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Who profits from working-time accounts? Empirical evidence on the determinants of working-time accounts on the employers' and employees' side

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Who profits from working-time accounts?

Empirical evidence on the determinants of working-time accounts on the employers' and employees' side

Ines Zapf

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Who profits from working-time accounts?

Empirical evidence on the determinants of working-time accounts on the employers' and employees' side

Ines Zapf (IAB)

Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

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Abstract

This study brings together results of the establishment and the individual level to get a better understanding of the use of working-time accounts in Germany. Using data from the Establishment Panel we first show that industrial relations factors, employment-contract characteristics and individual characteristics determine working-time accounts' use in establishments. Second, we provide the first analysis concerning the determinants of working-time accounts' use among employees and the employees' access to working-time accounts in establishments using working-time accounts. Using data from the German Socio Economic Panel we show that qualified employees more often have access to working-time accounts. Using linked-employer-employee data we show that in establishments using working-time accounts female employees, part-time employees and employees with fixed-term contracts are not disadvantaged regarding the access to working-time accounts.

Zusammenfassung

Arbeitszeitkonten sind ein bedeutendes Instrument interner Flexibilität, um die Arbeitszeiten der Beschäftigten zu variieren und den Arbeitseinsatz an ein verändertes Arbeitsaufkommen in Betrieben anzupassen. Diese Studie bringt Ergebnisse der Betriebsebene mit denen der Individualebene zusammen, um ein besseres Verständnis für den Einsatz von Arbeitszeitkonten in Deutschland zu erhalten. Mit den Daten des Betriebspanels zeigen wir zunächst, dass industrielle Beziehungen, Merkmale des Arbeitsvertrages und individuelle Merkmale der Beschäftigten den Einsatz von Arbeitszeitkonten in Betrieben bestimmen. Darüber hinaus bieten wir die erste empirische Analyse, die die Determinanten der Nutzung von Arbeitszeitkonten auf Seiten der Beschäftigten und den Zugang zu Arbeitszeitkonten von Beschäftigten in Arbeitszeitkontenbetrieben aufzeigt. Mit den Daten des Sozio-ökonomischen Panels zeigen wir, dass qualifizierte Beschäftigte häufiger Zugang zu einem Arbeitszeitkonto haben als unqualifizierte Beschäftigte. Auf Grundlage von Linked-Employer-Employee Daten zeigen wir, dass in Arbeitszeitkontenbetrieben Frauen, Teilzeitbeschäftigte und Beschäftigte mit einem befristeten Arbeitsvertrag beim Zugang zu einem Arbeitszeitkonto gegenüber Männern, Vollzeitbeschäftigten und Beschäftigten mit einem unbefristeten Arbeitsvertrag nicht benachteiligt sind.

JEL classification: J51, J81

Keywords: Working-time accounts, working-time flexibility, social inequality

1 Introduction

Against the background of the Great Recession, the financial and economic crisis of 2008/09, the use of working-time accounts (WTA) to overcome the negative effects in German establishments has attracted interest from politicians, labour market researchers and the interested public. Although the German economy was severely hit by the Great Recession, the repercussions for the labour market were surprisingly modest as German establishments extensively used measures of internal flexibility to safeguard employment.

During the Great Recession WTA were used together with other instruments of internal flexibility, like e. g. short-time work, to reduce the working time of employees temporarily. In contrast to previous economic crises, WTA were used for the first time extensively to safeguard employment. However, WTA are not a new or short-term used instrument to deal with cyclical fluctuations. Its use is rather well established in Germany. First forms of WTA were already developed in the 1960's with the aim to make the beginning and ending of the workday more flexible. Of great importance for the development of working time flexibility in general and the use of WTA specifically was the resolution of the collective agreement in the metal industry in 1984. After around seven weeks of industrial action, the employers' associations and the trade union IG Metall reached a compromise in which the weekly working time of employees was reduced in exchange for more working-time flexibility. Other agreements followed and provided a model for German establishments to achieve flexibility. This development led to a huge number of working-time flexibility models in sectoral and company agreements throughout the whole economy and provided the basis for the implementation of WTA in establishments (Herzog-Stein/Zapf 2014). Since then, WTA got more and more widespread among German establishments. By providing working time flexibility WTA can be an important instrument to gain competition advantages compared to other establishments and to successfully deal with daily, seasonal or cyclical demand fluctuations. However, besides these advantages establishments also have to take possible disadvantages into account. Those advantages and disadvantages can vary in establishments and therefore establishment-specific characteristics have to be considered, leading to that, that some establishments introduce WTA and some do not introduce them.

In this context, the first question is what determines the use of WTA in establishments? That is, which factors foster the decision to use WTA and which factors hinder the decision? And do these influencing factors change over time? The employers' decision (not) to introduce and use WTA affects their employees. By using WTA in an establishment employees can profit from employment stability, at least in the short run. However, not all employees at the labour market have access to WTA and also in establishments using WTA employers do not provide an access to WTA for every employee. The unequal distribution of the access to WTA can lead to social inequalities among employees. Therefore, the second question is which employees have access to WTA, i. e. can profit from the use of WTA to vary working hours and

to gain employment security? Third, are there also inequalities among employees concerning the access to WTA in establishments with WTA? In this paper, we provide answers to these questions.

The empirical literature already contributes to answer the first question. Ludewig (2001) identifies five factors that might have an influence on the use of WTA in establishments. The results of the regression analysis showed that establishment size, further training, the proportion of qualified employees and the existence of a works council were positively associated with the use of WTA. Bellmann/Gewiese (2004) investigated the introduction of WTA in establishments. They found a positive effect of the share of apprentices, establishment size, further training, the existence of a works council and collective agreements. In contrast, the share of female employees, unpaid overtime hours and a very high regional unemployment rate in Eastern Germany had a negative effect. In the context of the Great Recession Boeri/Bruecker's (2011) study of the use of short-time work as well as Bellmann/Gerner/Upward's (2012) study of the crisis response of establishments addressed the use of WTA. However, the analyses concerning WTA were not in the centre of both studies. Furthermore, Herzog-Stein/Zapf (2014) analysed the determinants of WTA's use to safeguard employment in general and in consequence of the Great Recession. However, the results of all of these studies only refer to single points in time and therefore do not take into account possible changes over time.

In this paper, we provide answers to the above mentioned questions by considering the employers' as well as the employees' side. We also take into consideration possible changes of influencing factors over time by comparing cross-sectional results. We contribute to the literature by providing the first empirical study concerning the determinants of the use of WTA among employees and the access to WTA of employees in establishments using WTA. Furthermore, we bring together results of the establishment level and the individual level to illuminate both sides and to get a better understanding of the use of WTA in general. Our analysis are made on basis of the *Establishment Panel*, a representative employer survey of the Institute for Employment Research (IAB) as well as on basis of the *German Socio Economic Panel Study* (SOEP), a representative survey of private households and persons of the German Institute for Economic Research (DIW). Additionally, we use unique information from linked-employer-employee data to examine the access to WTA of employees in establishments using WTA. These data are also provided by the DIW.

This paper is organised as follows. After presenting a definition of WTA and giving an overview of the regulation of WTA in Germany (chapter 2) we explain the different forms of WTA and their functions in chapter 3. In chapter 4 we describe the different datasets and the variables used. The methodological approach is also explained. In the fifth chapter we present the results of the descriptive and multivariate analyses. We start by analysing the employers' side and then consider the employees' side. After this, we present the results of the linked-employer-employee data.

Finally, in the sixth chapter, the results are summarised and their implications are also discussed.

2 Definition and regulation

2.1 Definition

Establishments introduce and use WTA with the aim to organize and regulate variable distributions of hours worked by its employees. Positive or negative deviations of hours worked from regular or collectively agreed on working hours lead to savings (i. e. credits) or deficits (i. e. debits) on WTA (Groß/Schwarz 2008; Seifert 1998). Therefore, if employees work more than the contractually agreed working hours they bank credits in their WTA. If employees work less than the contractually agreed working hours they have debits. The credits or debits on WTA have to be balanced out over a certain period of time. This period of time is defined as the compensation period. It describes the maximum number of weeks within which the credits or debits on WTA have to be balanced out. Therefore, during the compensation period the number of actual hours worked is in conformance with the contractually agreed working hours (Groß/Schwarz 2010; Seifert 1996).

2.2 Regulation

In Germany, the working time of employees is legally regulated by the Working Hours Act (*Arbeitszeitgesetz, ArbZG*). The Working Hours Act sets a legal framework for the maximum number of hours worked and states a working time of eight hours a day. However, the daily working time can be extended to ten hours a day if in the course of six months the daily working hours do not exceed eight hours on average (§ 3 ArbZG). The Working Hours Act widely leaves the distribution and regulation of working hours to collective and individual bargaining. Thus, the maximum number of working hours is in fact determined by the negotiating parties (§ 7 ArbZG).

