The Use of Working Time Accounts during the Great Recession in Germany

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Abstract

Working time accounts played an important role to overcome the negative effects of the Great Recession in Germany. The authors' analysis of data from the WSI Works Council Survey shows that the influence and presence of trade unions and the direct impact of the economic crisis are factors that increase the probability to use working time accounts to safeguard employment. Staff characteristics like the share of female workers or the share of highly qualified employees have a negative impact. No significant differences are found between the use of working time accounts to safeguard employment in general and the use in consequence of the economic crisis. This could be an indication that working time accounts have to be established well in advance before it is possible to use them to safeguard jobs during an economic crisis.

The German economy was severely hit by the Great Recession, the global financial and economic crisis of the years 2008 and 2009. Especially, export dependent establishments of the industrial sector were badly hurt. In 2009 Germany's gross domestic product shrank by more than five per cent. However, the repercussions of the economic slump for the labour market were surprisingly modest. Total employment declined only moderately and the number of workers even increased slightly. Paul Krugman (2009) even spoke in his column in the New York Times about the "Germany job miracle". This remarkable development is due to the establishments' extensive use of measures of internal flexibility. Many establishments affected by the economic slump followed strategies of labour hoarding to protect and retain firm-specific human capital and thus save redundancy costs as well as future search, recruitment and training costs. There are two ways to achieve labour hoarding: companies can either (temporarily) reduce working hours or decrease work intensity and hence labour productivity. In Germany working-time reduction played an important role. Various instruments like the variation in standard working hours, short-time work, reduced overtime and the reduction of accumulated time credits on working time accounts are available at establishments and were deployed during this economic crisis to achieve these temporary reductions in working hours. Overall, calculations of the Institute of Employment Research (IAB) show that the total annual working time per employee was equal to 1296 hours in 2009; this implies on average an annual working-time reduction by 43 hours or 3.3 per cent in comparison to 2008. Additionally, labour productivity decreased by 2.5 per cent in 2009.

Several recent studies analysed the remarkable German labour market performance during the Great Recession. A lot of them have a macroeconomic focus (Möller 2010a, Möller 2010b, Dietz et al. 2011, Herzog-Stein and Seifert 2010, Herzog-Stein et al. 2010). There is a general consensus that short-time work was one of the key elements to counteract the adverse effects of the Great Recession on the German labour market. A number of studies show that, like in previous economic slumps, many establishments used short-time work to finance the costs of labour hoarding at least partially (Bach et al. 2009a; Bach et al. 2009b; Bogedan 2010; Brautzsch and Will 2010; Crimmann and Bellmann 2010). However, in contrast to past experiences, this time working time accounts played a major role in the (temporary) reduction of hours worked in the economy. The use of working time accounts to safeguard employment during the Great Recession was the most common instrument used by establishments with a works council and at

least 20 employees (Bogedan et al. 2009; Zapf and Brehmer 2010). Furthermore, Zapf and Brehmer (2010) show that the number of accumulated working hours on working time accounts that were used up during the Great Recession were quite significant. Also, during the economic slump many establishments used working time accounts to safeguard employment over longer time periods than previously expected (Zapf and Herzog-Stein 2011).

So far existing studies on working time accounts in the context of the Great Recession focused mainly on the magnitude of the time credits that were used up or the time deficits that were accumulated to safeguard employment as a consequence of the economic crisis. Furthermore, to our knowledge attempts to investigate the use of working time accounts during the Great Recession econometrically are missing. However, there are many important open questions related to this use of working time accounts. We are especially interested in the following questions related to the use of working time accounts to safeguard employment: What is the role of trade unions? Are there differences between the various trade-union jurisdictions? What role does the crisis impact play? Is there a relationship between establishments' export dependence and the use of working time accounts? Are establishments' staff composition and staff characteristics factors influencing the use of working time accounts? Does a good working relationship between management and works council foster the use? We aim to find answers to these questions by exploring the forces governing the use of working time accounts to safeguard employment during the economic crisis. Using survey data from a representative survey of more than 1700 works councils we examine the in-plant determinants of the use of working time accounts to safeguard employment in general and the use in consequence of the Great Recession empirically.

Working Time Accounts as an Instrument for Internal Flexibility

For various reasons establishments have to be able to adjust their production to external factors like cyclical variations in product demand or long-term changes in trends due to for example increased international competition. Especially the need for flexibility with respect to the use of labour as a factor of production to adjust to externally induced changes is important. In the past,

the discussion about labour market flexibility was too often biased towards hiring and firing.[1] However (labour market) flexibility is more than hiring and firing. From an analytical perspective we can firstly distinguish between internal and external flexibility, i.e. whether flexibility takes place in- or outside the establishment (Atkinson 1985). Secondly, with respect to each of these two major dimensions of flexibility we can additionally distinguish between functional, financial, temporal or numerical flexibility.[2] In the following our main focus is on internal numerical flexibility, i.e. the flexibility to internally adjust the amount of labour input used in an establishment's production process. Among economists the focus has mainly been on external numerical flexibility, i.e. the flexibility to adjust an establishment's use of labour via the external labour market. This can be achieved by using temporary or fixed-term contracts. Alternatively, it can be the consequence of relaxed employment protection legislation. However, internal numerical flexibility has been mainly neglected in the German debate before the Great Recession. Internal numerical flexibility, also sometimes called working-time flexibility, refers to the adjustment of working hours or schedules of employed workers. It is achieved by using different working-time arrangements such as e.g. part-time work, flexible working hours or shift work, annualisation of working hours, leave from work, working time accounts and overtime (Chung et al. 2007).

Internal flexibility and especially working-time flexibility played a crucial role in saving jobs in Germany during the Great Recession. With the help of various instruments of internal numerical flexibility, like working time accounts, short-time work, temporary variations in standard working hours, and the reduction in overtime the total number of working hours was adjusted to reduce the amount of labour used in production (Möller 2010; Herzog-Stein and Seifert 2010).

However the extensive use of working time accounts during the Great Recession is a new phenomenon, because in previous economic slumps this instrument of internal numerical flexibility played no important role in safeguarding employment (Herzog-Stein and Seifert 2010). At the same time the importance of overtime has declined. Possible explanations for these developments are that the use and availability of working time accounts has increased over time.

[1] For an overview about the economic debate over employment protection legislation see e.g. Herzog-Stein and Logeay (2009) and the literature mentioned therein.

[2] For details see Keller and Seifert (2007).

During the economic boom preceding the Great Recession significant numbers of working hours were accumulated on these working time accounts which were then used up during the economic slump to safeguard employment.

