
The Effects of Employee Share Ownership: A Case Study of Siemens AG

Prof. Dr. Michael Wolff
Ulrike Zschoche



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Management Summary

- Although employee participation schemes are enjoying increasing popularity around the world as an instrument for compensation, there is still a lack of robust empirical results on their influence on employee motivation and performance. The focus of previous research has been restricted to compensation schemes for management. The aim of this joint study from the University of Göttingen and Siemens AG is to address these gaps in knowledge.
- Cooperating with Siemens AG has enabled the Chair of Management and Control at the University of Göttingen to conduct the first ever multi-dimensional empirical study on the effects of a globally implemented employee share ownership scheme. This opportunity makes it possible to consider aspects which hitherto could not be taken into account in empirical analyses (e.g. performance of individual employees) or can be seen as weaknesses in previous studies (e.g. no consideration of multiple years of observation). There are three specific research questions at the centre of this empirically based project:
 - *Does employee share ownership have a positive influence on employee motivation?*
 - *Does employee share ownership have a positive influence on individual employee performance?*
 - *Does employee share ownership have a positive influence on organisational performance?*
- For the empirical analysis of the research topics, a range of data was used from sources inside and outside of Siemens AG, the company at the centre of our study. The former were fully anonymised prior to analysis. A range of regression models were used to evaluate this comprehensive data; for an example year, 2012, this covered up to 270,000 Siemens AG employees. Overall, the expected positive influences of employee share ownership plans could indeed be confirmed. Addressing the three research questions, this means:
 - *With an increasing proportion of participants in the employee share ownership plan, the average employee motivation level increased.*For example: With an increasing proportion of employees in the employee share ownership plan in a particular organisational unit in the year 2011, the average employee motivation level in this organisational unit increased in 2012.
 - *With an increasing proportion of participants in the employee share ownership plan, the average individual employee performance level increased.*

- One illustration: With an increasing proportion of employees in the employee share ownership plan in a particular organisational unit in the year 2011, the average individual employee performance level in this organisational unit increased in 2012.

- *With an increasing proportion of participants in the employee share ownership plan, the average organisational performance increased*

To take one example: With an increasing proportion of employees in the employee share ownership plan in a particular organisational unit in the year 2011, the average organisational performance of this unit increased in 2012.

- The robustness of the empirical results was systematically tested and checked by means of a range of econometric methods and tests, the use of various indicators to describe the different facts of the study at hand (e.g. a selection of indicators was used to measure organisational performance), and the integration of numerous control variables to consider other possible influencing factors. The results proved to be statistically robust.
- Since the results of this study demonstrate the positive potential of this type of program, companies should use them to review their approach if they previously have not implemented an employee share ownership plan or if such plans were reserved for management staff: share ownership plans for the whole workforce can increase employee motivation and performance, in turn positively impacting on the performance of the organisation as a whole. Nonetheless, there are both internal and external factors which need to be considered if these employee share ownership plans are to gain general acceptance. For example, from an internal (i.e. the company's) point of view, decisive factors are the commitment of management staff, the design of the employee share ownership plan, and an appropriate internal communication strategy. From the external (i.e. governmental) point of view, successful implementation of participation schemes is encouraged in the longterm by factors including: stronger tax incentives for employee share ownership plans; promoting share ownership schemes as an element of mid- and long-term wealth creation; and reducing the bureaucracy involved in setting up and administering company share ownership plans.

Introduction

Share ownership plans for the whole workforce represent a corporate management tool which is less established in Germany than in some other countries and also generally less common than stock-based or stock-oriented compensation schemes for senior management. Research into this field has also previously concentrated on the analysis of stock-based or stock-oriented compensation schemes for upper management levels. Empirically robust studies investigating the impact of extending share ownership to all employees within a company are currently lacking.