The Working Hours Act does not regulate the introduction and use of WTA at all. WTA are widely regulated by collective agreements at the industry level as well as by agreements at the company level. Collective agreements set the framework conditions for the introduction and use of WTA. These framework conditions are negotiated between employers' associations and unions. The actual organization of WTA then takes place at the establishment level. At the establishment level management and works councils negotiate the design and configuration of WTA (Bispinck 1998; Esser 2007). Thus, the actual design and configuration can highly be adapted to a single establishment and its needs as well as the needs of its employees.

3 Forms and functions

3.1 Forms

Different forms of WTA exist according to the maximum number of accumulated savings or deficits as well as the length of the compensation period. According to Groß (2009), in 2007 the maximum number for accumulating savings on WTA was

on average 103 hours and the maximum number for accumulating deficits was on average 63 hours. The compensation period was on average 38 weeks.

At the establishment level the design and configuration of WTA vary a lot making it difficult to categorize different forms of WTA. However, according to Seifert (2001, 2005) it can be distinguished between four basic forms: flextime models, overtime accounts, “range” models and “savings” models. Flextime models allow savings as well as deficits. Employees are allowed to accumulate savings by working longer than the contractually agreed working hours, they are allowed to accumulate deficits by working shorter than the contractually agreed working hours. In contrast, overtime accounts only allow savings. With overtime accounts employees are not able to accumulate deficits. “Range” models are comparable to flextime models as employees can build up time credits or debits on WTA. But in comparison to flextime models the maximum number of credits or debits is higher and the compensation period is longer. Thus, “range” models grant more flexibility than flextime models. “Savings” models are comparable to overtime accounts as they also allow only savings, but no deficits. In contrast to overtime accounts the maximum number of accumulated savings is higher and the compensation period is longer on “savings” models.

According to the length of the compensation period the four basic forms of WTA can also be classified into two groups. Flextime models, overtime accounts and “range” models can be classified as short-time accounts. The compensation period of short-time accounts is normally up to one year or less. “Savings” models are described as long-term accounts. The compensation period of long-term accounts is more than one year. In recent years, long-time and the so-called lifetime accounts have gained importance. However, their use and availability are still very limited (Hildebrandt et al. 2009).¹

3.2 Functions

WTA can have very different functions according to their design and configuration. Of major importance is whether they are categorized as short-time or long-time accounts.

3.2.1 Short-time accounts

The major aim of short-time accounts is to adjust the working time of employees to a varying production and to deal with seasonal or cyclical fluctuations in demand. In case of a negative demand shock formerly accumulated hours on WTA can be used up or time deficits can be build-up in order to prevent lay-offs and to safeguard employment, at least in the short run (Bundesmann-Jansen/Groß/Munz 2000; Gerner 2010; Seifert 2005). During the Great Recession savings on WTA were used up and time-deficits were build-up in order to reduce the working time of employees. The

¹ For more details on lifetime accounts see e. g. Esser (2007), Hildebrandt (2007), Hildebrandt et al. (2009) and Seifert et al. (2013).

use of WTA together with other measures of internal flexibility helped to prevent the loss of (firm-specific) human capital in many establishments. Furthermore, WTA can also be a (temporary) alternative to the introduction of short-time work in establishments. In fact the regulations of the Federal Employment Agency claim that savings on WTA have to be used up by employees before short-time work can be announced by establishments (BMAS 2009).

Besides safeguarding employment establishments can also reduce idle time, use labour more efficiently, and increase productivity (Munz/Bauer/Groß 2002). Establishments can also obtain substantial cost advantages as with the use of WTA overtime premiums are reduced or even completely avoided and hence unit labour costs are reduced. Through the improved capacity utilisation establishments are able to reduce their unit capital cost. By synchronising working hours and the use of labour input storage costs are further reduced (Seifert 2001). WTA also decouple working time and wages, i. e. the wages of employees stay constant though their working time varies. Nevertheless, establishments also have to consider costs for the introduction and regulation of WTA into account. For employees, short-time accounts may improve their short-run time sovereignty. Employees with WTA can vary their working time according to their own needs and thus better fit familial or social time requirements and daily working schedules. However, in most cases the variation of the employees' working time must be in accordance with the employer's and/or other employees' needs (Gerner 2010). The accumulation or reduction of hours on WTA is often driven by company interests restricting the employees working time sovereignty again (Bundesmann-Jansen/Groß/Munz 2000). Furthermore, if formerly accumulated hours on WTA cannot be reduced during the compensation period, employees work in fact longer without getting extra pay and therefore perform unpaid overtime hours (Bauer et al. 2002).²

3.2.2 Long-time accounts

In contrast to short-time accounts, the main objective of long-time accounts is to accumulate working hours for specific purposes, like e. g. a sabbatical or further training. Long-time accounts are mainly designed to offer employees long-term time sovereignty during their working life without a pay loss as wages remain constant in non-working periods. However, some establishment-specific regulations also comprise the use of long-time accounts to deal with cyclical fluctuations in demand. In this case, the main purpose of an increased long-term time sovereignty of employees is becoming superfluous. Long-time accounts then have the same function as short-time accounts to safeguard employment. In contrast, life-time accounts aim to arrange the termination of an employment relationship at the end of a working life via early retirement. In order to retire earlier without pay losses, employees have to

² However, if employees cannot balance out the credits on WTA during the compensation period in some establishments they receive a financial compensation or the savings are transferred to long-time accounts (Bauer et al. 2002; Groß/Schwarz 2006).

build-up a high number of savings. If the accumulated hours on WTA are converted into money at the end of the working life, WTA also provide a contribution to occupational pension schemes (Hildebrandt 2007). These life-time accounts cannot be used to safeguard employment during an economic crisis.

4 Data, variables and method

In order to analyse the determinants of WTA on the employers' as well as on the employees' side we need data on the establishment level and on the individual level. The two levels are further combined by linked-employer-employee data (cf. chapter 4.3).

4.1 IAB establishment panel

The analysed data for the employers' side is the *Establishment Panel* of the IAB. The IAB *Establishment Panel* is a representative employer survey of employment parameters at individual establishments in Germany. It is conducted in Western Germany since 1993 and in Eastern Germany since 1996. Nearly 16,000 establishments from all branches of the economy and of all sizes are surveyed annually. The survey is carried out orally by personal interviews. The personal interviews are conducted by TNS Infratest Sozialforschung, Munich on behalf of the IAB. The sampling frame comprises all establishments in Germany with at least one worker subject to social security.

The IAB *Establishment Panel* covers a wide range of questions giving information on, for example, total employment, bargaining arrangements, total sales, exports and investment. In certain years specific questions are also asked, for example, concerning operating times, overtime hours and the use of WTA. Furthermore, the survey contains questions about central topics, for example, the demand for qualified employees and the employment of older employees (Bellmann 2002; Fischer et al. 2009).

Up to the year 2012 we can use twenty waves of the IAB *Establishment Panel*. The focus is on the analyses of establishment-specific factors. In contrast, information on individual factors of employees can only be included on an aggregate level. Furthermore, not all interesting factors are available in each wave.

4.1.1 Dependent variable

At the centre of the analyses with the IAB *Establishment Panel* is the question of which factors influence the use of WTA at the establishment level. The employers were asked the following question about the use of WTA: "Does your establishment/office offer working time accounts such as flexitime or annual working time agreements? Or are these planned?" This question is coded as a single dummy variable (0/1) that indicates whether WTA were already in operation. It takes the value of one if WTA were already in operation, it takes the value of zero if WTA were either planned or neither in operation nor planned. The question of the use of WTA

is available in the survey of 1999, 2002, 2004, 2006 and from 2008 to 2012 annually.

4.1.2 Independent variables

The independent variables are grouped to four main factors at the establishment level.

Industrial relations

We use two variables related to the industrial relations. The first dummy variable *Collective Bargaining Coverage* takes the value of one if the establishment is bound by an industry wide wage agreement or a company agreement concluded by the establishment and the trade unions. It takes the value of zero if the establishment is not bound by a collective agreement. The second dummy variable *Works Council* is a dummy variable and indicates whether a works council exists in the establishment.

Traditional instruments of external flexibility

Two variables were used as indicators for the use of traditional instruments of external flexibility. The variable *Recruitments* indicates whether the establishment recruited new employees in the first half of the year the survey was conducted. The variable *Lay-offs* indicates whether a dismissal on the part of the employer took place. The number of recruitments and the number of lay-offs is put in relation to the total number of employees.

