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Abstract: This paper reveals that German firms with working time accounts (WTAs) show a similar separation and hiring behavior in response to revenue changes as firms without WTAs. This finding casts doubt on the popular hypothesis that WTAs were the key driver of the unusually small increase in German unemployment in the Great Recession. One possible explanation is that firms substitute WTAs by short-time work. However, our results show no evidence for this substitution. Firms with WTAs use short-time work more to adjust labor over the cycle than firms without WTAs.

Keywords: Working time accounts, short-time work, business cycle
JEL codes: E20, E24, J20, J30

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1 Introduction

In the Great Recession in 2008 and 2009, Germany experienced a severe drop in GDP (6.6 percent from peak to trough) without a substantial rise in unemployment. This experience has become known as the "German labor market miracle" (Burda and Hunt, 2011 and Möller, 2010). The dissemination of WTAs has increased substantially in the last decade. About one third of all firms used working time accounts (WTAs) in 2009.[1] In the regulated German labor market, WTAs allow firms to flexibly increase working hours in good times and to reduce them in bad times without additional costs (see online Appendix for details). This new measure of internal flexibility may be key for explaining why firms have absorbed the negative aggregate shock by labor hoarding in this, but not in previous recessions.

Quantitative evidence on the effects of WTAs on firms' business cycle adjustment is relatively scarce.[2] We use data from the Institute for Employment Research (IAB) establishment panel to analyze two questions: First, does the use of WTAs help to explain why firms fire less (or hire more) in recessions? Specifically, we estimate by how much the change in the hiring and separation rates to a one percent change in revenue differs between firms with and without WTAs. We carefully control for firm characteristics, but find no evidence that firms with WTAs adjust hiring and separations differently over the business cycle than firms without. We ask in a second step whether firms that do not adjust hours with WTAs over the cycle use alternative policy measures instead. Surprisingly, firms with WTAs do not use short-time work (STW) less in response to revenue changes, if anything, they use it more. This result questions the popular hypothesis that these two labor market institutions act as substitutes in encouraging labor adjustment along the intensive margin (see Boeri and Bruecker, 2011 and Burda and Hunt, 2011).

2 Data and specification

In order to investigate the differential behavior of firms that use and that do not use WTAs, we employ the German Institute for Employment Research (IAB) establishment panel, a representative panel data set that surveys information from almost 16,000 personal interviews with high ranked managers (see online Appendix for a brief data description). We use data for the years 2006, 2009 and 2010, since information on both WTA and STW is only available in these years.

Table 1 shows descriptive statistics for establishments with and without WTAs. The two types of establishments are remarkably different. Establishments that use WTAs have on average more employees and higher revenues than establishments that do not use WTAs. Establishments with WTAs are more export oriented and employ a higher share of skilled workers than establishments without

[1] Source: IAB establishment panel.

[2] Two notable exceptions are Boeri and Bruecker (2011) and Bellmann et al. (2012). In contrast to these studies, we explicitly focus on the interaction between WTAs and STW as well as the pronounced heterogeneity between firms with and without WTAs (e.g., with respect to size and sector).

WTAs. In addition, labor in establishments with WTAs is more formally organized (e.g., with workers' councils and collective agreements), while establishments without WTAs are more likely to be family owned. On average, establishments with WTAs use more STW and have somewhat smaller flow rates than establishments without WTAs.

	WTA establishments	non-WTA establishments
number of employees	305.33	27.44
establishment revenue	65 mio.	5.2 mio.
export share (in percent)	12.76	3.44
skilled workers (in percent of employment)	77.48	57.45
high skilled workers (in percent of employment)	14.00	7.60
temporary workers (in percent of employment)	5.88	4.76
agency workers (in percent of employment)	2.34	0.50
share of establishments with workers' council	61.98	9.48
share of establishments with collective agreement	68.59	32.22
share of establishments with sole proprietorship	6.76	48.32
share of incorporated enterprises	6.15	1.03
share of establishments with professional management	58.67	14.52
short-time workers (in percent of employment)	6.59	2.15
hiring rate	4.37	5.09
separation rate	3.76	4.35

Table 1: Establishment characteristics on WTA and non-WTA establishments in IAB establishment panel (year 2006, 2009, 2010). A WTA establishment is defined as an establishment that always operated WTAs, a non-WTA establishment never operated WTAs in all years included in the sample.

