The Impact of Minimum Wages on Remuneration and Employment in the Construction Sector -

A Micro Data Analysis for West and East Germany

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Abstract

This paper uses German social security micro data to estimate the effects of the introduction of a minimum wage in the construction sector in 1997. We analyze the impact on wages and employment chances of those low-earnings workers likely to be affected by the minimum wage. For lack of data on working hours we estimate the individual probability of falling into the minimum wage regime. This variable is used as a regressor in a difference-in-differences approach. For West Germany we find that the minimum wage has neither remuneration nor employment effects for workers at the low end of the wage distribution. For East Germany a weakly positive impact on wages in the construction sector is detected but no employment effects. [Remark: The latter is not true in the new version of our econometric estimates which consider the correction of marginal effects in the logit model as derived by Ai, Norton (2003)]

Keywords:

Minimum Wages, Construction Sector, Difference in Differences.

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1 Introduction

With a vast theoretical and empirical literature the effects of minimum wages on earnings and employment is one of the most discussed questions in economics. Especially for the United States and the United Kingdom many empirical studies exist that analyze these effects (see evidence on minimum wages). In Germany the potential introduction of a minimum wage is an ongoing discussion topic since the country is one of only seven member countries of the European Union without a general minimum wage regulation. Suggestions range from the introduction of the same institutional minimum wage for all industries to a specific wage floor for each sector. Even though no common minimum wage exist, one sector in Germany, namely construction, has been covered by a generally binding minimum wage since 1997.

This paper analyzes the impact of the introduction of this minimum wage in the German construction sector in 1997 on wage growth and employment probability of those low-earning workers whose wages were likely to be affected by the minimum wage. As a quasi-experiment the introduction of this sector-specific minimum wage serves as an excellent testing ground for the investigation of economic impacts of the minimum wage. It allows us to compare periods without a binding minimum wage with those after its introduction by means of a difference-in-differences approach. For this purpose we use a large social security micro data set. In contrast to studies for other countries in the literature, we cannot unambigously assign individuals to the treatment group because quantitative information on working hours is missing. To estimate impacts of the hourly minimum wage we calculate the individual probability of coming under the minimum wage regime. The treatment group consists of individuals who most likely fall into this category.

To the best of the authors´ knowledge, our study is the first evaluating the impact of a minimum wage introduction in Germany using microeconometric methods. Our objective is to shed some light on the issue in order to base the ongoing minimum wage controversy in Germany on empirical facts.

The remainder of the paper is structured as follows. The next section gives a brief overview of the corresponding empirical literature. The institutional background of the introduction of the minimum wage in the German construction sector is pointed out in section 3. Section 4 outlines the difference-in-differences estimation strategy for identifying wage and employment effects under the restriction of missing quantitative working time information. Before discussing our estimation results in section 6, we describe our data in section 5. Section 7 concludes.

2 Evidence on Minimum Wages

Since the mid-nineties a growing number of studies have analyzed minimum wage effects, especially for the United States. Most of the studies find significant effects on the wage structure: the minimum wage has a considerable positive effect on the earnings of individuals on the lower end of the wage distribution (e.g. see Card and Krueger (1995) for the United States and Stewart (2004) for the UK). A good overview about the corresponding literature is provided by Brown (1999).

Concerning the effect of minimum wages on employment, the predominant result of studies from the 1970s and the 1980s was that minimum wages have a negative impact on employment. These studies were mostly based on aggregate time-series models and reported this effect especially for the low-skilled and young population groups in the United States.[1] On average a ten percent increase in the minimum wage was found to reduce teenage employment by one to three percent.

In the beginning of the 1990s the discussion about the employment effects of minimum wages arose again mainly due to a number of empirical studies using new estimation methods and micro data. Several of these studies came to conclusions that were not in line with traditional research. Trend-setting studies were Card and Krueger (1994) and Card and Krueger (1995). They are significant not only because of their findings but also because of the estimation strategy adopted by the two researchers. Analysing the effects of a minimum wage increase in the fast-food industry in New Jersey in 1992 based on own survey data and using a difference-in-differences approach they find evidence for a rise in employment. [2]

Also Card (1992) and Katz and Krueger (1992) for the United States, for instance,

[1]For a review see Brown et al. (1982).

[2]The studies were followed by a considerable controversy (see, for instance, Neumark and Wascher (2000) and Card and Krueger (2000)).

Dickens et al. (1999), Machin and Manning (1994), Dickens and Draca (2005) and Stewart (2004) for the United Kingdom, as well as Dolado et al. (1996) for France find that an increase in the minimum wage has significantly positive or no employment effects. In contrast to this, other studies detect evidence for negative (albeit not large) employment effects. (see, for instance, Deere et al. (1995) and Burkhauser et al. (2000) for the United States, Abowd et al. (1999) for France, Machin and Wilson (2004) and Machin et al. (2003) for the UK). For a review of the recent vast literature see Brown (1999) and Neumark and Wascher (2006).

3 Institutional background

The introduction of minimum wages in the German construction sector was connected with the Worker Posting Law (*Arbeitnehmerentsendegesetz*, AEntG) which was implemented in 1996 and was valid only for the construction sector.[3] The Law forces every foreign firm from a European Union Country as well as from other countries that temporarily sends workers to Germany, to comply with the German labor market laws, especially with those concerning minimum wages. Before the introduction of the Worker Posting Law posted workers were paid according to the regulations of their home country. Therefore, one aim of the Law might have been to protect the German workers in the construction sector from cheap competition from abroad.

As until then no institutional minimum wage in Germany was in force, the trade union and the employer side started to bargain over a new low-wage group in the labor contract for the construction sector. The setup of this newly-introduced minimum wage is as follows: After being declared generally binding by the government, it has to be applied to all blue-collar workers (except for trainees) and firms in the construction sector, [4] i.e. it does not depend on membership to the collective bargaining organisations. Therefore, the minimum wage law is also binding for posted workers. The compliance with this law is supervised by the German Federal Labor Office and the Custom Office. Violations can be punished by administrative fines up to 500.000 DM, since 1999 up to 1 million DM. Of

[3]The EU also adopted a similar Act in 1996, the Posting of Workers Directive.

[4]Further exceptions see below.

course, a total control cannot be ensured because of resource constraints and frequent changes of construction sites. However, as the construction sector is one of the sectors most affected by illegal employment of national as well as foreign workers, controls were tightened. According to Bosch et al. (2002) the administrative fines because of offenses against the Worker Posting Law increased from 15 million DM in 1997 over 48 million DM in 1998 to 77 million DM in 1999. Nevertheless, unfair practices like false statements of working hours in order to comply with the minimum wage are an open secret.

