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Are firms with financial participation of employees better off in a crisis? Evidence from the IAB Establishment Panel Survey**

In 2008/09 many countries all over the world were hit by a deep recession. At the beginning of the economic and financial crises a discussion about the practicability of financial participation of employees as an instrument to overcome the crises was initiated in Germany. Especially liquidity and productivity arguments were mentioned. This paper explores empirically whether firms having financial participation schemes of employees were better off during this turbulent time period. We focus on the function of financial participation schemes to stabilize employment and to avoid human capital losses, which is quite important in economic downturns. Our empirical analysis is based on the IAB-Establishment Panel Survey, which consists of almost 16,000 interviews every year. Our findings reveal that profit sharing and employee share ownership schemes are not outstanding crisis instruments.

Key words: **compensation, profit sharing, share ownership, treatment effects**
(JEL: M52, J33, C21)

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1. Introduction

As the Great Recession of 2008/2009 hit many countries all over the world, including Germany, many firms were confronted with both a decrease of product demands and financial distress. Therefore, in this situation firms which had already implemented financial participation of employees (FPE) can be regarded to have an advantage. However, because of the severity of the crisis the German government as well as other European institutions like the European Central Bank adopted bundles of measures to sustain the banks´ and firms´ financial stability. Likewise companies deployed several instruments in order to increase the working-time flexibility of their employees and to reduce their working time. Thus, this paper is going to investigate whether not only firms with FPE, but also other firms could overcome the precarious situation (Möller, 2010). In this article we focus on the employment stabilizing function of FPE in order to save human capital, which is important for firms managing precarious situations. The rest of this article is organised as follows: In the next chapter we are going to present the background, theoretical considerations, and related research. The third chapter is devoted to our empirical analyses and the fourth chapter concludes our study.

2. Background, theoretical considerations and related research

During an economic crisis firms are forced to consider their expenditures. Particularly, they have to rethink their payroll costs, in many cases with consequences for the workforce. Against this background some experts regard financial participation of employees as a chance for certain firms to manage the bad economic situation at this time. Mainly two arguments of financial participation of employees in economically rough times were discussed: Firstly, the liquidity saving function of FPE (Gilbert, Buxton, Golden, & Ryan, 2009; Hammer & Prähauser, 2010; Leuner, 2009). And secondly, the effect of FPE on employment stability and its implications to keep employees within the firm to retain their human capital (Azfar & Danninger, 2001; Gielen, 2011; Green & Heywood, 2011; Bellmann & Möller, 2010).

According to the first argument FPE and especially ESO may be crucial for firms with liquidity shortages for re-financing. Employees accept wage sacrifice - by means of wage reductions - abstain from contractual wage increases, particular special bonus payments or re-invest not-distributed earnings of profit sharing. Firms' financial status may be improved by the increase of the liable capital stock. Thereby, the investments necessary to compete with other companies can be financed – also by means of lower interest rates when it comes e.g. to bank loans (Leuner, 2009). The employees do not merely gain through the maintenance of their jobs but also by a higher income in economically better times (Apitzsch, 2009). Thus, financial participation of employees can be regarded as a suitable institution of recapitalization as they are interested in a sustainable development of the firm (in contrast to some external investors, which sometimes pursue different aims with takeovers of firms). To sum up, the literature suggests that firms in crisis situations (especially liquidity shortages) are better off when employees support the firm via financial participation.

The second rationale, the employment effect and its implications for saving human capital, we are going to examine in this article. For firms the personnel is crucial

for success und prosperity in the modern economic world. A skilled labour force is a prerequisite for economic growth and survival. Guest, Michie, Conway, Sheehan, (2003) pronounce the increasing importance of human resources as a key to competitive advantage and business success. The demand of highly qualified employees is prevalent in almost all industry sectors, not just in the IT-sector, where skill shortages are most evident. Hence, for firms it is essential to retain skilled labour and attract potential skilled labour.

