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ABSTRACT

Business Taxation and Wages: Evidence from Individual Panel Data*

Empirical evidence on the degree of business-tax shifting to employees via the wage level is highly controversial and rare. It remains open to which extent the tax burden is shifted, whether there are differences for tax increases and decreases, or whether there exists some treatment heterogeneity, that drive the respective results. Using a large administrative panel data set, we exploit the regional variation of the German business income taxation to address these issues. Our results suggest an elasticity of wages with respect to business taxes that ranges between -0.28 to -0.46, once we control for invariant unobserved regional and individual characteristics. Workers with low bargaining power, e.g., low-skilled, are affected most from business tax shifting, indicating that business-tax incidence involves distributional effects. Finally, we find evidence for an asymmetric tax incidence.

JEL Classification: H22, H25, J31, J38

Keywords: tax incidence, profit taxation, wages, asymmetric effects

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1 Introduction

Corporate income taxation is very popular among both, voters and policy makers, because alleged wealthy capital owners are supposed to bear the burden of this tax. In the public debate it is frequently ignored, however, that firms have the possibility to shift the tax burden through different channels. They may pass the burden to consumers through higher prices, to capital by lowering dividends and changing the investment strategy, or to workers in form of lower wages. National or international competition, however, reduces the scope for price increases and hence for the possibilities to shift the tax burden to consumers by increasing prices. The potential to pass the burden to capital-owners or workers, in turn, depends on the mobility of these production factors: the less mobile a factor is *vis-à-vis* the other, the higher the portion of the tax burden that can be passed to this factor. In an open economy with liberalized capital markets, capital is much more mobile than labor, so that the latter may bear a large part of the tax burden levied by business taxation.

In contrast to the popular view, most public economists appear to believe that the corporate income tax is borne by both, capital and labor, even though there is substantial disagreement about the division of the burden. According to Fuchs et al. (1998: 1398), public economists from the leading forty US research universities estimate the burden of corporate income taxation borne by capital to range from 20 to 65 percent. This wide range of estimates may be explained by the limited empirical evidence on the incidence of corporate income taxation, which for a long time relied on the simulation of general equilibrium models using some reasonable values for the central parameters of these models.

Recent empirical contributions to this question focus on the analysis of the relationship between corporate income taxation and wages using country- or firm-level data (surveyed, e.g., in Gentry 2007). Although each of these studies uses different data sets and methodologies, the majority concludes that labor bears a substantial portion of the burden from corporate income taxation (Hassett and Mathur 2006; Felix 2007; Desai et al. 2007; Arulampalam et al. 2010; Riedel 2010). The estimated elasticities of wages with respect to corporate income taxation range from about -0.1, restricting the analysis to the direct incidence, to about -0.9, measuring the whole general equilibrium effect. Under the assumption of an open economy, in which capital is more mobile than labor, these results confirm the hypotheses of theoretical general equilibrium models (Harberger 1995, 2006; Randolph 2006; Gravelle and Smetters 2006). Only a few empirical studies estimate the impact of business taxes on wages using individual-level data. These studies also provide evidence on a negative wage effect of corporate income taxation (Felix and Hines 2009; Liu 2009), even though their estimates appear to be substantially smaller if compared to those found by studies that rely on country- or firm-level data. The estimated elasticities of Liu (2009), for example, range from about -0.03 to -0.05 across different specifications.

This paper contributes to the existing empirical literature on the incidence of corporate income taxes in several respects. First, for the first time an extensive administrative individual panel-data set is used to estimate Mincer-type wage equations. This allows to identify the causal impact of business income taxes on wages using the variation of tax rates across counties and time. Restricting our analysis to male workers, the empirical results suggest that labor bears a significant burden of corporate income taxes, with the business-tax-elasticity of real wages ranging from -0.28 to -0.46. Second, we provide evidence that changes of business income taxes have asymmetric wage effects. In particular, the degree of business tax shifting is higher for tax reliefs than for tax increases, which may root, among other things, in downward-rigid wages (e.g., Goette et al. 2007). Finally, we show that the tax-induced wage effects differ among skill and age groups as well as for individuals with different job tenure, indicating that employees with low bargaining power, such as low skilled workers or workers with low seniority, suffer most from tax shifting.

The paper proceeds as follows: Section 2 provides a brief overview of the theoretical background on the incidence of business income taxation, derives our hypotheses and outlines the relevant aspects of the German corporate tax system. Section 3 describes the data used in the empirical analysis, the identification strategy and some sensitivity tests. The estimation results are presented in Section 4, while section 5 concludes.

2 Business Taxation and Wages

2.1 Theory and Hypotheses

The analysis of the incidence of corporate income taxes is usually based on general equilibrium models, which are evaluated using some plausible values for the central parameters of the respective model. The seminal contribution by Harberger (1962) considers a closed economy with two sectors and a fixed supply of capital and labor. The implementation of a corporate tax in one sector of the economy, which is designed as a partial factor tax on capital, results in a substitution effect, which reduces the return on capital relative to wages, and an output effect, which may reinforce or counteract the substitution effect, depending on whether the taxed sector is capital- or labor-intensive. Using plausible values for the main parameters of his model, Harberger (1962) concludes that capital is likely to bear the full burden of the corporate income tax.

Extensions to this model aimed to relax some of its critical assumptions, such as a fixed stock of capital, a closed-economy or perfect information (Fullerton and Metcalf 2002). Concerning the question on whether the burden of corporate taxation is predominantly born by capital or by labor, these extensions come to mixed conclusions. If one considers the case of an open economy with free capital mobility, labor may bear the full burden of corporate income taxes (e.g., Harberger 1995, 2006).[1] In an open economy, the after-tax rates of the return to capital equalize at the world capital market. Therefore, changes in national corporate taxation will only increase the national gross-of-tax rate of return to capital and will result in capital flight. Consequently, on the national level each hour of labor will be endowed with less capital, so that the wage rate must decrease. Furthermore, in an open economy with free trade, firms may be constrained in their price-setting behavior depending on the international competition for the good the firm produces. If the good is perfectly substitutable by foreign goods, the increased costs per unit resulting from an increase in corporate taxes cannot be shifted by raising prices. In this case, the only possibility for firms to adjust the cost structure to increased unit costs is to reduce

[1] This scenario is realistic for the case of Germany. A critical review of the models analyzing the incidence of corporate income taxes in an open-economy is provided by Gravelle (2010) as well as Gravelle and Hungerford (2011).

the costs of labor.

The effects of an open economy with free capital mobility and free trade may be reinforced by the structure of the national labor market. Given small (uncompensated) labor supply elasticities of men (Laisney et al. 1992; Zabel 1997; Evers et al. 2008), shifting the tax burden partly to labor via wage changes is less costly than shifting it to the relatively more mobile capital. While shifting the tax burden to investors would cause capital flight, reduced wages will not cause a dramatic decrease in labor supply. Just as the theory of optimal taxation suggests that one should tax the least mobile good or factor, firms may follow the same logic when shifting tax burdens.

If labor bears some of the burden of corporate taxes, corporate tax policy may further result in unintended effects on the income distribution if a disproportional share of this burden is born by a particular group of workers. To our knowledge, this possibility has rarely been investigated yet, since the existing models on the incidence of corporate taxation usually assume a perfect labor market with homogeneous workers. Allowing for different groups of workers, the burden of corporate income taxes born by labor may vary across these groups, because of a different bargaining position or a different degree of mobility. For example, globalization and skilled-biased technological change has increased the demand for skilled workers resulting in increased income equality (e.g., Autor et al. 2006; Card et al. 1999; Dustmann et al. 2009). The competition for high skilled workers together with the evidence that they are more mobile than low skilled workers may limit the possibility of firms to impart the burden of corporate taxes via lower wages to skilled workers. A similar argument may be put forward concerning the role of job tenure. To the extent that workers with higher job tenure accumulated more firm-specific human capital and hence have more bargaining power, firms may be reluctant to incriminate these workers with the costs of business taxation. Overall, these arguments suggest that the burden of business income taxes that is borne by labor may fall predominantly on young and unskilled workers.

Another issue that has not been considered in the relevant literature is the role of wage rigidities. There is ample evidence that labor markets are characterized by downward nominal and real wage rigidities (e.g., Dickens et al. 2007; Goette et al. 2007; Bauer et al. 2007; Heckel et al. 2008). The reasons for these rigidities are manifold. Unions try to prevent wage cuts (Holden 1994, 2003), but support wage rises. Firms may also hesitate to cut wages, as wage cuts may increase the probability of losing productive workers. There is also evidence that nominal wage cuts are considered as unfair and that workers react to wage cuts by a reduction in their effort (Kahneman et al. 1986; Shafir et al. 1997; Elsby 2009). In contrast, following efficiency-wage models, wage increases can be used to motivate the workforce. Akerlof and Yellen (1990) also argue that workers respond to rising wages by exerting higher effort due to reciprocity. With respect to the incidence of business taxes, these considerations imply that tax changes may have asymmetric effects on wages, with the effects of tax increases being less pronounced than those of tax reductions.

The following empirical analysis will test the various hypotheses derived in this section. In particular we will investigate whether labor bears a substantial burden of business taxes, whether this burden is allocated disproportionally on different types of workers and whether there is an asymmetric effect of business tax changes on wages. Before doing so, however, a brief description of the German business tax system is required.

2.2 Business Taxation in Germany

In Germany, a company's profit-tax burden is determined at two levels, the federal and the regional level. Most regulations of business taxation concerning depreciation rules and the tax base in general, are determined at the federal level and hence are identical for all companies. In addition, all corporations face a single federal tax rate τ_f levied on profits.[2] In 1991, a "solidarity surcharge" has been added to the federal tax rate shortly after the German re-unification, resulting in the overall federal tax rate being *de facto* given by $1.055 \cdot \tau_f$.

