of wage flexibility on the labor market.

Despite the importance of the topic only few studies based on large micro-data sets scrutinize differences in the wage structure in an international perspective although the availability of adequate data is steadily improving.[3] Of course, international comparisons of the wage structure are difficult for a number of reasons. Typically the collection of data in different countries does not obey the same principles. For example, main wage data sources in the US are survey data, while in Germany social security data play a more prominent role. In some instances information on hours worked is available, in others not. Definitions of skill types also differ between countries. Top-coding in the data in one case is more severe than in the other, and components included in the remunerations are not identical (tips, commissions, social security payments of workers and firms). There are even deep conceptual issues rendering direct comparisons of the wage distribution in different countries rather problematic. If the distributional patterns reflect the dispersion of productive abilities of the employed –and ability is mainly determined by skills– then the wage distribution should more or less reflect the distribution of skills in the population. The argument of Nickell, Bell (1996) and Freeman, Schettkat (2001) is that countries differ markedly in the dispersion of productive abilities in the population of workers. Using abilities scores Freeman, Schettkat show that the distribution of productive capabilities is more compressed in the German workforce than in other countries

[3] Examples of micro-data based international comparisons include Davis (1992, Blau, Kahn (1996, 2003), Freeman, Schettkat (2001), Krueger, Pischke (1998), Card et al. (1999). For a comparison Germany vs US see Kohnz, Erber (2000).

(Britain and the US, for instance). As a consequence of "skill compression", the wage dispersion should be more compressed as well. [4]

In the following we argue that, although there are good reasons for being skeptical regarding direct comparisons of the wage distribution, there are several possibilities for investigating hypotheses on distributional patterns using difference-in-differences techniques. Our main interest is to investigate the case for or against the assertion of wage compression from below. In the next section we first analyze the issue theoretically and derive several hypotheses. In section 3 we describe our data sets and harmonization methods. The results of our empirical investigation are contained in section 4 and section 5 concludes.

2 Theoretical considerations

2.1 *Wage compression from below: the accordion effect*

In their influential work, Blau, Kahn (1996, 2002) have argued that the differences between (continental) European countries on the one hand and the US and the UK on the other is mainly in the low tail of the wage distribution. Above the median, wage dispersion among the countries in their study is more or less comparable. Hence their diagnosis for the labor market in continental European countries is "wage compression from below".

In the German context, Sinn (2005) has coined the notion "accordion effect" for this phenomenon. German wage–setting institutions and regulations, so the argument goes, do not allow for adequate wage differentiation at the low end of the wage distribution. The one-sided pressure leads to an asymmetric deformation of the

[4] Newly available measures of school achievements (PISA) in different countries cast some doubts on the hypothesis that dispersion of productive capabilities among younger workers is lower in Germany compared to other countries. According to the PISA results, Germany is one of the countries with the highest variance in the measured ability scores.

wage distribution. The accordion effect implies that the percentiles of the wage distribution below the median are moving closer together while the upper tail of the distribution is not (or much less) affected.

The reasons behind this specific form of wage compression lie in the structure of wage-setting institutions in Germany. Although no legal minimum wage exists, several mechanisms can be identified that are presumably working in direction of the accordion effect. Negotiated standard wages establish de-facto minimum wage floors. Therefore, the institutional framework is likely to generate a fundamental asymmetry. Firms always have the freedom to pay a wage premium on top of the negotiated standard wage, but they are facing some constraints if they want to pay less.

The second main mechanism behind the accordion effect can be seen in the social security system. Social assistance schemes create a lower bound for wages. The more generous the social benefits are, the higher is the average reservation wage. A successful match between a worker and a workplace, however, requires that the wage offer exceeds the reservation wage which is less likely for low wage offers.

2.2 Actual and counterfactual distribution

Several hypotheses can be derived from the arguments for asymmetric deformation of the wage distribution given above. Consider the extreme case of an effective unique minimum wage. Then no wage should be observed below the minimum wage. Empirically this would correspond to a sharp truncation of the wage distribution at the minimum wage floor. However, such a situation is hardly realistic for the aggregate wage distribution. At least three arguments can be given for a smoothing of the distribution at the truncation point. First, the individual wage is observed with measurement error. Second, minimum wages might vary across

federal states and sectors of the economy. Third, the enforcement of a legal minimum wage may not be perfectly possible.

A truncation of the wage offer distribution can also be generated through the reservation wage. In case of individuals with identical preferences, endowments and information, this yields a unique reservation wage and hence again a sharp truncation of the wage distribution at this point. Smoothing down can be obtained by adding observational errors or heterogeneity of individuals. In the latter case one would expect not a sharp truncation but rather a thinning out of the natural wage distribution which becomes more effective the more one comes to the low end of the distribution.

A simple simulation experiment shows that truncation contaminated by an error process and a thinning out of the wage distribution both lead to observationally equivalent outcome.

In the first experiment we impose a truncation of a lognormal distribution alternatively at the first to the fourth decile and superimpose a normally distributed error term with mean zero and a standard deviation of 0.3.[5] The kernel density estimates of the resulting distributions are shown in figure 1 along with the non-truncated "natural" wage offer distribution – the so-called counterfactual.

The second experiment traces a thinning out in the left tail of the wage distribution. It is assumed that a wage offer *x* drawn from a lognormal distribution is above the reservation wage of a randomly selected person with probability

$$p(x) = \begin{cases} 1 - F(|d - x|) & \text{if} \quad x \le d \\ 1 & \text{if} \quad x > d \end{cases}, \tag{1.1}$$

[5] The standard error roughly corresponds to the standard error typically obtained for a Mincer type wage equation.

where *d* is a critical quantile of the wage distribution and $F(\cdot)$ is the distribution function of a standard normal. Figure 2 depicts the kernel density estimates of the resulting distributions with the first to the fourth decile as alternative choices for *d*.

It turns out that truncation contaminated by an error and a random thinning-out process lead to roughly the same results. Both simulations generate a steeper increase in the low tail of the distribution compared to the counter-factual. As can be verified from the two figures, the actual distribution is affected over the whole range of the distribution. Moreover, the mean and median will shift to the right. However, the deviation between the actual and the counterfactual distribution fades away at the high end of the distribution. Hence wage compression from below gives rise to the accordion effect.