Definition and Distribution of Working Time Accounts

The greater significance of working time accounts gives rise to the question of what working time accounts are. Working time accounts are used as an instrument of time management with the aim to organise and regulate variable distributions of hours worked over a certain period of time in an establishment. Deviations from regular or collectively agreed working hours lead to savings or deficits on these accounts. Working time accounts are the tools to account for the extra amount or deficit of hours worked during a certain predefined time period (Bauer et al. 2004; Gerner 2010). At the establishment level there is a variety of different forms of working time accounts. Therefore in general it is difficult to find one definition for all types of working time accounts. In practice the actual design and configuration of working time accounts depend mainly on the establishment-specific working-time models and the context they are used in (Bundesmann-Jansen et al. 2000). Despite the existence of numerous variants of working time accounts four basic forms can be distinguished according to Seifert (2001; 2004): flextime models, overtime accounts, “range” models, and “saving” models. Whereas the first three basic forms can be classified as short-time accounts, i.e. working time accounts with a shorter compensation period of normally less than one year, “saving” models have longer compensation periods (of more than one year). In recent years long-time accounts are gaining in importance. However their use and availability is still very limited in practice (see for example Hildebrandt et al. 2009).

In 1999 around 35% of all employees had working time accounts according to the IAB Establishment Panel. In 2009 51% already used them (Zapf and Brehmer 2010). Other studies like Bauer et al. (2004), Groß and Schwarz (2006), and Groß and Schwarz (2008) obtained comparable results. The spread of working time accounts varies significantly between economic sectors and between establishment sizes. In the industrial sector and in larger establishments working time accounts are more common than in the service sector or in smaller establishments (Groß and Schwarz 2008). There are also differences with respect to the upper and lower bound, and the compensation period. According to Groß and Schwarz (2006) the upper bound for the

number of hours saved on these accounts is on average 69 hours, the lower bound is equal to 39 hours of debit, and the average compensation period is 30 weeks. In general the upper and lower bound are larger in absolute hours and the compensation period is longer in the industrial sector than in the service sector. Overall the relative large span between the maximum credit and debit hours allows workers to save a considerable number of working hours on working time accounts. However, on average the compensation period is relatively short.

Functions of Working Time Accounts

Working time accounts as an instrument of internal flexibility are an alternative to measures of external flexibility like lay-offs. By temporarily reducing the number of hours worked the number of employed people at the establishment level can be kept constant, at least in the short run. Thus, the loss of (firm-specific) human capital can be prevented (Bundesmann-Jansen et al. 2000). In the case of cyclical or seasonal fluctuations working time accounts are an employment-safeguarding alternative to lay-offs. By decreasing the time deposits and if necessary building up time debts on working time accounts the total number of hours actually worked can be reduced and thus the amount of labour used in production can be adjusted (Seifert 2005). Working time variations are geared to the fluctuations in establishments' order position and are therefore an alternative to variations in the number of employees (Gerner 2010).

However there is more to working time accounts than safeguarding employment. Establishments can reduce idle time, use labour more efficiently, and increase productivity (Munz et al. 2002). According to Seifert (2001) establishments obtain significant cost advantages through the use of working time accounts: The costs of overtime premiums are reduced or even completely avoided and hence unit labour costs are reduced. Through the improved capacity utilisation establishments can reduce their unit capital cost and by synchronising working hours and the use of labour input storage costs are further reduced.

For workers the advantages of working time accounts vary depending on the type of working time account. Short-time accounts like flextime models, overtime accounts and "range" models may improve short-run time sovereignty and the fit of familial or social time requirements and daily working schedules. Hence they may reconcile work and family life (Gerner 2010). Long-

time accounts may increase the long-term time sovereignty by taking time savings for a sabbatical, further training or the care of elderly people as well as improving job security. In Germany life-time accounts as a special form of long-time accounts (only) have the aims to help to arrange the termination of an employment relationship at the end of a working life via e.g. early retirement and to provide a contribution to occupational pension schemes. However, due to the large magnitude of hours savings that are necessary to fulfil these aims they may enter in competition with the aims of long-time accounts (Hildebrandt 2007).

Overall the above remarks show that working time accounts are an effective instrument to deal with demand fluctuations. Hence the use of instruments of external flexibility like hiring and redundancies can be reduced and may be in some instances even become redundant. As a consequence working time accounts contribute in parts to improve the job security of "insiders". However this may be to the detriment of "outsiders" because their chances to find a job might be reduced. During the Great Recession accumulated time deposits on working time accounts were slashed and thus the scope of internal flexibility increased. In Germany job losses on a large scale as initially expected due to the magnitude of the economic downturn was mainly averted by adjusting working hours in response to the slump in demand with the help of working time accounts and other measures like e.g. short-time work and the variation of regular working hours.

Research Questions and Previous Findings

By now there are many studies analysing various aspects of working time accounts in Germany. Yet most of them focus on the spread as well as the (practical) regulations and arrangements of working time accounts.[3] Additionally, some analyses concentrate on flexible working-time arrangements in the context of working time accounts[4], and recently the potential of long-time accounts has become a focus of discussion[5]. So far the in-plant determinants of working time accounts have not received much attention; some results are presented in Ludewig (2001).

[3] See e.g. Seifert (2001), Seifert (2005), Bellmann and Gewiese (2004), Groß (2010), Groß and Schwarz (2010), and Groß et al. (2000).

[4] See e.g. Bosch et al. (2005), Kleinhenz et al. (2004), Seifert (2003).

[5] See Hildebrandt (2007), Hildebrandt et al. (2009).

In the context of the global financial and economic crisis and the so called “German job miracle” (Krugman 2009) the importance of working time accounts has been increasingly emphasised. According to Zapf and Brehmer (2010) around 34% of all establishments (with at least 20 employees and work council) used working time accounts in the time period between the third quarter 2008 and the third quarter 2009 to safeguard employment at their establishments by reducing accumulated time deposits or building up time deficits. On average the time deposits were reduced by around 45 hours per worker. Another study examined the in-plant use of working time accounts during the Great Recession. Zapf and Herzog-Stein (2011) identified three different types of users with respect to extend and timing of the usage of working time accounts. However, their results are only of a descriptive nature. So far there are no studies concerning the in-plant determinants of the use of working time accounts to safeguard employment during the Great Recession. The aim of this paper is to contribute to fill this gap and to identify empirically some in-plant determinants of the use of working time accounts to safeguard employment. Therefore, this study investigates the in-plant determinants of the use of working time accounts in Germany during the economic crisis in the time period of the third quarter 2008 and the first quarter 2010.

Factors Influencing Working Time Accounts’ Use

Influence and Presence of Trade Unions

In Germany trade unions represent the interests of the workers in those sectors of the economy that belong to their jurisdiction. They have a direct impact on working time accounts in so far as the design, rules, and regulations are based on collective agreements. Furthermore, trade unions have an indirect influence via unionised members of works councils, because works councils play crucial roles in the practical running and design of working time accounts at the establishment level. In so far as working time accounts exist, for trade unions they are generally preferable to redundancies. Although trade unions express concern over the fact that often the use of working time accounts and more specifically the use of time deposits on these accounts are dominated by establishment interests (Lindecke 2008; Hamm 2008) trade unions are supportive to the idea of using working time accounts to prevent job losses during an economic slump. Therefore, working time accounts can have a direct impact in the protection of the jobs of the insiders. By balancing

times with high product demand and longer working hours with times with low product demand and shorter working hours labour input of insiders is intertemporarily smoothed and brought in equilibrium with establishments' demand for labour.