The generally binding minimum wage came into force on January, 1, 1997. At that time, the minimum pay was 15.64 DM (8 €) per hour for workers in Eastern Germany and 17 DM (8.69 €) in Western Germany. As from September, 1, 1997 it was decreased to 15.14 DM (7.74 €) and 16 DM (8.18 €), respectively.

Statistically, the German construction sector is divided into Main Construction (*Bauhauptgewerbe*) and Subconstruction (*Ausbaugewerbe*). The latter is especially heterogeneous regarding the firms´ occupations. While the Worker Posting Law applies to all firms affiliated to the main construction sector, some occupations in the subconstruction sector are excluded from the general regulations. For instance, own minimum wage laws exists for firms principally dealing with painting and varnishing, roofing and demolition works. As our data does not allow a corresponding distinction, these exemptions might – to some extent – contaminate the estimations for the subconstruction sector.

4 Empirical Strategy

4.1 The difference-in-differences approach

The use of longitudinal data and the circumstances of the minimum wage introduction as a quasi-experiment allow us to apply the estimation method of difference-in-differences to evaluate the effects of the minimum wage.[5] We are interested in the wage growth[6] and employment probabilities as a result of the

[5]See, for instance, Angrist and Krueger (1999) or Heckman et al. (1999) for a further discussion of this approach.

[6]Despite the inaccuracy it entails in some cases, we will keep using the terms wages and earnings interchangeably for the rest of the analysis.

minimum wage introduction for those who are likely to be affected. Ideally, we would compare this result to a situation in which no minimum wage was introduced. As this is clearly not possible, we need to find a comparison group. The main idea of this approach is to compare the outcome before and after the introduction of the minimum wage of those who are likely to be affected (treatment group) with the before- and after-situation of a group with similar properties but not directly affected (control group). In the literature workers with payments shortly above the minimum wage are widely used as control group.

Let the (0,1) dummy variable T denote the treatment group for $T = 1$ and the control group otherwise. A simple form of the difference-in-differences approach has the following structure:

$$y_{it} = \alpha + \beta T_i + \gamma t_i + \delta(T_i t_i) + \varepsilon_{it} \tag{1}$$

where α denotes a constant, β a treatment-group-specific effect which accounts for permanent differences between the treatment and the control group and γ is the coefficient of the time trend common to control and treatment group. The coefficient of the interaction variable, δ, indicates the true effect of the treatment, whereas ε_{it} is an error term with the usual properties.

The coefficient δ can also be obtained by using the raw difference-in-differences estimator which is defined as the difference of two differences. The first is the difference in average outcome of the treatment group before (period 1) and after (period 2) the introduction of the minimum wage. The second is the difference in average outcome of the control group before and after the introduction of the minimum wage. More formally,

$$\delta = \left(y_2^{T=1} - y_1^{T=1}\right) - \left(y_2^{T=0} - y_1^{T=0}\right), \tag{2}$$

where the subscript indicates the period and the superscript the group. Two key assumptions concerning the conventional difference-in-differences approach have to be mentioned. First, the time trends have to be common to both groups in the absence of the minimum wage. This crucial assumption would be violated if the evolution of the wage growth or the employment probabilities in the construction sectors differed between the group directly affected by the minimum wage and the control group without a minimum wage law becoming effective. Second, it is supposed that the introduction of the minimum wage has no impact on the control group.

4.2 Working hours as an unobserved variable

In contrast to other studies we cannot base our analysis on the hourly wage data since our dataset, IAB-REG, contains daily earnings only. As described in section 5, we excluded all employees declared as part-time workers. Two problems arise in this context. First, there might be miscoding in the qualitative part-time variable. Since our analysis is restricted to male workers and the vast majority of this group is working full time, we consider this problem as not severe. Second, the usual empirical strategy (see, for instance, Stewart (2004)) compares the reported hourly wage in the previous period to the minimum wage floor becoming effective in the current period in order to define the treatment group. Adopting this strategy to earnings data would involve the assumption of exactly the same actual working time for all workers in our sample. Especially in the construction sector, however, there is a substantial variation in working time due to seasonal weather conditions, the business cycle and other construction-specific influences. Therefore, we decided to model the influence of working hours systematically.

Define the *notional* hourly wage as the remuneration per hour an individual would receive if no minimum wage regulation was enforced. Individual i at time t is under the minimum wage regime if the notional hourly wage, W_{it}^*, is below the minimum wage, W_t^{min},

$$W_{it}^* \leq W_t^{min}. \tag{3}$$

Correspondingly, denote notional daily earnings at actual hours, H_{it}, as $Y_{it}^* = W_{it}^* H_{it}$ and normal hours as $\bar{H}_t$. Using small letters for natural logarithms gives the minimum regime condition as

$$y_{it}^* - h_{it} \leq w_t^{min}. \tag{4}$$

For actual working hours we assume

$$h_{it} = c + \bar{h}_t + \tilde{\eta}_{it}. \tag{5}$$

Note that $\bar{h}_t$ is in principle an observed quantity, i.e. the log of contractual working hours plus the average overtime. In order to take into account a possible systematic deviation due to the concept of the working hours statistics[7] we included a constant c. The stochastic disturbance $\tilde{\eta}_{it}$ with $\mathrm{E}(\tilde{\eta}_{it}) = 0$ captures individual variation in working hours and corresponding measurement errors. Moreover, define the observable log daily earnings in the absence of a minimum wage as $y_{it} = y^*_{it} + \varepsilon_{it}$, where ε_{it} denotes an error term with $\mathrm{E}(\varepsilon_{it}) = 0$. Using this definition and substituting (5) in (4) it follows that a worker comes under the minimum wage regime if

$$y_{it} \leq c + \bar{y}^{min}_t + \eta_{it}. \tag{6}$$

where $\bar{y}^{min}_t = \bar{h}_t + w^{min}_t$ denotes the log of daily earnings at the minimum wage and normal working hours and the combined error term is $\eta_{it} = \tilde{\eta}_{it} + \varepsilon_{it}$.