Underlying share ownership schemes is the idea that such schemes enable a company to motivate employees and to increase their identification with the company through financial participation. Possessing shares in the company turns the staff members into co-owners. Theoretically, this then leads to them feeling a stronger sense of responsibility for their activities and a stronger sense of loyalty to the company. Furthermore, share ownership plans can also incorporate long-term elements designed to increase employee retention. These impact mechanisms can ultimately lead to an improvement in the company's performance, thanks to reduced fluctuation levels, higher employee motivation or increased productivity. However, these multi-dimensional impact mechanisms have yet to be investigated empirically within companies. This is primarily due to the lack of available data or the low generalisability of previous studies' results.

This study is the first to permit an indepth analysis of the complex impact mechanisms of employee share ownership within one company. It focuses on the impact of the share ownership scheme on employee motivation, individual employee performance, and organisational performance. The company being studied, Siemens AG, has been running a global employee share ownership plan since 2008. Linking several anonymised internal data sets from within the company creates an opportunity for a comprehensive analysis of employee participation in an international corporation. In this way, this joint study by the University of Göttingen and Siemens AG contributes to current international research on stock-based or stock-oriented compensation schemes. Additionally, the study's results can be used to derive important implications and success factors for the practical implementation of employee share ownership plans.

Study Design

Introduction

Stock-based or stock-oriented compensation schemes for management staff—especially upper management levels—are well accepted and have been subject to much study. They are very common in the USA and also enjoy popularity in Europe. According to the GEO Global Equity Survey (2014) 93 % of the companies surveyed in the USA offer their management staff stock-based or stock-oriented compensation schemes. In Europe this value is 87 % and in the rest of the world, 75 % of respondent companies had set up stock-based or stock-oriented compensation schemes. In the German Prime Standard, on average 37.4 % of the companies have stock-based or stock-oriented compensation schemes, with example values of 80 % for the DAX and 36 % for SDAX (Rapp & Wolff, 2013).

Theoretical arguments in favour of the implementation of stock-based or stock-oriented compensation schemes include the assertion that owners have only a limited ability to monitor and supervise upper management levels in their role as decision-makers. By coupling management remuneration to the company share value, upper management business decisions can be better evaluated—and therefore monitored—by means of investor behaviour (Fama & Jensen, 1983). Variable remuneration schemes with stock-based or share-oriented constituent parts can therefore contribute towards a convergence of the partially divergent interests of the owners and decision-makers and to a reduction in information asymmetries. (Holmstrom & Milgrom, 1994; Kruse, 1996). In this way, stock-based or stock-oriented elements in the compensation package become an important instrument for owners to control the behaviour of upper management (Bebchuk & Fried, 2003; Jensen & Murphy, 1990; Shavell, 1979). Furthermore, these compensation schemes typically have a multi-year assessment basis which provides the upper management with an incentive to take long-term decisions (Dittmann, Maug, & Spalt, 2010; Oyer, 2004; Shavell, 1979). The variable structure of these remuneration or compensation elements also leads to upper management being directly affected by the consequences of their decisions, ensuring an incentive to take decisions with the company's long-term success in mind (Eisenhardt, 1989; Jensen & Meckling, 1976).

A range of empirical studies have already demonstrated this positive incentive effect of stock-based or stock-oriented compensation elements for upper management. For example, a study of German companies by Rapp & Wolff (2012) demonstrated that companies with a high level of stock-based compensation restricted their investments less severely and reduced their expenditure on R&D less during the financial crisis. A positive correlation between stock-based or stock-oriented compensation elements and both expenditure on R&D as well as long-term investment decisions was also demonstrated for the USA before the financial crisis by, for example, Kang, Kumar & Lee (2006) and Wu & Tu (2007). Additionally, studies have been able to show a positive correlation between stock-based or stock-oriented compensation elements and business performance (Mehran, 1995; Pukthuanthong, Roll, & Walker, 2007).