2.3 The accordion effect and inter-quantile distances

The different shape of the actual distribution compared to the counterfactual has consequences for the inter-quantile distances. To express this in a more formal way, let us consider deciles as specific quantiles of the observed wage distribution, denote them as $D_i \ (i := 1,2..,9)$ and define $d_i := \mathrm{E}\left(\ln D_i\right)$. Then the expected relative distance between the deciles and the median is given by $\tilde{d}_i := \left| d_i - d_5 \right|$ for $(i := 1,2..,9)$. If the log transformation of the distribution generating the sample were symmetric, then the corresponding relative distances below and above the median would be equal, or $\tilde{d}_{5-i} = \tilde{d}_{5+i}$ for $i = 1,..,4$.

For the moment assume symmetry of the “natural” or counterfactual wage distribution. Due to the accordion effect described in section 2.1, compression in the left tail of the distribution then simply means that the log decile distances below the median are smaller than the corresponding ones above the median. This can be stated as

Hypothesis 1 (accordion effect): $\tilde{d}_{5+i} > \tilde{d}_{5-i}$ in ascending magnitude for $i = 1,..,4$.

Of course, the assumption of symmetry in the counterfactual log wage distribution might be seen critically. Therefore we develop alternatives in the following subsection.

2.4 The US as a reference case

A second type of hypotheses can be derived if one uses the US distribution as a reference case for an unconstrained (flexible) distribution. The underlying assertion is that the labor market in the US can be considered as a prototype of a market with a low level of regulations. Let D_i^G and D_i^{US} be the *i*-th decile in Germany and US. Assume that the natural or counterfactual wage distribution for a homogenous group of workers has the comparable inter-decile distances in the two countries. Assume further that wage compression from below is more relevant in the German case. Then, using the same notation as before, one can formulate

Hypothesis 2a:

$\tilde{d}_i^D < \tilde{d}_i^{US}$ for $i = 1,..,4,6,..,9.$

Note that the asserted constraints on the wage distribution in Germany would reduce all quantile distances from the median over the full range of the distribution. As outlined above, however, the effect of wage compression from below on the inter-quantile distances fades out in the right tail of the distribution. Hence one would expect the log distance from D9 to D5 in the two countries to be more similar than the distance from D5 to D1. This leads to a hypothesis which is closely related to what Blau, Kahn (1996, 2002) have postulated in their comparison between the US on the one hand, and Germany and other continental European countries like France on the other. According to their findings, the log decile distances below the

median appear to be substantially lower in Germany compared to the US, while the inequality measures are more or less identical in the right tail of the distribution. Correspondingly, one can formulate

Hypothesis 2b (Blau, Kahn):

$\tilde{d}_i^D < \tilde{d}_i^{US}$ for $i = 1,..,4,$

$\tilde{d}_i^D \simeq \tilde{d}_i^{US}$ for $i = 6,..,9.$

The disadvantage of hypotheses 2a and 2b is that they rely on the rather strong assumption of identical inter-decile of the counterfactuals in the two countries. Corresponding to the skill-compression argument, for instance, the spread in the ability distribution might differ considerably between the two countries. Therefore, it seems to be preferable to use a difference-in-difference approach.

Define the difference in the corresponding log distances of the deciles from the median in the upper and lower tail of the distribution as $\Delta_{5+i,5-.i} := \tilde{d}_{5+i} - \tilde{d}_{5-i}$ for $i = 1,..,4$. Note that a symmetric spread component of the counterfactual cancels out. The hypothesis stating that the US wage distribution is more close to the counter-factual can then be formulated as

Hypothesis 3 (Blau, Kahn, differences-in-differences):

$\Delta^D_{5+i,5-.i} > \Delta^{US}_{5+i,5-.i}$ for $i = 1,2,..,4.$

This means that in Germany there should be more “excess inequality” in the right tail over the left tail of the distribution than in the US It should be stressed that hypothesis 3 does not necessarily assume symmetry of the counterfactual log wage distribution. It only requires deviation from symmetry being not too dissimilar in the two countries.

2.5 Comparing different groups of workers

Another consideration concerns the effect of wage compression for different groups of workers. If the accordion effect were caused by minimum wages and/ or reservation wages that are determined by social security standards, the deformation of the actual wage distribution compared to the counter-factual should be more relevant for low-income groups. Hence low-skilled workers should be more affected by wage compression than skilled or high-skilled workers. By the same argument, one would expect a higher effect in an industry with relative low average wages and vice versa.

Again using a difference-in-difference approach to get rid of differences in the general spread of the distribution and denoting low-skilled (high-skilled) workers by superscript *u* (*s,*respectively) one can formulate:

Hypothesis 4 (skill-specific deformation):

$$\Delta^{s}_{5+i,5-i} < \Delta^{u}_{5+i,5-i} \text{ for } i = 1,2,..,4.$$

Finally, combining the intra- and international comparisons, one would obtain

Hypothesis 5 (skill-specific deformation in international comparison):

$$\Delta^{D,s}_{5+i,5-i} - \Delta^{US,s}_{5+i,5-i} < \Delta^{D,u}_{5+i,5-i} - \Delta^{US,u}_{5+i,5-i} \text{ for } i = 1,2,..,4.$$

This hypothesis states that the international differences in the left-tail deformation of the actual wage distribution should be less severe for the distribution of skilled or high-skilled workers compared to the low-skilled.

3 Data

3.1 Data sources

For the empirical analysis we use the *IAB-Beschäftigtenstichprobe* (IAB-BST) for Germany and the *Current Population Survey / Outgoing Rotation Group* (CPS-ORG)

for the US IAB-BST is a two percent random sample from the Employment Statistics of the Institute of Employment Research, Nuremberg. It includes all workers, employees and trainees being obliged to pay social insurance contributions. Not included in the data are self-employed persons, civil servants and students enrolled in higher education. Marginal employed persons are in the data set only since the year 1999.

We consider all workers who were employed on June 30th of each year. Because there are still large structural differences in labor market and migration patterns between the eastern and the western part of Germany we constrict the analysis to workers in West Germany. We exclude part-time workers, those in an apprenticeship or with more than one employment contract. Moreover, we drop all observations with no valid information on earnings, age, skills or the region of the workplace.