Employment-contract characteristics

We use four variables related to employment-contract characteristics. To investigate a possible part-time effect the *Proportion of Part-Time Workers* and the *Proportion of Workers in Marginal Employment* were taken into account. Marginal employment is a special additional form of part-time employment in Germany, which is exempted from social security contributions and payroll tax and is characterised by less than thirteen working hours a week on average (Voss/Weinkopf 2012). Furthermore, we include the *Proportion of Workers with a Fixed-Term Contract* and the *Proportion of Agency Workers*.³

Individual characteristics

Two variables are considered as indicators for the composition of the establishment's workforce that take into account individual characteristics of employees. First, the *Proportion of Female Workers* is taken into consideration. Second, the *Proportion of Skilled Workers and Qualified Salaried Employees/Civil Servants* is used as an independent variable.

³ Although agency workers are employed by the renting agency and are not directly employed by the establishment they work in, this variable is considered here as it is a very special form of an employment contract.

Control variables

We also control for a variety of establishment-specific factors that are widely regarded as having an influence on the existence and use of WTA. First, *Establishment Size* is included, which is measured by the logarithm of the number of employees. Second, thirteen dummy variables representing thirteen economic sectors are included. The economic sector *Construction Industry* is used as a reference group. Third, three dummy variables representing the kind of establishment are included. The *Independent Company* is used as a reference group. Fourth, five dummy variables representing the legal form of the establishment are taken into account. The *Individually Owned Firm* is used as a reference group here. Fifth, two dummy variables are included indicating the technical state of the plant and machinery, furniture and office equipment. *New Technology* indicates whether the establishment has the state-of-the-art equipment. *Old Technology* indicates whether the equipment is obsolete. Sixth, the variable *Investments in EDP, Information and Communication Technology* indicates whether the establishment invested in this area. Finally, a dummy variable indicating whether the establishment is located in *Eastern Germany* is included.

4.2 SOEP

The data for the employees' side used in this study were made available by the *SOEP*.⁴ The *SOEP* is an annual representative survey in private households and their members and started in West Germany in 1984 and in East Germany in 1990. Central topics in the *SOEP* are the current life situation, employment, income, health and illness issues, as well as the family situation. Moreover, there are key issues that change every year, for example data on further education and qualification (Göbel et al. 2008; Wagner/Frick/Schupp 2007).

Up to the year 2012 we can use twenty-nine waves of the *SOEP*. One major advantage of the *SOEP* data is the huge variety of individual factors. However, information about the establishment the employee works for are scarce.

4.2.1 Dependent variable

At the centre of the analyses with the *SOEP* data is the question of which factors influence the access to WTA at the individual level. Before employees get the question about the access to WTA, they are asked if they work overtime hours. The question was: "Do you work overtime?" Only if employees do work overtime hours they are asked the following question: "Can you also collect this over-time in a so-called working-hours account, which allows you time off to be taken within a year or longer?" This question is coded as a dummy variable. It takes the value of one if overtime hours can be collected on WTA, it takes the value of zero if overtime hours cannot be collected on WTA. Furthermore, all employees get the value of zero if

⁴ Socio-Economic Panel (SOEP), data for years 1984-2012, version 29, SOEP, 2013, doi: 10.5684/soep.v29

they are not working overtime hours at all. For those employees it is assumed that they do not have access to WTA. This approach is based on the assumption that they do not need an access to WTA as they do not work overtime hours which they can accumulate on WTA. With this approach the number of employees with WTA is not overestimated.

4.2.2 Independent variables

We consider individual factors as well as factors characterising the employment relationship, respectively, the workplace of the employee in the analyses. First, we take two dummy variables representing the contractually agreed working hours into account. The status *Full-Time Employment* is used as a reference group. Second, the dummy variable *Fixed-Term Contract* indicates whether the employee has a fixed-term contract. Third, the dummy variable *Agency Worker* indicates whether the employee is hired as an agency worker. Fourth, two dummy variables are taken into account considering the type of education or training usually necessary for this type of work. Here, *No Completed Vocational Training/Apprenticeship Required* serves as a reference group. Fifth, the level of autonomy in the workplace is considered, the reference group is a *Rather Low Level of Autonomy*.

Control variables

We control for several other individual and workplace-specific factors for which we assume an association with the use of WTA at the individual level. First, we take the occupational status into account with *Blue-Collar Workers* as a reference group. Second, we consider the required introduction or introductory training for the type of work. Here, a *Short Introduction on the Job* is used as a reference group. Third, we take the establishment size by different size classes into account. The *Establishment Size Less Than 20 Employees* is used as a reference group. Fourth, we consider different economic sectors with the *Manufacturing Industry, Including Construction Industry* as a reference group. Finally, the dummy variable *Eastern Germany* is included.

4.3 SOEP-LEE

In the *SOEP-LEE*⁵ data the employees' individual data from the *SOEP* are linked with information on their employers. The workplace data collected in the *SOEP-LEE* data expand the information on the work contexts and the working conditions collected by the *SOEP* data. The *SOEP-LEE* project has been implemented by asking all dependent employees in the *SOEP* survey to provide local contact information of their employer in 2011. The employer contact data was the basis for a standardized employer survey. The employer survey considers general information on the establishment, the economic situation, human resources policy, the personnel structure, career opportunities and income as well as information on the work organisation (DIW 2015; Liebig/Schupp 2014).

⁵ The abbreviation LEE describes linked employer-employee datasets.

For the analyses on basis of the *SOEP-LEE* we chose all establishments with WTA. The question in the employer survey was: “Does your establishment offer working-time accounts and if so, do all employees have access to working-time accounts or only a certain proportion?”⁶ This question is coded as a dummy variable that indicates whether WTA exist in the establishment. The variable takes the value of one if WTA exist for all employees or for some part of employees. It takes the value of zero if WTA do not exist in the establishment. Of major interest are those establishments, where only some part of employees has access to WTA, resulting in inequalities concerning the access to WTA among the workforce. However, due to the rather small number of cases the estimations could only be made for all establishments using WTA independently from the question if all or only some part of employees has access to WTA.⁷ Having chosen all establishments with WTA the factors influencing the access to WTA of employees were estimated at the individual level with the *SOEP* data.

4.4 Method

The dependent variable on basis of the *IAB Establishment Panel* as well as the dependent variable on basis of the *SOEP* were specified as dichotomous, that is, binary variables. By using dichotomous variables we differentiate between two states. With the *IAB Establishment Panel* data we differentiate between the use of WTA in establishments vs. no use of WTA in establishments and with the *SOEP* data we differentiate between the access to WTA of employees vs. no access to WTA of employees. The dichotomous structure of the dependent variables suggests the use of logit or probit models. The main differences between these two models are differing assumptions concerning the distribution of residuals. However, the results of underlying logit or probit regression models are in most cases identical.

For the empirical analyses we use logistic regression models. The basic equation for modelling probabilities in the logistic regression is:

$$P(y = 1) = \frac{\exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k)}{1 + \exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k)}$$

with $P(y=1)$ as the probability that the use of WTA in establishments, respectively, the access to WTA of employees occurs (see e. g. Greene 2008; Wooldridge 2013).

⁶ As the questionnaire of the employer survey only exists in German, the question was translated here.

⁷ The estimations with establishments, where only some part of employees has access to WTA are not presented here. However, the estimations were made separately. The results do not differ from the overall estimations presented in this paper.

In logistic regressions the β -coefficients cannot be interpreted contextually in a meaningful sense, but the direction of the association is given. A negative β -coefficient stands for a negative association, a positive β -coefficient stands for a positive association. Additionally, we use the average marginal effects (AME). The AME make the interpretation of results easier, as the average effect of the probability of the use of WTA, respectively, the access to WTA is described. Another advantage of AME is that they are robust against unobserved heterogeneity and therefore allow a comparison between models (Best/Wolf 2010).

The regression models are estimated separately for different years and the results are compared. By comparing the results for different years we can test whether there are differences in the effects of factors over time, that is, whether the coefficients are significant or insignificant in different years and whether AME are higher or lower. Strong differences between the models indicate non-time constant unobserved heterogeneity. With logistic regression models for different years we can show temporal developments of the influencing factors which cannot be provided with panel analyses.

5 Results

In the following, we present results of the distribution and determinants of WTA on the employers' side and the employees' side. Furthermore, we show the major results based on the linked-employer-employee data.

5.1 Employers' side

In this chapter we focus on the distribution as well as the determinants of WTA on the employers' side. To get information about the employers' side we used the data of the IAB *Establishment Panel* (cf. chapter 4).