In general the larger the share of union members in an establishment's work force the more influential a trade union becomes with respect to dealings at the establishment level. Therefore a strong union membership base among an establishment's workforce should increase the probability that working time accounts are used to safeguard employment.

But there are differences in the use of working time accounts between the jurisdictions of the different unions which are affiliated with the German Confederation of Trade Unions (DGB). They have their origin in historical differences with respect to the importance of internal numerical flexibility in economic sectors covered by the unions' jurisdictions in general. However, the specific instruments used to achieve internal flexibility in these economic sectors as well as different attitudes towards working time accounts by unions and employer organisations are also important. Furthermore differences in the strength of the individual unions have an influence, too. In general it can be expected that the use of working time accounts in general and its use to safeguard employment is more likely in the jurisdictions of the industrial unions.

Hypothesis 1: The strength of a trade union in an establishment is positively correlated with the likelihood that working time accounts are used to safeguard employment. In jurisdictions of the industrial unions the use of working time accounts to safeguard employment is more likely.

Direct Crisis Impact

The global financial and economic crisis had a major impact in the German economy resulting in a drastic decline of orders and turnover. Especially international trade, and hence the foreign demand for German products, declined dramatically. But, in contrast to the predictions made by economic forecasts[6], on aggregate no jobs were lost during the Great Recession in Germany

[6] As the magnitude of the Great Recession became obvious the main economic forecasters predicted an increase in unemployment by more than 1.4 million people from 2008 to 2010 to an average annual level of around 4.7 million unemployed (Projektgruppe Gemeinschaftsdiagnose 2009, pp. 51ff.).

(Zapf and Brehmer 2010). Nevertheless, in those sectors of the economy where exports play an important role jobs were still lost but to a lesser extent than expected. One reason for this surprising outcome is the use of internal in favour of external flexibility at the establishment level. In general, a large number of establishments used measures of internal flexibility in response to the drop in the demand for their products (Bogedan et al. 2010).

Hypothesis 2: Establishments that are directly affected by the economic crisis are more likely to use working time accounts to safeguard employment.

Export Dependence

International Trade increases economic volatility. Establishments with a high degree of export dependence are confronted with a larger degree of volatility.[7] Hence, such establishments need instruments to respond to changes in the demand for their products. They need the ability to adjust the use of their production factors to variations in their environment. The more volatile their environment and their demand is the more preferable it is for establishments to use measures of internal flexibility because in these circumstances the use of external flexibility involves many additional costs like e.g. layoff, search, hiring and training costs on a frequent basis.

Hypothesis 3: A high degree of export dependence is positively correlated with the use of working time accounts to safeguard employment.

Staff Composition and Staff Characteristics

At the establishment level many factors can restrict the use of working time accounts. Obviously, the use of time credits and the build-up of time deficits depend crucially on the individual worker's ability to accumulate extra working hours or to "repay" the time deficit in the future by working extra hours. However individual characteristics are important for the existence and the extent of these abilities. Thus, we expect differences between men and women in their ability to use working time accounts to safeguard employment because women still bear the main part of

[7] For details see e.g. Vannoorenberghe (2010) and the literature mentioned therein.

family responsibilities. As they are also more often restricted to part-time jobs (Wanger 2011) it is reasonable to expect that women, in contrast to men, are much more limited in their ability to accumulate savings on working time accounts. Furthermore, women can use the increased internal flexibility available through working time accounts mainly to vary the beginning and the end but not so much the absolute length of their working days. Women are experiencing an external restriction in their ability to build-up huge time deposits.

Workers' highest level of educational attainment and the skills requirements of jobs are other factors influencing the existence and use of working time accounts. It is an empirically established fact that the share of employees with working time accounts is lower among highly qualified employees than among qualified ones in Germany (Bauer et al. 2004). Furthermore, the organisation of working time of highly qualified employees differs from those with a lower qualification level. Among highly qualified employees trust-based working hours (Vertrauensarbeitszeit) are more common. Employees with a higher level of educational attainment are also more prevalent in administrational jobs or work in research and development which are to a lesser extent driven by fluctuations in demand or even might be countercyclically influenced by variations in demand. Workers with a lower or medium level of educational attainment work more often in the production department which is more directly influenced by fluctuations in demand.

Hypothesis 4: Individual characteristics influence the use of working time accounts. Ceteris paribus a higher share of female workers or of highly qualified employees at an establishment is negatively correlated with the use of working time accounts to safeguard employment.

Relationship between Works Council and Management

In establishments with a good collaboration between management and works council it is reasonable to assume that management and works council work closer together, and decisions are more often made jointly and in cooperation. In these circumstances an establishment's management will also incorporate a works council's interest for safeguarding employment in its decision making. In such an environment it is likely that both partners focus on a strategy to protect jobs in an economic downturn by using working time accounts to safeguard employment.

In establishments with a bad collaboration between these two parties it might be less likely that a job-protecting strategy is adopted. As a consequence in the latter case working time accounts are only used to a smaller degree to safeguard employment or in the extreme case not at all.

Hypothesis 5: A negative working relationship between management and works council is negatively correlated with the use of working time accounts to safeguard employment.

Data

The data analyzed here were collected as part of the WSI (Wirtschafts- und Sozialwissenschaftliches Institut in der Hans-Böckler-Stiftung) Works Council Survey, i.e. a regular survey of works councils in German establishments with a works council and 20 or more employees. Since 1997 the WSI regularly conducts surveys among German works councils. These surveys are complemented by special surveys which focus on current issues and topics. Between July and September 2009 a special survey focusing on the economic crisis and the measures taken at the establishment to safeguard employment was conducted. Between January and April 2010 the questionnaire of the special survey was included in the conducted regular survey. Aim of the surveys was to collect information for the analysis of the economic crisis towards establishments and employees as well as their options and reactions. The surveys were conducted as a computer-aided telephone survey by infas, one of the major German polling institutes. Respondents, mostly the heads of the local works councils, were asked to answer the questions on behalf of the entire council. In cases where the head was not available for an interview, an ordinary works council member was asked to participate in the survey. The construction of the sampling frame guarantees that the sample used in each survey is representative of the population of German establishments with a works council and 20 or more employees.[8]

In this analysis a balanced panel with about 1700 works councils, respectively establishments, is used in order to obtain information about the establishments over the course of the economic

[8] For details on the construction of the sample see Behrens (2008), S. 280.

crisis. In 2010 about 500 000 employees were employed in these establishments at the time of the survey. This corresponds to about 1.4 per cent of all employees in the whole economy.

Dependent Variables

At the centre of this analysis is the question which factors influence the use of working time accounts to safeguard employment at the establishment level. Two different dependent variables are used. Firstly, the works council was asked whether time credits were reduced or time deficits were build-up on working time accounts to safeguard employment. This question is coded as a single dummy variable that indicates whether in the time period between the third quarter 2008 and the first quarter 2010 time credits were reduced or time deficits built-up to safeguard employment. Secondly, all works councils that answered yes to the first question were additionally asked whether this indicated use of working time accounts took place in consequence of the actual economic crisis. Hence, a second dummy is introduced to indicate whether the use of working time accounts to safeguard employment is in consequence of the actual economic crisis.