To assess the business cycle behavior of establishments, we estimate the effect of changes in revenue x_{it} of establishment i in year t on its separation rate, hiring rate and the use of STW separately

$$y_{it} = x_{it}\beta_1 + x_{it}D_{it}^{wta}\beta_2 + z_{it}\beta_3 + \alpha_i + \gamma_t + u_{it},$$

where y_{it} represents separated workers, hired workers or workers on short-time work as a fraction of employment in establishment i in year t.[3] On the right hand side, x_{it} represents the corresponding establishment revenue (in logs) which is further interacted with a dummy indicating whether the establishment uses working time accounts ($D_{it}^{wta} = 1$) or not ($D_{it}^{wta} = 0$). We therefore estimate a semi-elasticity, i.e., the effects of a one percent change in revenue on the labor adjustment margin

[3]This approach follows Balleer et al. (2014) who investigate the effect of revenue changes on STW usage, but not WTA explicitly, nor the interaction with STW, nor the effect on flow rates.

(measured in percentage points). The estimated coefficients of the interaction terms allow a straightforward test and comparison of differences in this semi-elasticity between establishments that use WTAs and those that do not.[4]

In addition, we control for several establishment characteristics z_{it} (cp. the covariates listed in Table 1, see online Appendix for a detailed variable description). In this way, we explicitly take into account that establishments with WTA may adjust labor input differently compared to establishments that do not use WTAs due to their different size, sector or degree of labor organization. In addition, time fixed effects, γ_t, control for aggregate year effects and establishment fixed effects, α_i, control for time-invariant unobserved establishment heterogeneity.

In order to investigate establishment heterogeneity further, we explore the results of two additional specifications. We allow for a different response to revenue changes conditional not only on WTA, but also on establishment size and sector. Consequently, we add interactions between revenue and size (less than 10, 10 to 49, 50 to 199, and 200 and more employees) and sector (manufacturing, construction, services and others) and two-way interactions with revenue, WTA, and size and sector, respectively.[5]

3 Working time accounts and labor market flows over the cycle

Before the Great Recession, firms had accumulated a substantial surplus of on average 72 hours in their WTAs (see Herzog-Stein and Zapf, 2014). Given this fact, we analyze the relationship between WTAs and the separation behavior of firms. Unfortunately, the IAB establishment panel does not contain any information on the WTA balance (but only on the existence of WTAs). But even if only a certain fraction of establishments had substantial surpluses, they should affect the difference in adjustment behavior within the subsample. Table 2 shows that a one percent increase in revenue leads establishments to decrease their separation rate by approximately 0.018 percentage points.[6] Interestingly, this effect is not significantly different between establishments that use WTAs and establishments that do not (see estimation output in the online Appendix for details).[7]

Interacting revenue and WTA with dummies for different size classes reveals that small, medium and large establishments react differently to changes in revenue with respect to their separation behav-

[4]For a straightforward interpretation of the interaction term, we restrict the sample to firms that always or never have WTAs in all years in the sample.

[5]In fact, we explored heterogeneity even further and allowed for different reactions to revenue changes in further subgroups. We evaluated establishment heterogeneity using interactions with the existence of collective wage agreements, a workers' council, the legal structure, establishment age, ownership, professional management, export orientation and the average revenue volatility (prior to 2006). Our results are robust towards these modifications. Results are available upon request.

[6]Note that this number implies that a one standard deviation drop of revenue in an establishment generates an increase in the separation rate by 0.36 percentage points.

[7]While Boeri and Bruecker (2011) find a small, but positive effect of WTAs on employment with instrumental variables, Bellmann et al. (2012) find negative effects of WTAs on labor market flows. However, they argue that their estimates may be imprecise. We show that no systematic difference exists between firms that continuously apply WTAs and those that do not. Herzog-Stein and Zapf (2014) argue based on a survey of workers' councils that firms did not apply WTAs systematically different in the Great Recession compared to normal times.