The US data are from the Current Population Survey (CPS), which is a monthly survey of 50,000-60,000 households, conducted by the Bureau of the Census for the Bureau of Labor Statistics.[6] The particular version of the CPS data analyzed here is the Economic Policy Institute's (EPI) extract of the "Outgoing Rotation Group" (ORG) of the CPS. The ORG is a one-quarter subset of the CPS that, in addition to answering detailed questions about their labor market circumstances has, since 1979, also provided information on earnings from work.[7]

The extract of the ORG sample used here attempts to compensate for several problems with the raw CPS data. First, the hourly wage concept in the CPS is somewhat inconsistent within each annual survey. Hourly wages for "hourly workers" (those paid by the hour or who report their earnings on an hourly basis)

[6] I am grateful to John Schmitt (Washington) for the detailed description of the US data.
[7] See Webster (2000) and Gao (2003) for more thorough descriptions of CPS-ORG.

exclude overtime, tips, and commissions. Hourly wages for "non-hourly workers," however, are calculated as usual weekly earnings (a variable constructed by the BLS from more detailed responses) by usual weekly hours, and includes overtime, tips, and commissions. Within a given cross-section, therefore, the hourly earnings concept is not consistent across hourly and non-hourly workers. From 1994, when the Census and BLS thoroughly redesigned the CPS, respondents were allowed to answer that their "usual weekly hours" at work varied, a response not previously permitted. Each year since 1994, about 6% of workers chose to report that their hours varied, making it impossible to calculate an hourly wage for these workers. The EPI extract uses information on these workers' employment characteristics to impute their "usual weekly hours."

3.2 Harmonization of data

A sensible comparison of micro-data evidence for different countries requires a careful harmonization of variables. Several adjustments were necessary to render the US data as similar as possible to the German data. First, minor employment and self-employed were excluded from the US data since information on latter group are not available in the German data and the same is true for the former group before 1999. Second, because IAB-BST contains qualitative information on working time only, all comparisons were based on *earnings* rather than *on hourly wages*.[8] The information in the two variables PT_1 (part-time with more than 50 percent of normal full time hours) and PT_2 (part-time with less than 50 percent of normal full time hours) that are available in the German data set were used to exclude part-time workers. Accordingly, all workers with less than 35 usual hours per week were excluded from the US data. Third, in both countries three skill levels were defined, low-skilled, skilled and high-skilled workers applying ISEC codes as far as possible.

[8] In the following we use the notions “wages” and “earnings” interchangeable.

The category *low-skilled* was taken as equivalent to *less than high-school* in the US, the category *high-skilled* with *college plus*. All other groups were attributed to the intermediate skill category.[9] Fourth, in order to avoid specific selectivity problems we also excluded very young workers (<25) and old workers (>55).[10] For the data selection see *table 1*.

4 Results

4.1 Comparing the aggregate wage distribution between Germany and the US

Table 3 contains the deciles of the 2001 wage distribution for full-time workers in the US and Germany in PPP adjusted US dollars.[11] The table also gives the 95 percent lower and upper bounds for the deciles.[12] As can be expected by the high number of observations in the two samples, the confidence bounds indicate that the deciles are estimated with high precision.

Comparing all workers in the two countries, one observes that the lowest deciles (D1 and D2) in the US almost exactly correspond to those in Germany. By contrast, the US median exceeds the German one by roughly 15 percent, and the eighth decile (D8) by about one third. There are remarkable differences in the wage distribution by gender. Male full-time workers at the low end of the distribution are apparently better off than their US colleagues. PPP adjusted D1 earnings in Germany exceed those in the US by about 8 percent. This relation is reversed for the median and for higher deciles. For example, in the US the median is 23 percent and D8 is even 37 percent higher than the corresponding value for Germany. By

[9] These categories roughly correspond~~s~~ to ISCED classification's levels 0-2, 3-4 and 5-7, respectively. See also the equivalence table given in Freeman, Schettkat (2001).

[10] Note that a large share of German workers below age 20 is in the apprenticeship system which obeys specific remuneration rules.

[11] According to IMF data, the PPP US dollar exchange rate in 2001 was 1.03 for the US and 0.95 for Germany.

[12] The confidence bounds are calculated on the basis of binomial interpolations.

contrast, full-time female workers in Germany are worse off than their American colleagues over the whole range of the distribution. For this group D1, D5 and D9 for the US exceed the corresponding values for Germany by 21, 15 and 45 percent, respectively.

In order to obtain a comprehensive picture of the shape of the wage dispersion, *figure 3* draws the distances of the deciles from the median (in logs) in the US and Germany for all workers and by gender. For all workers the figure corroborates the perception of a substantially higher spread in the overall US wage distribution compared to Germany. Wage inequality as measured by log decile ratios in the US markedly exceeds the wage inequality in Germany *over the entire range of the distribution*.

In both countries the log decile distances from the median in the upper tail of the distribution surpass those in the lower tail. Hence there is some evidence for the accordion effect (hypothesis 1) not only in Germany but also in the US The measure of excess inequality in the upper tail of the distribution appears to be rather similar in the two countries. For example, $\Delta_{82} := \tilde{d}_8 - \tilde{d}_2$ is 3.2 log percentage points in the US and 3.8 in Germany.

Moreover, we observe that the relative distances from the median are always lower in Germany than in the US as suggested by hypothesis 2a. However, comparing the differences of this measure between the two countries in the lower and upper tail of the distribution, we find only minor differences. For example, $\tilde{d}_2^{US} - \tilde{d}_2^{D} = 0.145$ and $\tilde{d}_8^{US} - \tilde{d}_8^{D} = 0.140$ (see *table 3*). If anything, the evidence for hypothesis 2b (Blau, Kahn) finds only weak support for the overall distribution of full-time workers.

Differentiating by gender gives further insights. For male workers in the US, *figure 3* shows a remarkable symmetry in the log decile distances below and above the

median. Only the distances of the lowest and highest decile from the median are slightly higher for the latter ($\Delta_{91}^{US} = 0.038$). Hence one can conclude that the accordion effect is only visible for full-time male workers in the US at the very low end of the distribution. In contrast to this, the accordion effect for this group is strongly present in the German case. For instance, the relative distance of D8 from the median exceeds that of D2 by about 10 log percentage points.

When it comes to hypothesis 2, we do not find evidence for the Blau, Kahn hypothesis in its strong form (implying that the wage distributions above the median have more or less the same shape in both countries). However, as can be seen from figure 3, the German distribution for full-time male workers deviates from the US distribution especially in the left tail. Since we find strong evidence for $\Delta_{5+i,5-.i}^{D} > \Delta_{5+i,5-.i}^{US}$ for $i = 1,2,..,4.$, hypothesis 3 (i.e. Blau, Kahn in difference-in-difference form) is corroborated. All in all, the evidence supports the hypothesis that wage compression from below affects the earnings distribution for German male full-time workers significantly in the entire left tail of the distribution, while for the US this is the case at the very low end only.