Yet, a skilled labour force is certainly an asset for economic prosperity in any phase of the business cycle, but it is particular important in economic downturns. Firms which have to fight for survival are penalized twice when (highly qualified) staff is quitting in order to find another (apparently more secure) job. This is even more significant when the leaving employees withdraw their specific human capital. For a firm´s personnel department it is expensively to hire new employees because of substantial costs for searching, recruiting and familiarizing the newly hired employee. Particularly in periods of prospering business activity an appropriate work force is necessary for the further economic development.

Theoretical considerations

We refer to different theoretical considerations and apply arguments to FPE and crisis firms. Research in this field is dominated by the question whether flexibility of wages has consequences for employment, or rather whether profit sharing generates a more stable employment level and if it fosters long-term employment relations (which are especially important when it comes to skill shortages). Already in the 1980s and 1990s Weitzman studied the effect of financial participation. His idea was that - under some conditions (esp. the substitution argument) - profit sharing exerts incentives to retain workers when business shocks occur and moreover increase the demand for labour (Weitzman, 1984).

In contrast Long and Fang (2012) assume that financial participation is paid "on-top" of the base wage and therefore can be interpreted as an efficiency wage. Thus firms offering financial compensation above the market value attract and retain highly qualified labour (Long & Fang, 2012). This is simply because workers have an incentive to keep their well-paid job. Applying these considerations in a more psychological way, gift-exchange theory may give arguments for enhanced commitment of the employees (Akerlof, 1984). Based on the mechanism of reciprocity, considerations of gift-exchange theory claim that employees feel obliged to reciprocate the gift of financial participation through increased loyalty and effort (Baron & Kreps, 1999). Commitment and loyalty to the employer are the more important as the firms' economic situation is precarious and employees with outside options are considered searching for a new employer firm with a secure job. For firms in economic trouble it is even worse to loose well qualified employees: First, when the crisis is over and business is recovering, when the number and the value of incoming orders are increasing qualified labour is important. Secondly, it will be much more difficult to manage periods of economic recovering when there is a lack of skilled employees (esp. employees with a considerable amount of specific human capital) and new workers must be recruited

costly. Thus, our second hypothesis is that the "stabilizing effect" of FPE should be larger for qualified and especially highly qualified employees.

The principal-agent theory proposes that the use of financial participation may help to align the interests of the employer (principal) and the employee (agent) and hence to contribute to fostering commitment to stay with the firm (Pendleton & Robinson 2011). A trustful relationship between employer and employee is particular important and helpful when the firms´ economic situation is precarious and the future economic development uncertain. With greater interest alignment employee is more willing to accept deferred wage payment in periods when firm's economic situation is better. Especially, ESO induce employees to stay with the firm, since investment plans are based on a long-term basis and therefore provide a long-term incentive.

Related to this argument is the claim that profit sharing is an incentive instrument for enhancing employees' motivation and cooperation on the job (Long/ Fang 2012), creating a work context in which employees are motivated to work more diligently and effectively toward organizational goals, which matters especially in situations where the future is somehow unsecure for both parties.

Related research

A couple of studies analyse empirically the effect of FPE on employee retention, but as far as we know, there is no empirical investigation with quantitative data for firms in an economic crisis and the role of FPE. Gilbert et al. (2009) outlines the role of different types of ESO in crisis situations and the role of employees to provide vital liquidity during critical times. They discuss some arguments for better survival rates for firms with ESO in tough economic times. They mention not only the liquidity function since employees are shareholders of the firm, but also the different attitude and responsibility they show. This makes their work more effective, and increases the probability that their company will be successful. Fundamentally, employee owners are more accountable for their job performance and their fellow workers´ job performance – simply because they have a common stake in the success of their company (Gilbert et al., 2009). They suggest that the existence of ESO foster long-term employment relations and helps to retain highly skilled personnel to prevent difficult recruitment processes and cost for initial training.

As there are no empirical studies considering the role of FPE in firms in economic distress, and its consequences for human capital savings, in this chapter we are going to present some studies close to our theoretical considerations.