Define $\tilde{y}_{it} := y_{it} - \bar{y}^{min}_t$. It then follows that individual i comes under the minimum wage regime if $\tilde{y}_{it} - c \leq \eta_{it}$. Let $F(\cdot)$ be the standardized cumulative density function of η_{it}. The likelihood that the log notional wage of individual i, w^*_{it}, is at or below the minimum wage can be obtained as

$$\pi^{min}_{it} = \Pr\left(w^*_{it} \leq w^{min}_t\right) = 1 - F\left(z_{it}\right), \tag{7}$$

where $z_{it} = (\tilde{y}_{it} - c)/\sigma_\eta$ and σ_η is the standard deviation of η. In a static model the unobserved variable $\tilde{y}_{it}$ can be proxied by the difference between actual earnings in the period before the minimum wage law was enforced and the minimum wage of the current period. In a dynamic environment it is reasonable to project the minimum wage onto the period before the introduction taking into account the average growth rate of wages in the sector.

We estimated the parameter σ_η of the IAB-REG data for each subsector and region using a maximum likelihood grid search procedure where we also determined the magnitude of the treatment group (see section 4.3). With the standard deviation maximizing the likelihood and assuming normality for the distribution function $F(\cdot)$ the probability of coming under the minimum wage regime can be calculated for all workers in the sample using eq. 7.

[7] For the normal (contractual) weekly working hours we used data from IAB (2003) starting from 39.5 hours in 1994 over 39.2 hours in 1995 to 39.0 in 1996 and 1997 for the main construction sector in Eastern Germany. To account for the variation in working time we multiplied these with a factor for overtime.

4.3 Estimation Approach

Having determined the probability of an individual i belonging to the minimum wage regime based on the earnings of the previous year, we define the treatment group, or group 1, as all individuals with a probability exceeding 0.5. To get an adequate reference group for the difference-in-differences approach we create a control group, or group 2, with the same number of observations as the treatment group. This group consists of persons whose probabilities of belonging to the minimum wage regime are the highest below the critical mark of 0.5. The third group contains all remaining observations.

Note that this modified difference-in-differences approach necessarily violates the assumption that the control group is not affected by the minimum wage. With a certain probability individuals of the control group also might come under the minimum wage regime. This can contaminate our estimation results. However, as long as the probabilities of falling under the minimum regime are sufficiently different between the treatment and the control group, significant treatment effects should be observable.

For the wage growth estimation we use only observations of individuals that were employed on the cut-off date June, 30 in the years 1995, 1996 and 1997. We calculate the wage growth between the years 1995 and 1996 and 1996 and 1997, respectively.[8] The latter growth rate encompasses the minimum wage introduction while the first is generated in a period without minimum wage as required by the difference-in-differences approach. Additionally, we create the variable $DUR2$ denoting the duration of employment after September 1, 1996 and September 1, 1997, respectively. Thus, we are able to estimate not only the effects of the introduction of the minimum wage in January 1997, but also the impacts of

[8]We adjusted the growth rate calculations according to the length of the employment spells. For the year 1996 we adjusted the minimum wage by the median growth rate of the earnings.

its decline as from September 1997. Our estimation approach is the following:[9]

$$\begin{aligned}\Delta \ln w_{it} \quad = \quad & \boldsymbol{X}'_{it}\boldsymbol{\beta} + \alpha_1 pm1_{it} + \alpha_2 pm2_{it} + \alpha_3 pm3_{it} + \alpha_4 pm1_{it} DUR2_{it} + \\ & + \alpha_5 pm2_{it} DUR2_{it} + \alpha_6 pm3_{it} DUR2_{it} + \alpha_7 DUR2_{it} D97 + \\ & + \alpha_8 pm1_{it} D97 + \alpha_9 pm3_{it} D97 + \alpha_{10} pm1_{it} D97 DUR2_{it} + \\ & + \alpha_{11} pm3_{it} D97 DUR2_{it} + \varepsilon_{it} \qquad (8)\end{aligned}$$

with $D97$ as a (0,1) dummy variable for the year 1997, when the minimum wage law became effective and $\boldsymbol{X}'_{it}\boldsymbol{\beta}$ denoting a vector of control variables. The variables pmj $(j = 1, 2, 3)$ describe the probability of coming under the minimum wage regime, π_{it}, times a (0,1) dummy variable, Dj, indicating whether individual i belongs to group j.

The difference-in-differences estimator is given by α_8 which captures the minimum wage´s impact on the treatment group. Given a binding minimum wage we would expect a higher growth rate of wages of the treatment group in 1997 in order to comply with the minimum wage in comparison to the control group. More formally, if the coefficient α_8 is significantly positive, those individuals who belong to the minimum wage regime with a probability higher than 50% experienced a higher wage boost than the control group. Note that group 2 serves as a reference here. The effect of the minimum wage decline on the treatment group is indicated by the coefficient α_{10}. From a theoretical point of view we would expect a negative sign because of the decreasing minimum wage.

For the measurement of the minimum wage´s employment effects we estimate the employment retention probability of an individual i depending on his initial position in the wage distribution. In other words, we analyze the conditional probability that an individual i employed at date t is still employed at date $t + 1$ given his individual likelihood of falling into the minimum wage regime. Therefore, we used only individuals in our sample that were employed at the cut-off date June 30 in 1995 or 1996 taking into account the employment status at the cut-off date one year later, respectively. For the estimation we specified a

[9]We dropped one percent of observations with the highest and lowest wage growth values, respectively, in order to avoid outlier bias. Moreover, we excluded data with top-coded earnings. Due to the selection of our data, this affects only a minor number of observations.

logit model which has the following form:

$$
\begin{aligned}
P\left(e_{it+1}=1|e_{it}=1\right) \quad = \quad & \Lambda\left[\boldsymbol{X}'_{it}\boldsymbol{\beta}+\alpha_1 pm1_{it}+\alpha_2 pm2_{it}+\alpha_3 pm3_{it}+\alpha_4 D97+\right. \\
& \left. +\,\alpha_5 pm1_{it}D97+\alpha_6 pm3_{it}D97+\varepsilon_{it}\right], \qquad (9)
\end{aligned}
$$

where e_{it} denotes the employment status of individual i in period t and adopts the value 1 for being employed and 0 for being unemployed. The marginal effect of the coefficient α_5 then indicates the difference-in-differences estimate. This coefficient gives an answer to the question whether an individual with a probability larger than 50% of being affected by the minimum wage is more likely to loose the job than an individual of the control group. This is the case if the sign is significantly negative.