[2] Non-corporations are subject to a federal progressive income tax tariff at the personal level. Taxation of non-corporations, in principle, is quite similar to that of corporations, though there are some distinctive features. Given the complexity of business taxation, we restrict the following description to corporate taxation.

In addition to the federal tax rate, the tax law for corporations constitutes a basic tax rate for the regional tax of 5%.[3] Municipalities are entitled to influence this tax rate by applying a regional collection rate c_r ("Hebesatz"), resulting in a nominal regional tax rate of $\tau_r(c_r) := 0.05 \cdot c_r$.[4] This regional nominal tax rate, in turn, deviates from the effective tax rate, since the regional tax liability itself is deductible from the regional tax base. Denoting the tax-relevant profits with π, the tax base at the regional level, B_r, thus is $B_r = \pi/[1 + 1.05\, c_r]^{-1}$, so that the effective regional tax rate is given by $\tau_r^{\text{eff}}(c_r) = \tau_r(c_r)[1+\tau_r(c_r)]^{-1}$. Finally, this regional tax liability is further deductible from the federal tax base of the corporate income tax. Hence, the final federal tax liability is calculated as $1.055 \cdot \tau_f \cdot \left(1 - \tau_r^{\text{eff}}\right) \cdot \pi$.

Summarizing these features, the effective federal-cum-regional tax rate of corporations in Germany is determined by:

$$\tau^{\text{eff}}(\tau_f, c_r) = \tau_f \cdot 1.055 + (1 - \tau_f \cdot 1.055) \cdot \tau_r^{\text{eff}}(c_r). \tag{1}$$

From 2001 to 2007, the federal tax rate τ_f was 25%. The average collection rate c_r is 3.81 if calculated using the individuals in our sample, resulting in an average effective federal-cum-regional tax rate of corporations, τ^{eff}, of about 38.2%. If one uses only the counties covered in our data, rather than the individual information, the average collection rate is 3.58 and the resulting federal-cum-regional tax rate 37.6%. Note that both values deviate from the officially published tax burden of 38.65% in the corresponding period, because the Federal Ministry of Finance assumed an average collection rate of 4.0 in their calculations. For the remainder of the analysis, we will refer to the average collection rate and the corresponding federal-cum-regional tax rate calculated using the individual observations, since these rates appear to be most reasonable for the analysis of the wage effects of business income taxation.

Beyond the effective nominal burden, the effective corporate tax burden is determined by

[3] The tariff for non-corporations was progressive and increased with the size of sales from 0% to 5%. Note, however, that the sales threshold for the marginal rate of 5% of €72,500 is at a very low level. Therefore, most non-corporated companies faced, at the margin, a tax rate of 5%, too.

[4] Until 2003, this collection rate could be set by the municipalities without restrictions. Since 2004, the collection rate has to be set to at least 200%: $c_r \geq 2$. Note that the introduction of this lower threshold for the collection rate in 2004 does not affect our empirical analysis, since none of the counties in our sample had an average collection rate below this threshold in 2003.

additional regulations concerning the tax base, such as, for example, depreciation rules. As already noted, these rules are implemented on the federal level and hence do not affect the regional variation of corporate taxes. Finally, between 1998 and 2004, corporate income taxation changed significantly due to several tax reforms that affected the level of tax rates and depreciation rules. Throughout, however, these changes also occurred exclusively at the federal level and hence did not affect the regional variation of corporate taxes. Therefore, at the regional level the effective corporate tax rate in Germany varies only through the collection rate c_r.

Figure 1 depicts the distribution of the average collection rates of the German counties for the period covered by our data set. It illustrates that there is substantial variation of collection rates across counties. On average, bigger cities, such as Berlin, Hamburg and Munich, and industrial regions, such as the Ruhr area, tend to have higher collection rates. In the Saarland, Saxony, and North Rhine-Westphalia, the latter being the most populous federal state in Germany, collection rates are consistently higher than in other federal states.

3 Data and Identification Strategy

3.1 The Regional File of the IAB Employment Sample

To investigate the effect of business income taxation on individual wages, we employ the regional files of the IAB Employment Sample (IABS), which are provided by the Institute for Employment Research (IAB). The IABS is a representative 2% sample of the *Employment Statistics Register*, an administrative panel data set of the employment history of all individuals employed in Germany, who worked between 1975 and 2004 in an employment relationship covered by social security. For 1995, for example, the *Employment Statistics Register* contains the labor market history of almost 80% of all employed persons in West Germany, and more than 86% of all employed persons in East Germany.[5]

[5]The employee history is based on the integrated notification procedure for health insurance, the statutory pension scheme, and unemployment insurance. At the beginning and end of any employment

The IABS provides information on gross daily wages, which we deflate by the German Consumer Price Index (CPI) (Federal Statistical Office 2004 and 2006) using year 2000 prices. Note that the wage information in the IABS is censored from above due to a ceiling for the social security contributions.[6] To deal with the problem of censored wages, we rely on the imputation method proposed by Gartner (2005). Further information provided by the data comprises the employees' year of birth, sex, education, county of the working place, occupational status and industry.[7] The wage information suffers from some additional problems (Bauer et al. 2007). First, prior to 1984 one-time payments are not reflected in the recorded wage information. Second, Hunt (2001) has shown, that the determination of wages in Germany changed markedly due to the German reunification in 1989/90. To deal with these potential problems, we restrict our empirical analysis to the period from 1995 to 2004.

Similar to many other developed countries, the elasticity of labor supply with respect to wages is much higher for women if compared to men (Steiner and Wrohlich 2004). Therefore, we exclude female workers from the empirical analysis to avoid a potential sample-selection bias of our estimates. For similar reasons, we also exclude part-time workers, homeworkers and trainees. Furthermore, we drop all workers employed in mining as well as those working in the farming, forestry or energy sector from the sample. Finally, we restrict our analysis to workers not younger than 16 and not older than 62 years of age. The remaining sample covers 2,030,973 person-year-observations of 597,711 individuals.

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spell, employers are obliged to notify the social security agencies. This spell information is exact to the day. For spells spanning more than one calendar year, an annual notification for each employee covered by the social security system is compulsory, and provides an update on the employment characteristics of the employee. Civil servants and self-employed are not covered by the data, since they are not subject to the Social Security System. A detailed description of the data set is provided by Bender et al. (2000).

[6] In Germany, employees are only obliged to pay social security contributions up to a certain gross wage – the contribution ceiling. In the dataset, the wage of employees who earn wages that are above the ceiling is set to the level of the ceiling, which causes a truncated wage distribution. Dropping these individuals would change the skill distribution, because individuals with wages above the ceiling are predominantly high skilled (Bauer et al. 2007).

[7] We do not correct for potential measurement errors in the education variables (Fitzenberger et al. 2006), as we are not interested in the return of education.

3.2 Econometric Model and Identification Strategy

To investigate the effect of business income taxation on wages, we estimate the following augmented Mincerian wage equation (Mincer 1958):

$$\ln(w_{irt}) = X_{irt}\beta + S_{irt}\gamma + \delta \ln(c_{rt}) + Z_{rt}\rho + T_t + \epsilon_{irt}, \tag{2}$$

where w_{irt} refers to the real daily wage per employee i in region r and year t. X_{irt} is a vector of socio-economic characteristics of individual i, including age and age squared, three dummy variables describing the educational attainment of an individual (no vocational training, secondary schooling degree, and university degree with those having vocational training as reference group), two dummy variables describing the occupational status of a worker (low-skilled worker and white-collar worker including master craftsmen with blue-collar workers as reference group), job tenure and job tenure squared. S_{irt} is a vector of nine industry dummies controlling for unobserved time-invariant industry-specific effects and T_t a vector of nine year dummies in order to control for year-specific effects. Z_{rt} denotes a vector of additional regional characteristics including the regional labor density (defined as the number of workers per km^2 of the county), which is supposed to measure labor productivity due to increasing returns generated by congestion and agglomeration effects (Ciccone and Hall 1996), the number of firms per employee to measure regional labor market competition (as in Glaeser et al. 1992), as well as the local unemployment rate as a measure of the bargaining power of employees.[8] The parameters β, γ, ρ and δ of model (2) are to be estimated; ϵ denotes the error term, which is assumed to satisfy the usual properties.

The information on the size of local population is taken from the official Regional Accounts (VGRdL 2010), the size of the counties from the Regional Data Base of the official statistical offices,[9] the local unemployment rate from the official statistics of the German Federal Employment Agency, and the local collection rate from the Real-Tax Statistics of the Federal Statistical Office (Federal Statistical Office 1999-2010). These variables have

[8] We initially also included the local GDP per capita as a general wealth measure. The local GDP per capita is highly correlated ($corr = 0.7328$) with the local labor density, however. Hence, we dropped this variable.

[9] Cf. http://www.statistik-portal.de/

been merged to our sample of individuals using the regional identifiers available in the respective datasets. Descriptive statistics of all variables used in the analysis are reported in the Appendix (Table A1).