		WTA establishments		non-WTA establishments		difference	
baseline		-1.86^{***}	[0.67]	-1.83^{**}	[0.87]	-0.03	[1.08]
by size	< 10	-1.11	[1.48]	-1.80^{*}	[0.99]	0.69	[1.77]
	$[10-50)$	-2.37^{***}	[0.83]	-3.03^{***}	[0.91]	0.67	[1.23]
	$[50-200)$	-1.85^{**}	[0.73]	-1.27	[0.99]	-0.58	[1.22]
	> 200	-1.78^{***}	[0.63]	0.89	[0.96]	-2.67^{**}	[1.13]
						$p = 0.01$	
by sector	manufacturing	-1.71^{***}	[0.65]	-2.79^{**}	[1.24]	1.07	[1.39]
	services	-1.86^{**}	[0.83]	-0.68	[0.88]	-1.18	[1.20]
	construction	-1.06	[0.83]	-4.40^{**}	[1.75]	3.34^{*}	[1.94]
	others	-1.82	[0.90]	-0.66	[1.05]	-1.16	[1.38]
						$p = 0.09$	

Table 2: Separation reaction with respect to revenue changes. Robust standard errors in parenthesis are clustered at the establishment level. Establishment size is measured by the number of employees. p-values refer to an F-test of the overall significance of all WTA interaction terms. Detailed estimation output can be found in the online appendix in Table 5.

ior. However, even though the point estimates suggest that small establishments with WTAs fire less in recessions than small establishments without WTAs, these differences are not statistically significant. The only exception is the case of large establishments with more than 200 workers. However, the estimate of the semi-elasticity for large establishments without WTAs is very imprecise due to only 124 observations in this group. The difference between establishments with and without WTAs is therefore hard to interpret. Similar to the results by size, the responses of separation rates to changes in revenue differ across sectors. But again, the responses do not significantly differ between establishments that use WTAs and establishments that do not, except for a borderline significant positive effect in the construction sector.

Next, we analyze the response of the hiring rate with respect to revenue changes. We obtain no statistically significant results, neither for WTA, nor for non-WTA establishments. This finding implies that establishments adjust mainly via separations to business cycle shocks. Results are shown in the online Appendix (Table 6).

4 Working time accounts and short-time work over the cycle

In addition to WTAs, short-time work constitutes a policy measure that enhances the flexibility of hours in Germany. STW subsidizes the wage payments when firms reduce hours worked of their employees if firms show credibly that they face a short-fall in demand. An open question is whether and how the use of WTAs and its effects on separations is related to the use of STW in the same firm. The fact that we find no difference in separations between establishments with and without WTAs could suggest that this outcome is driven by a different usage of STW over the cycle. Put differently,

WTAs and STW could be substitutes with respect to the adjustment of hours worked (as suggested by Boeri and Bruecker, 2011 or Burda and Hunt, 2011).[8]

Table 1 demonstrates that establishments with WTAs use STW more and, hence, that these two labor market institutions are clearly no substitutes on average. Here, we ask whether establishments with and without WTAs use STW in a different way over the cycle. We further investigate whether these policy tools are used differently in establishments of different size or sector.

Table 3 shows the STW usage of different types of establishments in response to a one percent change in revenue (detailed estimation output can be found in the online Appendix). Establishments with WTAs set a higher fraction of their workers on STW compared to establishments without WTAs. As a result, also over the cycle, establishments that use the formal hours adjustment WTA use the STW policy more.

		WTA establishments		non-WTA establishments		difference	
baseline		-11.90^{***}	[1.73]	-2.07^{***}	[0.71]	-9.84^{***}	[1.88]
by size	< 10	-8.61^{**}	[3.77]	-1.14	[0.71]	-7.47^{*}	[3.84]
	$[10-50)$	-11.72^{***}	[1.94]	-5.61^{***}	[1.47]	-5.94^{**}	[2.43]
	$[50-200)$	-13.48^{***}	[1.95]	-4.51^{*}	[2.36]	-8.97^{***}	[3.05]
	> 200	-12.51^{***}	[2.21]	-6.29^{***}	[2.18]	-6.22^{**}	[3.07]
						$p = 0.02$	
by sector	manufacturing	-12.87^{***}	[2.02]	-4.71^{***}	[1.20]	-8.15^{***}	[2.35]
	services	-10.08^{***}	[1.60]	-1.11	[0.70]	-8.97^{***}	[1.75]
	construction	-10.52^{***}	[1.92]	-3.16^{***}	[1.13]	-7.36^{***}	[2.23]
	others	-9.76^{***}	[1.67]	-3.31^{**}	[1.34]	-6.45^{***}	[2.13]
						$p = 0.00$	