5 Data and Descriptive Evidence

5.1 Data

Our study uses social security micro data from IAB-REG. IAB-REG is a 2% random sample from the employment register of Germany´s Federal Labor Office.[10] The data set includes all workers, salaried employees and trainees obliged to pay social security contributions and covers more than 80% of all those employed. Civil servants, family workers and self-employed persons are excluded. The German social security system requires firms to record the stock of workers at least at the beginning and the end of each year. Additionally, all changes in employment relationships within the year (for instance, hirings, quits, dismissals) have to be reported with the exact information on the date when the change occurred. Therefore, the employment register traces detailed histories for each worker's time in covered employment as well as spells of unemployment for which the worker received unemployment benefits.[11] Because of legal sanctions for misreporting, the data´s information on periods of coverage and the earnings is highly reliable.

IAB-REG also contains several variables describing workers' characteristics (like age, skill level, gender, job status, occupation, nationality) and some information

[10] The establishment of IAB-REG dates back to 1973. Data are available from 1975 to 2001. The data is described briefly in Bender et al. (2000) and in more detail in Bender et al. (1996).

[11] Spells for which workers have no entitlement to unemployment benefits are not reported and therefore cannot be distinguished from periods of non participation in the labor market.

on the employer (industry, location). As mentioned above, quantitative information on hours worked is not included. However, the data set comprises a qualitative variable distinguishing between full-time work and two forms of part-time work.

Due to the contribution ceiling in the German social security system, earnings are censored. Top coding, however, is not a problem in studies on minimum wages imposing only certain constraints for the control group which seem to be reasonable anyway.[12]

For the following empirical analysis we use only observations for the construction sector for a time period before and after the introduction of the minimum wage (1995 to 1997). Because of some data problems for female workers (job instability, coding errors for part-time status), we decided to use observations for men only.[13] Part-time and home workers and trainees are also excluded from the investigation. Moreover, we restrict the analysis to workers aged 20 to 60.

5.2 Descriptive Evidence

Table 2 contains some basic information on wages in the German construction sector[14] from 1994 to 1999. The median wage in the West increased from 1994 to 1999 by more than 6% compared to a smaller increase of roughly 4% in the East. In both parts of the country wage growth rates were highest for the first decile (D1) and monotonously fall for higher deciles. Wage growth was thus highest at the very low end of the distribution which indicates wage compression. The amount to which this occurred, however, differed sharply between the two parts of the country. Whereas in the West the growth rates of the lower deciles in the left tail of the distribution exceeded those of the median only slightly, there were substantial differences in the East. Total $D1$ wage growth between 1994 and 1999 exceeded median wage growth by a factor of 3. According to these figures, wage compression in the second half of the nineties was markedly stronger in the East German construction sector than it was in the Western part of the country.

[12]Workers with earnings above the critical level were simply excluded from the wage regressions.

[13]Since female workers in blue-collar construction jobs are rare, this limitation is not severe.

[14]If not explicitly stated otherwise, we analyze the construction and sub-construction sector together.

Substantial differences also appear in the relative magnitude of the minimum wage. The minimum wage amounted to less than two-thirds of the median wage in the West German construction sector, but to roughly 88 percent in the East. This implies a markedly higher coverage in the East.

In 1994 the relative difference between $D1$ and the median was only slightly lower in the East (13.7 vs. 15.8 log percent). Until the end of the nineties, the difference has risen to almost 5 log percentage points (see table 2).

The substantial changes in the lower tail of the East German wage distribution for the construction sector becomes evident also in figure 1 and 2. These figures show the relative distance between the deciles below and above the median of the wage distributions in the years 1994 to 1999. More formally, define D_i $(i = 1, 2, \cdots, 9)$ and $d_i := \ln D_i$. The relative distance between the deciles and the median is then given by $\tilde{d}_i := |d_i - d_5|$. Note that in case of symmetry of the log wage distribution the corresponding relative distances below and above the median would be equal ($\tilde{d}_{5-i} = \tilde{d}_{5+i}$ for $i = 1, \cdots, 4$).

Figure 1 shows a remarkable inter-temporal stability of the wage distribution in the West German construction sector. According to this figure, there is no strong evidence for wage compression below the median. By contrast, Figure 2 indicates significant changes in the East German wage distribution. From 1994 to 1999 the log distances from the median are systematically decreasing in the left tail of distribution, whereas no such changes occur in the right tail. Comparing the distributions for West and East Germany also gives interesting insights. Whereas in East Germany inequality above the median - as measured by log distances - is comparable to the West or even higher, the reverse is true for inequality below the median.

<+++ Table 2 about here +++>

<+++ Figure 1 about here +++>

<+++ Figure 2 about here +++>

6 Estimation Results

6.1 Wage effects

We first present the results of the wage equation estimations. Because of the different situations in West and East Germany we calculate different estimations for the two parts of the country. Moreover, as the institutional regulations are not identical between the main construction and the subconstruction sector we estimate separate models.

Table 6 contains the results for the main construction sector. As explained in section 4, the left-hand variable is the difference of log daily earnings (times 100). Variant 1 refers to estimates which takes the standard deviation of actual hours variation from U.S. data, whereas variant 2 is based on Maximum Likelihood estimates of the model parameters. The results show that the estimated coefficients and t-statistics differ markedly between the two approaches. Besides the interaction variables to be included in the difference-in differences approach, we use as additional control variables age and age squared, six dummy variables on skill level (SKILL)[15], two on job status (craftsman, foreman) and eight variables on the type of the region (RT2 to RT9)[16]. For West Germany we also include a variable for German nationality of the worker (NAT).

<+++ Table 6 about here +++>

Except for variant 1 in West Germany, the estimated coefficients for age and age squared do not exhibit the usual pattern (negative for age and positive for age squared). However, the coefficients are not statistically significant. We observe that the same is true for most of the coefficients for the skill and region type dummies, whereas the coefficients for job status are highly significant in all variants of the estimations. According to the results for the West, construction

[15]SKILL2 describes workers with completed vocational training but no higher education, SKILL3 and 4 graduates with at least 12 years of schooling (*Abitur*) with and without additional vocational training completed, whereas SKILL5 and 6 stand for graduates of a university of applied science or a full university, respectively. We also defined a dummy variable for the category "skill missing", SKILL7. The reference group are workers with neither higher education nor vocational training completed.

[16]The type of region ranges from the surroundings of metropolitan cities (RT2) to rural areas in the periphery (RT9). Metropolitan cities (RT1) were chosen as reference region.

workers of German nationality experienced an additional wage growth of roughly 0.5 log percentage points between 1995 and 1997 compared to their non-German colleagues. The time dummy for the year 1997 is significantly negative in all variants reflecting the reduction in earnings for construction workers due to a recession. With few exceptions, the t-statistics of coefficients are typically higher for the Maximum Likelihood estimates.