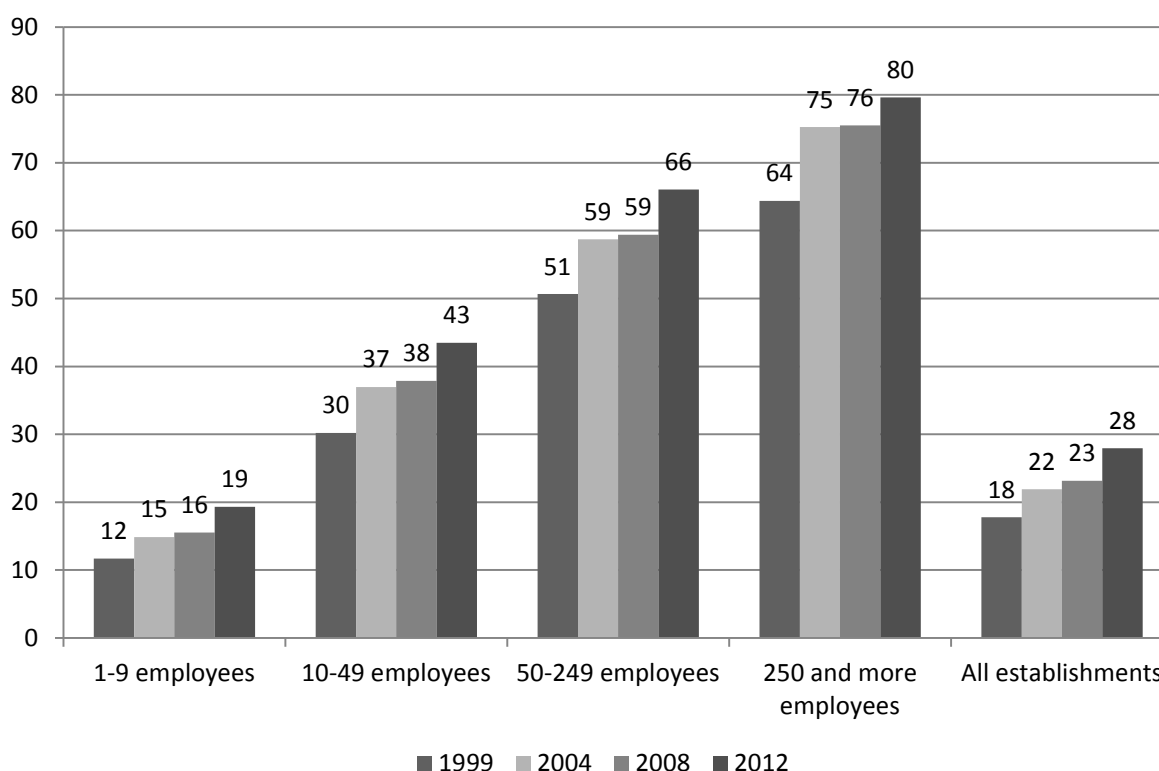
5.1.1 Distribution of WTA among establishments

During the reference period (1999-2012) the share of establishments using WTA increased widely. In 1999, around 18 per cent of all establishments had WTA and until 2012 around 28 per cent of all establishments used WTA (cf. Figure 1). In larger establishments WTA are more widespread as compared to smaller establishments. Among larger establishments with 250 or more employees the share of establishments using WTA increased from around 64 to 80 per cent. Among smaller establishments with up to 9 employees the share increased from around 12 to 19 per cent.

The lower distribution of WTA in smaller establishments can mainly be explained by the relatively high effort for those establishments. In smaller establishments the effort for introducing WTA seems to be higher than the resulting benefits for introducing WTA in form of a formalised or standardised flexibility. Smaller establishments seem to organise flexible working times more informally and therefore WTA as a formal instrument to organise working time flexibility are not needed (Bell-

mann/Gewiese 2003; Bosch 1996; Kraetsch/Trinczek 1998). In contrast, the relatively large share of establishments with WTA among larger establishments can be attributed to the fixed costs of WTA. Establishments have to take costs for the introduction (initiation process costs, bargaining costs) and regulation (documentation costs) of WTA into account. Due to the fixed costs character of WTA, the average costs for introducing WTA decrease with an increasing number of employees. Therefore, WTA are cheaper for larger establishments as compared to smaller establishments.

Figure 1
Share of establishments using WTA by size class, 1999-2012



Source: IAB-Establishment Panel, own calculations.

A more detailed analysis of the distribution of WTA by size classes shows a different dynamic according to its distribution and structure. According to Figure 1 WTA are less widespread in smaller establishments and the share of establishments using WTA only increased by around 8 percentage points here. Hence, in relation to 1999 its share increased by around 65 per cent (cf. Table 1). In larger establishments the share of establishments with WTA increased by around 15 percentage points, but in relation to 1999 its share only increased by around 24 per cent. The overall increasing share of establishments using WTA by around 57 per cent is therefore mainly driven by smaller establishments. This development can also be shown when we compare the share of establishments with WTA by size classes among all establishments with WTA and the distribution of establishments by size classes among all establishments. Smaller establishments are still underrepresented among establishments with WTA and larger establishments are overrepresented. However, the

results show a slightly shift towards smaller establishments. Among smaller establishments the share of establishments using WTA increased in absolute and relative terms, whereas it decreased among larger establishments.

Table 1
Distribution and structure of establishments (using WTA) by size class

<i>Share of establishments with WTA by size class</i>	1999	2012	Change in percentage points (2012 to 1999)	Change in per cent (2012 to 1999)
1-9 employees	11.7	19.3	7.6	64.7
10-49 employees	30.2	43.5	13.3	43.9
50-249 employees	50.7	66.1	15.4	30.5
250 and more employees	64.4	79.6	15.2	23.6
All establishments	17.8	28.0	10.2	57.0
<i>Share of establishments with WTA by size class among all establishments with WTA</i>				
1-9 employees	48.0	48.1	0.1	0.2
10-49 employees	37.7	38.8	1.1	2.9
50-249 employees	11.5	10.8	-0.7	-6.1
250 and more employees	2.8	2.3	-0.5	-17.8
All establishments	100.0	100.0	0.0	0.0
<i>Share of establishments by size class among all establishments</i>				
1-9 employees	73.0	69.7	-3.3	-4.5
10-49 employees	22.2	24.9	2.7	12.3
50-249 employees	4.1	4.6	0.5	13.1
250 and more employees	0.8	0.8	0.0	4.4
All establishments	100.0	100.0	0.0	0.0

Source: IAB-Establishment Panel, own calculations.

5.1.2 Utilisation intensity

The utilisation intensity of WTA describes the share of employees with WTA in an establishment using WTA. Between 1999 and 2012 the overall utilisation intensity increased from around 83 to 89 per cent (cf. Table 2). A differentiation by size classes shows, that the utilisation intensity is higher in smaller establishments as compared to larger establishments. However, this result is not surprising as the introduction and use of WTA leads to higher costs for smaller establishments in relation to their number of employees (cf. chapter 5.1.1). Therefore, an introduction and the use of WTA in smaller establishments only seem to be useful, when all employees have access to WTA. Smaller establishments often also do not have different working time regulations for certain groups of employees. In contrast, in larger establishments the working time regulations are more differentiated by using different instruments for gaining working time flexibility for certain groups of employees. Hence, in larger establishments it is quite common that not all employees have access to WTA.

Table 2
Utilisation intensity by size class and industries

	1999	2012
<i>Establishment size</i>		
1-9 employees	85.4	90.1
10-49 employees	82.3	87.7
50-249 employees	78.5	84.9
250 and more employees	73.2	84.4
<i>Industry</i>		
Agriculture and forestry/fishing	61.9	88.1
Mining/electricity and water supply	82.2	88.5
Consumer goods/food	73.8	83.9
Basic materials and producer goods	86.6	83.0
Investment and consumer durables	85.1	89.0
Construction industry	82.6	87.3
Wholesale and retail trade/repair	76.7	87.3
Transportation/information/communication	86.4	90.6
Financial and insurance activities	93.4	91.2
Accommodation and food service activities	85.5	82.7
Education	85.4	87.4
Human health/social work activities/veterinary	81.0	91.3
Other services	93.2	89.6
Non-profit organisations/public administration/compulsory social security	82.6	89.7
All establishments	83.1	88.5

Source: IAB-Establishment Panel, own calculations.

5.1.3 Determinants of WTA's use in establishments

To gain major insights to the determinants of WTA's use in establishments we used binary logistic regressions. The binary logistic regressions were estimated separately for different years to see potential differences of influencing factors over time (cf. chapter 4.4).

Table 3 shows the influence of establishment-specific factors on the probability to use WTA in an establishment. First, the results show a positive association between industrial relations factors and the use of WTA. Establishments with industry-wide collective agreements or company agreements and establishments with works councils use more often WTA as compared to establishments without collective or company agreements and establishments without works councils. The results also show a stronger effect for works councils as compared to collective or company agreements. It seems to be that works councils are more important for the introduction and use of WTA as collective or company agreements. The importance of works councils can be traced back to the German Works Constitution Act (*Betriebsverfassungsgesetz*), which regulates the participation of works councils in the decision making process. By integrating works councils in the decision making process employees' needs can be considered when introducing and using WTA. In contrast, collective agreements are less important due to shifting competences from the collective to the establishment level (Berg 2008; Hermann et al. 2001). Nevertheless,

collective agreements are still important factors for determining the use of WTA in establishments.