For full-time female workers the results for the US are quite similar to those of male workers, although wage compression from below here also affects the second decile. In the German case, however, the picture is remarkably different. Wage inequality for female workers with earnings below the median comes very close to the amount of inequality found for low-pay female workers in the US In the upper tail of the distribution the log decile distances from the median in the two countries are even more pronounced than for male workers. For example, we find $\tilde{d}_8^{US} - \tilde{d}_8^{G} = 0.113$ for males, while the corresponding difference for female workers is 0.156. Therefore, one has to conclude that for female workers there is an

accordion effect at the low end of the wage distribution in the US, while there is no evidence for a corresponding phenomenon in the German case. Perhaps somewhat astonishingly, the German results would be in line with wage compression from *above* rather than with wage compression from *below*. This is clearly at odds with all variants of the Blau, Kahn hypothesis.

4.2 Results for different skill groups

We now differentiate between skill groups. As pointed out above, excess inequality in the right tail of the distribution should be more pronounced for low-skilled rather than for skilled or high-skilled workers. *Figure 4* gives an overview of the results. We start with the findings for the US and Germany separately before comparing the two countries. There are several remarkable features. First, for skilled workers in the US we find almost perfect symmetry for both genders, only at the very low end of the wage distribution for females there seems to be a minor deformation. In contrast to this, there is clear indication that the US wage distribution for low-skilled male and female workers exhibits the accordion effect. For the former, excess inequality above the median amounts to roughly 15 log percentage points and for the latter roughly 9 percentage points if $\Delta_{9,1}$ is considered (see *table 4*). What the data for low-skilled workers in the US suggest is exactly in accordance with hypothesis 4 (i.e. a marked left-tail deformation of the wage distribution for low-skilled workers due to wage compression from below).

Now consider the German earnings distributions. Rather surprisingly, the only case that corresponds to a priori expectations of excess inequality in the right tail of the distribution is that of *skilled* male workers. In all other cases, the distributions exhibit excess inequality not above, but *below* the median, i.e. $\Delta_{5+i,5-i} < 0 \text{ for } i = 1,..,4$. Hence for male workers in Germany, hypothesis 4 is clearly rejected.

The case of female workers is even more at odds with common perceptions. For both skill groups the relative distances of the lower deciles from the median in Germany exceed the corresponding measures for the US According to these results, hypotheses 1 to 4 are all rejected and it comes as no surprise that also hypothesis 5 is not supported by the empirical evidence. More precisely, one obtains $\Delta_{9,1}^{D,s} - \Delta_{9,1}^{US,s} = -0.303$ and $\Delta_{9,1}^{D,u} - \Delta_{9,1}^{US,u} = -0.315$ for female workers which clearly contradicts the hypothesis.

In Germany the highest decile for skilled male workers is censored. Calculating the measures for D8 instead gives: $\Delta_{8,2}^{D,s} - \Delta_{8,2}^{US,s} = 0.088$ and $\Delta_{8,2}^{D,u} - \Delta_{8,2}^{US,u} = -0.119$, which again rejects hypothesis 5.

When it comes to the group of high-skilled male workers in Germany, even the median is censored. Therefore we are not able to calculate the log decile distances from the median in this case. For high-skilled female workers, the highest decile available is D7. *Figure 5* shows for US male workers of this skill category almost perfect symmetry of the log distances as should be expected in the absence of wage compression. By contrast, for female high-skilled in the US there is a certain indication for compression at D1 and D2. As far as these measures can be calculated in the German case, the log distance of the deciles from the median at the low and high end of the distribution are roughly identical. As far as the comparison is possible, our findings show no marked differences between the two countries for high-skilled females below the median. In the right tail of the distribution, however, the spread in the US distribution seems to surpass the German one.

5 Conclusions

Wage compression from below is a common diagnosis for the German wage distribution. Although no overall minimum wage regulation does exist in Germany, tariff wages or high reservation wages could lead to a deformation of the wage distribution. In the theoretical part, we show by simulations that a “truncation-plus-error” model and a “random thinning-out” approach qualitatively lead to the same results. Although the entire distribution is affected, the impact of wage compression from below is mainly found in the left tail. Compared to an unconstrained distribution, the relative inter-quantile distances should shrink especially below the median. We develop alternative hypotheses in order to identify this so-called accordion effect. It is argued that the phenomenon should be more visible for low-skilled workers than for skilled and high-skilled workers. Moreover, the wage distribution in countries with a more flexible labor market such as in the US should be closer to the counterfactual than in countries with high standards of social security systems, higher union coverage and more institutional regulations such as in Germany.

In the empirical investigation large micro data sources for the US and Germany are used. We confine the analysis to full-time workers and harmonize the data as far as possible.

For skilled and high-skilled full-time male workers in the US we find almost perfect symmetry in the inter-decile distances below and above the median. This can be taken as evidence for the presumption that measures of inequality are close to symmetry in the left and right tail of the counterfactual distribution. This is so because for high-pay groups the actual distribution should be close to the counterfactual.

For other groups in the US we find evidence of an accordion effect at least at the very low end of the distribution. The effect tends to be higher for females than for males and is more significant for low-skilled rather than for skilled workers. Hence the findings for the US support our expectations because there is a (moderate) deformation of the wage distribution due to the accordion effect exactly where it was supposed to work (i.e. at the low deciles of groups which tend to be ill-paid).

The results for Germany, however, are contrary to what one would have expected in case of marked wage compression from below. Skilled male workers are the only group for which the differences of the inter-decile distances fit the pattern of the accordion effect. For low-skilled workers of both genders and for female workers in general we find higher inter-quantile distances *below* rather than *above* the median. This is clearly in contrast to the interpretation given in the famous work by Blau, Kahn (1996 and 2002). Put differently, in these cases we simply find the reverse of what one would expect if the "wage-compression-from-below hypothesis" did hold.

A further puzzling phenomenon is the strong evidence for the accordion effect for skilled male workers in Germany rather than for low-skilled. A tentative explanation is that the bargained standard wages are especially important for this group. *Facharbeiter* – the German notion for skilled workers – are the main target group of the unions. If unions typically opt for wage compression, this could produce the presented results.