The main parameter of interest is δ, which measures the elasticity of wages with respect to a change in the regional collection rate c_{rt}, i.e., $\frac{\partial w/w}{\partial c_r/c_r}$. However, to be able to compare our estimates to those of the existing literature, we need to derive the elasticity of wages with respect to the federal-cum-regional effective business tax rate $\frac{\partial w/w}{\partial \tau^{\text{eff}}/\tau^{\text{eff}}}$. Using equation (1), $\tau_f = 0.25$, and the average collection rate of $\bar{c}_r = 3.81$, we obtain $\partial \tau^{\text{eff}}/\partial c_r = [0.05 \cdot (1 - \tau_f \cdot 1.055)] \cdot [(1 + 0.05 c_r)^2]^{-1} = 0.026$. Using this number together with the average effective corporate tax rate derived in the last section ($\bar{\tau}^{\text{eff}} = 0.382$), we can calculate that the elasticity $\eta(\tau^{\text{eff}}, c_r) \equiv \frac{\partial \tau^{\text{eff}}/\tau^{\text{eff}}}{\partial c_r/c_r} = 0.26$. Therefore, increasing the average overall business tax rate by 1% requires the collection rate c_r to rise by $1/\eta(\tau^{\text{eff}}, c_r) = 3.86$ percent, i.e., the average elasticity of wages with respect to the federal-cum-regional effective corporate income tax is obtained by multiplying our estimates of δ by 3.86.

In a first step, we estimate regression model (2) using OLS, adding subsequently the vector S_{irt} and the elements of vector Z_{rt} to a basic specification that includes only the individual-specific elements in X_{irt}, the regional collection rate c_{rt}, and time fixed effects T_t as explanatory variables. Most likely these estimates deliver biased estimates of δ because of unobserved regional characteristics that are correlated with both, the collection rate and wages. A good regional infrastructure may, for example, attract both firms and high wage workers, which in turn may result in upward biased estimates of δ. We therefore estimate equation (2) adding county fixed effects to the specification in order to take time-invariant unobserved regional heterogeneity into account. As long as the variables included in vector Z_{rt} are able to control for time-variant regional heterogeneity, this specification should deliver unbiased estimates of δ. One may suspect, however, that even in the model with county fixed effects the estimates of δ may be biased because of unobserved individual heterogeneity. In a final step we therefore considered also individual fixed effects in addition to the regional fixed effects to our specification.

In our most saturated specification with time, county and individual fixed effects, the identification of our main parameter of interest δ comes either from counties that changed their collection rate from one year to another or from individuals who moved to a working place in another county with a different collection rate. Table 1 provides descriptive statistics on the average collection rates as well as changes in the collection rates for the 343 counties covered by our sample. The average collection rate across all counties increased steadily from 350 in 1995 to almost 364 in 2004. It becomes apparent that the variation of the collection rate between the counties and over time is sufficient to credibly identify δ. The standard deviation of the collection rate per year is close to 50%-points. Every year between 65 and 75% of the counties change their collection rate. These changes affected on average about 45% of the individuals covered in our sample. Table 1 further shows that decreases of the collection rate are markedly less common than tax increases. However, on average 22% of the counties decreased their collection rate every year affecting on average about 15% of the individuals in our sample. These numbers are clearly sufficient for investigating our hypothesis on asymmetric tax effects. In addition to the variation of collection rates shown in Table 1, we also obtain variation through movers between counties, since on average more than 20% of the individuals covered in our sample change per annum the county of their working place.[10] In these cases, we obtain variation in the collection rate even if the collection rate in both counties is unchanged, given they differ in levels.

As discussed above, we expect the effect of business income taxes on wages to vary for different groups of workers. In order to test this hypothesis, we interact $\ln(c_{rt})$ with the educational variables, two age indicators (16 to 30 and 51 to 62 years of age with the group of 31 to 50 year old acting as the reference group) as well as job tenure. Finally, we test the hypothesis that an increase in business income taxes has a different effect on wages in absolute terms than a comparable tax reduction by separating the development of the collection rate of each county into tax cuts and tax increases. In order to do so, we first generate two non-linear variables neg_{rt} and pos_{rt}. If Δc_{rt} is the change of the collection rate in year t and county r, these two variables are defined as $neg_{rt} = -\frac{1}{2}\left[abs(\Delta c_{rt}) - \Delta c_{rt}\right]$ and $pos_{rt} = \frac{1}{2}\left[abs(\Delta c_{rt}) + \Delta c_{rt}\right]$, respectively (Cover

[10] Descriptive Statistics on the movers are provided in Table A2 in the Appendix.

1992). Using neg_{rt} and pos_{rt}, we generate two hypothetical collection rate levels: $c_{rt}^{pos} = c_{r,1995} + \sum_{k=1996}^{t} pos_{rt}$ and $c_{rt}^{neg} = c_{r,1995} + \sum_{k=1996}^{t} neg_{rt}$. Starting at the initial level in 1995, c_{rt}^{pos} increases by pos_{rt} when we observe a tax increase and remains constant otherwise. Similarly, c_{rt}^{neg} does only decrease in years where we observe tax reliefs, and remains constant in all other years. The log of these two variables enter our specification as explanatory variables in order to obtain comparable estimates to the pooled version. Note that by definition we expect a negative sign of the coefficient of $\ln(c_{rt}^{pos})$ and a positive sign for the coefficient of $\ln(c_{rt}^{neg})$. The null hypothesis of interest is that the coefficients of these two variables are equal in absolute terms.

It is well known that there is the possibility of spurious regression when the regressor of interest varies at higher level than the dependent variable, as in our study (Kloek 1981; Moulton 1986: 385). The combination of individual and grouped data may cause a special within-group correlation, referred to as the clustering or Moulton problem. Moulton (1990) shows that ignoring this intra-group correlation can generate estimated standard errors that are likely to be downward biased. Especially for panel data, where either the serial or the intraclass correlation is underestimated, there is no mainstream procedure how to address this problem (Angrist and Pischke 2009: 308–323). Therefore, we apply two alternative approaches. Following Angrist and Pischke (2009: 319) the commonly used standard cluster adjustment developed by Liang and Zeger (1986), that generalizes the White (1980) correction of standard errors by allowing for clustering as well as for heteroskedasticity, is sufficient as long as the number of clusters is large enough, namely, as a rule of thumb, about 42. Hence, with 343 counties as clusters, we should have enough groups for the clustering method to work well (Angrist and Pischke 2009; Donald and Lang 2007). All standard errors are estimated applying this cluster correction.

As an alternative correction technique we follow Combes et al. (2008) by using a two-step estimation procedure in order to account for potential error correlation. In a first step only the regressors at the individual level together with region-year interaction terms are considered in the estimation procedure. In a second step, the estimated region-year-specific interaction effects obtained in the first step are regressed on all aggregated region-specific variables.

We further performed two additional robustness checks in order to test for the sensitivity of our estimation results. First, our estimates may be biased if employees tend to avoid the negative tax-induced wage effect by moving to another county. We account for this problem by estimating the above regression models separately for individuals who move from one county to another and those who stayed in their county. Second, our results may be biased because of unobservable structural differences in political or strategic decisions of the establishments in our sample. We deal with this potential risk by including a linear time trend as well as an interaction term between the time trend and the local collection rate to capture such structural differences at least to some extent.

4 Estimation Results

The estimated effects of the logarithm of the local collection rate on individual wages using pooled OLS are summarized in row (A) of Table 2.[11] The result of our most basic specification in column (1), which controls only for individual characteristics and year effects, implies a positive relationship between the local collection rate and wages. This result does not change substantially, when we subsequently add additional controls for the job tenure of the individual, industry dummies as well as the regional controls to the specification (columns (2)-(4)).

As these pooled OLS results are very likely biased due to unobserved regional heterogeneity, we estimated equation (2) including regional fixed effects. The results of these regressions, reported in row (B) of Table 2, suggest that the OLS estimates are upward biased. After controlling for unobserved time invariant regional heterogeneity, the estimated effect of the local collection rate becomes negative, as expected. Our most extended specification results in an elasticity of wages with respect to a change in the regional collection rate of -0.054 (column (4) of Table 2), which implies an elasticity of wages with respect to the federal-cum-regional effective business tax rate of -0.208.

The results when controlling for both, regional and individual fixed effects, are shown in row (C) of Table 2. It appears that the estimated elasticities increase in absolute terms if

[11] The full estimation results are reported in Appendix-Tables B1 to B3.

time invariant unobserved individual heterogeneity is taken into account. The estimated coefficient of our most saturated specification in column (4) implies an elasticity of wages with respect to a change in the regional collection rate of -0.072, which corresponds to an elasticity with respect to the overall effective tax rate of -0.278. Note that these estimates are smaller than those obtained by Felix and Hines (2009), but substantially higher than those reported by Liu (2009).

The estimated coefficients of the other control variables are all in line with intuition and the existing literature: there is a substantial wage differential between the Western and Eastern part of Germany, with wages in the former GDR being roughly 20% lower than those in West-Germany; individual wages show an inverted U-shaped pattern with age and job tenure; employees with higher education levels earn higher wages; the individual wage is statistically significant (i) positively affected by the local labor density and (ii) negatively by the local competition and county-specific unemployment rate, respectively.

The results of the second step of the alternative two-stage procedure are reported in Table 3.[12] The different specifications imply a wage elasticity with respect to a change in the regional collection rate that ranges between -0.111 and -0.084, which corresponds to an overall business tax elasticity of wages ranging between -0.428 and -0.324. Hence, it appears that our estimation results are qualitatively robust with respect to this different correction method.

Table 4 summarizes the results of our sensitivity analysis.[13] Analyzing movers and stayers separately confirm that employees bear a substantial portion of the German profit tax, irrespective of being a mover or a stayer. For both groups we find statistically significant negative effects of business income taxes on wages, being nearly twice as high for movers than for stayers. Restricting the sample to individuals who move between counties, the estimated coefficient of our most saturated specification reveals an elasticity of wages with respect to a change in the regional collection rate of -0.135, which implies an elasticity of -0.521 with respect to the federal-cum-regional effective tax. The respective elasticities for stayers are -0.082 and -0.316. Obviously changing the job reduces the bargaining

[12] The full estimation results are shown in Tables B4 (first-stage results) and B5 in Appendix B.
[13] The full estimation results are reported in Tables B6 to B8 in Appendix B

power, so that, all other things equal, the degree of tax shifting rises. Using the modified specification with the interaction term of the time trend and the collection rate, we again find a statistically significant and negative effect on the wage. Overall, the sensitivity analysis suggests that the estimated negative effects of business income taxes on individual wages are robust towards changes in the specification and sample considered.