Table 3: Short-time work reaction with respect to revenue changes. Robust standard errors in paranthesis are clustered at the establishment level. Establishment size is measured by the number of employees. p-values refer to an F-test of the overall significance of all WTA interaction terms. Detailed estimation output can be found in the online appendix in Table 7.

When we disaggregate the results with respect to size and sector, the point estimates for the STW semi-elasticities are the largest for the large establishments and for the manufacturing sector. This finding is in line with the conventional view that STW is predominantly used by large manufacturing firms. However, for all subgroups the difference of semi-elasticities is statistically significant (at the 1 percent level in most cases). Thus, we do not find any evidence (in any subgroup) that WTAs and STW are substitutes. This is still the case if we divide the estimated semi-elasticities by the average STW usage in establishments with and without WTAs, i.e., if we calculate instead of semi-elasticities.[9]

[8] German law states that employees with surplus hours in their WTA are not allowed to be laid off, nor can they reduce hours by STW. Surplus hours have to be reduced to zero beforehand or the firm has to compensate the worker at overtime rates.

[9] In our view, semi-elasticities are more appropriate and easier to interpret. When STW increases from 0.5 to 1.5 percent of the workforce, we obtain the same semi-elasticity as for an increase from 2 to 3 percent of the workforce. By contrast, the

5 Conclusions

This paper has revealed several surprising facts on the relationship between WTAs and firms' labor adjustment behavior based on the IAB establishment panel. First, firms' hiring and separation behavior is not affected by whether they operate WTAs or not. This finding sounds a cautionary note on the widely held view that the dissemination of WTAs was a key driver of the German labor market miracle. The missing job losses in Germany are potentially explained by other exceptional factors such as the preceding wage moderation or the nature of the aggregate shock. Note that our findings do not rule out the argument of Burda and Hunt (2011) that underhiring and therefore overtime hours in the preceding boom had an important impact on the German labor market miracle. However, our analysis provides no signs that WTAs were a necessary condition for the intertemporal transfer of working hours in the recession.

Second, firms with WTAs do not only use more STW on average. They also use STW in a more cyclical manner. This casts doubt on the hypothesis that WTAs and STW are substitutes. Establishments without WTAs may have utilized other informal ways of transferring working hours over time.[10] These informal mechanisms may be facilitated because these establishments are substantially smaller and act in different industrial relations regimes. In the end, even though we control for (un)observed heterogeneity carefully, there may be underlying differences between firms with and without WTAs that affect the estimated semi-elasticties directly. An example are different production technologies that determine how capital and labor are utilized and substituted. Likewise, some firms may react differently to up- and downturns in demand, e.g., due to the type of products they sell, and, hence, show a different attitude towards input adjustments. It is certainly an interesting topic for future research how production functions and measures such as WTAs or STW interact in the labor adjustment reaction of firms to economic shocks.

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elasticity would increase three times as much in the former case. Detailed results on elasticities are available upon request.

[10] As we have no information on the actual number of working hours in the IAB establishment panel, this hypothesis is not testable.

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A Description of the institutions working time account and short-time work

Working time accounts ("Arbeitszeitkonten"): Working time accounts are firm-level agreements that allow employers to use overtime without an additional compensation for the employee under the condition that working time is reduced by equal hours within an agreed window of time (typically approximately one year). Equally, working hours may fall below contract hours without wage cuts, if they are made up in due time. A worker with surplus hours cannot be laid off or be sent on short-time work without previously compensating the worker at overtime rates.

Working time accounts have become increasingly popular in Germany (also due to more flexible legislation). In the late 1990's, 18 percent of firms had a working time account, nowadays, 34 percent of all employees have a working time account. Compare, e.g., Herzog-Stein and Zapf (2014) for a more detailed description of working time accounts.