All in all our analysis casts some doubts on the within-group wage dispersion playing some role for the clearly unsatisfactory employment situation of low-skilled workers in the German labor market. A possible alternative hypothesis is that between-group wage differentials (between groups of workers defined by skill, experience or industry) are inadequate. In this context a recent study by Beaudry, Green (2003) seems relevant. These authors have investigated the wage-education

relationships in the United States and Germany. They state that the skill premium "…evolved very differently in the two countries while the education composition of employment differences evolved in a parallel fashion." Beaudry, Green (2003) develop an endogenous organizational choice model where they assume that new technology is skill-intensive and is complementary to physical capital. Then high accumulation of physical capital relative to human capital is associated with a flattening and upward shift of the wage education profile.

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Table 1:

Number of observations and data selection for Germany in 1984, 1990, 1992 and 2001

	2001
Total (excl. those in apprenticeship)	**568,233**
East	91,097
Multiple jobs	16,988
part-time < 50%	61,563
part-time > 50%	55,645
Age < 25 or age >55	52,227
minor employment	3,910
minor employment	64,839
N	**286,803**
thereof	
Male	192,427
Female	94,376
low-skilled	37,231
skilled	184,815
high-skilled.	34,034
skill missing	30,723

Table 2:

Deciles of the wage distribution for full-time workers in the US and Germany (in PPP adjusted US Dollars, 2001)

	US			D		
Decile	Value	95% confidence limits		Value	95% confidence limits	
		lower	upper		lower	upper
	all workers					
D1	46.8	46.4	47.1	45.6	45.6	46.6
D2	58.9	58.9	58.9	58.9	58.9	59.9
D3	69.9	69.2	70.5	67.5	67.5	67.5
D4	80.9	80.9	81.2	75.1	74.1	75.1
D5	93.3	92.8	94.2	80.8	80.8	81.7
D6	108.6	107.4	108.9	89.3	89.3	89.3
D7	127.3	126.5	127.3	99.8	98.8	99.8
D8	152.7	150.1	152.7	115.0	114.0	115.0
D9	200.3	198.1	203.6	#	#	#
N	110,954			286,803		
	male workers					
D1	51.5	51.5	52.5	56.1	56.1	57.0
D2	66.2	65.0	66.2	66.5	66.5	66.5
D3	79.2	78.0	79.5	74.1	73.2	74.1
D4	91.7	90.5	92.1	79.8	79.8	79.8
D5	105.9	105.9	107.4	86.5	86.5	87.4
D6	121.5	121.2	123.2	95.0	95.0	96.0
D7	141.4	141.4	144.2	107.4	106.4	107.4
D8	170.7	169.7	173.8	124.5	124.5	125.4
D9	226.3	226.3	226.3	#	#	#
N	61,442			192,427		
	female workers					
D1	41.5	41.2	42.4	34.2	33.3	34.2
D2	51.5	51.5	51.9	45.6	44.7	45.6
D3	59.6	59.2	60.3	54.2	54.2	55.1
D4	70.6	69.9	70.6	62.7	62.7	62.7
D5	79.5	79.2	80.6	69.4	69.4	69.4
D6	90.5	90.5	91.7	76.0	76.0	77.0
D7	106.1	105.9	107.4	84.6	84.6	84.6
D8	127.3	126.5	127.3	95.0	95.0	96.0
D9	164.1	161.9	165.5	113.1	113.1	114.0
N	49,512			94,376		

Notes: #: Decile not available because of censored data.

Table 3:

Distances of deciles from the median and differences between corresponding measures in the lower and upper tail of the distribution for full-time workers in the US and Germany (log differences in absolute value, 2001)

	distance to D5 (left tail)			distance to D5 (right tail)			difference right tail – low tail	
	US	D		US	D		US	D
	all workers							
$\tilde{d}_4$	0.142	0.073	$\tilde{d}_6$	0.152	0.101	Δ_{64}	0.010	0.027
$\tilde{d}_3$	0.289	0.180	$\tilde{d}_7$	0.311	0.211	Δ_{73}	0.022	0.031
$\tilde{d}_2$	0.461	0.316	$\tilde{d}_8$	0.493	0.353	Δ_{82}	0.032	0.038
$\tilde{d}_1$	0.690	0.571	$\tilde{d}_9$	0.764	#	Δ_{91}	0.074	#
	male workers							
$\tilde{d}_4$	0.145	0.080	$\tilde{d}_6$	0.137	0.094	Δ_{64}	-0.007	0.014
$\tilde{d}_3$	0.291	0.154	$\tilde{d}_7$	0.289	0.217	Δ_{73}	-0.003	0.062
$\tilde{d}_2$	0.470	0.262	$\tilde{d}_8$	0.477	0.364	Δ_{82}	0.007	0.102
$\tilde{d}_1$	0.721	0.433	$\tilde{d}_9$	0.759	#	Δ_{91}	0.038	#
	female workers							
$\tilde{d}_4$	0.118	0.101	$\tilde{d}_6$	0.130	0.092	Δ_{64}	0.012	-0.009
$\tilde{d}_3$	0.288	0.247	$\tilde{d}_7$	0.289	0.198	Δ_{73}	0.001	-0.049
$\tilde{d}_2$	0.434	0.419	$\tilde{d}_8$	0.471	0.315	Δ_{82}	0.038	-0.105
$\tilde{d}_1$	0.650	0.707	$\tilde{d}_9$	0.725	0.489	Δ_{91}	0.075	-0.218

Table 4:

Distances of deciles from the median and differences between corresponding measures in the lower and upper tail of the distribution for full-time workers in the US and Germany by skill and gender (log differences in absolute value, 2001)