The results reported in Table 4 suggest that the degree of tax shifting of business taxes on wages is different for movers and stayers. The estimates reported in Table 5, in which we allow the effect of business taxes on wages to differ by the education, age and job tenure of the individuals, further confirm that the effects of business tax shifting are heterogeneous for different groups of employees. Column (1) of Table 5 suggests that the negative effect of business taxation on wages is decreasing with the education of an individual. In particular the low-skilled appear to suffer from an increase in business income taxes, while we find no relationship between the regional collection rate and wages for the highest two skill groups of employees. For lowest-skilled we find with −0.635% (−0.165 for the collection rate) the highest elasticity of all groups (in absolute terms) in our study.[14] These results indicate that firms shift profit taxes only to the lower-skilled, but not to the employees with secondary schooling or academic degrees. Hence, business tax incidence involves significant redistributional effects. The estimated coefficients reported in column (2) of Table 5 indicate, that the negative wage effect of business income taxes is higher for young and older workers if compared to middle-aged employees.[15] Finally, it appears that the negative wage effect of the collection rate diminishes with increasing job tenure (column (3)). These results suggest that the extent to which a firm can pass over business taxes to wages indeed varies for different group of workers. It appears in particular, that those employees with a low bargaining power, such as low-skilled and young or older workers as well as those with a low job tenure, are most strongly affected by business tax shifting.

Finally, Table 6 provides a test for the hypothesis of an asymmetric tax incidence. In

[14]For individuals with vocational training the elasticity is −0.290, for those with secondary school degree −0.125 (−0.032), and for those with college/university degree +0.059 (0.015). F-tests prove that the latter two elasticities are not statistically different from zero, that is, their wages are not affected by business tax incidence.

[15]The elasticity is −0.447% (−0.116) for the youngest age group, −0.238% (−0.062) for the middle aged group, and −0.291% (−0.076) for the oldest age group.

all specifications shown in columns (1) to (3), both tax cuts and tax increases have statistically significant effects with the expected sign. On average, business tax cuts involve an elasticity of +0.332 (+0.086 for the collection rate) and increases of the effective tax rate an elasticity of −0.224 (−0.058 for the collection rate). In model (4) the signs of the coefficients are also as expected, however, only the coefficient of tax reliefs is significant.[16] Applying the two-step technique proposed by Combes et al. (2008) our result of asymmetric effects is confirmed. Even in model (4) both coefficients are significant with the expected sign. However, the effect of tax increases rises in absolute terms, while the effect of tax reliefs decreases.[17] The sum of the coefficients of tax reliefs and tax increases is statistically significant different from zero in model (2) to (4); in the two-stage approach the effects are significantly different even in model (1). Therefore, our results provide robust evidence for an asymmetric tax incidence of business taxation. We conclude that tax reliefs cause stronger effects than tax increases. This evidence is in line with the notion that downward wage rigidities hamper the possibilities of firms to shift the burden to business tax increases on workers.

5 Conclusion

This paper provides empirical evidence on the incidence of business taxation on wages. In contrast to the existing literature on this issue, we combine individual labor market data for Germany with county-specific effective tax rates rather than simulating general equilibrium models or using country- or firm-level data. This allows us to apply an augmented version of the Mincer wage equation to identify the causal impact of business taxes on wages using panel data models. The data set enables us further to document the heterogeneity of the effect of business taxes on wages for different types of workers. Additionally, differentiating tax increases and tax reliefs, we provide first empirical evidence for an asymmetric business tax shifting behavior of companies.

Our results indicate that the elasticity of wages with respect to changes of the effective

[16] The coefficient of tax increases is significant at the 5% level if we control for labor market competition and labor density only, but drop the unemployment rate.

[17] The results are reported in Table B14.

business tax rate ranges between -0.28 and -0.46. Workers with low bargaining power, i.e., low-skilled, young and older workers as well as employees with low job tenure, suffer most from business tax shifting activities, where workers without vocational training and young workers are affected most. Therefore, the income distribution will be changed by business tax rate reforms: while the wage elasticity with respect to business income taxation for workers without occupational degree and that of the young workers ranges between -0.64 and -0.45, academics and workers with secondary schooling seem not to suffer at all by profit tax shifting. We further provide robust evidence that the effects of tax reliefs and tax increases are significantly different. Tax reliefs, on average, caused a statistically significant wage increase of about 0.305%. In contrast, we find no robust evidence for an significant effect of tax increases, on average. If there is an effect at all, our results suggest an elasticity of roughly -0.2. This significantly lower effect of tax increases can be explained, for instance, by downward-rigid wages.

Comparing our estimates to similar studies for the US shows, that our estimates are substantially higher than the rather low elasticities of -0.03 to -0.05 obtained by Liu (2009). However, our estimated elasticity for tax reliefs is lower if compared to the corresponding estimates of Felix and Hines (2009), who found that a reduction of the business tax rate by 1% rises wages by 0.36%. However, given our evidence for asymmetric and group-specific business tax effects, using data from a country and time period where there have been less tax rate decreases than tax increases, an empirical study may find lower elasticities than studies that used data from the same country in a period with relatively more tax reliefs, or that used data in the same period from a different country with relatively more tax cuts. Similarly, different region-specific labor force structures may cause markedly different business tax elasticities. Therefore, some of the dissent on the size of (business) tax incidence may simply root in the usage of different data where the relation and intensity of tax cuts and tax increases as well as the characteristics of the workforce are different.

The empirical evidence suggest that in modern developed economies, that are similar structured as Germany, tax relief policies may have higher multipliers than often expected. Applying the estimated elasticity of -0.305 to the average nominal daily gross wage in our sample, a cut of the business tax rate by 1% is associated with a rise of the average nominal yearly wage of about €165. In comparison, rising the business tax rate by 1% could decrease the average nominal yearly gross wage by up to about €110. Overall, an expansive fiscal policy via tax cuts for companies may well involve significant positive long-term demand effects by the workforce due to higher wages. At the same time, the corresponding negative effects of companies' tax shifting toward employees in the course of a contractive fiscal policy via tax increases is markedly lower – or even negligible.

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Table 1: Regional Variation of the Collection Rate c_r

Year	Mean(c_r)	S.D.	$\Delta\, c_r > 0$ (rel. freq.)	$\Delta\, c_r < 0$ (rel. freq.)
1995	350.3	47.7		
1996	352.9	47.4	0.56	0.14
1997	355.7	48.7	0.58	0.16
1998	356.8	49.9	0.50	0.20
1999	357.4	49.4	0.38	0.30
2000	358.0	49.4	0.41	0.24
2001	358.8	48.6	0.45	0.25
2002	360.4	48.9	0.47	0.22
2003	362.7	49.2	0.46	0.27
2004	363.8	49.3	0.50	0.22
Total	357.7	48.9	0.48	0.22

Source: Own calculations, German Real-Tax Statistics. Observations: 3430 county-year observations of 343 counties.

Table 2: Wage Effects of Business Taxes: OLS and Fixed-Effects Estimates. Dependent Variable: ln(Daily Wage)

	(1)	(2)	(3)	(4)
(A) OLS	0.1255***	0.1312***	0.1636***	0.1324***
	(0.0244)	(0.0254)	(0.0259)	(0.0440)
(B) Regional Fixed-Effects	-0.0694***	-0.0985***	-0.0955***	-0.0543***
	(0.0148)	(0.0182)	(0.0174)	(0.0203)
(C) Regional and Individual Fixed Effects	-0.1111***	-0.1183***	-0.1165***	-0.0719**
	(0.0261)	(0.0258)	(0.0261)	(0.0304)
Individual Controls	Yes	Yes	Yes	Yes
Job Tenure	No	Yes	Yes	Yes
Industry Dummies	No	No	Yes	Yes
Regional Controls	No	No	No	Yes
Observations	1,829,261	1,827,579	1,824,587	1,785,056

*The table reports the estimated coefficients of $ln(c_r)$. Individual controls: age, age squared, a dummy for East Germany, three dummy variables for the educational degree and two dummy variables for the occupational status. Job tenure: job tenure and job tenure squared. Regional controls: local labor density, local competition, local unemployment rate. Constant and year dummies are included in all specifications. Clustered standard errors in parentheses. ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table 3: Wage Effects of Business Taxes: Second Stage Estimates. Dependent Variable: Estimated County-Year Fixed Effects

	(1)	(2)	(3)
ln(Collection Rate)	-0.1112***	-0.1026**	-0.0844***
	(0.0266)	(0.0239)	(0.0221)
Regional Controls			
Local Labor Density	No	Yes	Yes
Local Competition	No	Yes	Yes
Local Unemployment Rate	No	No	Yes
Observations	3,167	3,159	3,088

The table reports the results of our second stage FE estimates of the two-stage alternative. Consequently all models only include regional controls and nine year dummies. Robust standard errors in parentheses. ****significant at 1% level;* ***significant at 5% level;* **significant at 10% level.*

Table 4: Wage Effects of Business Taxes: Sensitivity Analysis. Dependent Variable: ln(Daily Wage)

	(1)	(2)	(3)	(4)
(A) Movers	-0.2164***	-0.2162***	-0.2090***	-0.1348***
	(0.0481)	(0.0462)	(0.0430)	(0.0371)
(B) Stayers	-0.1071***	-0.1102***	-0.1096***	-0.0817***
	(0.0208)	(0.0214)	(0.0215)	(0.0208)
(C) Linear Time Trend	-0.0841***	-0.0807***	-0.0796***	-0.0272*
	(0.0221)	(0.0221)	(0.0219)	(0.0146)
Individual Controls	Yes	Yes	Yes	Yes
Job Tenure	No	Yes	Yes	Yes
Industry Dummies	No	No	Yes	Yes
Regional Controls	No	No	No	Yes
Observations	1,829,261	1,827,579	1,824,587	1,785,056

The table reports the estimated coefficients of $ln(c_r)$. Individual controls: age, age squared, a dummy for East Germany, three dummy variables for the educational degree and two dummy variables for the occupational status. Job tenure: job tenure and job tenure squared. Regional controls: local labor density, local competition, local unemployment rate. Constant and year dummies are included in all specifications. Clustered standard errors in parentheses. ***significant at 1% level; **significant at 5% level; *significant at 10% level.