Second, the results only partly show an association between the use of traditional instruments of external flexibility and the use of WTA as instrument of internal flexibility. WTA seem to be more widespread in establishments also using recruitments as external instruments. But the coefficients are only partly significant. For 2009 and 2012 the results show a complementary use of WTA and recruitments. This complementary use is quite plausible, as the accumulation of hours on WTA is restricted by legal regulations concerning the maximum number of working hours. Moreover, the accumulation of working hours is also restricted by collective or establishment-specific agreements. Thus, also in establishments with WTA recruitments become necessary in order to adjust the work effort to a higher workload and to distribute the workload among more employees. In contrast, lay-offs seem to be not associated with the use of WTA. Lay-offs do not seem to be a barrier for the use of WTA or making its use more difficult. This is plausible, when lay-offs only occur after all possibilities of using (internal) instruments to adjust the work effort were exploited.

Third, the results mostly show a significant correlation between different characteristics of the employment contract and the use of WTA. With an increasing share of regular part-time employees and employees in marginal employment the probability of using WTA decreases. The share of regular part-time employees is statistically significant in 2002 and 2006, the share of employees in marginal employment is significant in 2009 and 2012. Considering the share of employees in marginal employment in the analyses, the negative correlation seems to shift from regular part-time employees towards employees in marginal employment. With an increasing or decreasing share of employees in marginal employment establishments can react quickly to demand fluctuations. Since 2003 marginal employment got more important in Germany as the limit for earnings was augmented to 400 Euros per month making the use of marginal employment more easily for establishments. With an increasing share of employees in marginal employment the establishments' interest to use WTA may decrease, mainly according to two reasons: On the one hand, the potential of accumulating surpluses on WTA is limited for marginal employed persons as their working time hardly varies. On the other hand, establishments can use marginal employment to vary working hours instead of using WTA. The variation of regular part-time employment can also be a substitute towards the use of WTA. To sum up, establishments can reach working time flexibility through regular part-time and marginal employment and therefore do not need WTA to gain working time flexibility.

A negative association can also be shown between the share of employees with fixed-term contracts and the use of WTA. Here, the results show a certain trade-off between measures of internal and external flexibility. The probability of using WTA in establishments decreases with an increasing share of employees with fixed-term contracts. Establishments with a higher share of employees with fixed-term con-

tracts seem to have more difficulties to arrange the use of WTA efficiently. These difficulties can be attributed on the one side to the fact that employees with short and limited employment relationships are less capable to organize the accumulation of working time surpluses and deficits according to establishment-specific needs. On the other side, instruments of external flexibility generally get more important, when the number of employees at the margin increases in relation to the core workforce. The results show a positive correlation between the share of agency workers and the use of WTA. This complementary use of agency workers and WTA as measures of external and internal flexibility seems to be important for establishments with a high need of flexibility. In those establishments agency workers can also serve as a buffer for the core workforce as in case of negative demand fluctuations the number of agency workers can be reduced. In contrast, employees of the core workforce can decrease accumulated hours on WTA by working shorter. In establishments with agency workers there is an increasing polarisation between insiders with long and save employment relationships and employees in atypical employment at the margin.

Fourth, the results show significant correlations between individual characteristics of employees and the use of WTA. WTA seem to be underrepresented in establishments with a higher share of female employees. The coefficients are statistically significant with the exception of 2009. It seems to be more difficult to use WTA according to establishment-specific needs when the share of female employees increases. Women more often need working time flexibility according to their own needs, e. g. to better fit familial obligations. In comparison to women, the working times of men can be better adjusted to establishment-specific needs. The results show a positive correlation between the share of skilled workers and qualified employees and the use of WTA. As skilled workers and qualified employees have a high amount of general and establishment-specific human capital, establishments are interested in longterm relationships. The higher the share of skilled workers and qualified employees in an establishment, the more useful are measures of internal flexibility to keep human capital in the establishment and to use it efficiently. In case of negative demand fluctuations the work effort can be adjusted by decreasing the number of accumulated hours on WTA. In case of positive demand fluctuations human capital can be used more intense as the working time is longer and savings are accumulated on WTA.

By comparing cross-sectional results we can see whether the influencing factors of WTAs use change over time. All in all, the influencing factors are quite constant over time meaning that the determining factors widely remain the same although time changes. The industrial relations and the composition of the establishments workforce measured by employment-contract characteristics and individual characteristics of employees constantly contribute to explain the use of WTA in establishments.

Table 3
Determinants of WTA's use

	2002			2006			2009			2012		
	Coeff.	Std.-error	AME	Coeff.	Std.-error	AME	Coeff.	Std.-error	AME	Coeff.	Std.-error	AME
<i>Collective bargaining coverage (Ref.: No collective agreement)</i>												
Industry wide or company agreement	0.207 ***	0.062	0.040	0.366 ***	0.067	0.069	0.409 ***	0.066	0.074	0.272 ***	0.066	0.050
<i>Works council (Ref.: No works council)</i>												
Works council	0.744 ***	0.073	0.154	0.686 ***	0.079	0.135	0.515 ***	0.080	0.094	0.487 ***	0.079	0.092
Recruitments	0.001	0.002	0.000	0.000	0.002	0.000	0.006 ***	0.002	0.001	0.007 ***	0.002	0.001
Lay-offs by employer	-0.002	0.002	0.000	-0.001	0.001	0.000	-0.001	0.001	0.000	-0.001	0.001	0.000
Proportion of part-time workers	-0.003 *	0.001	-0.001	-0.005 ***	0.002	-0.001	-0.001	0.002	0.000	0.001	0.002	0.000
Proportion of workers in marginal employment				-0.001	0.003	0.000	-0.012 ***	0.002	-0.002	-0.010 ***	0.002	-0.002
Proportion of workers with a fixed-term contract	-0.007 ***	0.002	-0.001	-0.003	0.002	-0.001	-0.007 ***	0.002	-0.001	-0.007 ***	0.002	-0.001
Proportion of agency workers	0.014 **	0.007	0.003	0.024 ***	0.006	0.004	0.021 ***	0.007	0.004	0.015 **	0.006	0.003
Proportion of female workers	-0.002 *	0.001	0.000	-0.003 *	0.001	-0.001	-0.002	0.001	0.000	-0.004 ***	0.001	-0.001
Proportion of skilled workers and qualified salaried employees/civil servants	0.006 ***	0.001	0.001	0.004 ***	0.001	0.001	0.006 ***	0.001	0.001	0.005 ***	0.001	0.001
Establishment size	0.241 ***	0.023	0.046	0.310 ***	0.026	0.056	0.280 ***	0.027	0.049	0.328 ***	0.027	0.059
<i>Sektor (Ref.: Baugewerbe)</i>												
Agriculture and forestry/fishing	0.093	0.200	0.018	-0.098	0.238	-0.018	0.285	0.276	0.049	0.396	0.250	0.069
Mining/electricity and water supply	-0.162	0.231	-0.031	-0.078	0.267	-0.014	0.092	0.246	0.016	0.332	0.251	0.058
Consumer goods/food	-0.214	0.134	-0.041	-0.221	0.169	-0.040	0.011	0.170	0.002	0.054	0.169	0.010
Basic materials and producer goods	-0.005	0.125	-0.001	-0.433 ***	0.157	-0.079	0.058	0.166	0.010	0.218	0.164	0.039
Investment and consumer durables	0.230 **	0.117	0.044	0.115	0.149	0.021	0.439 ***	0.145	0.075	0.435 ***	0.144	0.077
Wholesale and retail trade/repair	-0.837 ***	0.123	-0.162	-0.723 ***	0.147	-0.135	-0.386 ***	0.148	-0.070	-0.306 **	0.146	-0.056
Transportation/information/communication	-0.762 ***	0.162	-0.146	-1.000 ***	0.174	-0.186	-0.589 ***	0.162	-0.109	-0.437 ***	0.156	-0.081
Financial and insurance activities	-0.505 ***	0.191	-0.096	-0.815 ***	0.211	-0.150	-0.499 **	0.226	-0.092	-0.416 *	0.223	-0.077
Accommodation and food service activities	-0.307 *	0.181	-0.059	-1.042 ***	0.215	-0.195	-0.295	0.195	-0.054	-0.272	0.190	-0.050
Education	-1.023 ***	0.179	-0.194	-1.090 ***	0.212	-0.202	-0.580 ***	0.214	-0.107	-0.473 **	0.197	-0.088
Human health/social work activities/veterinary	-1.231 ***	0.153	-0.234	-1.020 ***	0.174	-0.190	-0.287 *	0.172	-0.052	-0.304 *	0.168	-0.056
Other services	-0.684 ***	0.119	-0.133	-0.576 ***	0.143	-0.107	-0.146	0.147	-0.026	0.038	0.145	0.007
Non-profit organisations/public administration/compulsory social security	-0.240	0.161	-0.046	-0.596 ***	0.194	-0.108	-0.065	0.205	-0.012	0.145	0.202	0.026