	distance to D5 (left tail)			distance to D5 (right tail)			difference right tail – low tail	
	US	D		US	D		US	D
	low-skilled male workers							
$\tilde{d}_4$	0.095	0.067	$\tilde{d}_6$	0.138	0.063	Δ_{64}	0.043	-0.004
$\tilde{d}_3$	0.207	0.139	$\tilde{d}_7$	0.237	0.122	Δ_{73}	0.031	-0.017
$\tilde{d}_2$	0.332	0.249	$\tilde{d}_8$	0.401	0.199	Δ_{82}	0.069	-0.050
$\tilde{d}_1$	0.475	0.452	$\tilde{d}_9$	0.629	0.310	Δ_{91}	0.154	-0.142
	skilled male workers							
$\tilde{d}_4$	0.127	0.068	$\tilde{d}_6$	0.137	0.084	Δ_{64}	0.010	0.016
$\tilde{d}_3$	0.268	0.141	$\tilde{d}_7$	0.250	0.180	Δ_{73}	-0.018	0.039
$\tilde{d}_2$	0.419	0.220	$\tilde{d}_8$	0.404	0.293	Δ_{82}	-0.015	0.073
$\tilde{d}_1$	0.625	0.352	$\tilde{d}_9$	0.607	#	Δ_{91}	-0.018	#
	low-skilled female workers							
$\tilde{d}_4$	0.093	0.086	$\tilde{d}_6$	0.079	0.079	Δ_{64}	-0.014	-0.007
$\tilde{d}_3$	0.162	0.219	$\tilde{d}_7$	0.200	0.166	Δ_{73}	0.038	-0.053
$\tilde{d}_2$	0.274	0.373	$\tilde{d}_8$	0.313	0.246	Δ_{82}	0.038	-0.127
$\tilde{d}_1$	0.409	0.614	$\tilde{d}_9$	0.498	0.389	Δ_{91}	0.089	-0.225
	skilled female workers							
$\tilde{d}_4$	0.122	0.097	$\tilde{d}_6$	0.103	0.076	Δ_{64}	-0.019	-0.021
$\tilde{d}_3$	0.223	0.220	$\tilde{d}_7$	0.223	0.169	Δ_{73}	0.000	-0.051
$\tilde{d}_2$	0.369	0.399	$\tilde{d}_8$	0.377	0.264	Δ_{82}	0.009	-0.135
$\tilde{d}_1$	0.539	0.667	$\tilde{d}_9$	0.589	0.414	Δ_{91}	0.050	-0.253

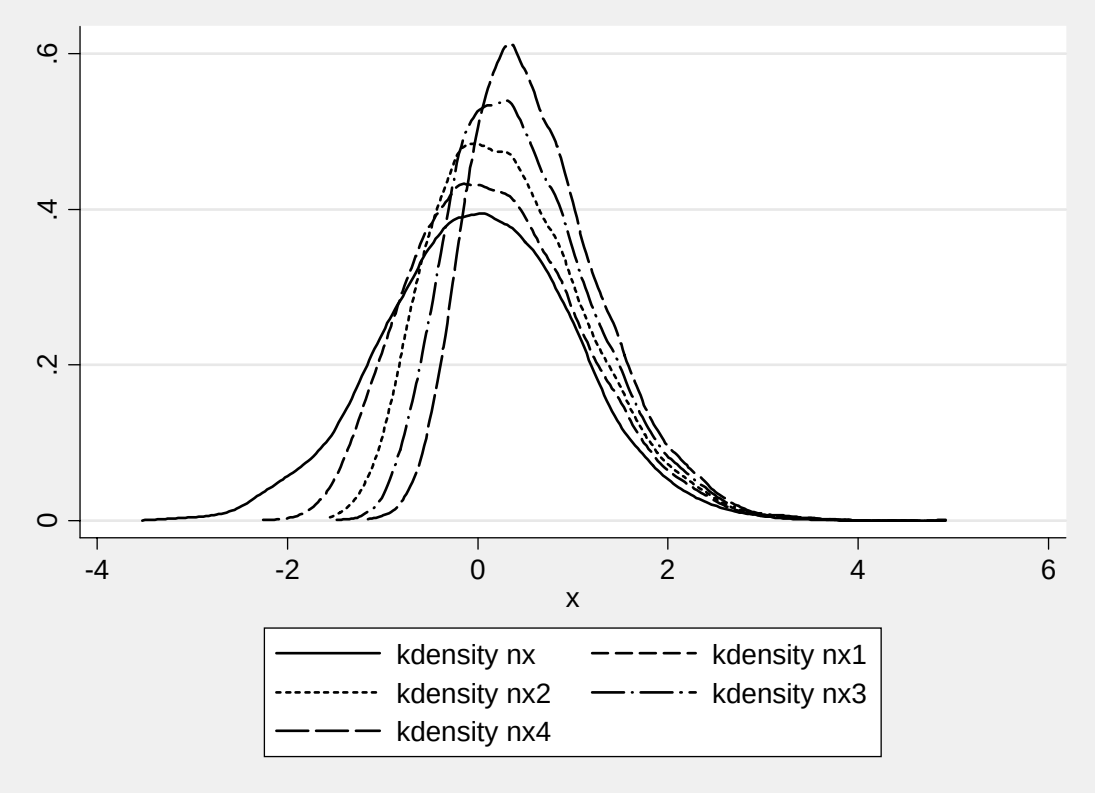


Figure 1: Effect of superimposing an error process on a normal distribution truncated at the first to the fourth decile