Table 5: Wage Effects of Business Taxes: Heterogeneous Effects. Dependent Variable: ln(Daily Wage)

	Interactions with		
	Education	Age	Tenure
	(1)	(2)	(3)
ln(Collection Rate)	-0.0752***	-0.0616**	-0.1004***
	(0.0259)	(0.0264)	(0.0313)
No Vocational Training*ln(c_r)	-0.0893***		
	(0.0118)		
Secondary School*ln(c_r)	0.0428*		
	(0.0239)		
College/University Degree*ln(c_r)	0.0904***		
	(0.0308)		
Aged 16-30 years*ln(c_r)		-0.0542***	
		(0.0118)	
Aged 51-62 years*ln(c_r)		-0.0139*	
		(0.0073)	
Job Tenure*ln(c_r)			0.0046***
			(0.0007)
within-R^2	0.1374	0.1192	0.1372
adj. within-R^2	0.1372	0.1190	0.1370
N	1,785,056	1,785,056	1,785,056

The table reports the estimated coefficients of ln(c_r) *and its interaction terms. Individual controls: a dummy for East Germany, three dummy variables for the educational degree and two dummy variables for the occupational status. Model (1) and (3) include age and age squared, model (2) two age dummies for groups "16–30 years" and "51–62". Job tenure: job tenure and job tenure squared. Regional controls: local labor density, local competition, local unemployment rate. Constant and nine year and industry dummies are included in all specifications. Clustered standard errors in parentheses. ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table 6: Wage Effects of Business Taxes: Asymmetric Effects. Dependent Variable: ln(Daily Wage)

	(1)	(2)	(3)	(4)
$\ln(c_{rt}^{pos})$	-0.0661***	-0.0546***	-0.0534***	-0.0219
	(0.0234)	(0.0181)	(0.0176)	(0.0231)
$\ln(c_{rt}^{neg})$	0.0588**	0.0992***	0.0987***	0.0789***
	(0.0251)	(0.0265)	(0.0261)	(0.0277)
Individual Controls	Yes	Yes	Yes	Yes
Job Tenure	No	Yes	Yes	Yes
Industry Dummies	No	No	Yes	Yes
Regional Controls	No	No	No	Yes
Observations	1,829,261	1,827,579	1,824,587	1,785,056

*All models control for individual and regional fixed effects. Individual controls: age, age squared, a dummy for East Germany, three dummy variables for the educational degree and two dummy variables for the occupational status. Job tenure: job tenure and job tenure squared. Regional controls: local labor density, local competition, local unemployment rate. Constant and year dummies are included in all specifications. Clustered standard errors in parentheses. ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Appendix

Table A1: Descriptive Statistics

Variable	Mean	(Std. Dev.)
Nominal Gross Daily Wage	147.998	(223.05)
ln(Nominal Gross Daily Wage)	4.415	(0.432)
Collection Rate (c_r) in percent	380.576	(57.295)
Share of observations with changing c_r*	0.622	(0.485)
Share of observations with increasing c_r*	0.421	(0.494)
Share of observations with decreasing c_r*	0.201	(0.401)
East Germany	0.154	(0.361)
Age in years	39.386	(9.858)
Job Tenure in years	6.781	(6.881)
No Vocational Training	0.124	(0.33)
High school Degree	0.637	(0.481)
Secondary School (Abitur)	0.038	(0.191)
College/ University Degree	0.113	(0.316)
Low-skilled Worker	0.253	(0.435)
Blue-collar Worker	0.374	(0.484)
White-collar Worker	0.373	(0.484)
Primary Industry	0.094	(0.291)
Investment Goods Production	0.224	(0.417)
Consumer Goods Production	0.060	(0.237)
Food and Allied Industries	0.026	(0.161)
Building and Construction Trade	0.126	(0.332)
Distributive Service	0.118	(0.323)
Communication and Transport Industries	0.073	(0.260)
Economic Service	0.127	(0.333)
Social Service	0.084	(0.278)
Other Services	0.067	(0.249)
Local Labor Density	0.583	(0.728)
Local Competition	1.236	(0.620)
Local Unemployment Rate	10.561	(4.514)
Local GDP per capita in thousands €	26.874	(12.334)
Movers between counties	0.216	(0.411)

** Share of observations where c_r differs between year t and $t-1$.*

Table A2: Number and Fraction of Movers between counties

year	N(total)	N(movers)	fract.(movers)
1996	211,318	38,904	0.18
1997	212,814	43,708	0.21
1998	212,858	44,753	0.21
1999	207,358	47,098	0.23
2000	209,838	53,103	0.25
2001	215,128	51,300	0.24
2002	202,757	39,209	0.19
2003	204,972	46,712	0.23
2004	132,128	25,746	0.19
Total	1,809,171	390,533	0.22

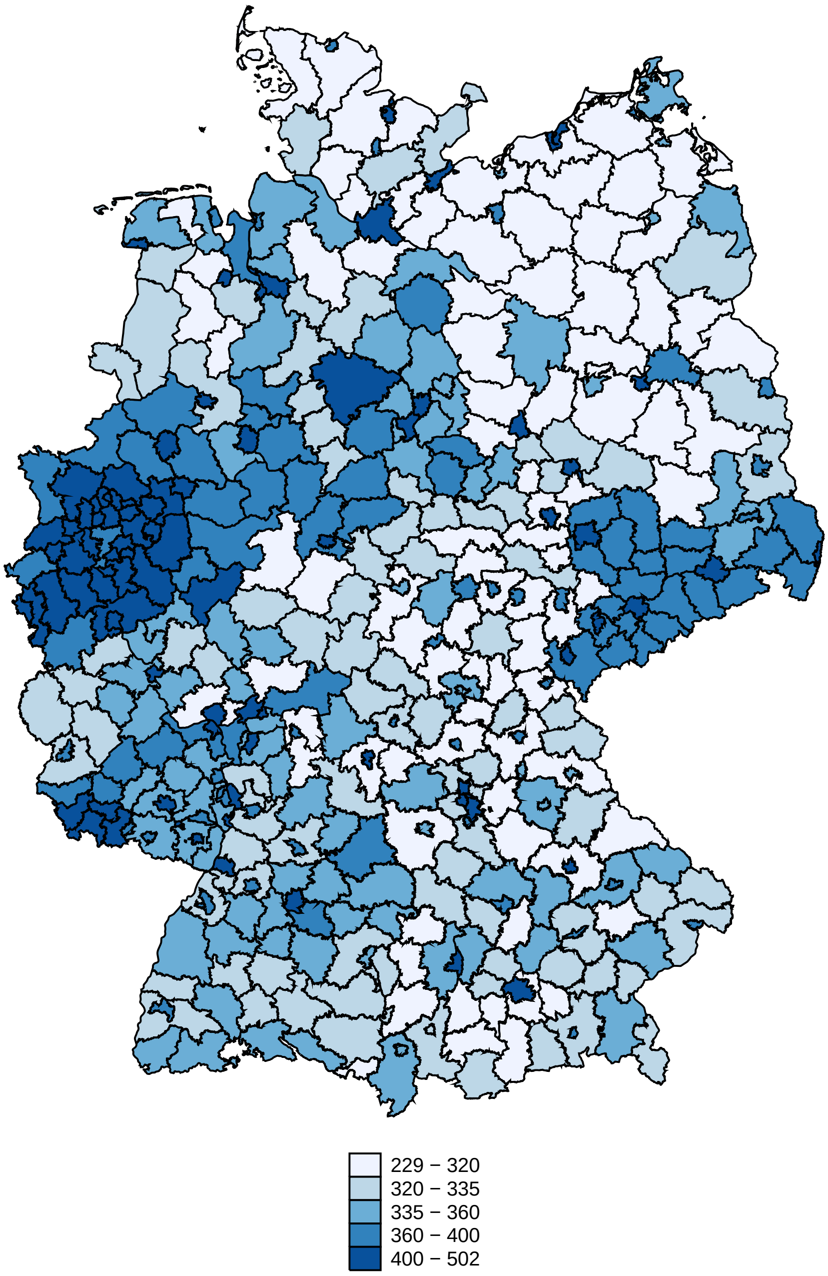
Source: IABS and German Real-Tax Statistics.