	2002			2006			2009			2012		
	Coeff.	Std.-error	AME	Coeff.	Std.-error	AME	Coeff.	Std.-error	AME	Coeff.	Std.-error	AME
<i>Type of establishment (Ref.: Independent company or independent organization)</i>												
A place of business/office/branch of a larger enterprise/organization	0.057	0.082	0.011	0.013	0.092	0.002	-0.044	0.097	-0.008	0.058	0.100	0.011
Head office of an enterprise/organization with other places of business/offices/branches	0.151 **	0.073	0.029	0.342 ***	0.080	0.062	0.324 ***	0.081	0.056	0.384 ***	0.080	0.069
Regional of specific middle-level authority of a multi-level company or a multi-level authority/organization	0.088	0.131	0.017	0.116	0.160	0.021	0.168	0.209	0.029	-0.038	0.199	-0.007
<i>Legal form (Ref.: Individually owned firm)</i>												
Partnership (limited partnership, general partnership, partnership under the Civil Code)	0.414 ***	0.128	0.078	0.581 ***	0.175	0.101	0.343 **	0.163	0.058	0.030	0.166	0.005
Limited liability company or limited commercial partnership with a limited company as a partner	0.287 ***	0.093	0.055	0.335 ***	0.106	0.061	0.459 ***	0.097	0.083	0.328 ***	0.095	0.060
Company limited by shares (public limited company, partnership limited by shares)	0.603 ***	0.157	0.113	0.266	0.171	0.048	0.355 *	0.187	0.060	0.445 **	0.203	0.078
Public corporation, public law foundation, institution, authority or office	0.159	0.148	0.030	0.469 ***	0.168	0.085	0.467 ***	0.169	0.080	0.635 ***	0.168	0.111
Other legal form (e. g. association or cooperative)	0.054	0.137	0.010	0.148	0.152	0.027	-0.133	0.150	-0.024	-0.086	0.145	-0.016
<i>Technical state (Ref.: Neither new nor old technology)</i>												
New technology	-0.006	0.057	-0.001	0.211 ***	0.065	0.039	0.099	0.066	0.018	0.058	0.063	0.011
Old technology	0.023	0.140	0.004	-0.003	0.169	-0.001	0.069	0.172	0.012	-0.193	0.154	-0.035
<i>Investments (Ref.: No investments)</i>												
Investments in EDP, information and communication	0.391 ***	0.056	0.077	0.300 ***	0.062	0.056	0.290 ***	0.061	0.052	0.183 ***	0.060	0.034
<i>Region (Ref.: West Germany)</i>												
East Germany	0.007	0.057	0.001	0.099	0.064	0.018	0.050	0.063	0.009	0.054	0.062	0.010
Constant	-1.704 ***	0.149		-1.740 ***	0.174	-9.980	-1.580 ***	0.171		-1.663 ***	0.168	
Number of cases	8268			6903			7040			7117		
Pseudo-R ² (Mc Fadden)	0.18			0.20			0.18			0.19		
-2 LL	9321.8			7467.2			7414.8			7654.8		

*p<0.1, **p<0.05, ***p<0.01

Source: IAB-Establishment Panel, own calculations.

5.2 Employees' side

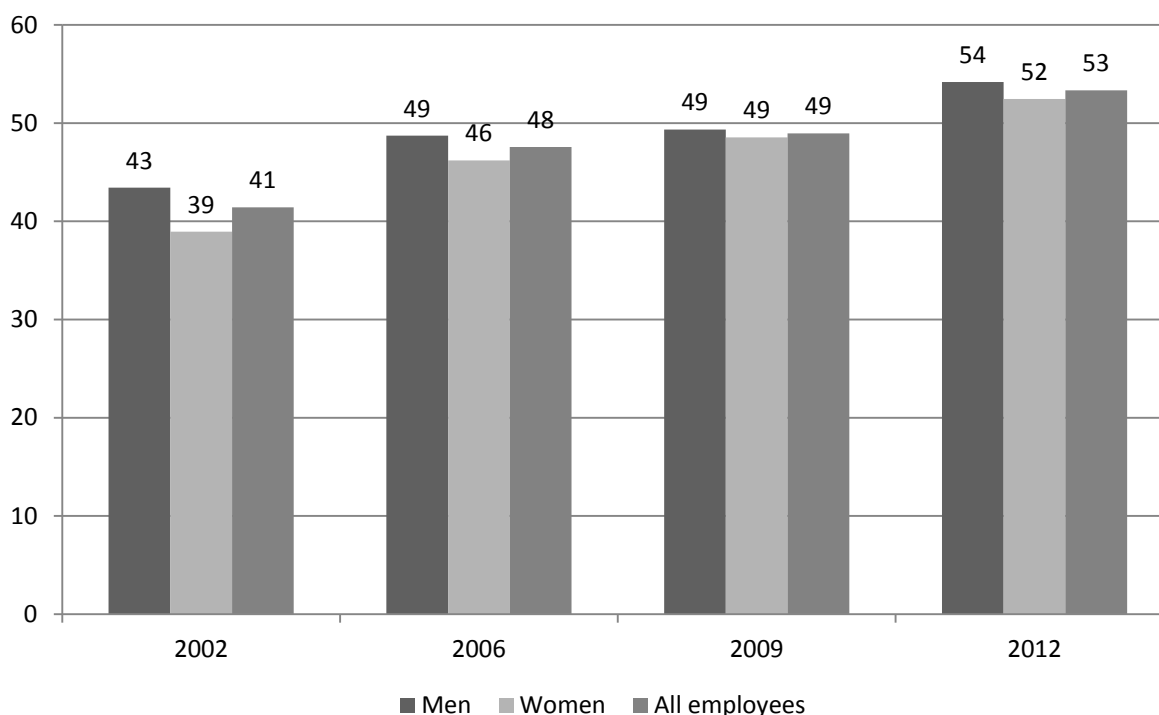
So far, we analysed the influencing factors of WTA's use on the establishment side. In this chapter we now consider the employees' side. The employees' opportunity to have access to WTA is mainly driven by the employers decision to introduce WTA. If employers decide to introduce WTA they also decide which employees get access to this instrument. However, employees can choose establishments with WTA as their employer, thus getting access to them.

In the following, we analyse the distribution and the determinants of WTA's use on the employees' side. We analyse which employees much more often have access to WTA on the labour market. The access to WTA on the labour market is independent of the question, whether the employees' employer uses WTA or not. The analyses are made on basis of data of the *SOEP*.

5.2.1 Distribution of WTA among employees

Figure 2 shows the share of employees with access to WTA differentiated by gender. This access is independent from the fact whether the employee works in an establishment using WTA. In general, men slightly have more access to WTA as compared to women. But the difference is statistically significant only in the year 2002. In 2002, around 43 per cent of all men on the labour market had access to WTA, the share of women was around 39 per cent. In 2012, around 54 per cent of men and 53 per cent of women had access to WTA.

Figure 2
Share of employees with WTA by gender



Source: SOEP 2002-2012, own calculations.

5.2.2 Determinants of WTA among employees

The regressions were estimated separately and results are presented separately for men and women in Table 4 and Table 5. These tables show the effects of individual factors to the probability of having access to WTA.

First, the probability to have access to WTA is lower for women in marginal employment as compared to women in full-time employment.⁸ This result supports the assumption that working hours of employees in marginal employment often do not vary so that an access to WTA is not worthwhile for those employees. Women in regular part-time employment also seem to have a lower probability to have access to WTA as compared to full-time working women. But the results are only partly significant. In contrast, there seems to be no significant difference regarding the access to WTA between regular part-time and full-time working men. Employees in marginal or regular part-time employment are mostly women. According to this, the results of the establishment level with a negative effect of regular part-time and marginal employment are in accordance with the results of the individual data. The individual data showed that women in marginal and regular part-time employment have a lower probability of having access to WTA.

Second, men with fixed-term contracts seem to have a lower probability of having access to WTA as compared to men with an unlimited employment contract. However, the coefficients are also only partly significant. Among women, there seems to be no difference between employees with fixed-term contracts and those with an unlimited contract. Significant differences only exist in 2002.

Third, there are no significant differences between agency workers and non-agency workers. The results show that agency workers are not excluded from WTA in principle.