There are some different empirical studies, which refer to the relationship between FPE and investments in human capital respectively training activities (Robinson & Zhang, 2005; Pendleton & Robinson, 2011; Kraft & Lang 2013). Others consider some measure of employment stability (Gielen, 2011; Green & Heywood, 2011). Finally, some studies highlight merely the effect of FPE on employment stability (without any human resource variable) (Azfar & Danninger, 2001; Bellmann & Möller, 2010).

Robinson and Zhang (2005) analyse the function of ESO to safeguard valuable investments in human capital. Based on data of the Workplace Employee Relation Survey (WERS) of 1998 they conclude that there is a positive relationship between

valuable investments in human capital and ESO, which confirms their argument that FPE can be implemented to retain high qualified employees and safeguarding investments in human capital.

Pendleton and Robinson (2011) also focus on ESO, but analyse with the data of the WERS 2004 whether the use of ESO programs will be associated with higher propensity for firms to provide off-the-job training and whether the probability of providing training varies according to the level of employee participation in stock plans. Both propositions are verified by the authors.

Kraft and Lang (2013) use German data of the IAB-Establishment Panel from 2007 - 2009 to analyse the impact of profit sharing on training intensity. With the matching method they compare groups of firms with different participation levels introducing profit sharing with firms without profit sharing. All in all they conclude that the introduction of profit sharing significantly increases the share of employees who get trained.

Similar Gielen (2011) investigates whether paying a profit-related wage stimulates training investments. Based on data of the British Household Panel Survey 1998 to 2007 she analyses the effect of profit sharing on training, wages and labour turnover. She argues that labour turnover may be lower due to a reduced separation probability, and thereby a longer amortization period of training investments, which holds esp. for young worker, and second, due to an increased effort, which increases the returns of training.

Green and Heywood (2011) identify two channels through which profit sharing play an important role for training activities. The first emphasizes the indirect role of profit sharing for reducing worker separation and thereby amortization for training investments. Secondly, profit sharing may mitigate the hold-up problem associated with the investment into human capital. In their regressions with data of the British Household Survey and the Labour Force Survey they find evidence for both channels.

Azfar and Danninger (2001) propose that profit sharing reduces turnover and thus increases expected returns to firm-specific human capital investments. They use data from the U.S. National Longitudinal Survey of Youth to estimate the tenure profile for total separations, and separately for quits and layoffs. They consistently find lower separation, quit, and layoff rates for profit-sharing firms. The authors also demonstrate that profit sharing is related to higher wage growth, so they conclude that a rapid rate of skill accumulation is associated with profit sharing.

With the data of the IAB Establishment survey from 2001to 2007 Bellmann and Möller (2010) investigate the effect of profit sharing on firms´ hirings, layoffs, and quits. In their regressions they find negative effects of profit sharing on separation and turnover density, but positive effects on hirings. However, these results are not significant in the panel estimations.

All in all, previous literature suggests that there is a relationship between FPE and employee retention with consequences for human capital savings resp. training activities. Applying these theoretical considerations in the context of the financial and economic crises of 2008/2009 empirically we use data of a comprehensive establishment survey.

3. Empirical analyses

3.1 The IAB-Establishment Panel Survey

We base our empirical analysis on the data from the IAB Establishment Panel Survey (cf. Fischer, Janik, Müller, & Schmucker, 2009; Ellguth, Kohaut, S., & Möller, 2014). This survey has been conducted annually since 1993 and covers all industry sectors and establishment sizes. The population of this data set comprises all establishments with at least one employee who is liable for social security as of June, 30th of the previous year. The basis for sampling is the establishment file of the Federal Employment Service.

The survey is generally carried out as of face-to-face interviews in the establishments by interviewers of TNS Infratest Social Research (Munich). Letters of recommendation from the chairman of the Federal Employment Agency's executive board and the president of the German Employers' Association considerably contribute to the remarkable high response rate of 84% for interviews with establishment that participate repeatedly. Currently there are approximately 16,000 establishments in the IAB Establishment Panel that are surveyed on a large number of issues, such as employment development and structure, business policy and development, investment activities, innovations, public funding, employment policy, initial vocational and further training, recruitment, wages and salaries, working time and general information about the establishment. The survey also includes various focal topics every year.