Table A3: Wage Effects of the Regional Collection Rate: Regional Extensions. Dependent Variable: ln(Daily Wage)

	(I)	(II)	(III)	(IV)
(A) OLS	0.1636***	0.0631	0.1324***	0.1112***
	(0.0259)	(0.0634)	(0.0440)	(0.0251)
(B) Regional Fixed-Effects	-0.0955***	-0.0826***	-0.0543***	-0.0427^{0**}
	(0.0174)	(0.0166)	(0.0203)	(0.0192)
(C) Regional and Individual Fixed Effects	-0.1164***	-0.0978***	-0.0719**	-0.0512*
	(0.0261)	(0.0488)	(0.0304)	(0.0274)
Individual Controls	Yes	Yes	Yes	Yes
Job Tenure	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Regional Controls				
Local Labor Density	No	Yes	Yes	Yes
Local Competition	No	Yes	Yes	Yes
Local Unemployment Rate	No	No	Yes	Yes
Local GDP per capita	No	No	No	Yes
Observations	1,824,587	1,819,579	1,785,056	1,785,056

*(i) The table reports the estimated coefficients of $ln(c_r)$. (ii) Individual controls: age, age squared, a dummy for East Germany, three dummy variables for the educational degree and two dummy variables for the occupational status. Job tenure: job tenure and job tenure squared. Constant and year dummies are included in all specifications. (iii) Clustered standard errors in parentheses. (iv) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Figure 1: Distribution of the pooled average collection rates of the German counties in %



Data source: Real-Tax Statistics of the Federal Statistical Office

Appendix B – Not intended for publication

Table B1: Pooled OLS Basic Wage Equation Estimates

Dep. Var.: ln(Wage Rate)	Model 1	Model 2	Model 3	Model 4
ln(Collection Rate)	0.1255***	0.1312***	0.1636***	0.1324***
	(0.0244)	(0.0255)	(0.0259)	(0.0440)
Age	0.0507***	0.0406***	0.0400***	0.0406***
	(0.0008)	(0.0006)	(0.0006)	(0.0006)
Age Squared	-0.0005***	-0.0004***	-0.0004***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.3921***	-0.3461***	-0.3307***	-0.2441***
	(0.0088)	(0.0090)	(0.0087)	(0.0281)
No Vocational Training (VT)	-0.0803***	-0.0831***	-0.0840***	-0.0850***
	(0.0033)	(0.0030)	(0.0024)	(0.0023)
Secondary School (Abitur)	0.0824***	0.0990***	0.0986***	0.0958***
	(0.0045)	(0.0043)	(0.0036)	(0.0036)
College/University	0.3092***	0.3348***	0.3153***	0.3092***
	(0.0055)	(0.0044)	(0.0036)	(0.0030)
Low-skilled Worker	-0.0951***	-0.0809***	-0.0684***	-0.0693***
	(0.0040)	(0.0035)	(0.0028)	(0.0026)
White-collar Worker/	0.2117***	0.2146***	0.2705***	0.2665***
Master Craftmen	(0.0034)	(0.0033)	(0.0029)	(0.0027)
Job Tenure		0.0271***	0.0244***	0.0245***
		(0.0009)	(0.0007)	(0.0007)
Job Tenure Squared		-0.0007***	-0.0006***	-0.0006***
		(0.0000)	(0.0000)	(0.0000)
Local Labor Density				0.0209**
				(0.0105)
Local Competition				-0.0222***
				(0.0061)
Local Unemployment Rate				-0.0093***
				(0.0019)
R^2	0.4550	0.4918	0.5237	0.5242
adj. R^2	0.4550	0.4918	0.5237	0.5242
N	1,829,261	1,827,579	1,824,587	1,785,056

*(i) Constant and year dummies are included in all estimates but not reported; Model 3 and 4 additionally control for industry dummies. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B2: Regional FE Basic Wage Equation Estimates

Dep. Var.: ln(Wage Rate)	Model 1	Model 2	Model 3	Model 4
ln(Collection Rate)	-0.0694***	-0.0985***	-0.0955***	-0.0543***
	(0.0148)	(0.0182)	(0.0175)	(0.0203)
Age	0.0508***	0.0409***	0.0403***	0.0406***
	(0.0008)	(0.0006)	(0.0006)	(0.0006)
Age Squared	-0.0005***	-0.0004***	-0.0004***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.0169***	-0.3522***	-0.3596***	-0.0964***
	(0.0006)	(0.0066)	(0.0065)	(0.0144)
No Vocational Training (VT)	-0.0865***	-0.0891***	-0.0895***	-0.0896***
	(0.0028)	(0.0026)	(0.0021)	(0.0020)
Secondary School (Abitur)	0.0773***	0.0927***	0.0923***	0.0923***
	(0.0040)	(0.0040)	(0.0036)	(0.0036)
College/University	0.3005***	0.3249***	0.3058***	0.3062***
	(0.0030)	(0.0026)	(0.0026)	(0.0026)
Low-skilled Worker	-0.0970***	-0.0829***	-0.0695***	-0.0703***
	(0.0034)	(0.0030)	(0.0023)	(0.0023)
White-collar Worker/	0.2080***	0.2101***	0.2637***	0.2635***
Master Craftmen	(0.0029)	(0.0028)	(0.0025)	(0.0026)
Job Tenure		0.0268***	0.0243***	0.0243***
		(0.0007)	(0.0006)	(0.0006)
Job Tenure Squared		-0.0007***	-0.0006***	-0.0006***
		(0.0000)	(0.0000)	(0.0000)
Local Labor Density				0.0406*
				(0.0214)
Local Competition				-0.0172***
				(0.0043)
Local Unemployment Rate				-0.0036***
				(0.0007)
N	1,829,261	1,827,579	1,824,587	1,785,056

*(i) Constant and year dummies are included in all estimates but not reported; Model 3 and 4 additionally control for industry dummies. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B3: Individual and Regional FE Basic Wage Equation Estimates

Dep. Var.: ln(Wage Rate)	Model 1	Model 2	Model 3	Model 4
ln(Collection Rate)	-0.1111***	-0.1183***	-0.1165***	-0.0719**
	(0.0261)	(0.0258)	(0.0261)	(0.0304)
Age	0.0542***	0.0485***	0.0493***	0.0498***
	(0.0011)	(0.0010)	(0.0010)	(0.0009)
Age Squared	-0.0006***	-0.0005***	-0.0005***	-0.0005***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.2024***	-0.2039***	-0.2241***	-0.1066***
	(0.0144)	(0.0130)	(0.0127)	(0.0507)
No Vocational Training (VT)	-0.0212***	-0.0239***	-0.0235***	-0.0237***
	(0.0022)	(0.0022)	(0.0021)	(0.0021)
Secondary School (Abitur)	0.0114***	0.0131***	0.0138***	0.0132***
	(0.0037)	(0.0036)	(0.0035)	(0.0036)
College/University	0.0801***	0.0810***	0.0806***	0.0806***
	(0.0032)	(0.0032)	(0.0031)	(0.0032)
Low-skilled Worker	-0.0279***	-0.0234***	-0.0184***	-0.0184***
	(0.0017)	(0.0017)	(0.0015)	(0.0016)
White-collar Worker/	0.0535***	0.0579***	0.0710***	0.0694***
Master Craftsmen	(0.0021)	(0.0022)	(0.0021)	(0.0021)
Job Tenure		0.0097***	0.0087***	0.0089***
		(0.0002)	(0.0002)	(0.0002)
Job Tenure Squared		-0.0003***	-0.0003***	-0.0003***
		(0.0000)	(0.0000)	(0.0000)
Local Labor Density				0.0736**
				(0.0371)
Local Competition				-0.0265***
				(0.0049)
Local Unemployment Rate				-0.0037***
				(0.0006)
within-R^2	0.1098	0.1198	0.1364	0.1370
adj. within-R^2	0.1096	0.1196	0.1362	0.1368
N	1,829,261	1,827,579	1,824,587	1,785,056

(i) Constant and year dummies are included in all estimates but not reported; Model 3 and 4 additionally control for industry dummies. (ii) Clustered standard errors are in parenthesis. (iii) ****significant at 1% level;* ***significant at 5% level;* **significant at 10% level.*

Table B4: First Stage Estimation

Dep. Var.: ln(Wage Rate)	First Stage Specification
Age D1 (16-30 years)	-0.0452***
	(0.0006)
Age D3 (51-62 years)	-0.0370***
	(0.0006)
No Vocational Training (VT)	-0.0263***
	(0.0010)
Secondary School (Abitur)	0.0147***
	(0.0015)
College/University	0.0835***
	(0.0015)
Low-skilled Worker	-0.0168***
	(0.0008)
White-collar Worker/ Master Craftsmen	0.0786***
	(0.0010)
Job Tenure	0.0122***
	(0.0001)
Job Tenure Squared	-0.0005***
	(0.0000)
N	1,785,056
$Prob > F^a$	0.0000

*(i) The model further includes all available individual and county-year fixed effects as well as nine industry dummy variables. (ii) Standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

[a] F-Test that person and county-year effects are equal to zero.