In comparison to stock-based or stock-oriented share ownership schemes for upper management, share ownership plans for the whole workforce are less common, especially in Germany (GEO Global Equity Insights, 2014; Mathieu, 2009). For example, in Germany in 2008 one million employees held some form of stock or capital participation in their company. The figures in the UK and France, however, are 2.6 million and 3.1 million respectively, even though the absolute number of workers in each country's total workforce is lower than in Germany (Mathieu, 2009). Nonetheless, employee share ownership is gaining in significance in Germany and is increasingly present as an issue at both

company and governmental levels (Aktienbasierte Mitarbeiterbeteiligung, 2011; Deutsches Aktieninstitut, 2013, 2014). For example, the number of employee shareholders in Germany has increased by about one third in the last five years, rising to 1.2 million (Schmidt, 2014).

The fact that these schemes are still less popular in Germany compared to the rest of Europe or the USA is due partly to a late uptake by companies in Germany of the idea of schemes for the whole workforce (Mathieu, 2009). Furthermore, the tax-exempt amount in Germany is low compared to other European countries, which could also partly explain the low participation by employees (Aktienbasierte Mitarbeiterbeteiligung, 2011; Deutsches Aktieninstitut, 2013). Another factor is the more significant role played in the USA by employee share ownership schemes as an element of retirement planning: an employee stock ownership scheme is often an optional and significant constituent part of the pension scheme, since US statutory old-age pensions cover no more than basic needs (Poutsma & Nijs, 2003). This is a decisive aspect in the broad acceptance of employee share ownership in the USA.

Consistent with this, research has so far focussed on the effects of compensation schemes for upper management, whilst there are only few analyses of the impacts of employee share ownership schemes. The current state of this research will be presented in the following section.

Current State of Empirical Research

The main focus of previous studies in the field of employee share ownership schemes has been on an investigation of possible impacts on feelings of identification and loyalty. Among others, Liu, Lin & Lin (2009), Long (1978), Poutsma & Nijs (2003) and Whitener (2001), demonstrate that an employee share ownership scheme leads to growth in the feelings of commitment and loyalty which employees have towards their company. Furthermore, Kruse (2013) has shown that employee share ownership schemes can increase the attractiveness of a company for employees. Other studies have demonstrated that employee share ownership schemes can decrease employee fluctuation. One main reason for this is because the cost to an employee of changing employer increases (Sengupta, Whitfield, & McNabb, 2007). Where share ownership plans incorporate features such as compulsory retention periods or graduated vesting, this can help to retain employees long-term in the company and align them to its aims (Oyer & Schaefer, 2005). By preventing sale of stock options for a certain time, measures such as holding or vesting periods create an incentive for employees to think and act according to long-term business interests.

In addition to studies investigating the effect of employee share ownership schemes on feelings of identification and loyalty among employees, there is also a small number of empirical studies dealing with an analysis of impacts on performance. However, these studies can be seen to have clear weaknesses, which will be dealt with individually below. Studies of the impact on individual employee performance have not yet been carried out, primarily because hardly any suitable data at the level of individual employees has been available. Studies of the impact of employee participation on organisational performance are mostly subject to significant restrictions since they require an empirically robust approach which implies, inter alia, the use of consistent internal company data over a period of several years. The most significant weaknesses of these empirical studies are presented in Figure 1. The section on the experimental approach below (page 16) explains how these weaknesses were addressed by the current study.