3.2 Measures and descriptive results

Several variables are used for the empirical analysis. First, we describe the main variables we need for the research question, the financial participation and the crisis variable and give short information about their empirical evidence. Then, a description of the measure for employee change and change of qualification of the workforce over time is mentioned below. A variety of further variables is used for empirical analysis. For an overview and a brief description see Appendix Table A1.

Financial Participation of Employees (FPE)

Questions concerning the existence of profit sharing and employee share ownership schemes are included in the waves 2001, 2005, 2007, 2009 and 2011 of the IAB Establishment Panel Survey. In our empirical analyses we used a combined measure for FPE, because the number of cases for establishments using employee share ownership is rather limited. Table 1 displays the descriptive information: about 10 percent of all establishments have at least one of the two remuneration schemes. At the aggregate level this measure is nearly not varying over time. Furthermore FPE is increasing with firm size: Despite less than 10 percent of establishments with less than 50 employees exhibit a FPE scheme and about 40 percent of all establishments with 500 and more employees adopt it.

Table 1: Proportion of establishments with fpe

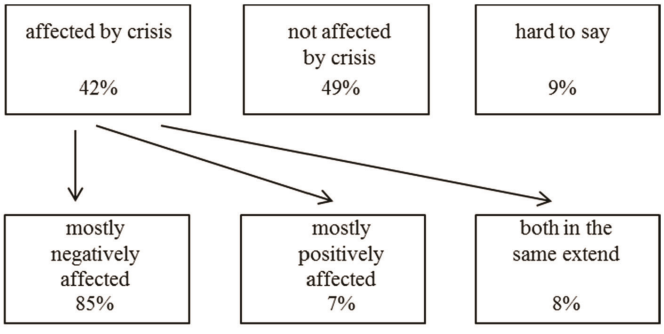
	number of employees				
	all	1-49	50-199	200-499	>=500
	-1-	*-2-*	*-3-*	*-4-*	*-5-*
2007	0.103	0.093	0.260	0.320	0.395
2009	0.090	0.082	0.221	0.273	0.370
2011	0.101	0.093	0.232	0.291	0.371

IAB Establishment Panel 2007, 2009, 2011; weighted results.

Measure about the economic and financial crisis of 2008/09

In order to identify establishments which were affected by the Great Recession 2008/09 we use information from the survey carried out 2010. The respondents were requested to assess whether the firm is affected by the crises (Figure 1). They could tick "Yes", "No" or "Hard to tell". If they chose "Yes", they were asked, if the crises-driven consequences were "mostly negative" or "mostly positive" or "both to the same extend". One might be surprised about the possibility of positive consequences of the crises. But in the context of the crisis of 2008/09 several subsidies were granted by the German Federal Government (e.g. for investments in infrastructure from economic stimulus packages, like the so called car scrappage bonus or other industry-specific bonuses for short-time work). Hence, we cannot exclude positive consequences a priori.

Figure 1: Structure of the crisis variable



Source: IAB Establishment Panel 2010; weighted results

Almost half of all establishments in Germany were not affected by the economic and financial crisis, while 42 percent of the establishments were affected. The majority of the crisis-affected establishments reported mostly negative consequences (85 percent),

while a minority of 7 percent reported mostly positive consequences. The respective 8 percent reported both (positive and negative consequences) in the same extent.

Table 2: Structure of crisis and non-crisis establishments (selected variables)

	crisis establishments	non-crisis establishments
no. of employees *(mean)*	13,415,000 *(18.5)*	21,032,000 *(16.0)*
% FPE (2007)	0.123	0.086
% FPE (2009)	0.107	0.083
% FPE (2011)	0.116	0.092
% qualified employees	0,68	0,70
% highly qualified employees	0,11	0,14

IAB Establishment Panel 2010; weighted results.

For our empirical analysis we constructed a dummy variable as a crisis indicator which is assigned to the value 1, if the establishment reports *negative* consequences of the financial and economic crisis 2008/09, else the value is 0. In the following we describe these establishments simply as "crisis" and "non-crisis" establishments.