Note that the observations include the wage growth from 1995 to 1996 and 1996 to 1997. For this time period we find a statistically highly significant positive effect of the probability of belonging to the minimum wage regime. This means that low-wage earners in the respective groups have a higher chance for wage growth beyond the average. Therefore, there is some indication for reversion to the mean. Interactions of the probability for the minimum wage regime and the length of the employment spell after September 1, are highly significant positive in the ML estimates for the control group 2 and the general reference group 3, whereas the coefficients are negative for the treatment group 1 in the West. Relative to the control group, wage growth of workers with a high propensity of belonging to the minimum wage group tends to be negative in the last four months of a year.

Of special importance are the effects for the interaction of the probability of the minimum wage for the treatment group with a dummy variable for 1997 and the same for $DUR2$, the time of the employment spell after September 1. We observe a positive effect for $pm1D97$ in both parts of the country, which is, however, (weakly) significant for the East, only. There is thus some evidence that the minimum wage regulation indeed fostered wage growth of low-wage earners in the East, but not in the West. When it comes to the variable $pm1DUR2D97$, which measures the difference-in-difference effect in September 1997, it turns out that there is no significant influence of the reduction in the minimum wage on wage growth of low-wage earners. This might be interpreted as an indication of nominal wage rigidity. Once the minimum wage is introduced, the payments to workers are not reduced even after a downward adjustment of the lower wage floor.[17]

Table 7 gives the analogous results for the subconstruction sector in West and

[17]The literature on nominal and real wage rigidity has found a lot of evidence for non-adjustment of wages in face of shocks (see ...)

East Germany. In order to save space, we do not interpret the coefficients of the control variables in more detail. Note, however, that here the region types exhibit statistically significant effects in most cases, whereas skill level and nationality are of minor importance. As for the main construction sector we find a negative time effect for 1997 and for all variants a positive effect of the likelihood for belonging to the minimum regime, pm. With respect to the interaction effect of $pm1$ and the dummy for the year 1997, the coefficients are positive, but insignificant. The interaction of $pm1$ with the two time effects ($pm1DUR2D97$) is negative, but not significant at the 5 percent level. Hence one can conclude that there are no marked effects of the institutional changes occurring in 1997 in the subconstruction sector.

<+++ Table 7 about here +++>

6.2 Employment effects

Now we turn to the results of the employment function estimation. As before, different estimations for West and East Germany and the two subsectors are provided. As dependent variable on the left hand side serves here the (0,1) employment status variable conditioned on employment in the previous period.

Table 8 gives the result of logit estimates for the main construction sector showing marginal effects for the two model variants used also in the wage equations. The marginal effect of the variables age and age squared on employment for the main construction sector exhibit the expected pattern and is quite robust across variants of the estimates and across both parts of the country. According to the estimates, an increasing age of a person raises the employment probability of a person but at a decreasing rate. All coefficients are statistically highly significant.

<+++ Table 8 about here +++>

The influence of completed vocational training (skill group 2) on the likelihood of employment is significantly positive, whereas all other skill effecs are not significant. Job status craftsman (*Facharbeiter*) has a highly significant positive effect on the employment probability except for the ML variant for the West where this effect is significant at the 10 percent level only. The marginal effect of job status foreman (*Meister, Polier*) is positive if the US variation in hours is used, but not in the ML versions for West and East Germany. The effects of the region types are mostly positive and significant, indicating that the employment prospects of construction workers are typically better outside the metropolitan areas which form the control group. German nationality increases employment probability by more than a percentage point in the West.[18] The time effect for the year 1997 is negative which reflects the recession in the construction sector at that time. The probability of belonging to the minimum wage regime exhibits a negative influence on the probability of being employed in the next period. Finally, the interaction between $pm1$ and the time dummy variable $D97$ which measures the difference-in-differences effect is positive for the West and negative for the East, but not significant at all reasonable levels of significance.[19] We thus can conclude that a causal effect of the minimum wage regulation on employment in the construction sector can not be found in the data.

Table 9 shows the corresponding results for the subconstruction sector. Without going into detail one can observe that the effects of age, skill and region type are similar to those found for the main construction sector. Both types of job status are highly significant in the East, but not in the West if the ML variant is considered. Nationality has no significant effect on the employment probability in the subconstruction sector. The time effect for 1997 is weaker than for the main construction sector and not significant in the West. This indicates a milder recession for this sector at least in the West. The effect of the probability of belonging to the minimum wage regime is negative and highly significant for all groups and estimation variants in the West. For the East this is true for the treatment group only. The sign of the important interaction effect $pm1D97$ shows an inverse pattern compared to the main construction sector, it is negative for the West and positive for the East. However, as in table 8, the corresponding z-statistics are far from reaching the critical level even at the 10 percent level. Also in this sector we do not find significant employment effects of the change in the minimum wage.

<+++ Table 9 about here +++>

[18]Note that information on nationality is not available for East Germany.

[19]The same is true for the corresponding interactions with $pm3$.

7 Conclusions

The main purpose of this paper was to study the impact of the minimum wage introduction in the German construction sector in January 1997 on wage growth and conditional employment probability of the workers with a high probability of falling into the minimum wage regime. We used social security micro-data from IAB-REG with daily earnings. To identify the individuals mainly affected by the minimum wage we calculated the individual probability based on the earnings of the previous year. For wage growth as well as for employment probability estimation we specified a difference-in-differences approach. Those workers with a probability higher than 50% of belonging to the minimum wage regime were defined as the treatment group. Observations with probability below, but close to 0.5 were taken to form the control group.

The estimated impact on the wage growth in the main construction sector is weakly positive for East Germany, whereas we find significant effects neither for West Germamy nor for the whole subconstruction sector. The decrease of the minimum wage in September 1997 also did not have any significant consequences on wages. For the treatment group no significantly negative impact on the conditional employment probability in any of the subsectors and regions emanating from the minimum wage introduction is detectable.

To summarize, we find no negative impact of the minimum wage and the Worker Posting Law on the German Construction Sector. Yet, we advise against transferring these results uncritically to other sectors or the whole German economy since the many pecularities of the construction sector have to be taken into account.

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Table 1: Basic Statistics Wage Equation

	Dummy-Variable Specification
c	0.018
σ_η	0.722
ln lik	20901.381
N	18730
$\bar{R}^2$	0.117
RMSE	0.079
F(34,18697)	73.62
LR-test	63.66

Notes: Dummy-Variable Specifaction: Specification of the model with dummy variables for capturing the treatment effect. LR-Test: Test of treatment effects ($\chi^2(2)$).