Table B5: Basic FE 2nd Stage Estimates

Dep. Var.: Est. County-Year FE	Model 1	Model 2	Model 3	Model 4
ln(Collection Rate)	-0.1112***	-0.1026***	-0.0844***	-0.0712***
	(0.0266)	(0.0239)	(0.0221)	(0.0196)
Local Labor Density		0.0724**	0.0488	0.0317
		(0.0296)	(0.0339)	(0.0291)
Local Competition		-0.0360***	-0.0232***	-0.0229***
		(0.0048)	(0.0044)	(0.0043)
Local Unemployment Rate			-0.0057***	-0.0055***
			(0.0005)	(0.0005)
Local GDP per Capita				0.0021***
				(0.0004)
within-R^2	0.8002	0.8230	0.8525	0.8580
Prob > F	0.0000	0.0000	0.0000	0.0000
N	3,167	3,159	3,088	3,088

*(i) Constant and year dummies are included in all estimates but not reported. (ii) Robust standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B6: Individual and Regional FE Basic Wage Equation Estimates (Mover)

Dep. Var.: ln(Wage Rate)	Model 1	Model 2	Model 3	Model 4
ln(Collection Rate)	-0.2164***	-0.2162***	-0.2090***	-0.1348***
	(0.0481)	(0.0462)	(0.0430)	(0.0371)
Age	0.0746***	0.0715***	0.0723***	0.0717***
	(0.0019)	(0.0018)	(0.0018)	(0.0017)
Age Squared	-0.0008***	-0.0008***	-0.0008***	-0.0008***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.2401***	-0.2416***	-0.2659***	-0.0014
	(0.0256)	(0.0251)	(0.0233)	(0.0722)
No Vovational Training (VT)	-0.0377***	-0.0385***	-0.0358***	-0.0358***
	(0.0039)	(0.0039)	(0.0036)	(0.0037)
Secondary School (Abitur)	0.0012	0.0028	0.0025	0.0018
	(0.0060)	(0.0059)	(0.0057)	(0.0057)
College/University	0.0835***	0.0820***	0.0808***	0.0803***
	(0.0052)	(0.0052)	(0.0052)	(0.0051)
Low-skilled Worker	-0.0419***	-0.0374***	-0.0298***	-0.0294***
	(0.0032)	(0.0032)	(0.0030)	(0.0030)
White-collar Worker/	0.0552***	0.0566***	0.0764***	0.0763***
Master Craftmen	(0.0040)	(0.0040)	(0.0038)	(0.0038)
Job Tenure		0.0209***	0.0190***	0.0193***
		(0.0007)	(0.0007)	(0.0006)
Job Tenure Squared		-0.0008***	-0.0007***	-0.0008***
		(0.0000)	(0.0000)	(0.0000)
Local Labor Density				0.1138**
				(0.0561)
Local Competition				-0.0611***
				(0.0087)
Local Unemployment Rate				-0.0062***
				(0.0013)
within-R^2	0.1540	0.1683	0.2030	0.2058
adj. within-R^2	0.1531	0.1674	0.2021	0.2049
N	330,343	329,901	329,349	328,922

*(i) Constant and year dummies are included in all estimates but not reported; Model 3 and 4 additionally control for industry dummies. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B7: Individual and Regional FE Basic Wage Equation Estimates (Stayer)

Dep. Var.: ln(Wage Rate)	Model 1	Model 2	Model 3	Model 4
ln(Collection Rate)	-0.1071***	-0.1102***	-0.1096***	-0.0817***
	(0.0208)	(0.0214)	(0.0215)	(0.0208)
Age	0.0471***	0.0438***	0.0444***	0.0440***
	(0.0009)	(0.0009)	(0.0009)	(0.0008)
Age Squared	-0.0005***	-0.0004***	-0.0005***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.2161***	-0.2143***	-0.2512***	-0.1525***
	(0.0272)	(0.0270)	(0.0227)	(0.0396)
No Vovational Training (VT)	-0.0139***	-0.0158***	-0.0166***	-0.0166***
	(0.0028)	(0.0028)	(0.0028)	(0.0028)
Secondary School (Abitur)	0.0157***	0.0169***	0.0174***	0.0174***
	(0.0041)	(0.0040)	(0.0039)	(0.0039)
College/University	0.0704***	0.0713***	0.0705***	0.0706***
	(0.0048)	(0.0047)	(0.0047)	(0.0047)
Low-skilled Worker	-0.0140***	-0.0114***	-0.0090***	-0.0088***
	(0.0021)	(0.0021)	(0.0020)	(0.0020)
White-collar Worker/	0.0541***	0.0570***	0.0643***	0.0640***
Master Craftmen	(0.0026)	(0.0027)	(0.0027)	(0.0027)
Job Tenure		0.0049***	0.0043***	0.0048***
		(0.0002)	(0.0002)	(0.0002)
Job Tenure Squared		-0.0001***	-0.0001***	-0.0001***
		(0.0000)	(0.0000)	(0.0000)
Local Labor Density				0.0448*
				(0.0256)
Local Competition				-0.0183***
				(0.0045)
Local Unemployment Rate				-0.0031***
				(0.0006)
within-R^2	0.0900	0.0934	0.1013	0.1022
adj. within-R^2	0.0897	0.0932	0.1011	0.1019
N	1,294,764	1,294,024	1,292,114	1,289,250

*(i) Constant and year dummies are included in all estimates but not reported; Model 3 and 4 additionally control for industry dummies. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B8: Wage Equation Estimates With Linear Time Trend

Dep. Var.: ln(Wage Rate)	Model 1	Model 2	Model 3	Model 4
ln(Collection Rate)	-0.0841***	-0.0807***	-0.0796***	-0.0272*
	(0.0221)	(0.0221)	(0.0219)	(0.0146)
Age D1 (16-30 years)	-0.0542***	-0.0456***	-0.0455***	-0.0456***
	(0.0021)	(0.0019)	(0.0018)	(0.0019)
Age D3 (51-62 years)	-0.0445***	-0.0364***	-0.0365***	-0.0369***
	(0.0011)	(0.0009)	(0.0009)	(0.0009)
No Vovational Training (VT)	-0.0244***	-0.0267***	-0.0261***	-0.0267***
	(0.0022)	(0.0022)	(0.0021)	(0.0022)
Secondary School (Abitur)	0.0132***	0.0147***	0.0154***	0.0146***
	(0.0039)	(0.0037)	(0.0036)	(0.0037)
College/University	0.0842***	0.0846***	0.0842***	0.0841***
	(0.0033)	(0.0033)	(0.0032)	(0.0033)
Low-skilled Worker	-0.0263***	-0.0212***	-0.0168***	-0.0168***
	(0.0017)	(0.0017)	(0.0015)	(0.0016)
White-collar Worker/	0.0652***	0.0692***	0.0817***	0.0798***
Master Craftmen	(0.0023)	(0.0023)	(0.0023)	(0.0022)
Time Trend	0.0107***	0.0106***	0.0107***	0.0104***
	(0.0004)	(0.0005)	(0.0005)	(0.0005)
Job Tenure		0.0131***	0.0121***	0.0120***
		(0.0002)	(0.0002)	(0.0002)
Job Tenure Squared		-0.0005***	-0.0005***	-0.0005***
		(0.0000)	(0.0000)	(0.0000)
Local Labor Density				0.0055
				(0.0127)
Local Competition				0.0058
				(0.0037)
Local Unemployment Rate				-0.0070***
				(0.0003)
within-R^2	0.0866	0.1030	0.1191	0.1194
adj. within-R^2	0.0863	0.1026	0.1187	0.1191
N	1,829,261	1,827,579	1,824,587	1,785,056

*(i) Constant and year as well as county-time trend dummies are included in all estimates but not reported; Model 3 and 4 additionally control for industry dummies. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B9: Model 4 Extended by Including Interaction with Education

Dep. Var.: ln(Wage Rate)	Pooled OLS	Regional FE	Reg./ Ind. FE
ln(Collection Rate)	0.1455***	-0.0454**	-0.0752***
	(0.0421)	(0.0201)	(0.0259)
EDU D1 (no VT)*ln(c_r)	-0.1005***	-0.1123***	-0.0893***
	(0.0210)	(0.0165)	(0.0118)
EDU D3 (Abitur)*ln(c_r)	0.0059	0.0171	0.0428*
	(0.0352)	(0.0326)	(0.0239)
EDU D4 (College/Uni)*ln(c_r)	-0.0100	0.0253	0.0904***
	(0.0270)	(0.0186)	(0.0308)
Age	0.0406***	0.0405***	0.0499***
	(0.0006)	(0.0006)	(0.0009)
Age Squared	-0.0004***	-0.0004***	-0.0005***
	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.2440***	-0.0818***	-0.1064**
	(0.0219)	(0.0153)	(0.0505)
No Vocational Training (VT)	0.0483*	0.0594***	0.0937***
	(0.0279)	(0.0221)	(0.0155)
Secondary School (Abitur)	0.0872*	0.0684	-0.0445
	(0.0471)	(0.0434)	(0.0307)
College/University	0.3224***	0.2713***	-0.0418
	(0.0381)	(0.0261)	(0.0407)
Low-skilled Worker	-0.0696***	-0.0706***	-0.0185***
	(0.0026)	(0.0024)	(0.0016)
White-collar Worker/	0.2660***	0.2632***	0.0694***
Master Craftmen	(0.0027)	(0.0025)	(0.0022)
Job Tenure	0.0245***	0.0243***	0.0088***
	(0.0007)	(0.0007)	(0.0002)
Job Tenure Squared	-0.0006***	-0.0006***	-0.0003***
	(0.0000)	(0.0000)	(0.0000)
Local Labor Density	0.0210*	0.0395*	0.0732**
	(0.0107)	(0.0210)	(0.0370)
Local Competition	-0.0222***	-0.0174***	-0.0265***
	(0.0061)	(0.0043)	(0.0049)
Local Unemployment Rate	-0.0093***	-0.0037***	-0.0038***
	(0.0020)	(0.0007)	(0.0007)
N	1,785,056	1,785,056	1,785,056

*(i) Constant and year as well as industry dummies are included in all estimates but not reported. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B10: Model 4 Extended by Including Interaction with Age