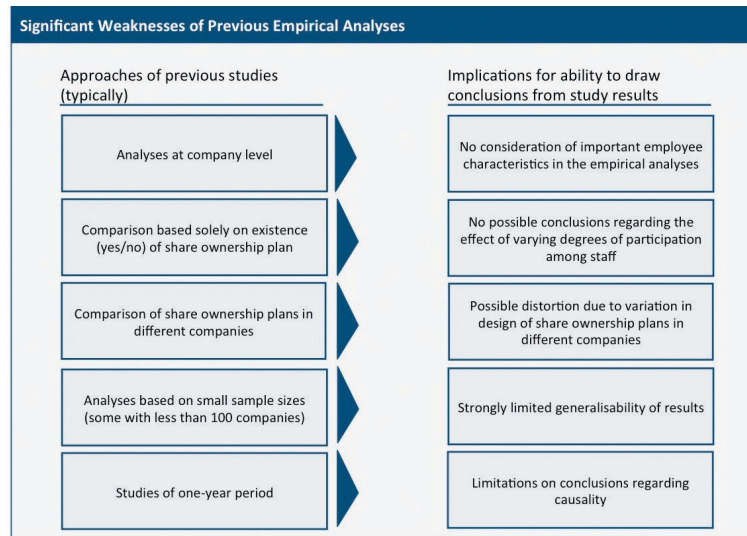


Figure 1: Approaches and validity of previous studies

Existing studies generally analyse the impact of share ownership plans at company level without considering important characteristics of the staff, in spite of the fact that factors such as age, in-company activity (e.g. production unit) or duration of employment can have a significant impact on the participation in and effect of a share ownership scheme.

Furthermore, some studies analyse the effect of employee participation by comparing companies with share ownership schemes to companies without them. This type of comparison cannot determine the impacts of differing degrees of employee participation, so statements can be only be made about the behaviour of companies with share ownership plans compared to those with no schemes, without considering the number of participating employees. However, differing degrees of participation in company units can have a considerable influence on the effect of share ownership schemes. For example, if one unit has 2 % of its employees participating in a share ownership plan but another has 20 %, the effect of the plan on the unit may be different. So studies need to consider the variation in extent of employee participation if they are to fully reflect employee participation in the company.

Another approach used to analyse employee share ownership plans is the analysis of different companies with share ownership plans. The problem with these comparisons lies in the variations in plan design, which can distort the results of the studies. For example, a difference in the design of one share ownership scheme may lead to it being significantly more attractive to employees than a plan in another company. This distorts any analysis of the effects of the schemes because the initial situations being compared are different. The design of these studies therefore makes them inadequate for general statements on the effects of employee share ownership plans.

Furthermore, studies are often based on a one-year period, which limits the ability to detect causal relationships. For example, employee share ownership can have an effect on employee motivation but an effect in the opposite direction is also possible, with more highly motivated employees being more likely to participate in a share ownership program than other employees. So in this case, the level of motivation explains the level of plan participation rather than any effect of the plan explaining employee motivation. Controls for this reverse causality should be carried out in the run-up to a study, but this does require an observation period of more than one year.

There are other effects that could influence the impact of employee share ownership plans, such as differences in the surrounding economy or culture. In order to take as many of these into consideration as possible, the sample of companies or organisational units should be chosen to include a variety of countries and sectors. If this is not done, the variance in the data is often not high enough to be able to make generally applicable statements. Overly restrictive samples therefore strongly limit the generalisability of the study's results.

Bearing these abovementioned weaknesses in mind, it is not surprising that the few studies of the effect on performance come to conclusions which are partly contradictory. Some empirical studies confirm the positive effect of employee share ownership plans on business performance (Bradley, Estrin, & Taylor, 1990; Wyld & Maurin, 2011), whereas others refute it or only confirm it in a limited way (Faleye, Mehrotra, & Morck, 2009; Guedri & Hollandts, 2008; Jones & Kato, 1995). These studies often use a very small sample and only study the interdependencies at the company level. For example, in a study by Bradley, Estrin & Taylor (1990), one company with an employee share ownership plan is compared to its major competitors. A descriptive comparison concludes that the reason for the first company performing better than the competitors is the higher proportion of employees who are shareholders in the company. However, this should be more accurately viewed as a correlation between two effects rather than a definitive statement of a causal relationship.

To summarise, a review of previous research leads to the conclusion that the effect of employee share ownership is a rewarding field of study but that there are design weaknesses in the studies carried out so far.

Derivation of the Research Questions

From a theoretical perspective, the introduction of employee participation schemes is a response that could meet the demand for an increase in employee retention and employee identification with the company, as well as higher performance levels.