Figure 1: Inequality Measures for the Wage Distribution of West German Construction Sector 1994 to 1999) (Absolute Log Percentile Distances to the Median)

Table 2: Deciles of the Wage Distribution and the Minimum Wage

Decile	*Year*						% diff.
	1994	1995	1996	1997	1998	1999	(6)/(1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	West						
	wages in Euro						
D1	8.70	8.88	9.07	9.07	8.97	9.40	8.0
D2	10.06	10.33	10.70	10.61	10.61	10.82	7.5
D3	11.06	11.33	11.69	11.60	11.69	11.88	7.4
D4	11.79	12.15	12.42	12.42	12.42	12.59	6.8
Median	12.51	12.78	13.14	13.05	13.05	13.30	6.3
	ln difference to median *100						
D1	15.8	15.8	16.1	15.8	16.3	15.1	
D2	9.5	9.2	8.9	9.0	9.0	9.0	
D3	5.4	5.2	5.1	5.1	4.8	4.9	
D4	2.6	2.2	2.5	2.2	2.2	2.4	
	minimum wage						
average				8.52	8.18	8.18	
- as % of median				65	63	62	
- ln diff. to median				18.5	20.3	21.1	
	East						
	wages in Euro						
D1	6.20	6.38	6.56	6.73	6.73	6.93	11.8
D2	6.91	7.09	7.35	7.53	7.53	7.63	10.3
D3	7.53	7.62	7.89	8.06	7.97	8.15	8.1
D4	8.06	8.15	8.42	8.51	8.42	8.49	5.3
Median	8.51	8.68	8.95	8.95	8.86	8.84	3.9
	ln difference to median *100						
D1	13.7	13.4	13.5	12.4	11.9	10.6	
D2	9.0	8.8	8.5	7.5	7.1	6.4	
D3	5.3	5.7	5.5	4.5	4.6	3.5	
D4	2.3	2.7	2.7	2.2	2.2	1.7	
average	-	-	-	7.91	7.74	7.74	
- as % of median	-	-	-	88.4	87.4	87.6	
- ln diff. to median				5.3	5.9	5.8	

Notes: Description of data and data sources see text; ln diff. to median: log. difference between minimum wage and median *100. The figures in the table were calculated for full-time blue-collar male workers in the construction and sub-construction sector assuming normal weekly working hours. Average overtime hours were calculated from aggregate data.

Table 3: Wage Growth Estimates for the Construction Sector, East Germany (1995-97)

	Coeff.	t-Stat
Dpm1	0.026	11.510
DTY	−0.019	−2.020
Dpm1DTY	0.027	5.910
Dpm3	−0.023	−12.360
Dpm3DTY	−0.003	−0.810
AGE	−0.001	−1.060
AGE^2	0.000	0.350
DSKILL2	−0.004	−1.410
DSKILL3	−0.013	−1.410
DSKILL4	0.020	1.370
DSKILL5	−0.002	−0.610
DSKILL6	0.005	2.800
DSKILLU	0.024	6.320
DRT2	−0.005	−0.950
DRT3	−0.005	−1.990
DRT4	−0.001	−0.620
DRT5	−0.002	−0.920
DRT6	−0.008	−3.640
DRT7	−0.001	−0.560
DRT8	−0.006	−2.270
DRT9	0.002	0.950
LDUR1-95	0.033	2.570
LDUR2-95	−0.234	−11.280
LDUR1-96	0.094	6.980
LDUR2-96	0.031	1.480
LDUR1-97	0.070	5.390
LDUR2-97	0.098	4.040
DUR1-95	−0.010	−0.770
DUR2-95	0.183	9.960
DUR1-96	0.005	0.480
DUR2-96	0.128	7.450
DUR1-97	0.027	2.280
DUR2-97	0.063	3.470
D1995	0.065	7.010
constant	0.015	1.340

Notes: for description of variables and estimation method see text.

Table 4: Logit Regression for Employment (Construction Sector, East Germany 1995-97)

	Coeff.	t-Stat
dpm1	−0.790	−9.040
DTY	−0.730	−3.540
dpm1DTY	−0.090	−0.620
dpm3	0.551	6.120
dpm3DTY	−0.209	−1.500
AGE	0.119	6.090
AGE^2	−0.189	−7.980
DSKILL2	0.197	1.910
DSKILL3	0.063	0.150
DSKILL4	−0.131	−0.250
DSKILL5	0.005	0.040
DSKILL6	0.358	5.460
DSKILLU	0.299	1.740
DRT2	0.568	2.270
DRT3	0.346	3.050
DRT4	0.331	3.280
DRT5	−0.331	−3.370
DRT6	0.276	3.080
DRT7	0.184	1.930
DRT8	0.306	2.860
DRT9	0.568	5.720
LDUR1-95	4.013	8.980
LDUR2-95	8.925	13.870
LDUR1-96	2.462	6.280
LDUR2-96	8.725	15.840
LDUR1-97	2.889	8.540
LDUR2-97	12.000	22.410
D1995	0.394	0.200
constant	−1.906	0.416
	Test statistics	
N	20821	
Pseudo R^2	0.177	
ln Likelih.	−5585.071	

Notes: for description of variables and estimation method see text.

Table 5: Corrected Interaction Effects

Variable	Mean	Std.Dev.	Min	Max
Interaction eff.	-0.047	0.018	-0.074	0.045
stand.err.	0.019	0.007	0.003	0.052
z-statistic	-2.615	0.591	-3.422	2.041

Notes: for description of variables and estimation method see text.

Table 6: Wage Function Estimates for the Main Construction Sector (1995-97)