Table 2 gives a brief description about the structure of the crisis and non-crisis establishments. As can be seen in Table 2, structure of crisis and non-crisis establishments is very similar. On average non-crisis establishments are something smaller and qualification level is somewhat higher. In contrast, FPE is more prevalent in "crisis establishments".

Dependent variables: change of employment in total and change of qualified and highly qualified employees

As mentioned above wages linked to firms profit should foster long-term employment relation. Hence the first indicator describes the change of employment in different periods for the two subgroups: "crisis firms" and "non-crisis firms". Thereby we not just consider the number of employees in total but also differentiate between two skill levels: qualified and highly qualified employees.

Our first outcome variable is the change of employment, which is the standardized change in the number of employees from one year to another:

$$(1) \quad \Delta L = \frac{[(L_t - L_{t-1})\ ]}{0.5 * [(L_t + L_{t-1})]},$$

where *L (labour)* is the number of employees and *t* is a time index.

Secondly, we are analysing the change of qualified personnel and thirdly of high qualified personnel in the same formula as in (1).

3.3 Sample and Method

For our estimations we use information of the IAB-Establishment Panel from 2007 to 2011. The estimation sample is constructed as a balanced panel, including 8,109 numbers of cases for each of the five years, which means that the whole sample covers 40,545 observations. Due the construction of the growth rate variable sample size is reduced by 8,109 number observations (one of the five years) to 32,436. Further on, some observations in the estimations are lost due to missing values.

In a first step, we compare the employment development 2008 versus 2007, 2009 versus 2008, 2010 versus 2009 and 2011 versus 2010 between crisis and non-crisis firms. This is done by estimating the following simple regression:

$$(2)\ \Delta L_{it} = \delta_{08} t_{08} + \delta_{09} t_{09} + \delta_{10} t_{10} + \delta_{11} t_{11} + \delta_{08,C}\, t_{08} C_i + \delta_{09,C}\, t_{09} C_i + \delta_{10,C}\, t_{10} C_i + \delta_{11,C}\, t_{11} C_i + x'_{it}\beta + \varepsilon_{it},$$

where ΔL_{it} is the standardized employment development in firm i between year t-1 and t. Moreover, t_{08}, t_{09}, t_{10} and t_{11} are time dummies. Therefore, δ_{08} identifies the change of employment in non-crisis firms between 2007 and 2008 (δ_{09}, δ_{10} and δ_{11} dito). C_i is a dummy variable, indicating that a firm is negatively affected by the crisis. Thus, $\delta_{08} + \delta_{08,C}$ identifies the employment development in crisis firms from 2007 to 2008 ($\delta_{09} + \delta_{09,C}$ and $\delta_{010} + \delta_{10,C}$ have the corresponding interpretation for the employment change in crisis firms from 2009 to 2010 and 2010 to 2011 respectively). The difference in the employment developments between crisis and non-crisis firms is given by $\delta_{08,C}$. x_{it} is a vector of control variables and ε_{it} an error term. We control for several structural variables, like industry sector, legal status, existence of a collective wage agreement, works councils and two important variables for the measurement of employment change: partial plant closing/ spin-off and insourcing. Moreover some additional variable are taken into account which we assume to have an effect on employment: part time employment, investments and innovations and further training. We are estimating (2) by ordinary least square.

In addition to the equation of employment change, we run two specifications covering the change in qualification of the workforce for the concerned time period. As a measure for qualification of the workforce we use two different indicators: first, we analyse the change of the number of *qualified employees*. This measure covers the number of employees for jobs which require an initial training/ apprenticeship or an adequate work experience) and the number of employees for jobs which require a university degree (*highly qualified employees*). As a second measure solely the change of highly qualified employees is considered.