Short-time work ("Kurzarbeit"): In contrast to working time accounts that are agreed on at the firm level, short-time work is administered by the employment agency. A firm in financial difficulties may apply for short-time work. If admitted, the firm reduces working hours and wages, accordingly. Workers are compensated for between 60 and 67 percent of the net wage loss by the employment agency. Compare, e.g., Burda and Hunt (2011) for a more detailed discussion. Interestingly, short-time work has an automatic and a discretionary policy component. The latter implies that the government expands short-time work in recessions by facilitating the rules. Balleer et al. (2014) disentangle the effects of these two components.

B Data description and variable definition

The Institute for Employment Research (IAB) establishment panel is a representative German establishment level panel data set that contains establishment level data from approximately 16,000 personal interviews with high ranked managers each year. Data access was provided via on-site use at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and subsequently through remote data access. Table 4 summarizes the variable definition of the variables used in this paper. Establishments report the number of short-time workers, new hirings and separations in the first half of each year in the sample. Table 4 also contains all control variables used in the estimations.

Variable	Definition
revenue	Revenue expectations for year t as reported by establishment end of June in year t (in logs)
employees	Number of employees as reported by the establishment end of June of year $t-1$ (also as dummy with 4 categories as defined in text)
WTA	Establishment operates working time accounts in all years in the sample (dummy yes (1)/no)
STW over employment	Number of short-time workers in establishment in the first half of year t divided by the number of employees in $t-1$ (multiplied with 100)
hiring rate	Number of hirings in the first half of year t relative to average number of employees between beginning of January and end of June of year t (multiplied with 100)
separation rate	Number of separations in the first half of year t divided by the average number of employees between beginning of January and end of June of year t (multiplied with 100)
works council	Establishment has works council (dummy yes (1)/no)
collective agreement	Establishment is bound to collective agreement, either on establishment or sector level (dummy yes (1)/no)
agency workers	Number of agency workers as reported end of June of year t divided by total employment in t (multiplied with 100)
export share	Share of exports relative to total revenues in year $t-1$
share of skilled	Number of skilled and high-skilled workers as reported end of June of year t divided by total employment in t (multiplied with 100)
temporary workers	Number of workers with a temporary contract as reported end of June of year t divided by total employment (multiplied with 100)
share of women	Number of female employees as reported end of June of year t divided by total employment in t (multiplied with 100)
sector	4 dummy variables for different sectors as defined in IAB panel (manufacturing, construction, services, and others; others comprises agriculture, mining, food, non-profit organizations, and administration)

Table 4: Variable definition.

C Detailed estimation results

	Interaction with WTA only and size			Interaction with sector	
	(1)	(2)	(3)		(4)
log revenue	-1.819^{**}	-1.828^{**}	-1.802^{*}	log revenue	-0.678
	[0.83]	[0.87]	[0.99]		[0.88]
revenue × WTA	-0.144	-0.027	0.688	revenue × WTA	-1.183
	[1.05]	[1.08]	[1.77]		[1.20]
revenue $\times D_2^{emp}$			-1.235	revenue $\times D_2^{sector}$	-2.110^{***}
			[0.90]		[1.22]
revenue $\times D_3^{emp}$			0.528	revenue $\times D_3^{sector}$	-3.721^{***}
			[1.20]		[1.51]
revenue $\times D_4^{emp}$			2.689^{**}	revenue $\times D_4^{sector}$	0.020
			[1.23]		[0.85]
revenue $\times D_2^{emp}\times$ WTA			-0.020	revenue $\times D_2^{sector}\times$ WTA	2.258^{*}
			[1.65]		[1.31]
revenue $\times D_3^{emp}\times$ WTA			-1.264	revenue $\times D_3^{sector}\times$ WTA	4.522^{***}
			[1.87]		[1.68]
revenue $\times D_4^{emp}\times$ WTA			-3.360^{*}	revenue $\times D_4^{sector}\times$ WTA	0.0225
			[1.88]		[0.98]
employees	0.005^{***}	0.005^{***}	0.005^{***}	employees	0.005^{**}
	[0.002]	[0.002]	[0.002]		[0.002]
workers' council		0.707	0.650	workers' council	0.728
		[0.78]	[0.78]		[0.81]
collective wages		-0.228	-0.267	collective wages	-0.139
		[0.63]	[0.63]		[0.64]
agency workers		-0.027^{***}	-0.028^{***}	agency workers	-0.028^{***}
		[0.01]	[0.01]		[0.01]
temporary workers		-0.006	-0.005	temporary workers	-0.005
		[0.02]	[0.02]		[0.02]
high skilled		-0.003	-0.003	high skilled	-0.002
		[0.03]	[0.03]		[0.03]
export share		-0.013	-0.013	export share	-0.013
		[0.02]	[0.02]		[0.02]
women		-0.056^{***}	-0.056^{***}	women	-0.061^{***}
		[0.02]	[0.02]		[0.02]
year=2009	0.346	0.364	0.342	year=2009	0.290
	[0.23]	[0.24]	[0.24]		[0.23]
year=2010	0.010	-0.011	-0.020	year=2010	-0.090
	[0.24]	[0.24]	[0.24]		[0.25]
observations	10,394	10,135	10,135	observations	9,822
establishments	4,228	4,211	4,211	establishments	4,181
R^2 (within)	0.01	0.01	0.01	R^2 (within)	0.01