	Dependent Variable: $\Delta \ln W_{it} \times 100$							
	West				East			
	Variant 1 (US)		Variant 2 (ML)		Variant 1 (US)		Variant 2 (ML)	
	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.
const.	0.374	0.42	–8.819	–9.43	–2.581	–2.07	–8.503	–6.47
age	–0.054	–1.23	0.051	1.19	0.064	1.04	0.053	0.88
age^2	0.009	0.18	–0.086	–1.65	–0.094	–1.23	–0.079	–1.05
skill2	0.114	0.67	0.384	2.31	–0.113	–0.32	–0.233	–0.66
skill3	2.879	1.37	3.485	1.70	1.880	0.83	1.444	0.64
skill4	0.200	0.16	0.235	0.20	–1.056	–0.95	–1.069	–0.96
skill5	0.369	0.18	–0.339	–0.17	2.651	1.52	2.476	1.43
skill6	–0.983	–0.32	–0.380	–0.13	10.578	2.61	9.286	2.30
skill7	–0.119	–0.63	0.265	1.42	–0.210	–0.53	–0.214	–0.55
craftsman	0.575	3.60	1.155	7.37	0.788	3.61	0.777	3.59
foreman	1.675	5.24	5.016	15.35	2.574	5.43	4.128	8.52
RT2	0.155	0.87	–0.310	–1.77	–0.679	–1.14	–0.933	–1.57
RT3	0.608	2.59	0.099	0.43	–0.336	–1.05	–0.565	–1.77
RT4	1.070	3.10	0.423	1.26	–0.124	–0.44	–0.273	–0.97
RT5	0.538	2.03	–0.052	–0.20	0.012	0.04	–0.026	–0.08
RT6	0.582	3.48	–0.160	–0.97	–0.935	–3.51	–1.174	–4.42
RT7	0.670	3.45	–0.072	–0.38	–0.308	–1.08	–0.512	–1.80
RT8	0.960	4.87	0.179	0.92	–0.569	–1.86	–0.715	–2.35
RT9	0.853	3.07	0.065	0.24	0.110	0.40	–0.089	–0.33
NAT	0.360	2.59	0.554	4.07	-	-		-
D97	–3.104	–9.52	–2.663	–3.54	–1.172	–2.14	–0.898	–1.01
DUR2D97	0.018	6.65	0.013	1.97	0.004	0.92	0.000	–0.03
pm1	7.537	4.01	21.949	9.07	8.197	9.33	21.475	16.36
pm2	11.448	4.41	22.714	10.34	7.012	4.96	18.977	11.79
pm3	17.760	3.55	19.705	15.25	2.522	0.89	14.881	9.32
pm1DUR2	–0.022	–1.14	–0.035	–1.44	0.024	3.03	0.031	3.09
pm2DUR2	0.046	1.81	0.047	2.26	0.041	3.30	0.041	3.27
pm3DUR2	0.220	4.91	0.099	11.11	0.136	5.72	0.077	8.14
pm1D97	1.963	0.79	1.778	0.53	3.684	2.46	4.045	1.79
pm1DUR2D97	0.011	0.41	0.019	0.55	0.002	0.11	0.008	0.39
pm3D97	11.012	1.57	6.715	2.24	4.966	1.00	4.550	1.59
pm3DUR2D97	–0.115	–1.80	–0.059	–2.28	–0.094	–2.15	–0.049	–1.94
	Test Statistics							
N	20184				12587			
σ_η	1.333		5.125		1.333		5.375	
R^2	0.066		0.111		0.104		0.113	
ln Likelih.	23565.1		24058.5		13835.1		13905.1	

Notes: Variant 1 (US):Standard deviation of hours (σ_η) taken from U.S. reference values; Variant 2 (ML): Maximum Likelihood estimation of standard deviation of hours (σ_η); for description of variables and estimation method see text.

Table 7: Wage Function Estimates for the Subconstruction Sector (1995-97)

	Dependent Variable: $\Delta \ln W_{it} \times 100$							
	West				East			
	Variant 1 (US)		Variant 2 (ML)		Variant 1 (US)		Variant 2 (ML)	
	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.
const.	2.074	1.95	–3.847	–3.48	2.967	1.80	2.294	1.38
age	–0.057	–1.09	–0.017	–0.33	–0.148	–1.89	–0.002	–1.97
age^2	0.014	0.22	–0.005	–0.08	0.134	1.36	0.001	1.43
skill2	0.772	2.48	0.691	2.26	–0.096	–0.15	–0.001	–0.12
skill3	1.469	1.03	1.562	1.11	0.285	0.09	0.000	0.01
skill4	0.980	0.96	0.889	0.89	0.771	0.54	0.008	0.55
skill5	1.084	0.67	1.202	0.76	1.997	0.71	0.019	0.67
skill6	–0.982	–0.25	–1.261	–0.32	1.500	0.41	0.015	0.40
skill7	0.222	0.65	0.210	0.62	0.645	0.93	0.007	0.96
craftsman	0.149	0.60	0.189	0.77	–0.383	–1.14	–0.004	–1.19
foreman	0.843	2.16	2.301	5.89	2.865	4.58	0.031	4.93
RT2	0.034	0.18	–0.009	–0.05	–1.174	–1.81	–0.012	–1.89
RT3	–0.308	–1.16	–0.606	–2.32	–1.695	–4.14	–0.018	–4.28
RT4	0.247	0.56	–0.077	–0.18	–0.687	–2.06	–0.007	–2.22
RT5	0.279	0.95	–0.072	–0.25	–1.247	–3.10	–0.013	–3.19
RT6	–0.146	–0.79	–0.450	–2.48	–1.893	–5.78	–0.019	–5.94
RT7	–0.547	–2.27	–0.964	–4.05	–0.876	–2.43	–0.009	–2.55
RT8	–0.839	–3.35	–1.169	–4.73	–0.768	–1.99	–0.008	–2.12
RT9	–0.646	–1.64	–1.078	–2.76	–0.797	–2.34	–0.008	–2.49
NAT	0.148	0.78	0.189	1.00	.	.	.	.
D97	–4.202	–9.97	–5.713	–5.68	–2.087	–2.57	–1.587	–1.69
DUR2D97	0.027	7.61	0.040	4.74	0.012	1.67	0.007	0.84
pm1	5.846	2.69	16.214	5.84	5.893	5.01	7.781	5.80
pm2	11.927	3.29	22.013	6.77	4.967	2.57	5.589	2.93
pm3	9.811	2.47	15.376	10.82	0.435	0.09	2.594	0.79
pm1DUR2	0.004	0.17	0.001	0.03	0.017	1.72	0.019	1.74
pm2DUR2	–0.006	–0.18	–0.016	–0.55	0.030	1.83	0.035	2.20
pm3DUR2	0.137	3.91	0.062	6.34	0.102	2.42	0.070	2.71
pm1D97	3.112	1.00	6.395	1.51	1.954	1.02	1.318	0.59
pm1DUR2D97	–0.036	–1.22	–0.068	–1.69	–0.011	–0.67	–0.005	–0.23
pm3D97	17.484	2.98	12.356	3.47	4.294	0.54	1.234	0.23
pm3DUR2D97	–0.162	–3.08	–0.114	–3.74	–0.070	–1.02	–0.026	–0.55
	Test Statistics							
N	12294				6418			
σ_η	1.333		5.0755		1.333		2.175	
R^2	0.066		0.094		0.077		0.078	
ln Likelih.	15478.9		15666.1		7774.2		7776.5	

Notes: Variant 1 (US):Standard deviation of hours taken from U.S. reference values; Variant 2 (ML): Maximum Likelihood estimation of standard deviation of hours; for description of variables and estimation method see text.