With respect to our estimation strategy we refer to the one adopted by Bellmann and Gerner (2012). First, we are analysing the employment change (and change of qualified workforce) for non-crisis and crisis firms, as well as the corresponding differences. Then, we run this estimation for firms with and without FPE, where an establishment is marked as an FPE-establishment, when the following condition is fulfilled:

$$(3)\ \text{FPE} \begin{cases} = 1 \ \ if\ FPE(2009)\ equals\ 1 \\ = 0 \quad else \end{cases}$$

This is because our research question is based on the assumption that having FPE in crisis times will have consequences for employment. Presuming the data of 2007 and 2008 are pre-crisis data and such of the year 2011 assigning the post-crisis era, data for 2009 and 2010 are relevant for the research question. In our estimation sample 25,955 observations are establishments without FPE and 4,851 are establishments with FPE.

Further, the differences between crisis and non-crisis firms can be interpreted as difference-in-difference estimates, what implicitly means that we are controlling for biases caused by unobserved heterogeneity between crisis and non-crisis plants (Caliendo, 2006).

3.4. Multivariate results

In this section, we will look at the employment change over time, first for all and subsequently for different qualification levels. Thereby we attempt to identify different patterns for crisis versus non-crisis firms and for firms with and without financial participation schemes. Hence, we run three regressions with different dependent variables: first, the change of total employment (Table 3a-c), and subsequently the change of the number of qualified and highly qualified employees (Table 4 and Tables in the Appendix. These three regressions are carried out at first for all firms (A) and afterwards for firms with (B1) and without (B2) FPE. We differentiate our analysis by the crisis situation of the firm (in the respective table in column 1 and 2). The related regression results for the specification in Table 3a are reported in the Appendix Table A2.

Change of total employment

Table 3a (A) shows the employment change in total as well as for crisis and non-crisis establishments. As can be seen, in the crisis period of 2008/2010 coefficient for crisis establishments is negative whereas the respective coefficient for non-crisis establishments is positive. For both subgroups of firms the growth rate is positive in the pre-crisis period 2007/2008.

To identify differences in the change of employment between establishments with and without FPE in the crisis, we run regressions for firms with and without FPE separately (Table 3a, B1 and B2). The estimates are similar to the results of the section A) in respect to the signs and the relative dimension. Again in the crisis period we find negative employment effects in firms affected by the crisis. Table 3b shows the differences of the coefficients of firms with and without FPE in both periods. All differences are positive, which indicates an employment stabilizing function of FPE. However, since the difference of coefficients in crisis firms with and without FPE in the crisis period 2008/2010 (=0.0007) is not that high and even lower as in non-crisis firms (=0.0206), we cannot corroborate the hypothesis that FPE is an instrument for employment stability in crisis situations.

Table 3a: Change of the number of employees in crisis and non-crisis estabslishments with and without FPE

	crisis *-1-*	non-crisis *-2-*
A) all firms		
2007/2008	0.0135	0.0072**
2008/2010	-0.0432***	0.0267**
B1) firms with FPE		
2007/2008	0.0210	0.0080
2008/2010	-0.0425***	0.0447*
B2) firms without FPE		
2007/2008	0.0119	0.0069
2008/2010	-0.0432***	0.0241*

IAB Establishment Panel 2007 - 2011; *, **, *** indicates a significance level at 10%, 5% and 1%

Table 3b: Change of the number of employees in crisis and non-crisis establishments with and without FPE

	crisis *(1,Table 3a, B1-(1,Table 3a,B2)* *-1-*	non-crisis *(2,Table 3a,B1)-(2,Table 3a,B2)* *-2-*
2007/2008	0.0091	0.0011
2008/2010	0.0007	0.0206

IAB Establishment Panel 2007-2011

Table 3c: Differences in the change of the number of employees in crisis establishments with and without FPE

crisis firms	with FPE *-1-*	without FPE *-2-*	difference *-3-*
2008/2009	-0.0286	-0.0318	0.0032
2009/2010	-0.0139**	-0.0114**	-0.0025
2008/2010	-0.0425***	-0.0432***	0.0007

IAB Establishment Panel 2007-2011

Just to give a more detailed insight in the crisis period from 2008 to 2010 Table 3c shows employment change for the first crisis period 2008/2009 (row 1) and the second crisis period 2009/2010 (row 2). As can be seen the differences of the coefficients of both crisis periods differ in their signs, but not quite in their dimension. In the first crisis period 2008/2009 firms without FPE face a higher employment reduction (3.18 %), whereas in the second crisis period 2009/2010 employment reduction is higher in firms with FPE (1.39 %), but both on a rather low level.