Dep. Var.: ln(Wage Rate)	OLS	Regional FE	Reg./ Ind. FE
ln(Collection Rate)	0.1542***	-0.0347*	-0.0616**
	(0.0455)	(0.0205)	(0.0264)
Age D1*ln(Collection Rate)	-0.1649***	-0.1679***	-0.0542***
	(0.0134)	(0.0131)	(0.0118)
Age D3*ln(Collection Rate)	0.0604***	0.0622***	-0.0139*
	(0.0136)	(0.0134)	(0.0073)
Age D1 (16-30 years)	0.0563***	0.0600***	0.0260*
	(0.0179)	(0.0174)	(0.0150)
Age D3 (51-62 years)	-0.0543***	-0.0567***	-0.0188*
	(0.0171)	(0.0167)	(0.0100)
Dummy: East Germany	-0.2418***	-0.0823***	-0.1199***
	(0.0219)	(0.0123)	(0.0449)
No Vovational Training (VT)	-0.0862***	-0.0908***	-0.0269***
	(0.0023)	(0.0020)	(0.0022)
Secondary School (Abitur)	0.0955***	0.0920***	0.0149***
	(0.0036)	(0.0036)	(0.0037)
College/University	0.3120***	0.3090***	0.0841***
	(0.0030)	(0.0026)	(0.0033)
Low-skilled Worker	-0.0677***	-0.0686***	-0.0166***
	(0.0026)	(0.0023)	(0.0016)
White-collar Worker/	0.2691***	0.2662***	0.0786***
Master Craftmen	(0.0027)	(0.0026)	(0.0022)
Job Tenure	0.0262***	0.0260***	0.0118***
	(0.0007)	(0.0006)	(0.0002)
Job Tenure Squared	-0.0007***	-0.0007***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)
Local Labor Density	0.0205*	0.0385**	0.0658**
	(0.0105)	(0.0176)	(0.0320)
Local Competition	-0.0223***	-0.0165***	-0.0285***
	(0.0061)	(0.0042)	(0.0046)
Local Unemployment Rate	-0.0092***	-0.0037***	-0.0043***
	(0.0020)	(0.0007)	(0.0006)
N	1,785,056	1,785,056	1,785,056

*(i) Constant and year as well as industry dummies are included in all estimates but not reported. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B11: Model 4 Extended by Including Interaction with Job Tenure

Dep. Var.: ln(Wage Rate)	OLS	Regional FE	Reg./ Ind. FE
ln(Collection Rate)	0.0714*	-0.1024***	-0.1004***
	(0.0416)	(0.0231)	(0.0313)
Job Tenure*ln(c_r)	0.0094***	0.0080***	0.0046***
	(0.0012)	(0.0009)	(0.0007)
Age	0.0408***	0.0407***	0.0499***
	(0.0007)	(0.0007)	(0.0009)
Age Squared	-0.0004***	-0.0004***	-0.0005***
	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.2454***	-0.0850***	-0.1170**
	(0.0213)	(0.0144)	(0.0476)
No Vovational Training (VT)	-0.0850***	-0.0896***	-0.0236***
	(0.0023)	(0.0020)	(0.0021)
Secondary School (Abitur)	0.0963***	0.0928***	0.0133***
	(0.0036)	(0.0036)	(0.0036)
College/University	0.3097***	0.3066***	0.0807***
	(0.0030)	(0.0026)	(0.0032)
Low-skilled Worker	-0.0697***	-0.0706***	-0.0185***
	(0.0026)	(0.0024)	(0.0016)
White-collar Worker/	0.2660***	0.2632***	0.0694***
Master Craftmen	(0.0027)	(0.0025)	(0.0021)
Job Tenure	0.0121***	0.0136***	0.0028***
	(0.0015)	(0.0013)	(0.0008)
Job Tenure Squared	-0.0007***	-0.0006***	-0.0003***
	(0.0000)	(0.0000)	(0.0000)
Local Labor Density	0.0204*	0.0463**	0.0710**
	(0.0104)	(0.0214)	(0.0343)
Local Competition	-0.0219***	-0.0151***	-0.0255***
	(0.0061)	(0.0043)	(0.0047)
Local Unemployment Rate	-0.0095***	-0.0035***	-0.0037***
	(0.0019)	(0.0007)	(0.0006)
N	1,785,056	1,785,056	1,785,056

*(i) Constant and year as well as industry dummies are included in all estimates but not reported. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B12: Individual and Regional FE Asymmetric Wage Equation Estimates

Dep. Var.: ln(Wage Rate)	Model 1	Model 2	Model 3	Model 4
$\ln(c_{rt}^{pos})$	-0.0661***	-0.0546***	-0.0534***	-0.0219
	(0.0234)	(0.0181)	(0.0176)	(0.0231)
$\ln(c_{rt}^{neg})$	0.0588**	0.0992***	0.0987***	0.0789***
	(0.0251)	(0.0265)	(0.0261)	(0.0277)
Age	0.0385***	0.0340***	0.0344***	0.0346***
	(0.0008)	(0.0007)	(0.0007)	(0.0007)
Age Squared	-0.0004***	-0.0003***	-0.0004***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.1610***	-0.1975***	-0.2175***	-0.1184***
	(0.0235)	(0.0278)	(0.0282)	(0.0334)
No Vovational Training (VT)	-0.0028	-0.0045*	-0.0058**	-0.0061**
	(0.0027)	(0.0027)	(0.0027)	(0.0027)
Secondary School (Abitur)	0.0085*	0.0095**	0.0103**	0.0104**
	(0.0044)	(0.0044)	(0.0044)	(0.0044)
College/University	0.0572***	0.0575***	0.0565***	0.0586***
	(0.0045)	(0.0045)	(0.0044)	(0.0045)
Low-skilled Worker	-0.0122***	-0.0096***	-0.0075***	-0.0076***
	(0.0023)	(0.0023)	(0.0023)	(0.0023)
White-collar Worker/	0.0501***	0.0537***	0.0602***	0.0587***
Master Craftmen	(0.0032)	(0.0032)	(0.0032)	(0.0033)
Job Tenure		0.0056***	0.0051***	0.0053***
		(0.0002)	(0.0002)	(0.0002)
Job Tenure Squared		-0.0002***	-0.0002***	-0.0002***
		(0.0000)	(0.0000)	(0.0000)
Local Labor Density				0.0389*
				(0.0201)
Local Competition				-0.0097**
				(0.0043)
Local Unemployment Rate				-0.0030***
				(0.0005)
within-R^2	0.0646	0.0691	0.0750	0.0744
adj. within-R^2	0.0643	0.0688	0.0746	0.0740
N	1,068,547	1,067,570	1,065,716	1,026,658

*(i) Constant and year dummies are included in all estimates but not reported; Model 3 and 4 additionally control for industry dummies. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B13: Asymmetric Wage Equation Estimates using Different Estimation Techniques

Dep. Var.: ln(Wage Rate)	OLS	Regional FE	Reg. and Ind. FE
$\ln(c_{rt}^{pos})$	0.0351	0.0981***	-0.0219
	(0.0369)	(0.0184)	(0.0231)
$\ln(c_{rt}^{neg})$	0.1352***	0.0500***	0.0788***
	(0.0239)	(0.0103)	(0.0277)
Age	0.0343***	0.0346***	0.0346***
	(0.0008)	(0.0008)	(0.0007)
Age Squared	-0.0003***	-0.0003***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)
Dummy: East Germany	-0.2745***	0.0348***	-0.1184***
	(0.0138)	(0.0102)	(0.0334)
No Vovational Training (VT)	-0.0683***	-0.0733***	-0.0061**
	(0.0027)	(0.0024)	(0.0027)
Secondary School (Abitur)	0.1073***	0.1036***	0.0104**
	(0.0056)	(0.0058)	(0.0044)
College/University	0.3074***	0.3036***	0.0586***
	(0.0044)	(0.0040)	(0.0045)
Low-skilled Worker	-0.0522***	-0.0524***	-0.0076***
	(0.0029)	(0.0027)	(0.0023)
White-collar Worker/	0.2704***	0.2681***	0.0587***
Master Craftmen	(0.0028)	(0.0027)	(0.0033)
Job Tenure	0.0134***	0.0131***	0.0053***
	(0.0007)	(0.0006)	(0.0002)
Job Tenure Squared	-0.0003***	-0.0003***	-0.0002***
	(0.0000)	(0.0000)	(0.0000)
Local Labor Density	0.0206**	0.0722*	0.0398*
	(0.0083)	(0.0373)	(0.0201)
Local Competition	-0.0182***	-0.0234***	-0.0097***
	(0.0061)	(0.0060)	(0.0043)
Local Unemployment Rate	-0.0075***	-0.0019***	-0.0030***
	(0.0012)	(0.0008)	(0.0005)
N	1,026,658	1,026,658	1,026,658

*(i) Constant and year as well as industry dummies are included in all estimates but not reported. (ii) Clustered standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*

Table B14: Asymmetric FE 2^{nd} Stage Estimates

Dep. Var.: Est. County-Year FE	Model 1	Model 2	Model 3	Model 4
$\ln(c_{rt}^{pos})$	-0.0782***	-0.0654***	-0.0519***	-0.0519***
	(0.0160)	(0.0138)	(0.0142)	(0.0142)
$\ln(c_{rt}^{neg})$	0.0279***	0.0244***	0.0204**	0.0204**
	(0.0101)	(0.0086)	(0.0084)	(0.0084)
Local Labor Density		0.0606**	0.0445	0.0317
		(0.0308)	(0.0330)	(0.0291)
Local Competition		-0.0324***	-0.0233***	-0.0229***
		(0.0051)	(0.0052)	(0.0043)
Local Unemployment Rate			-0.0056***	-0.0055***
			(0.0006)	(0.0005)
Local GDP per Capita				0.0021***
				(0.0004)
within-R^2	0.8187	0.8371	0.8669	0.8721
Prob > F	0.0000	0.0000	0.0000	0.0000
N	1,858	1,852	1,781	1,781

*(i) Constant and year dummies are included in all estimates but not reported. (ii) Robust standard errors are in parenthesis. (iii) ***significant at 1% level; **significant at 5% level; *significant at 10% level.*