Increasing employee participation in companies by means of share ownership leads to this psychological effect of loyalty and identification. By owning shares and thus becoming co-owners of the company, the employees will be more interested in their future and more motivated. Employees gain a more positive attitude to their work and feel more responsibility for their company if they have the opportunity to invest in the company they work for, influence decisions with voting rights, and own a personal share of the company. The financial incentive provided by share ownership also achieves the goal of raising and intensifying employees' interest in the development of their company.

These psychological effects of employee share ownership increase the identification employees feel with the company as well as their ties to the company, which both then increase employee motivation and commitment. Increased motivation can be a measurable expression of the retaining and identifying effects of employee share ownership. The current study is the first to measure these effects by means of a company-wide survey. In this way the study can investigate whether employee share ownership plans have a positive effect on employee motivation (Figure 2), with the specific research question being:

Research question 1:

Does employee share ownership have a positive influence on employee motivation?

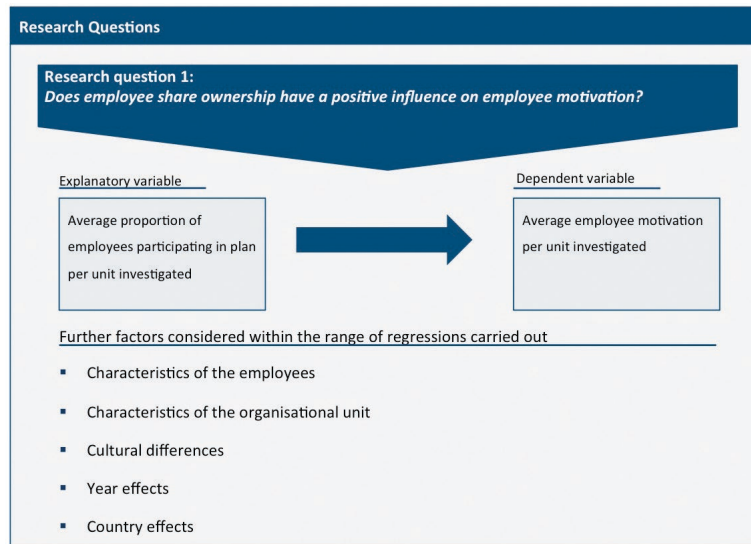


Figure 2: Employee share ownership and motivation

Another reason for setting up company employee share ownership plans is the aim of increasing individual employee performance. If a staff member has increased feelings of identification with the company and higher motivation, they will pursue their work with a greater sense of commitment. Working harder means they increase their individual performance. Increased individual performance levels then lead to their performance being assessed more highly by their line managers.

So these performance assessments offer an opportunity to measure the psychological effects of employee share ownership as with the first research question and, in addition, to investigate the direct effect of employee share ownership on the behaviour of employees. Nonetheless, previous research has not studied whether participation in share ownership plans leads to an increased performance of participating employees. The second research question is therefore (Figure 3):

Research question 2:

Does employee share ownership have a positive influence on individual employee performance?

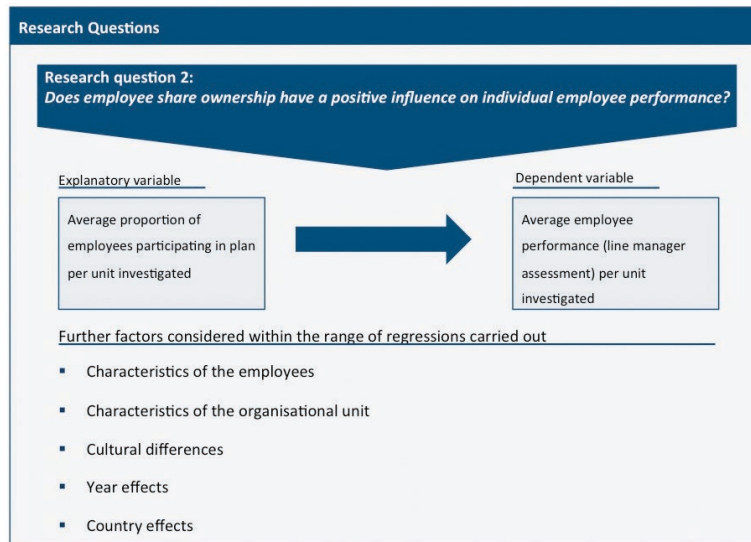


Figure 3: Employee share ownership and individual performance

Where individual performance increases due to employees participating in share ownership plans, the performance of the organisational unit also rises. This causal relationship leads to the assumption that increased participation in share ownership plans leads to a direct positive influence on the organisational performance.