Table 8: Employment Function Logit Estimates for the Main Construction Sector (1995-97)

	Dependent Variable: Employment Status							
	West				East			
	Variant 1 (US)		Variant 2 (ML)		Variant 1 (US)		Variant 2 (ML)	
	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.
age	0.910	8.75	0.784	8.23	0.821	4.52	0.853	4.69
age^2	-1.246	-9.99	-1.107	-9.66	-1.389	-6.29	-1.425	-6.46
skill2	1.289	2.87	0.899	2.21	2.456	2.19	2.516	2.24
skill3	1.865	0.49	1.245	0.32	-5.092	-0.59	-4.717	-0.55
skill4	-4.745	-1.04	-3.931	-0.96	1.183	0.36	0.933	0.28
skill5	-3.653	-0.54	-1.178	-0.23	-3.385	-0.57	-2.774	-0.48
skill6	.	.	.	.	-3.168	-0.24	-2.544	-0.20
skill7	-0.767	-1.70	-1.001	-2.34	-0.367	-0.33	-0.376	-0.34
craftsman	1.410	3.33	0.626	1.67	2.666	3.77	2.815	3.97
foreman	3.000	5.59	-0.600	-0.56	2.384	1.76	1.341	0.87
RT2	0.894	2.19	1.197	3.37	4.367	3.38	4.398	3.42
RT3	0.145	0.24	0.549	1.08	5.229	7.96	5.232	7.97
RT4	-0.051	-0.06	0.407	0.54	4.960	7.83	4.993	7.90
RT5	0.209	0.32	0.717	1.33	0.048	0.05	0.117	0.13
RT6	0.592	1.46	1.137	3.26	4.589	7.42	4.586	7.41
RT7	0.142	0.29	0.679	1.65	4.121	6.36	4.154	6.42
RT8	0.815	1.68	1.271	3.12	4.285	6.27	4.302	6.30
RT9	1.253	1.93	1.627	3.06	6.437	11.44	6.427	11.41
NAT	1.389	3.81	1.045	3.19	.	.	.	.
D97	-0.896	-2.64	-1.549	-2.15	-2.250	-2.97	-1.903	-1.84
pm1	-10.278	-8.66	-29.191	-17.00	-20.321	-15.95	-36.663	-11.19
pm2	-25.062	-15.79	-39.300	-24.29	-15.899	-8.26	-26.787	-7.37
pm3	-49.097	-15.9	-41.723	-20.12	-19.791	-3.78	-23.676	-4.88
pm1D97	0.546	0.34	2.092	0.95	-1.678	-1.05	-2.517	-1.05
pm3D97	6.229	1.49	3.269	1.33	-0.690	-0.10	-1.552	-0.46
	Test Statistics							
N	23272				15146			
σ_η	1.329		5.125		1.329		5.375	
Pseudo R^2	0.089		0.102		0.090		0.088	
ln Likelih.	-5383.5		-5306.7		-5158.8		-5169.9	

Notes: The coefficients in the table are marginal effects calculated at variable means. The effect for the dummy variables indicates a change from zero to one. For more notes see table reftab:Wage7.

Table 9: Employment Function Logit Estimates for the Subconstruction Sector (1995-97)

	Dependent Variable: Employment Status							
	West				East			
	Variant 1 (US)		Variant 2 (ML)		Variant 1 (US)		Variant 2 (ML)	
	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.
age	0.388	3.35	0.355	3.28	0.492	2.22	0.505	2.28
age^2	-0.530	-3.67	-0.509	-3.77	-0.843	-3.06	-0.858	-3.11
skill2	3.917	4.08	3.853	4.13	3.370	1.60	3.342	1.59
skill3	.	.	.	.	.	.	.	.
skill4	1.738	1.32	1.617	1.32	-0.082	-0.02	-0.079	-0.02
skill5	1.676	0.73	1.696	0.85	-2.559	-0.26	-2.639	-0.26
skill6	-3.618	-0.46	-5.769	-0.58	.	.	.	.
skill7	0.839	1.71	0.831	1.83	0.249	0.15	0.252	0.15
craftsman	0.408	0.75	0.311	0.61	3.293	2.85	3.345	2.88
foreman	1.606	2.36	0.460	0.51	4.607	4.41	4.646	4.46
RT2	-0.007	-0.01	0.027	0.06	0.975	0.59	0.919	0.56
RT3	0.830	1.47	0.948	1.89	2.858	3.21	2.839	3.17
RT4	1.342	1.57	1.363	1.79	3.772	5.06	3.750	5.01
RT5	0.805	1.26	0.985	1.76	0.619	0.56	0.594	0.54
RT6	-0.002	0	0.165	0.41	1.743	2.09	1.694	2.01
RT7	-0.198	-0.35	0.080	0.16	3.164	3.94	3.130	3.87
RT8	1.519	3.22	1.521	3.58	1.636	1.71	1.577	1.63
RT9	1.000	1.34	1.000	1.48	3.421	4.52	3.380	4.44
NAT	0.240	0.57	0.180	0.46	.	.	.	.
D97	-0.165	-0.42	-0.234	-0.29	-1.788	-1.90	-1.827	-1.78
pm1	-7.681	-6.59	-19.178	-11.01	-10.600	-6.59	-11.559	-5.33
pm2	-13.014	-7.68	-22.874	-13.12	-2.930	-1.12	-2.220	-0.76
pm3	-22.782	-9.15	-24.143	-10.91	2.181	0.23	0.923	0.14
pm1D97	-1.072	-0.7	-1.014	-0.46	2.253	1.24	2.549	1.20
pm3D97	-1.098	-0.32	0.069	0.03	-7.614	-0.71	-3.559	-0.53
	Test Statistics							
N	13662				7384			
σ_η	1.329		5.075		1.329		2.175	
Pseudo R^2	0.076		0.083		0.051		0.050	
ln Likelih.	-2444.0		-2424.1		-2014.7		-2016.4	

Notes: The coefficients in the table are marginal effects calculated at variable means. The effect for the dummy variables indicates a change from zero to one. For more notes see table reftab:Wage7.

Figure 2: Inequality Measures for the Wage Distribution of West German Construction Sector 1994 to 1999) (Absolute Log Percentile Distances to the Median)

Figure 3: Interaction effect for individual observations and incorrect reference line

Figure 4: Z-Statistics for individual observations