At first glance both dependent variables look very similar. However, only the second dependent variable deals with the fact that the use of working time accounts to safeguard employment was in consequence of the Great Recession at the establishment. In the first case, although working time accounts are used to safeguard employment, the reasons for it are not specified and can vary. One possibility is the existence of a pact of employment and competitiveness determining the variation of working hours via working time accounts to safeguard employment in, for example, exchange for formal job guarantees by the employer.[9] In such a situation it is possible that working time accounts are linked as a regular instrument with the safeguarding of employment without any actual economic crisis of a general or company-specific type threatening jobs at this establishment.

Independent Variables

[9] For details on pacts of employment and competitiveness in Germany see Seifert and Massa-Wirth (2005).

Influence and Presence of Trade Unions. To capture the idea that a trade unions' influence depends on their strength in an establishment the variable *union density* is used. Union density measures the share of trade union members among an establishment's work force in per cent. In this analysis trade union members are defined as workers of an establishment that are members of one of the seven trade unions affiliated with the DGB that are active in the private sector of the German economy or that are members of another trade union.[10] It is assumed that with a rising share of trade union members among an establishment's work force a trade union's influence and strength with respect to decisions in an establishment are increasing.

To take account of possible differences in trade unions' attitudes towards working time accounts a series of nine dummy variables is created. Each dummy variable represents a different trade union jurisdiction. It is assumed that by identifying the trade union jurisdiction to which the work force of an establishment belongs to, differences in attitudes towards working time accounts can be identified. The service sector union Ver.di is chosen as reference unit. Apart from the six dummy variables representing the remaining trade unions affiliated with the DGB, there is one additional dummy variable representing those establishments in which the respondent from the works council indicated that the workers of this establishment are predominantly organised by another trade union than one of the six trade unions affiliated with the DGB. Furthermore, an additional dummy variable is included for those establishments where no trade union is representing the establishment's work force.

Direct Crisis Impact. Three different groups of variables are used as indicators for the direct crisis impact on an establishment: turnover, orders position, and layoffs of core workers. The first group of variables is based on information about the establishment's turnover in 2009. The first variable *turnover2009_1* is a dummy variable that indicates whether the turnover in the first half of 2009 was worse than in the first half of 2008. The second dummy variable *turnover2009_2* is equal to one if the turnover in the second half of 2009 was worse than in the first half of 2009. The reference unit for both dummy variables is a constant or increasing turnover.

[10] The trade union for police officers (GdP) is excluded from the analysis because there are no members working in the establishments included in the WSI Works Council Survey.

The second group of variables is based on information about establishments' orders positions. *Orders2009* indicates whether an establishment's order position at the time of the first survey in the summer of 2009 was worse than in July 2008. *Orders2010* is a dummy variable taking the value of one if an establishment's order position at the time of the second survey at the beginning of 2010 was worse than at the time of the first survey. In both cases the reference unit is a constant or improving order position.

Finally, the layoff of core workers is included as an additional variable providing information about whether an establishment was affected by the economic crisis or not. Again, a set of two dummy variables is used. The first one, *layoffs_1*, indicates whether in the time period between July 2008 and the time of the first survey core workers had to be made redundant. *Layoffs_2* is a dummy variable taking the value of one if core workers had to be laid off in the period between the first and the second survey.

Export Dependence. The respondents from the works councils were asked about the degree of the establishment's *export dependency*. A dummy variable is created which is equal to one if an establishment exhibits a medium to high degree of export dependency and zero otherwise (Reference unit: a low degree of export dependency).

Staff Composition and Staff Characteristics. Two different variables are used as indicators for the composition of the establishment's work force. First, the *share of female workers* in the establishment is used as an explanatory variable. In general it is assumed that due to family obligations women are more restricted in their ability to accumulate savings on working time accounts than men. Therefore, during an economic slump in establishments with a high share of female workers the ability to use working time accounts to safeguard employment is on average more limited than in establishments with a smaller share. Second, the *share of high-skilled workers*, i.e. workers with a university degree or a degree from a university of applied sciences (Fachhochschule), is used as an explanatory variable as well to take the influence of staff composition into account. It is assumed that the higher the share of high-skilled workers the more limited the establishment's ability to use working time accounts to safeguard employment, as other types of working-time arrangements are more frequently used among high-skilled workers than working time accounts.

Relationship between Works Council and Management. Finally, a dummy variable is included in the analysis taking the value of one if the employer's information behaviour in its working relationship with the establishment's works council is bad, i.e. the works council has to ask the employer multiple times to obtain information. The reference category is a good information behaviour, i.e. the works council obtains the information at the first request or by the employer's own accord. The assumption is that in establishments with a good information behaviour there is a good collaboration between management and works council and therefore it is more likely that management and works council focus on a strategy to safeguard employment during an economic slump.

Furthermore, the model controls for a variety of factors that are widely regarded as having an influence on the existence and the use of working time accounts. Firstly, eight dummy variables representing different economic sectors are included. The economic sector "transport and communication" is used as a reference group. Secondly, *establishment size*, i.e. the logarithm of the number of employees, is included as another control variable. Thirdly, a dummy variable indicating whether the establishment is located in *East Germany* is included. Finally, two dummy variables are included indicating whether the establishment was confronted with an economic crisis that was independent of the Great Recession. The first dummy variable *crisis1* covers the time period between July 2008 and the time of the first survey in the summer of 2009. The second dummy variable *crisis2* covers the time period between the time of the first survey and the time of the second survey. For both variables the reference category is that in the time period under consideration the establishment was not confronted with an economic crisis that was independent of the Great Recession.

Results

Sample means, proportions, and variable ranges are reported in Table 1. Additionally, a correlations matrix is provided in the appendix. Overall in around 46% of all establishments time credits were reduced or time deficits were build-up on working time accounts to safeguard employment in the time period between the third quarter 2008 and the first quarter 2010. More

than half of these users of working time accounts utilized them over the whole time period under consideration.

{{Place Table 1 about here}}

In total around 68% of all establishments were affected by the economic crisis. In 36% of all establishments time credits were reduced or time deficits were build-up on working time accounts to safeguard employment in the time period between the third quarter 2008 and the first quarter 2010 as a consequence of the economic crisis. Nearly half of them (46%) indicated that they used them over the whole time period under consideration due to the economic crisis. From all establishments that utilized working time accounts to safeguard employment approximately four out of five indicated that the economic crisis was the reason for the use of the working time accounts to safeguard employment.