Change of the number of qualified and highly qualified employees

In the next step, we consider the change in the number of qualified personnel (Table 4). As can be seen in the Appendix results are - all in all - the similar to those of Table 3a-c. However, the differences between the change of the number of qualified and highly qualified employees in firms with and without FPE displayed in Table 4 are significantly higher compared to the differences of the number of all employees.

Table 4: Differences in the change of the number of employees in crisis establishments with and without FPE 2008/2010

crisis firms	with FPE	without FPE	difference
	-1-	-2-	-3-
all employees	-0.0425***	-0.0432***	0.0007
qualified employees	-0.0254	-0.0464***	0.0210
highly qualified employees	-0.0127	-0.0840***	0.0713**

IAB Establishment Panel 2007-2011

In the crisis period 2008/2010 the reduction of qualified employment in firms with FPE is 2.54 % whereas in firms without FPE the reduction is almost twice as high (4.64 %). The results for highly qualified employees are even more significant. Particularly the reduction of the number of highly qualified employees in firms without FPE is with 8.40 % rather significant. Hence the difference of 7.13 % for highly qualified and of 2.10 % of qualified employees corroborates the "stabilizing effect hypothesis" of FPE both for qualified and highly qualified employees: The change (=reduction) of the number of employees is always significantly smaller in the establishments which had implemented FPE schemes before the beginning of the Great Recession of 2008/09.

4. Conclusion

We investigated the question whether firms using FPE during the Great Recession of 2008/09 were better prepared to face both the declining product demand and financial stress in comparison in to companies which had not implemented such a scheme before the crisis. Two arguments can be mentioned: the liquidity saving function and the employment retention function of FPE. Although there are some empirical studies about the effect of FPE on employee retention, there is no empirical evidence available about the role of FPE in firms during economic distress. Based on the IAB Es-

tablishment Panel Survey of 2007 – 2011 we explored the employment development of firms hit by the Great Recession with and without FPE. Our multivariate analyses revealed mixed results: For the development of total employment we did not obtain a significant effect of FPE. In contrast for the change of both the number of qualified and highly qualified employees the establishments implemented FPE were better off than establishments without FPE.

We interpreted these findings against the background of massive government interventions in Germany during the Great Recession and establishments´ personnel strategies to increase employee flexibility and at the same time to reduce their working time. Thus, the incremental impact of FPE seems to be rather limited – moreover in the context of the brevity of the crisis in Germany (Bellmann, Gerner, & Laible, 2016).

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Appendix

Table A1: Description of variables

variables	description
FPE (1=yes)	existence of schemes of financial participation of employees (profit sharing or employee share ownership)
negatively affected by crisis (1=yes)	self-assessment: firm was negatively affected by the global financial crisis of 2008/09
part time (1=yes)	employees working part time (30.06)
works council (1=yes)	existence of a works or staff council
collective wage agreement (1=yes)	firm is bound by an industry-wide or company collective agreement
investment in ICT (1=yes)	investment in information and communication technology (prev. year)
investment in production (1=yes)	investment in production facilities (prev. year)
futher training (1=yes)	financing of further training (first half of the resp. year)
partial plant closing	parts of the establishment closed / spin-off
insourcing	other parts of the establishments were incorporated
process innovation	activities in process innovations (prev. year)
process innovation	activities in product innovations (prev. year)
West Germany (1=yes)	West and East Germany
legal status	1=single enterprise
	2=partnership/ unincorporated firm
	3=limited liability company
	4=incorporated firm/jount stock company
	5=public corporation
	6=other legal form
status of the establishment	1=independent, autonomous firm
	2=company head quarter
	3=branch establishment/ office
	4=regional / specialist inter-mediate level-establishment