Fourth, employees with completed vocational training/apprenticeship required more often have access to WTA as compared to employees where no completed vocational training/apprenticeship is required to fulfil tasks. Employees with completed vocational training/apprenticeship have a higher amount of general and establishment specific human capital. Due to their higher amount of human capital employers are interested in providing them WTA. By providing WTA, employers can use efficiently the human capital of their employees as employees are working longer and thus accumulate hours on WTA in case of positive demand fluctuations. In case of negative demand fluctuations human capital can be kept in the establishment by working shorter and thus reducing hours on WTA instead of laying-off qualified employees. The positive association between vocational training and access to WTA corresponds to the results at the establishment level with a higher share of qualified

⁸ Due to the limited number of cases the model for men does not control for marginal employment. When still controlling for marginal employment for men, the regression results are highly robust.

employees increasing the establishments probability to use WTA. Women with a medium degree of autonomy in their workplace more often have access to WTA as compared to women with a low degree of autonomy. In contrast, men with a high degree of autonomy have a lower probability of having access to WTA as compared to men with a rather low degree of autonomy. However, this result can be explained by the fact that men with a higher degree of autonomy often have other working time arrangements, e. g. trust based working hours. Trust based working hours are counterintuitive to the use of WTA as with trust based working hours the working time is not documented.

Comparing the cross-sectional results for male employees we can see that the amount of accumulated general and establishment-specific human capital is an important factor for explaining the access to WTA over time. This is also true for women. Furthermore, working in marginal employment and a medium level of autonomy are robust explaining factors over time for women. For both men and women also the establishment-specific characteristics, like e. g. the establishment size and some economic factors, are quite constant explaining factors over time.

Table 4
Determinants of access to WTA, male employees

	2002			2006			2009			2012		
	Coeff.	Std. error	AME	Coeff.	Std. error	AME	Coeff.	Std. error	AME	Coeff.	Std. error	AME
<i>Employment status (Ref.: Full-time)</i>												
Part-time	-0.296	0.223	-0.067	0.151	0.204	0.036	0.066	0.198	0.016	-0.011	0.202	-0.003
<i>Marginal employment</i>												
<i>Fixed-term contract (Ref.: No fixed-term contract)</i>												
Fixed-term contract	-0.104	0.128	-0.024	-0.420 ***	0.141	-0.099	-0.249 *	0.132	-0.059	-0.010	0.149	-0.002
<i>Agency worker (Ref.: No agency worker)</i>												
Agency worker	-0.482 *	0.275	-0.109	0.318	0.209	0.075	-0.043	0.214	-0.010	0.348	0.239	0.083
<i>Type of education/training necessary (Ref.: No completed vocational training/apprenticeship required)</i>												
Compl. voc. training/apprenticeship req.	0.357 ***	0.082	0.081	0.565 ***	0.104	0.134	0.349 ***	0.099	0.082	0.412 ***	0.110	0.098
Compl. education at university	0.125	0.123	0.028	0.237	0.148	0.056	0.079	0.149	0.019	0.130	0.151	0.031
<i>Autonomy at the workplace (Ref.: Low level of autonomy)</i>												
Medium level of autonomy	0.322 ***	0.116	0.073	-0.053	0.126	-0.012	0.178	0.113	0.042	0.055	0.121	0.013
High level of autonomy	-0.208	0.127	-0.047	-0.548 ***	0.142	-0.130	-0.328 **	0.134	-0.077	-0.199	0.140	-0.048
<i>Occupational status (Ref.: Blue-collar worker)</i>												
White-collar worker	-0.254 **	0.106	-0.058	-0.069	0.121	-0.016	-0.368 ***	0.109	-0.087	-0.471 ***	0.120	-0.113
Civil servant	-0.153	0.171	-0.035	0.050	0.184	0.012	-0.152	0.201	-0.036	-0.266	0.218	-0.064
<i>Required introduction/introductory training (Ref.: Short introduction on the job)</i>												
Longer training period	0.199 **	0.086	0.045	0.155	0.095	0.037	0.350 ***	0.097	0.082	0.239 **	0.107	0.057
Special training or courses	0.386 ***	0.101	0.087	0.290 ***	0.106	0.069	0.443 ***	0.107	0.104	0.374 ***	0.113	0.089
<i>Establishment size (Ref.: Less than 20 employees)</i>												
20-199 employees	0.163 *	0.089	0.037	0.252 **	0.101	0.060	0.240 **	0.099	0.057	0.362 ***	0.112	0.086
200-1999 employees	0.593 ***	0.095	0.134	0.489 ***	0.107	0.116	0.510 ***	0.106	0.120	0.621 ***	0.133	0.148
More than 2000 employees	0.792 ***	0.096	0.179	0.654 ***	0.110	0.155	0.704 ***	0.104	0.166	0.644 ***	0.120	0.154
<i>Economic sectors (Ref.: Manufacturing industry, incl. construction)</i>												
Commerce/transport/catering industry	-0.159 *	0.094	-0.036	-0.296 ***	0.102	-0.070	-0.421 ***	0.097	-0.099	-0.273 **	0.110	-0.065
Other services	-0.208 **	0.091	-0.047	-0.263 ***	0.100	-0.062	-0.172 *	0.092	-0.040	-0.059	0.105	-0.014
Public service/education/health	-0.081	0.107	-0.018	0.051	0.114	0.012	0.123	0.113	0.029	0.113	0.120	0.027
<i>Region (Ref.: West Germany)</i>												
East Germany	0.425 ***	0.087	0.096	0.324 ***	0.088	0.077	0.297 ***	0.089	0.070	0.185 **	0.092	0.044
Constant	-1.047 ***	0.113		-0.757 ***	0.127		-0.695 ***	0.130		-0.528 ***	0.141	
Number of cases	5023			3971			4123			3348		
Pseudo-R ² (McKelvey and Zavoina's)	0.04			0.03			0.04			0.03		
Pseudo-R ² (McFadden)	0.04			0.04			0.04			0.03		

*p<0.1, **p<0.05, ***p<0.01

Source: SOEP 2002-2012, own calculations.

Table 5
Determinants of access to WTA, female employees

	2002			2006			2009			2012		
	Coeff.	Std. error	AME	Coeff.	Std. error	AME	Coeff.	Std. error	AME	Coeff.	Std. error	AME
<i>Employment status (Ref.: Full-time)</i>												
Part-time	-0.171 **	0.078	-0.039	-0.041	0.075	-0.009	-0.154 **	0.070	-0.036	-0.071	0.078	-0.016
Marginal employment	-1.310 ***	0.291	-0.298	-1.017 ***	0.206	-0.238	-1.038 ***	0.196	-0.240	-0.910 ***	0.185	-0.211
<i>Fixed-term contract (Ref.: No fixed-term contract)</i>												
Fixed-term contract	0.281 **	0.121	0.064	0.003	0.134	0.001	0.071	0.117	0.016	-0.164	0.124	-0.038
<i>Agency worker (Ref.: No agency worker)</i>												
Agency worker	-0.264	0.347	-0.060	0.163	0.287	0.038	-0.031	0.248	-0.007	-0.082	0.302	-0.019
<i>Type of education/training necessary (Ref.: No completed vocational training/apprenticeship required)</i>												
Compl. voc. training/apprenticeship req.	0.523 ***	0.109	0.119	0.442 ***	0.115	0.103	0.452 ***	0.113	0.105	0.425 ***	0.119	0.099
Compl. education at university	0.177	0.149	0.040	-0.048	0.157	-0.011	0.058	0.159	0.013	0.047	0.164	0.011
<i>Autonomy at the workplace (Ref.: Low level of autonomy)</i>												
Medium level of autonomy	0.146	0.099	0.033	0.185 *	0.102	0.043	0.161 *	0.096	0.037	0.334 ***	0.103	0.078
High level of autonomy	0.027	0.137	0.006	-0.036	0.142	-0.008	0.005	0.145	0.001	0.156	0.149	0.036
<i>Occupational status (Ref.: Blue-collar worker)</i>												
White-collar worker	0.152	0.119	0.035	0.255 **	0.128	0.060	0.076	0.122	0.018	0.183	0.141	0.043
Civil servant	-0.101	0.188	-0.023	-0.267	0.223	-0.062	-0.528 ***	0.204	-0.122	-0.359 *	0.218	-0.083
<i>Required introduction/introductory training (Ref.: Short introduction on the job)</i>												
Longer training period	0.437 ***	0.088	0.099	0.375 ***	0.088	0.088	0.265 ***	0.103	0.061	0.294 ***	0.096	0.068
Special training or courses	0.284 ***	0.103	0.064	0.277 ***	0.108	0.065	0.381 ***	0.116	0.088	0.301 ***	0.107	0.070
<i>Establishment size (Ref.: Less than 20 employees)</i>												
20-199 employees	0.385 ***	0.091	0.087	0.415 ***	0.094	0.097	0.618 ***	0.097	0.143	0.433 ***	0.102	0.101
200-1999 employees	0.849 ***	0.101	0.193	0.664 ***	0.105	0.155	0.974 ***	0.100	0.226	0.716 ***	0.110	0.166
More than 2000 employees	0.622 ***	0.115	0.141	0.488 ***	0.108	0.114	0.886 ***	0.097	0.205	0.769 ***	0.111	0.179
<i>Economic sectors (Ref.: Manufacturing industry, incl. construction)</i>												
Commerce/transport/catering industry	-0.211 **	0.105	-0.048	-0.295 **	0.122	-0.069	-0.115	0.125	-0.027	-0.228 *	0.122	-0.053
Other services	0.018	0.096	0.004	-0.186	0.115	-0.044	-0.022	0.114	-0.005	-0.039	0.115	-0.009
Public service/education/health	0.030	0.092	0.007	0.125	0.105	0.029	0.311 ***	0.109	0.072	0.284 ***	0.106	0.066
<i>Region (Ref.: West Germany)</i>												
East Germany	0.113	0.085	0.026	0.150	0.092	0.035	0.180 **	0.083	0.042	0.076	0.087	0.018
Constant	-1.569 ***	0.143		-1.183 ***	0.145		-1.394 ***	0.155		-1.190 ***	0.164	
Number of cases	4179			3511			3873			3382		
Pseudo-R ² (McKelvey and Zavoina's)	0.05			0.04			0.05			0.05		
Pseudo-R ² (McFadden)	0.06			0.06			0.07			0.07		

*p<0.1, **p<0.05, ***p<0.01

Source: SOEP 2002-2012, own calculations.