Table 5: Dependent variable is the separation rate (total separations in percent of employment). Robust standard errors are clustered at the establishment level. ***/**/* denotes 1/5/10 percent significance. Employment dummies represent the following categories: 0-9, 10-49, 50-199, 200+ employees (0-9 is base category). Sectoral dummies represent manufacturing, construction, services and others (services is base category).

	Interaction with WTA only and size			Interaction with sector	
	(1)	(2)	(3)		(4)
log revenue	-0.316	-0.250	-0.004	log revenue	0.302
	$[0.71]$	$[0.76]$	$[0.83]$		$[0.84]$
revenue $\times$ WTA	1.165	0.214	0.201	revenue $\times$ WTA	0.192
	$[1.11]$	$[1.22]$	$[1.91]$		$[1.59]$
revenue $\times D_2^{emp}$			-0.176	revenue $\times D_2^{sector}$	-1.452
			$[1.35]$		$[1.24]$
revenue $\times D_3^{emp}$			0.112	revenue $\times D_3^{sector}$	-1.217
			$[2.25]$		$[1.58]$
revenue $\times D_4^{emp}$			-0.233	revenue $\times D_4^{sector}$	-1.191
			$[1.89]$		$[2.00]$
revenue $\times D_2^{emp} \times$ WTA			0.935	revenue $\times D_2^{sector} \times$ WTA	1.134
			$[2.31]$		$[1.47]$
revenue $\times D_3^{emp} \times$ WTA			0.055	revenue $\times D_3^{sector} \times$ WTA	0.065
			$[2.92]$		$[2.06]$
revenue $\times D_4^{emp} \times$ WTA			-0.358	revenue $\times D_4^{sector} \times$ WTA	0.373
			$[2.63]$		$[2.07]$
employees	-0.006^{***}	-0.007^{**}	-0.006^{**}	employees	-0.007^{**}
	$[0.002]$	$[0.003]$	$[0.003]$		$[0.003]$
workers' council		-0.529	-0.491	workers' council	-0.617
		$[1.27]$	$[1.27]$		$[1.32]$
collective wages		-0.876	-0.869	collective wages	-0.840
		$[0.69]$	$[0.69]$		$[0.74]$
agency workers		0.001	0.0004	agency workers	0.001
		$[0.01]$	$[0.01]$		$[0.01]$
temporary workers		0.368^{***}	0.368^{***}	temporary workers	0.373^{***}
		$[0.37]$	$[0.05]$		$[0.06]$
high skilled		0.009	0.008	high skilled	0.009
		$[0.02]$	$[0.02]$		$[0.02]$
export share		0.032^{*}	0.032^{*}	export share	0.033^{*}
		$[0.02]$	$[0.02]$		$[0.02]$
women		0.013	0.013	women	0.015
		$[0.02]$	$[0.02]$		$[0.02]$
year=2009	-1.785^{***}	-1.656^{***}	-1.649^{***}	year=2009	-1.725^{***}
	$[0.28]$	$[0.28]$	$[0.28]$		$[0.30]$
year=2010	-1.299	-1.186^{***}	-1.179^{***}	year=2010	-1.265^{***}
	$[0.30]$	$[0.30]$	$[0.30]$		$[0.32]$
observations	$10,394$	$10,135$	$10,135$	observations	$9,822$
establishments	$4,228$	$4,211$	$4,211$	establishments	$4,181$
R^2 (within)	0.01	0.06	0.06	R^2 (within)	0.06