Enhanced identification with the company and increased employee motivation directly influence the behaviour of employees, thus increasing the productivity of an organisational unit. Further, organisational performance is also increased where an employee share ownership plan can attract talented new staff to a company and ensure they remain with the company in the long term. In organisational units where costs of replacing staff are high, for example in specialised technical fields, employee share ownership plans are therefore worthy of particular attention from companies. A reduced fluctuation rate leads to expertise remaining in-company, increasing efficiency in the organisational unit and, in turn, an increase in its organisational performance.

Insufficient data meant that it was hitherto not possible to investigate the related question of whether an increased individual performance can be assumed to lead to increased business performance. Previous studies concentrated either on the productivity of employees or the business performance but did not analyse the relationship between these two aspects. This leads to the third and final research question relating to employee share ownership plans and their effect on organisational performance (Figure 4):

Research question 3:
Does employee share ownership have a positive influence on organisational performance?

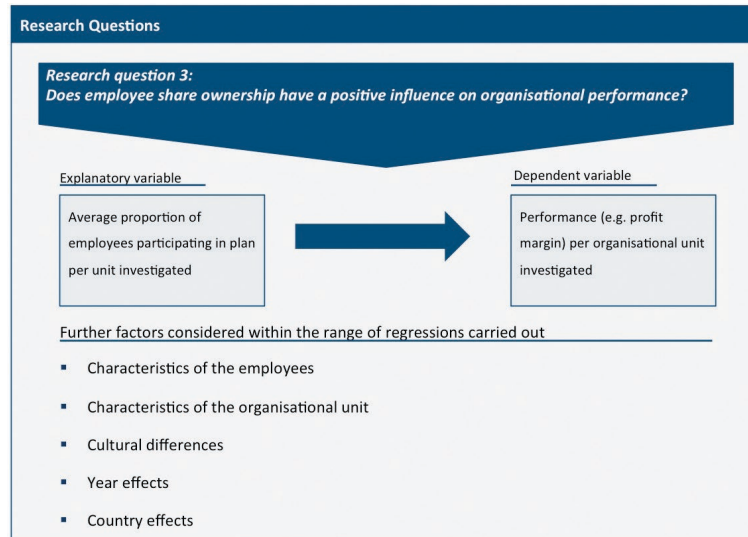


Figure 4: Employee share ownership and organisational performance

To summarise, the research questions asked in this study investigate which effects employee share ownership plans can have on company's employees and which effects can be seen at the organisational level. The focus of the study's empirical research is summarised in Figure 5.