There are considerable differences between the different economic sectors. The use of working time accounts to safeguard employment was most common in the investment and consumer durables industry. Around seven out of ten establishments used them in this industry during the time period under consideration. Least prevalent was the use of working time accounts to safeguard employment in the credit and insurance sector. Only 3% of all establishments in this sector used working time accounts. Controlling for the reason of the utilization of working time accounts most common was the reduction of time credits and the built-up of time deficits on working time accounts due to the economic crisis in the investment and consumer durables industry (63%). Again in the credit and insurance sector the use of working time accounts as a consequence of the economic crisis was nearly nonexistent (1%). Although the Great Recession had its origin in the credit and insurance sector the use of working time accounts did not play a role at all in this sector to safeguard employment during the economic crisis in Germany.

Establishment size was also an important factor. The use of working time accounts to safeguard employment was more prevalent in larger establishments: In establishments with 200-499 employees more than half used working time accounts. In establishments with 49 or less employees only 41% of all establishments used them. These differences are also observable in so

far as the use of working time accounts due to the economic crisis is concerned (43% versus 31%).

There are no obvious differences in the general use of working time accounts to safeguard employment with respect to whether the region was East or West Germany. However, the use of working time accounts to safeguard employment as a consequence of the economic crisis was more prevalent in West Germany (37% versus 31%).

Regression estimates: All establishments

The first regression results are presented in Table 2. Regression *Model 1* investigates the general use of working time accounts to safeguard employment between the third quarter 2008 and the first quarter 2010. *Model 2* examines the use of working time accounts to safeguard employment in consequence of the actual economic crisis during the same time period. Therefore logistic regressions were estimated with dichotomous variables (1 or 0, respectively) indicating whether working time accounts were used or not. With respect to the independent variables both estimated models are identical with the exception of the variable *GEW*. In the jurisdiction of the union for education and science (*GEW*) there was not enough variation with respect to the use of working time accounts to safeguard employment in consequence of the actual economic crisis to include this variable in a logistic regression.

{{Place Table 2 about here}}

Influence and Presence of Trade Unions (Hypothesis 1). The first hypothesis suggested, firstly, a positive relationship between a trade union's strength in an establishment and the use of working time accounts and, secondly, that the use of working time accounts to safeguard employment is more likely in jurisdictions of industrial unions. A significant ($p<0.05$) positive relationship is only found between union density and working time accounts use to safeguard employment in consequence of the actual economic crisis (*Model 2*). In accordance with the first hypothesis in both models the industrial-union dummies *IG BAU* ($p<0.01$), *IG BCE* ($p<0.01$ and $p<0.05$, respectively) and *IG Metall* ($p<0.01$), have a significant positive impact on the probability of the use of working time accounts to safeguard employment. Thus – in comparison to the reference

jurisdiction of the service sector union (Ver.di) – in the jurisdictions of the construction workers union (IG BAU), the chemical and mineworkers union (IG BCE), and the metalworkers union (IG Metall) there is a higher probability that working time accounts are used (in consequence of the economic crisis) to safeguard employment.

Direct Crisis Impact (Hypothesis 2). The second hypothesis predicted a positive correlation between being directly affected by the economic crisis and the use of working time accounts to safeguard employment. Three different groups of variables were used. With respect to turnover and order position in both equations only *Turnover2009_1* ($p<0.05$ and $p<0.01$, respectively) and *Orders2009* ($p<0.05$ and $p<0.01$, respectively) have a statistically significant, positive effect. Hence, a turnover in the first half of 2009 that was worse than the turnover in the first half of 2008 or an order position in the summer 2009 that was worse than in July 2008 both are positively associated with the use of working time accounts to safeguard employment (in consequence of the economic crisis). Layoffs of core workers in an establishment in both time periods have a positive impact on the probability of using working time accounts. However, whereas *Layoffs_2* is significant at the one per cent level in both models, *Layoffs_1* is only significant at the ten per cent level in the first model and at the five per cent level in the second model.

Export Dependence and Demand Shocks (Hypothesis 3). The third hypothesis stated that the higher the degree of export dependence the more likely the use of working time accounts to safeguard employment. There is a statistically significant positive association ($p<0.01$) between a high export dependence and the use of working time accounts to safeguard employment in consequence of the economic crisis (*Model 2*). In the first model there is a positive association, too. However, it is only statistically significant at the ten per cent level.

Staff Composition and Staff Characteristics (Hypothesis 4). The fourth hypothesis dealt with the influence of individual characteristics on the use of working time accounts. Firstly, it was hypothesised that a higher share of female workers among an establishment's work force is negatively correlated with the use of working time accounts. In accordance with this hypothesis the share of female workers has a negative and statistically significant effect ($p<0.01$) in both models. The second part of the hypothesis stated that there is a negative correlation between the

use of working time accounts to safeguard employment and the share of highly qualified employees. In both models the share of highly qualified employees is statistically significant ($p<0.01$) and negatively associated with the use of working time accounts to safeguard employment.

Relationship between Works Council and Management (Hypothesis 5). The fifth hypothesis proposed that a negative working relationship between management and works council is negatively correlated with the use of working time accounts to safeguard employment. However, a variable indicating a poor information behaviour from the employer towards an establishment's works council is statistically insignificant in both models. In so far as an employer's poor information behaviour is an indication for a negative working relationship between management and works council the results from the two estimated models do not support the fifth hypothesis.

Other explanatory variables. Additionally, in both models dummy variables, controlling for the economic sector the establishment belongs to, are included. *Credit and Insurance* has a statistically significant negative impact ($p<0.01$ and $p<0.05$, respectively) on the probability that working time accounts are used to safeguard employment in both models. *Other Industries* has a statistically significant negative effect ($p<0.01$) in both models, too. The dummies for all other economic sectors are statistically insignificant. As expected an increasing *Establishment Size* has a statistically significant positive association with the use of working time accounts to safeguard employment in both models ($p<0.05$ and $p<0.01$, respectively) since working time accounts are more common in larger establishments. There is no statistically significant difference in the use of working time accounts to safeguard employment between East and West Germany in both models. Finally, in both models two variables taking into account the possibility of establishment specific economic crises independent of the Great Recession in the time period under consideration do also have no statistically significant impact on the probability to use working time accounts to safeguard employment.

Regression estimates: Establishments directly affected by the Great Recession

In Table 3 the regression estimations are repeated for those establishments that were directly affected by the actual economic crisis according to their own works council's assessment.

Model 3 investigates the general use of working time accounts to safeguard employment and *Model 4* the use of working time accounts to safeguard employment in consequence of the actual economic crisis. The investigated time period is again the third quarter 2008 until the first quarter 2010. However, in addition to the exclusion of the variable *GEW* as in *Modell 2* the dummy variable *Credit and Insurance* had to be excluded from the fourth model because in this economic sector there is not enough variation with respect to the use of working time accounts to safeguard employment in consequence of the actual economic crisis to include this variable in a logistic regression.