Table 6: Dependent variable is the hiring rate (total hirings in percent of employment). Robust standard errors are clustered at the establishment level. ***/**/* denotes 1/5/10 percent significance. Employment dummies represent the following categories: 0-9, 10-49, 50-199, 200+ employees (0-9 is base category). Sectoral dummies represent manufacturing, construction, services and others (services is base category).

	Interaction with WTA only and size			Interaction with sector	
	(1)	(2)	(3)		(4)
log revenue	-2.066^{***}	-2.067^{***}	-1.140	log revenue	-1.108
	[0.68]	[0.71]	[0.71]		[0.70]
revenue × WTA	-10.486^{***}	-9.835^{***}	-7.466^{*}	revenue × WTA	-8.971^{***}
	[1.82]	[1.88]	[3.84]		[1.75]
revenue $\times D_2^{emp}$			-4.473^{***}	revenue $\times D_2^{sector}$	-3.606^{***}
			[1.48]		[0.91]
revenue $\times D_3^{emp}$			-3.367	revenue $\times D_3^{sector}$	-2.052^{**}
			[2.40]		[0.92]
revenue $\times D_4^{emp}$			-5.148^{**}	revenue $\times D_4^{sector}$	-2.199^{*}
			[2.24]		[1.26]
revenue $\times D_2^{emp}\times$ WTA			1.527	revenue $\times D_2^{sector}\times$ WTA	0.816
			[4.09]		[1.57]
revenue $\times D_3^{emp}\times$ WTA			-1.507	revenue $\times D_3^{sector}\times$ WTA	1.607
			[4.59]		[1.56]
revenue $\times D_4^{emp}\times$ WTA			1.246	revenue $\times D_4^{sector}\times$ WTA	2.251
			[4.65]		[1.54]
employees	0.014^{**}	0.016^{***}	0.017^{***}	employees	0.016^{**}
	[0.006]	[0.006]	[0.006]		[0.006]
workers' council		2.694	2.499	workers' council	2.377
		[2.22]	[2.20]		[2.26]
collective wages		-0.896	-0.853	collective wages	-0.939
		[0.87]	[0.87]		[0.89]
agency workers		-0.130^{***}	-0.132^{***}	agency workers	-0.125^{**}
		[0.05]	[0.05]		[0.05]
temporary workers		-0.101^{**}	-0.100^{**}	temporary workers	-0.103^{**}
		[0.04]	[0.04]		[0.04]
high skilled		0.050^{**}	-0.049^{*}	high skilled	0.052^{**}
		[0.03]	[0.03]		[0.03]
export share		-0.087^{*}	-0.088^{*}	export share	-0.078^{*}
		[0.05]	[0.05]		[0.05]
women		-0.029^{*}	-0.031^{*}	women	-0.025
		[0.02]	[0.02]		[0.02]
year=2009	7.825^{***}	7.544^{***}	7.572^{***}	year=2009	7.802^{***}
	[0.43]	[0.43]	[0.43]		[0.46]
year=2010	6.956^{***}	6.832^{***}	6.915^{***}	year=2010	7.073^{***}
	[0.40]	[0.41]	[0.41]		[0.43]
observations	10,441	10,178	10,178	observations	9,863
establishments	4,231	4,214	4,214	establishments	4,183
R^2 (within)	0.09	0.09	0.09	R^2 (within)	0.09

Table 7: Dependent variable is the number of short-time workers over total employees. Robust standard errors are clustered at the establishment level. ***/**/* denotes 1/5/10 percent significance. Employment dummies represent the following categories: 0-9, 10-49, 50-199, 200+ employees (0-9 is base category). Sectoral dummies represent manufacturing, construction, services and others (services is base category).