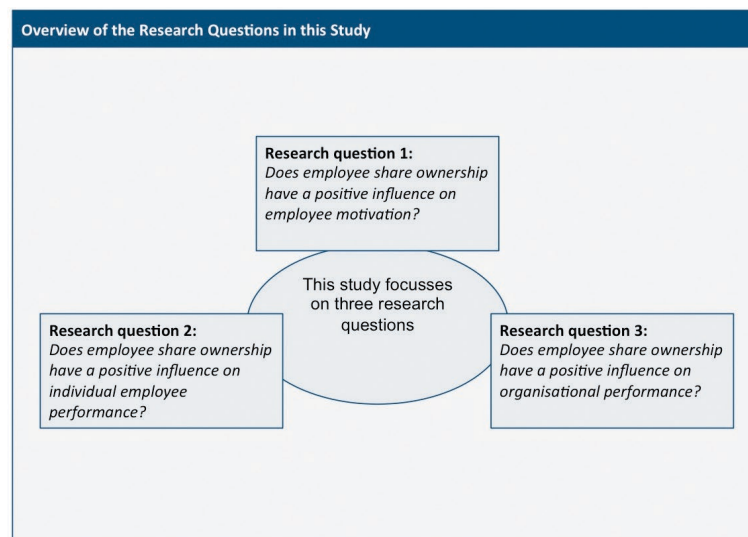


Figure 5: Overview of the individual research questions

Empirical Study Design

Rationale of the Research Approach Adopted

This joint study by the University of Göttingen and Siemens AG makes it possible to contribute in an innovative way to current international research activities in the field of stock-based or stock-oriented compensation schemes, especially on the effects of employee share ownership plans. Whereas previous studies have generally concentrated on remuneration schemes for upper management or comparisons of share-based remuneration between companies, this joint study enables a unique internal perspective taking into account the broader organisational context. Applying current standard econometric methods makes it possible to derive indications of the effects of the employee share ownership plans which can provide insights into their impacts which are relevant to both academic research and practical implementation in the field.

Share Ownership Plans at Siemens AG¹

The share ownership plans at Siemens AG for the general workforce and managerial staff were introduced across the board in 2008 and have been implemented worldwide in recent years. Prior to 2008, employees at Siemens AG in Germany had the opportunity to take part in the “Belegschaftsaktienprogramm” [Workforce Share Program] and management around the world received “Siemens Stock Awards”.

Today, Siemens AG offers approximately 97% of its employees in 60 countries the opportunity to acquire company stock with financial assistance from the company (see Figure 6). This means that voluntarily acquiring a stake in the company in the form of shares is open to almost every employee. The declared aim of this is to enable stock options for all staff regardless of their income level. Both employees and managers of Siemens AG have the chance to invest a certain portion of their salary or bonuses in company stock.

A further component of the “Share Matching Plan” allows employees who are not management staff to invest in shares under the “Monthly Investment Plan”. For a period of 12 months they can invest a certain amount from their salary in shares. Under this plan it is also possible to acquire parts of shares. This is designed to enable participation in the plan for employees who can or want to invest only a very small amount in shares; these might be production workers in countries with low wage levels, for example. The shares acquired under the “Monthly Investment Plans” are then carried over into the “Share Matching Plan” at the end of the period. The employees then also have the right to receive one “Matching Share” for every three shares which they retain for three years².

¹ Source: Siemens Company Report 2014

² Employees in Germany can additionally take part in the “Basis-Aktien-Programm” [Base Share Program]. Under this plan, they can invest a certain sum in shares, which is then supplemented tax-free by Siemens AG.

This unique starting position makes it possible to conduct a worldwide analysis of the employee share ownership plans over a period of several years from a company-internal point of view. This study is able to analyse complex impact mechanisms within the company because of its anonymised access to internal company data sets on employees' participation in the share ownership plans, aggregated employee motivation, aggregated individual employee performance and organisational performance.



Figure 6: Overview of share ownership plans at Siemens AG

Methodological Approach

For the present analysis, various company-internal data sets from Siemens AG were consolidated. As illustrated in Figure 7, the anonymity of the data was completely ensured: no data could be traced back to individual employees or specific organisational units. In this way, data for the period 2009 – 2013 was consolidated for an average of 270,000 employees or 9600 organisational units per year.

The starting point for the analysis was the measurement of employees' behaviour regarding participation in employee share ownership plans: to what extent individual employees took part in the plans. Further internal data was consolidated to carry out the analyses of motivation and performance. The motivation analysis is based on a company-wide internal survey of all employees regarding their motivation carried out by an external consultancy. A range of questions on motivation were used to establish a value for each employee's level of motivation. In order to preserve employee anonymity, an average value per organisational unit was used. The individual performance was measured using the performance assessments made by an employee's line manager. This was also calculated per organisational unit. The organisational performance was measured by means of a variety of company-internal indicators such as profit and free cash flow margin.