{{Place Table 3 about here}}

Both regression models mostly confirm the results of the previous two models. With respect to the positive relationship between a trade union's strength in an establishment and the use of working time accounts to safeguard employment as proposed by Hypothesis 1 in both models the variable *Union Density* is only significant at the ten per cent level and hence an inference with respect to the sign of the effect is not possible. Again, in establishments in the jurisdictions of the *IG Metall* ($p<0.01$) and the *IG BCE* ($p<0.05$) there is a statistically significant higher probability that working time accounts were used to safeguard employment (in consequence of the actual economic crisis). However, different from the previous two models *IG BAU* has only a statistically significant ($p<0.05$) positive impact on the use of working time accounts to safeguard employment in general and not in consequence of the actual economic crisis. Furthermore, there is a statistically significant positive association ($p<0.05$) between a high export dependence and the use of working time accounts to safeguard employment in general as well as in consequence of the economic crisis (Hypothesis 3). The share of female workers and the share of highly qualified workers again are both statistically significant and have a negative association with the use of working time accounts to safeguard employment in both models (Hypothesis 4). Also, the variable indicating poor information behaviour is again statistically insignificant in both models (Hypothesis 5).

In contrast to the previous two models the two groups of variables being related to turnover and order position are neither significant in the third nor in the fourth model. However, this is not very surprising, both types of information are highly correlated with the works council's

assessment whether an establishment is affected by the actual economic crisis or not. However, layoffs of core workers in the time period between the first and the second survey are still statistically significant ($p<0.05$ and $p<0.01$, respectively) and positively associated with the use of working time accounts to safeguard employment (Hypothesis 2).

Discussion

The German economy was severely hit by the Great Recession. The economic slump was the deepest since the Great Depression in the 1930s. However, the labour market performance during the economic crisis was quite remarkable. In contrast to the predicted large increase in unemployment the German labour market was impressively robust. As a consequence unemployment increased only modestly during a short time period and then started to decline again. Crucial for this observed development was the extensive use of measures of internal-numerical flexibility, also sometimes called working-time flexibility, to safeguard employment during the Great Recession.

Research investigating the establishments' response to the Great Recession and the measures undertaken to safeguard employment found that, in contrast to previous economic slumps where instruments like overtime and short-time work were crucial, this time a relatively new tool, the so called working time accounts, played an important role (Bogedan et al. 2009; Herzog-Stein and Seifert 2010). The aim of this paper was to improve the understanding about the use and the in-plant determinants of working time accounts to safeguard employment in Germany. Based on a unique dataset from two waves of the WSI Works Council Survey covering the time period from the third quarter 2008 to the first quarter 2010 five hypothesis were empirically investigated. The first hypothesis dealt with the relationship between trade unions and working time accounts, the second one with the connection between a direct crisis impact and working time accounts. The third hypothesis was about the link between an establishment's export dependence and working time accounts, the fourth one about an establishment's staff composition and staff characteristics and working time accounts, and the final hypothesis about the quality of the working relationship between management and works council and the use of working time accounts. We investigated these five hypotheses with respect to the use of working time accounts to safeguard employment

in general and in consequence of the actual economic crisis. We looked at all establishments and only those that were influenced by the economic slump.

Overall, with respect to the examined five hypotheses and hence the in-plant determinants of working time accounts, no significant differences between the use of working time accounts to safeguard employment in general and the use of working time accounts in consequence of the actual economic crisis were found. This is also true with respect to the use of all establishments in the WSI Works Council Survey and the restriction of the sample to those establishments that were directly affected by the Great Recession.

Concerning the first hypothesis we found only weak evidence for a positive relationship between the strength of a trade union in an establishment and the use of working time accounts to safeguard employment, but we found evidence in favour of the second part of the first hypothesis in the sense that in the jurisdictions of the industrial unions there is a higher probability that working time accounts are used to safeguard employment.

On the whole, three different types of variables were used to examine the second hypothesis that establishments that are directly affected by the economic crisis are more likely to use working time accounts to safeguard employment. While the evidence is mixed with respect to the individual variable, in total we found significant evidence supporting Hypothesis 2.

We also found some evidence for the third hypothesis that a high degree of export dependence is positively correlated with the use of working time accounts to safeguard employment. Particularly, this is true for the use of working time accounts in consequence of the actual crisis or establishments that are directly affected by the economic slump.

As expected we found strong evidence for the importance of the influence of individual staff characteristics on the use of working time accounts to safeguard employment (Hypothesis 4). A higher share of female workers or a higher share of highly qualified employees at an establishment are both statistically significant negatively related with the use of working time accounts to safeguard employment.

We found no evidence for a negative correlation between a negative working relationship between management and works council and the use of working time accounts to safeguard employment. However, we were only able to test this fifth hypothesis indirectly with the help of a variable about the information behaviour.

One possible explanation for and implication of these findings is that working time accounts are not a quick instrument that can be easily implemented during an economic crisis to safeguard employment. Working time accounts have to be already installed and in use at an establishment to be available as an instrument to safeguard employment. They require some organisational and bureaucratic efforts from an establishment's management and works council. In that sense they are more comparable to labour market institutions. They are very important for the functioning of production and (labour) market processes when they are established. However, their creation and development takes time and is not done over night. Therefore, for an establishment, its management and its employees to be able to harvest the fruits of working time accounts during a time of an economic crisis working time accounts have to be established in advance and be in place before they can become powerful tools to safeguard employment.

However, certain qualifications are in order with respect to the above comments. Our analysis is to our knowledge the first of its kind with respect to working time accounts. Therefore, the presented results need to be examined further. Especially, in a next step the analysis of the use of working time accounts to safeguard employment should take into account the different types of working time account users identified in previous research. Also more and better data about the use of working time accounts and more research into the role of working time accounts to safeguard employment are necessary.

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Tables

Table 1. Descriptive Statistics.

Independent Variable	*Hypothesized Sign*	*Sample Mean or Proportion*	*use of working time accounts to safeguard employment*	*use of working time accounts to safeguard employment in consequence of the actual economic crisis*	*Variable Range*
Transport and Communications	none	6.1%	48.1%	32.1%	0 or 1
Basic Materials and Producer Goods	none	10.9%	67.9%	59.5%	0 or 1
Investment and Consumer Durables	none	16.8%	68.8%	62.3%	0 or 1
Consumer Goods	none	12.0%	51.0%	39.4%	0 or 1
Construction Industry	none	5.1%	63.6%	46.6%	0 or 1
Trade and Repair	none	15.8%	39.3%	32.0%	0 or 1
Other Private and Public Services	none	23.7%	27.9%	17.7%	0 or 1
Credit and Insurance	none	4.9%	3.5%	11.6%	0 or 1
Other Industries	none	4.7%	28.4%	12.4%	0 or 1
Establishment Size	none	520.5	NA	NA	9 - 19 000
East Germany	none	16.7%	43.5%	30.3%	0 or 1
West Germany	none	83.3%	46.0%	37.0%	0 or 1
Turnover2009_1	+	53.2%	60.7%	53.6%	0 or 1
Turnover2009_2	+	24.5%	56.6%	48.1%	0 or 1
Orders2009	+	51.0%	59.1%	52.0%	0 or 1
Orders2010	+	23.5%	53.6%	46.4%	0 or 1
Union Density	+	31.0	NA	NA	0 - 100%
Ver.di	none	40.7%	25.3%	50.0%	0 or 1
IG BAU	+	4.9%	68.2%	48.2%	0 or 1
IG BCE	+	10.1%	60.0%	49.7%	0 or 1
GEW	none	0.6%	27.3%	0.0%	0 or 1
IG Metall	+	29.5%	69.5%	61.2%	0 or 1
NGG	none	5.2%	53.3%	36.7%	0 or 1
Transnet	none	0.6%	30.0%	30.0%	0 or 1
Other Unions	none	2.6%	31.1%	17.8%	0 or 1
No Unions	none	5.8%	24.8%	17.8%	0 or 1
Export Dependency	+	39.4%	63.1%	55.9%	0 or 1
Crisis1	none	21.4%	47.3%	37.8%	0 or 1
Crisis2	none	18.0%	51.0%	39.7%	0 or 1
Share of Female Workers	-	36.5	NA	NA	0 - 100%
Share of High-Skilled Workers	-	17.2	NA	NA	0 - 100%
Layoffs_1	+	29.6%	55.1%	46.1%	0 or 1
Layoffs_2	+	26.9%	58.1%	50.6%	0 or 1
Poor Information Behaviour	-	28.5%	44.7%	34.4%	0 or 1