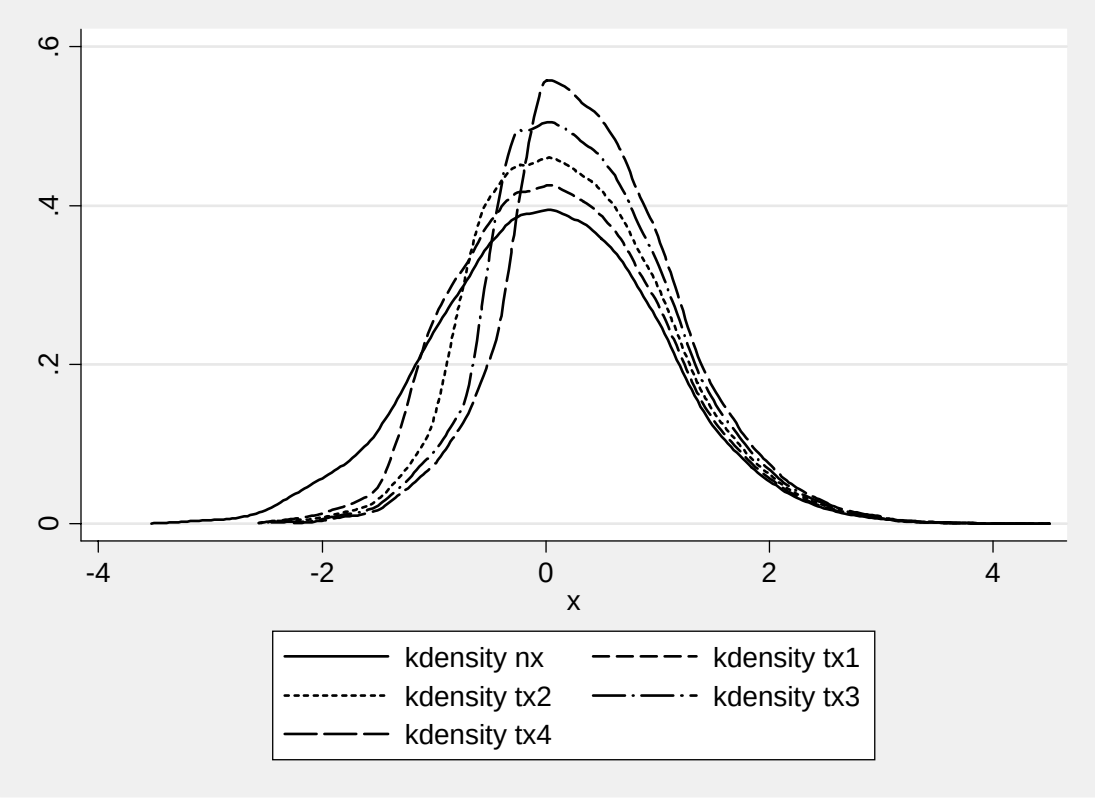
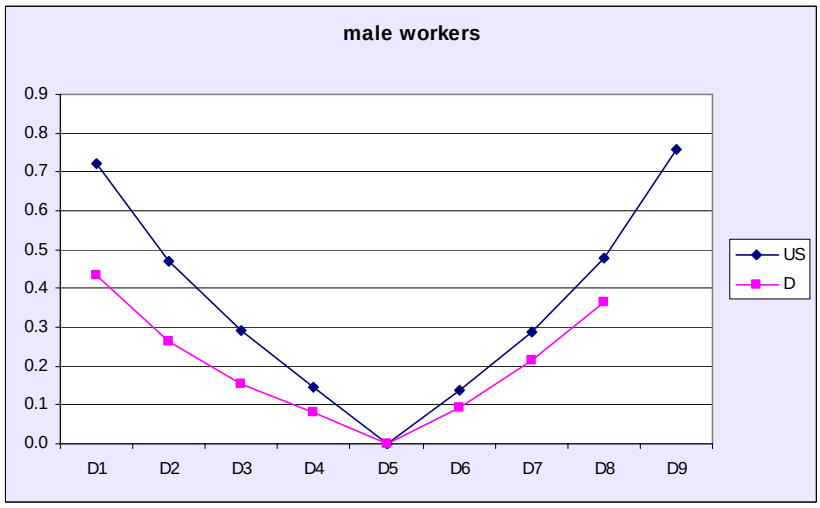


Figure 2: Effect of thinning out of a normal distribution below the first to the fourth decile



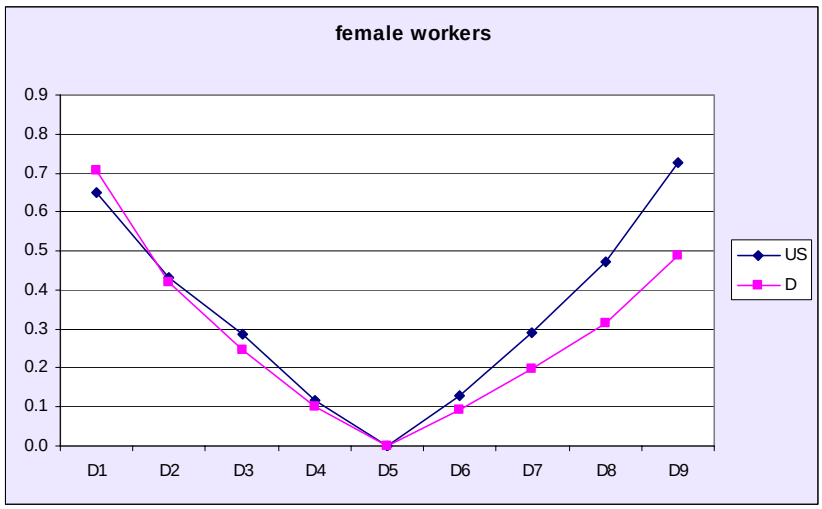


Figure 3: Distances of deciles from the median of the earnings distribution in the United States and Germany (full-time workers 2001, log differences in absolute value)