5.3 Matched employer-employee-data

So far, the analyses with the *SOEP* data showed the individual determinants of the employees' access to WTA at the labour market. However, with these data we could not take into consideration whether the employee works in an establishment using WTA or not. Up to now, we cannot answer the question if employees have a lower probability of an access to WTA because they do not have access to WTA in an establishment using WTA? On basis of the *SOEP-LEE* data for the year 2011 we can see for the first time, which employees do not have access to WTA although the establishment in which they work uses WTA.

In the analysis we used a two-step process. In the first step we selected all establishments using WTA. In the second step we analysed on the individual level for which individual factors the probability of having access to WTA is higher, respectively, lower in establishments using WTA.

Before analysing the employees access to WTA in establishments using WTA we had to drop off all inconsistent cases. Inconsistent cases were all those cases in which the employee stated that he or she had not access to WTA, but the establishment stated that all employees have access to WTA (N=188 from N=797). Inconsistent cases were also those cases in which employees stated that they had access to WTA, but the establishment stated not to have WTA at all (N=94 from N=797).⁹

Due to the relatively small number of cases the estimations could not be made separately for men and women. Furthermore, only few independent variables could be considered. As independent variables the model includes gender, a regular part-time employment and a fixed-term contract. Including regular part-time employment and a fixed-term contract we can see whether employees in atypical employment are disadvantaged concerning the access to WTA. Furthermore, the type of education/training and the type of introduction/introductory training usually necessary for the type of work were considered in the analysis. These variables refer to the accumulation of establishment-specific human capital. The level of autonomy in the workplace was also considered in the analysis as working time arrangements can differ among employees with a different degree of autonomy.

The regression results show that in establishments using WTA employees with completed vocational training/apprenticeship and employees with a longer training period in the company or participation in special training or courses more often have access to WTA (cf. Table 6). This means that in establishments using WTA more often those employees have access to WTA for those a higher amount of establish-

⁹ After having dropped all inconsistent cases the estimations were made separately for all establishments in which only certain groups of employees have access to WTA and for all establishments in which all or only certain groups of employees have access to WTA. The results of the different estimates do not differ according to the determinants.

ment-specific human capital can be assumed. Establishment-specific human capital is used efficiently and kept in establishments by using WTA in case of demand fluctuations and providing these accounts for employees with completed vocational training/apprenticeship or longer training or participation in special training/courses. In contrast, there are no significant differences in the access to WTA between gender, employment status and fixed-term contracts. Thus, women, regular part-time employees and employees with fixed-term contracts are in principle not excluded from the access to WTA in establishments using WTA. This result is, however, quite plausible as according to the Act on Part-Time Work and Fixed-Term Employment (*Teilzeit- und Befristungsgesetz, TzBfG*) in Germany employees in regular part-time or with fixed-term contracts cannot be placed in a worse position than full-time employees or employees with an unlimited contract. Furthermore, women seem not to be discriminated as compared to men at the establishment level.

Table 6
Determinants of employees' access to WTA in establishments using WTA

	2011	
	Coeff.	Std. error
<i>Gender (Ref.: Male)</i>		
Female	-0.304	0.282
<i>Employment status (Ref.: Full-time)</i>		
Part-time	-0.037	0.364
<i>Fixed-term contract (Ref.: No fixed-term contract)</i>		
Fixed-term contract	0.586	0.439
<i>Type of education/training necessary (Ref.: No completed vocational training/apprenticeship required)</i>		
Completed vocational training/apprenticeship required	0.820 **	0.368
Completed education at university/"fachhochschule"	0.690	0.502
<i>Autonomy at the workplace (Ref.: Low level of autonomy)</i>		
Medium level of autonomy	-0.002	0.349
High level of autonomy	-0.717	0.441
<i>Required introduction/introductory training (Ref.: Short introduction on the job)</i>		
Longer training period in the establishment	1.088 ***	0.333
Special training or courses	1.127 ***	0.352
Constant	0.086	0.295
Number of cases	420	
Pseudo-R ² (McFadden)	0.08	

*p<0.1, **p<0.05, ***p<0.01

Source: SOEP-LEE 2011, own calculations.

6 Conclusion

WTA are an instrument of internal flexibility to vary working hours of employees and to adjust the work effort to the workload in an establishment. In 2012, around 28 per cent of all establishments and 53 per cent of all employees had (access to) WTA.

Overall, the above regression analyses showed the determinants of WTA's use on the employers' as well as on the employees' side. Unique information provided by

linked-employer-employee data answers the question which employees have access to WTA in establishments using WTA.

The regression analyses on the establishment level provides evidence that industrial relations factors, such as collective or company agreements and works councils are important determinants of the use of WTA in an establishment. Furthermore, we found evidence that employment-contract characteristics as well as individual characteristics of employees influence the use of WTA in establishments. The probability of using WTA decreases with an increasing share of employees in marginal employment, with fixed-term contracts and women. In contrast, the probability of using WTA increases with an increasing share of agency workers and of qualified employees. Those establishments using WTA can gain competition advantages and can better deal with daily, seasonal or cyclical demand fluctuations.

At the individual level, we found evidence that women in marginal employment are disadvantaged concerning the access to WTA, whereas women with completed vocational training/apprenticeship required to fulfil job tasks and women with a medium level of autonomy are advantaged in the access to WTA. Men with fixed-term contracts and men with a higher degree of autonomy are disadvantaged in the access to WTA, while men with completed vocational training/apprenticeship required more often have access to WTA. Overall, there are existing inequalities in the access to WTA at the labour market. Especially, marginal employed women and men with fixed-term contracts cannot profit from WTA to the same degree as other employees at the labour market. One possible explanation for the inequalities of these groups is that marginal employed women and men with fixed-term contracts can be attributed to specific labour market segments. It can be assumed that they more often work in so-called unstructured labour markets, respectively, secondary open employment systems, where employers are less interested in using WTA and providing them to their employees. However, in establishments with WTA minor inequalities exist concerning the access to WTA among employees. The results show that part-time employees, employees with fixed-term contracts and women are in principle not disadvantaged in the access to WTA as compared to full-time employees, employees with an unlimited contract and men. But the linked-employer-employee data also show, that employees with completed vocational training/apprenticeship required more often have access to WTA in establishments using WTA compared to employees with no completed vocational training required.

A comparison of the results at the establishment level with those of the linked-employer-employee data shows that a negative influence of the share of part-time employees, of employees with fixed-term contracts and of female employees to the use of WTA does not necessarily mean that part-time employees, employees with fixed-term contracts and women have a lower probability of having access to WTA in establishments using WTA. However, it can be shown that the qualification of employees is an important factor for explaining the use of WTA at the establishment level as well as at the individual level. An increasing share of qualified employees

increases the probability of WTA's use in an establishment and in establishments using WTA qualified employees more often have access to WTA as compared to non-qualified employees. The importance of the qualification level can be explained by the fact that the general and establishment-specific human capital of qualified employees can be used efficiently and kept in establishments by using WTA as an instrument of internal flexibility.

In conclusion, WTA can be an important measure for establishments to stay competitive and to help deal with cyclical fluctuations and temporary changes in demand. WTA can be used to safeguard employment, at least in the short run. During the Great Recession WTA were used with other instruments of internal flexibility in order to prevent job losses. Therefore, they are an interesting instrument in the toolkit of German establishments. However, establishments have to consider that WTA are not a quick instrument that can be easily created and implemented in case of cyclical fluctuations to prevent job losses. It takes time until WTA become powerful instruments to safeguard employment as they require organisational and bureaucratic efforts from the negotiation partners (Herzog-Stein/Zapf 2014).

Against the background of an assumed lack of qualified workers due to demographic changes in the future the use of WTA can also lead to competitive advantages concerning the recruitment process. Establishments can use WTA in order to increase their attractiveness as an employer, as with WTA employees can profit from a better work-life-balance.

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