Notes: N=1738

Table 2. Use of Working-Time Accounts to Safeguard Employment (All Establishments): Binary Logistic Regression.

Dependent Variable	*Model 1* *use of working time accounts to safeguard employment*			*Model 2* *use of working time accounts to safeguard employment in consequence of the actual economic crisis*		
Independent Variable	*Coefficient*		*Standard Error*	*Coefficient*		*Standard Error*
Transport and Communications (reference)						
Basic Materials and Producer Goods	-0.087		0.349	0.222		0.371
Investment and Consumer Durables	-0.124		0.332	0.208		0.355
Consumer Goods	0.166		0.330	0.493		0.357
Construction Industry	0.238		0.435	0.336		0.453
Trade and Repair	-0.241		0.309	0.344		0.336
Other Private and Public Services	-0.016		0.302	0.293		0.339
Credit and Insurance	-2.335	***	0.658	-2.766	**	1.083
Other Industries	-1.074	***	0.387	-1.350	***	0.492
Establishment Size (natural log)	0.129	**	0.050	0.192	***	0.055
East Germany	0.034		0.173	-0.066		0.193
Turnover2009_1	0.452	**	0.188	0.757	***	0.203
Turnover2009_2	0.108		0.168	0.080		0.177
Orders2009	0.475	**	0.190	0.585	***	0.204
Orders2010	-0.034		0.167	0.282		0.177
Union Density	0.004		0.003	0.007	**	0.003
Ver.di (reference)						
IG BAU	1.283	***	0.392	1.218	***	0.408
IG BCE	0.726	***	0.271	0.765	**	0.297
GEW	0.401		0.876			
IG Metall	1.050	***	0.231	1.001	***	0.249
NGG	0.525		0.325	0.359		0.353
Transnet	-0.383		0.794	0.427		0.826
Other Unions	-0.077		0.464	-0.507		0.595
No Unions	0.070		0.328	0.063		0.384
Export Dependency	0.286	*	0.159	0.499	***	0.167
Crisis1	-0.096		0.176	-0.202		0.192
Crisis2	0.150		0.185	0.035		0.198
Share of Female Workers	-0.011	***	0.004	-0.015	***	0.004
Share of High-Skilled Workers	-0.013	***	0.004	-0.015	***	0.005
Layoffs_1	0.302	*	0.161	0.409	**	0.172
Layoffs_2	0.443	***	0.168	0.594	***	0.177
Poor Information Behaviour	-0.108		0.149	-0.141		0.162
Constant	-1.463	***	0.418	-2.962	***	0.461
Valid Cases	1304			1291		
-2 Log Likelihood	1400.840			1209.888		
McFadden R^2	0.225			0.301		
Adjusted Count R^2	0.449			0.439		
Model Chi-Square	406.198			520.789		
Sig.	0.000			0.000		

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level

Table 3. Use of Working-Time Accounts to Safeguard Employment (Establishments Directly Affected by the Great Recession): Binary Logistic Regression.

Dependent Variable	*Model 3* *use of working time accounts to safeguard employment*			*Model 4* *use of working time accounts to safeguard employment in consequence of the actual economic crisis*		
Independent Variable	*Coefficient*		*Standard Error*	*Coefficient*		*Standard Error*
Transport and Communications (reference)						
Basic Materials and Producer Goods	-0.252		0.414	0.008		0.415
Investment and Consumer Durables	-0.219		0.404	0.043		0.403
Consumer Goods	-0.115		0.399	0.249		0.404
Construction Industry	0.047		0.582	0.574		0.574
Trade and Repair	-0.356		0.373	0.124		0.377
Other Private and Public Services	0.045		0.378	0.420		0.389
Credit and Insurance	-2.768	***	0.797			
Other Industries	-1.350	***	0.463	-2.014	***	0.567
Establishment Size (natural log)	0.102	*	0.061	0.161	**	0.062
East Germany	-0.054		0.220	-0.016		0.229
Turnover2009_1	0.197		0.231	0.364		0.239
Turnover2009_2	0.009		0.187	-0.066		0.191
Orders2009	0.270		0.230	0.292		0.237
Orders2010	-0.289		0.194	0.050		0.201
Union Density	0.007	*	0.004	0.006	*	0.004
Ver.di (reference)						
IG BAU	1.030	**	0.503	0.798		0.498
IG BCE	0.658	**	0.326	0.703	**	0.340
GEW	-0.045		1.293			
IG Metall	1.020	***	0.280	1.075	***	0.287
NGG	0.995	**	0.485	0.551		0.462
Transnet	-0.703		0.843	-0.060		0.862
Other Unions	-0.399		0.586	-0.304		0.634
No Unions	0.207		0.378	0.034		0.415
Export Dependency	0.382	**	0.194	0.388	**	0.197
Crisis1	0.037		0.210	-0.151		0.215
Crisis2	-0.021		0.218	-0.129		0.224
Share of Female Workers	-0.016	***	0.004	-0.020	***	0.005
Share of High-Skilled Workers	-0.011	**	0.005	-0.017	***	0.005
Layoffs_1	0.246		0.191	0.366	*	0.195
Layoffs_2	0.455	**	0.194	0.567	***	0.198
Poor Information Behaviour	-0.160		0.180	-0.236		0.185
Constant	-0.549		0.525	-1.488	***	0.530
Valid Cases	898			840		
-2 Log Likelihood	942.284			894.241		
McFadden R^2	0.227			0.228		
Adjusted Count R^2	0.411			0.429		
Model Chi-Square	276.067			263.361		
Sig.	0.000			0.000		