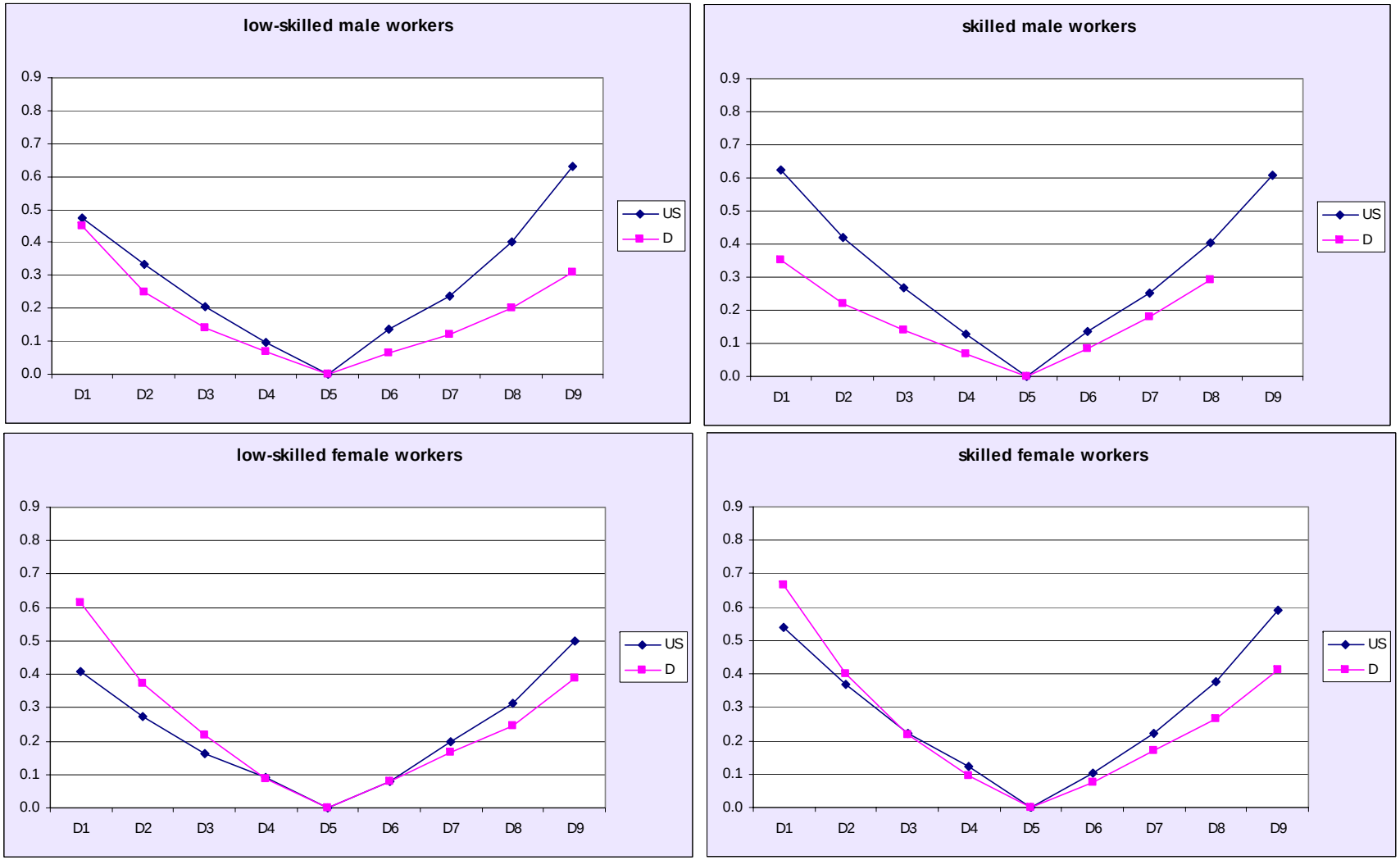
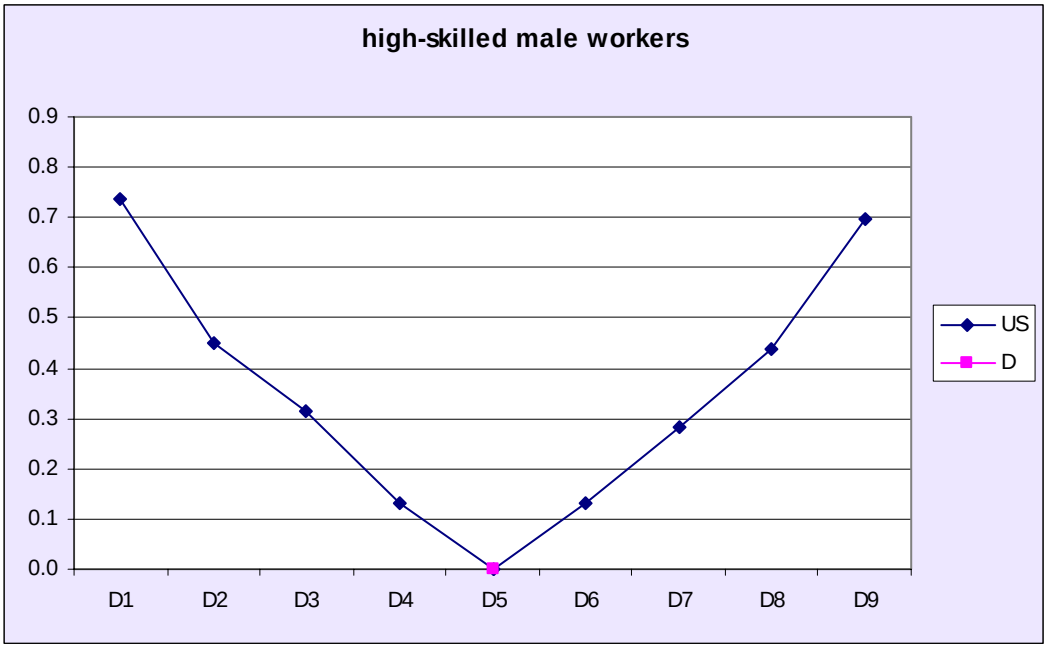


Figure 4: Distances of deciles from the median of the earnings distribution in the United States and Germany by skill and gender (full-time workers 2001, log differences in absolute value)



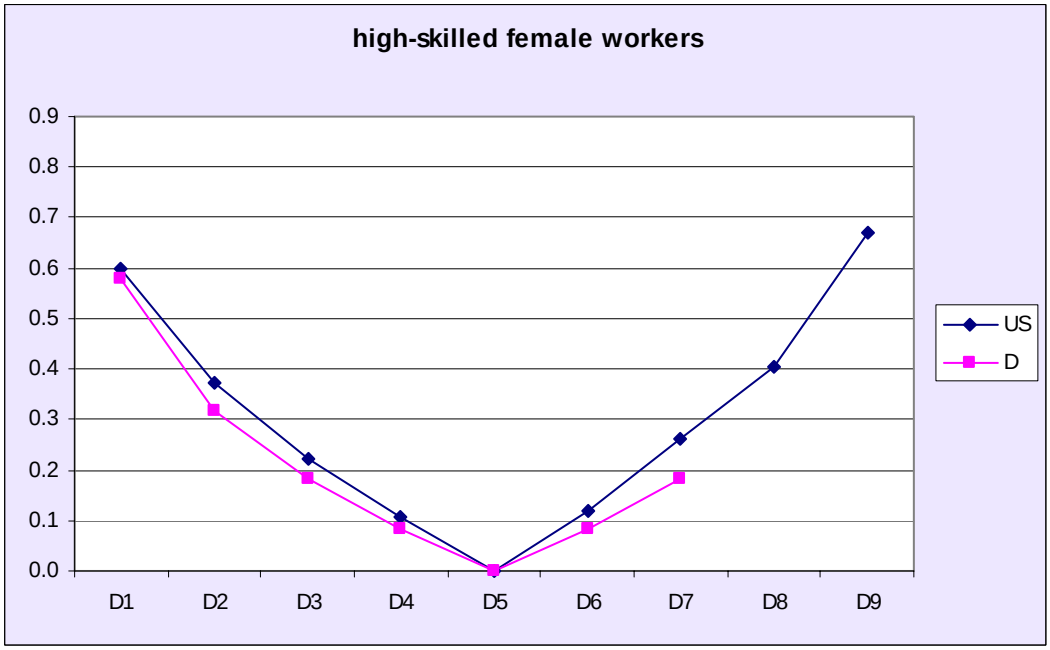


Figure 5: Distances of deciles from the median of the earnings distribution in the United States and Germany for high-skilled workers by gender (full-time workers 2001, log differences in absolute value)

Note: The measures for male workers cannot be calculated in the German case because of censoring. The same applies to D8 and D9 for female workers of this skill category.