Table A1 cont.

industry structure	1=agriculture and forestry
	2=mining, energy and water supply
	3=manufacturing
	4=construction
	5=trade
	6=traffic, warehousing, information and communication
	7=financial services
	8=service sector
	9=public administration and non-profit sector

Appendix Table A2: Regression results (refer.Tab. 3a)

	all firms	with FPE	without FPE
	-1-	*-2-*	*-3-*
year (ref: 2011)			
2007/2008 (1=yes)	0.0072**	0.0080	0.0069*
2008/2009 (1=yes)	0.0063*	0.0124*	0.0055
2009/2010 (1=yes)	0.0204***	0.0323***	0.0186***
year*crisis (ref: year2011*crisis)			
year2007/08*crisis (1=yes)	0.0063	0.0129	0.0049
year2008/09*crisis (1=yes)	-0.0375***	-0.0408***	-0.0373***
year2009/10*crisis (1=yes)	-0.0324***	-0.0462***	-0,0300***
part-time work (1=yes)	0.0388***	0.0186***	0.0419***
works council (1=yes)	-0.0158***	-0.0123**	-0.0172***
collective wage agreement (1=yes)	-0.0039	-0.0073	-0.0032
investment in ICT (1=yes)	0.0079***	0.0096*	0.0075**
investment in production (1=yes)	0.0089***	0.0006	0.010***
further training (1=yes)	0.0146***	0.0239***	0.0133***
partial plant closing (1=yes)	-0.1895***	-0.1653***	-0.1975***
insourcing (1=yes)	0.1810***	0.1456***	0.1950***
process innovation (1=yes)	0.0078***	0.0055	0.0080***
product innovation (1=yes)	0.0067**	0.0062	0.0066*
West Germany (1=yes)	-0.0019	0.0079	-0.0037
industry structure controls	yes	yes	yes
no of observations	30,806	4,851	25,955
F (33,30773); F(33,4818); F(33,25922)	62.42***	17,30***	49.30***

IAB Establishment Panel 2007 - 2011; *, **, *** indicates a significance level at 10%, 5% and 1%. Regression results refer to Table 3. Variables also controlled: status and legal status of the establishment.

Appendix Table A3a: Change of the number of qualified employees in all establishments and in establishments with and without FPE

	crisis	non-crisis
	-1-	*-2-*
A) all firms		
2007/2008	0.0219	0.0181**
2008/2010	-0.0423***	0.0393**
B1) firms with fpe		
2007/2008	0.0202	0.0183
2008/2010	-0.0254*	0.0454*
B2) firms without fpe		
2007/2008	0.0225	0.0181*
2008/2010	-0.0464***	0.0387*

IAB Establishment Panel 2007-2011

Appendix Table A3b: Differences in the change of qualified employees in establishments with and without FPE

	crisis	non-crisis
	(1,Table 4a,B1-(1,Table 4a,B2)	*(2,Table 4a,B1)-(2,Table 4a,B2)*
	-1-	*-2-*
2007/2008	-0.0023	0.0002
2008/2010	0.0210	0.0067

IAB Establishment Panel 2007-2011

Appendix Table A4a: Change of the number of highly qualified employees in all establishments and in establishments with and without FPE

	crisis	non-crisis
	-1-	*-2-*
A) all firms		
2007/2008	-0.0035	-0.0150
2008/2010	-0.0720*	-0.0157
B1) firms with fpe		
2007/2008	0.0154	-0.0275
2008/2010	-0.0127	0.1232
B2) firms without fpe		
2007/2008	-0.0068	-0.0137
2008/2010	-0.0840***	-0.0382

IAB Establishment Panel 2007-2011

Appendix Table A4b: Differences in the change of highly qualified employees in establishments with and without FPE

	crisis	non-crisis
	(1,Table 5a,B1-(1,Table 5a,B2)	*(2,Table 5a,B1)-(2,Table 5a,B2)*
	-1-	*-2-*
2007/2008	0.0222	-0.0138
2008/2010	0.0713	0.0850

IAB Establishment Panel 2007-2011