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level

Appendix Table A1. Variable Correlations

Independent Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
1 Transport and Communications	1															
2 Basic Materials and Producer Goods	-0.10	1														
3 Investment and Consumer Durables	-0.13	-0.18	1													
4 Consumer Goods	-0.09	-0.13	-0.17	1												
5 Construction Industry	-0.06	-0.08	-0.11	-0.08	1											
6 Trade and Repair	-0.10	-0.14	-0.19	-0.14	-0.09	1										
7 Other Private and Public Services	-0.15	-0.21	-0.27	-0.20	-0.13	-0.22	1									
8 Credit and Insurance	-0.06	-0.08	-0.11	-0.08	-0.05	-0.09	-0.13	1								
9 Other Industries	-0.06	-0.08	-0.11	-0.08	-0.05	-0.09	-0.13	-0.05	1							
10 Establishment Size (natural log)	0.08	0.11	0.01	-0.11	-0.04	-0.02	-0.08	0.07	0.03	1						
11 East Germany	0.02	-0.02	-0.03	-0.04	0.01	-0.01	0.08	-0.07	0.04	-0.07	1					
12 Turnover2009_1	0.00	0.16	0.20	0.02	-0.04	0.00	-0.23	-0.07	-0.06	0.04	-0.09	1				
13 Turnover2009_2	-0.02	0.02	0.09	0.02	-0.04	0.03	-0.06	-0.06	-0.02	-0.05	-0.01	0.23	1			
14 Orders2009	0.00	0.15	0.19	-0.02	-0.05	-0.01	-0.20	-0.02	-0.06	0.04	-0.11	0.72	0.28	1		
15 Orders2010	-0.03	-0.06	0.09	0.07	-0.02	0.04	-0.03	-0.06	-0.04	-0.09	0.01	0.11	0.37	0.14	1	
16 Union Density	0.14	0.18	0.16	0.02	0.03	-0.13	-0.23	-0.20	0.07	0.13	-0.04	0.16	0.02	0.11	0.01	1
17 Ver.di	0.21	-0.28	-0.36	-0.04	-0.16	0.09	0.26	0.26	0.14	0.01	-0.03	-0.22	-0.05	-0.19	-0.04	-0.24
18 IG BAU	-0.04	0.03	-0.09	-0.08	0.55	-0.09	-0.04	-0.05	-0.02	-0.05	0.02	-0.05	-0.02	-0.03	0.04	0.00
19 IG BCE	-0.06	0.44	-0.13	-0.04	-0.05	-0.03	-0.11	-0.08	0.07	0.11	0.03	0.03	-0.05	0.02	-0.09	0.17
20 GEW	-0.02	-0.03	-0.04	-0.03	-0.02	-0.03	0.14	-0.02	-0.02	-0.05	0.04	-0.05	-0.02	-0.04	-0.02	-0.06
21 IG Metall	-0.14	0.06	0.59	-0.12	-0.01	-0.06	-0.22	-0.15	-0.13	0.02	-0.03	0.26	0.12	0.26	0.09	0.26
22 NGG	-0.02	-0.09	-0.11	0.46	-0.05	0.04	-0.11	-0.05	-0.05	-0.01	0.01	-0.02	-0.03	-0.09	0.03	0.05
23 Transnet	0.20	-0.03	-0.04	-0.03	0.02	-0.03	-0.02	0.02	-0.02	0.03	0.01	0.00	-0.01	0.00	-0.05	0.07
24 Other Unions	-0.04	0.01	-0.06	0.06	-0.03	-0.01	0.07	-0.03	-0.01	-0.03	0.00	-0.03	-0.03	-0.03	-0.06	-0.01
25 No Unions	-0.06	-0.06	0.00	-0.02	-0.02	0.05	0.10	-0.01	-0.06	-0.12	0.03	-0.01	0.02	0.00	0.03	-0.29
26 Export Dependency	-0.04	0.26	0.35	0.03	-0.09	-0.04	-0.31	-0.16	-0.10	0.15	-0.09	0.34	0.09	0.30	0.05	0.22
27 Crisis1	-0.04	0.04	-0.04	0.06	-0.03	0.01	0.05	-0.06	-0.03	0.06	-0.04	0.09	0.03	0.06	-0.01	0.05
28 Crisis2	-0.05	0.02	0.04	0.05	0.00	0.01	-0.02	-0.07	-0.03	0.03	0.00	0.09	0.17	0.08	0.09	0.05
29 Share of Female Workers	-0.08	-0.19	-0.30	0.05	-0.17	0.10	0.39	0.18	-0.08	0.03	0.06	-0.21	-0.04	-0.18	-0.07	-0.36
30 Share of High-Skilled Workers	-0.11	-0.12	-0.03	-0.05	-0.03	-0.11	0.33	0.01	-0.04	-0.10	0.05	-0.09	-0.01	-0.04	0.00	-0.28
31 Layoffs_1	0.05	0.04	0.03	0.02	-0.07	0.06	-0.11	-0.01	0.01	0.04	-0.04	0.16	0.06	0.15	0.02	0.08
32 Layoffs_2	0.00	0.05	0.07	0.02	-0.09	0.07	-0.10	-0.03	-0.02	0.06	-0.02	0.19	0.16	0.22	0.10	0.05
33 Poor Information Behaviour	-0.03	-0.02	0.00	0.00	0.03	0.02	0.05	-0.06	-0.04	-0.14	0.00	-0.02	0.05	-0.02	0.04	-0.01

Appendix Table A1. Variable Correlations (continued)

17	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*	*32*	*33*
1																
-0.17	1															
-0.28	-0.08	1														
-0.06	-0.02	-0.03	1													
-0.54	-0.15	-0.24	-0.05	1												
-0.18	-0.05	-0.08	-0.02	-0.16	1											
-0.07	-0.02	-0.03	-0.01	-0.06	-0.02	1										
-0.12	-0.03	-0.05	-0.01	-0.10	-0.04	-0.01	1									
-0.19	-0.05	-0.09	-0.02	-0.16	-0.06	-0.02	-0.04	1								
-0.42	-0.10	0.17	-0.07	0.40	0.00	-0.05	0.01	-0.03	1							
0.05	0.00	0.03	0.03	-0.05	0.01	0.00	-0.03	-0.05	-0.04	1						
-0.02	0.01	-0.01	-0.01	0.03	0.03	-0.01	0.00	-0.04	0.04	0.33	1					
0.46	-0.14	-0.12	0.04	-0.39	-0.03	-0.01	0.09	0.05	-0.30	0.10	0.03	1				
0.02	0.00	-0.04	0.10	-0.08	-0.11	-0.02	0.05	0.21	-0.14	-0.02	0.03	0.11	1			
0.01	-0.08	0.04	-0.03	0.01	-0.02	-0.01	0.04	0.00	0.05	0.15	0.08	-0.02	-0.02	1		
-0.03	-0.03	0.03	-0.03	0.11	-0.08	-0.05	-0.05	-0.02	0.10	0.12	0.15	-0.05	0.02	0.41	1	
0.02	0.00	-0.04	0.04	0.03	-0.01	0.01	-0.01	-0.04	-0.03	0.06	0.09	0.06	0.01	0.04	0.06	1