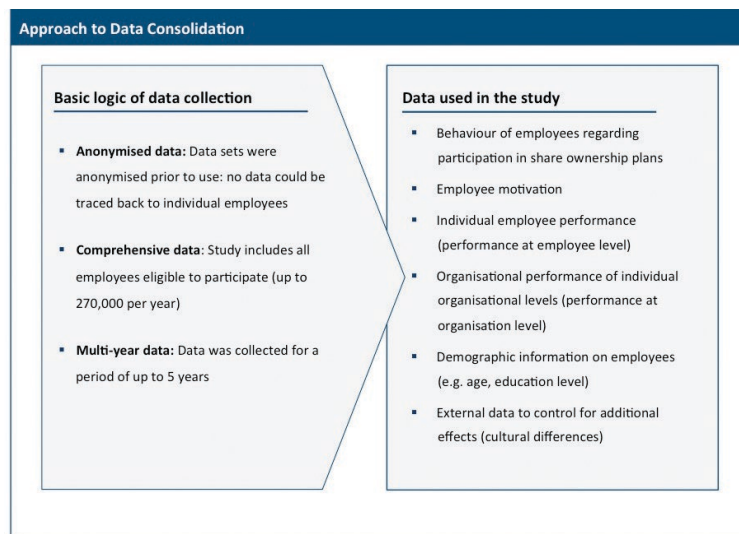


Figure 7: Data underlying the study

The following section describes how the design of this study addressed the typical challenges faced by empirical studies which have already been presented above in the section on the weaknesses of previous studies. Addressing these problematic areas in the study ensured the robustness and generalisability of its results (Figure 8).

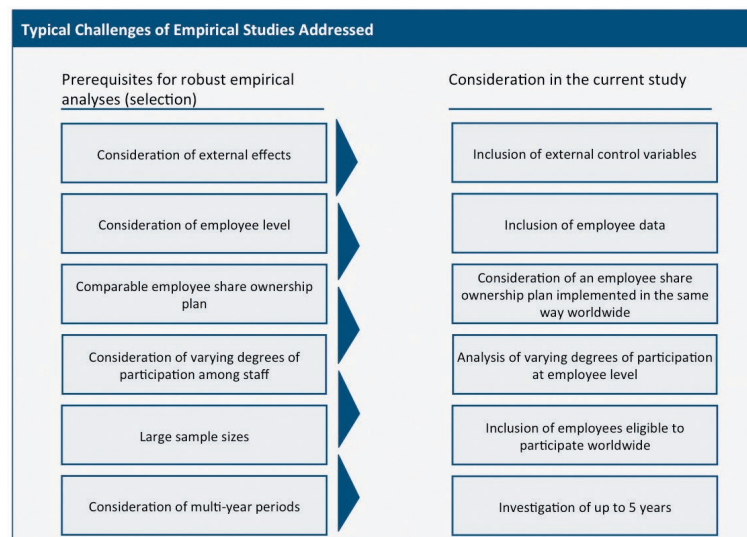


Figure 8: Empirical challenges taken into account in this study

In order to take into account further possible factors influencing employee motivation or performance at the individual and organisational levels, further additional data was included and considered within the empirical study. In particular, external data was included as a control for additional effects. It should be assumed that external factors can have an influence on the relationship between employee share ownership and employee motivation or performance. Examples here include factors relating to the surrounding economy or culture. The economic situation in a country or the profitability of specific sectors, for example, could have an influence on organisational performance. It might also be conceivable that staff motivation increases in times of crisis since jobs become scarce

and staff work particularly hard. Cultural differences could lead to employees in certain countries judging their own motivation differently or line managers assessing performance differently to their counterparts in other countries.

At the individual employee level it is important to control for factors which can have an influence on the effect of employee share ownership. However, previous studies have not taken the employee level into account in their analyses. One example of an important individual control variable is age; another is duration of employment in that company. It might be the case, for example, that younger employees are more liable to take risks than older ones and therefore invest more heavily in shares. Alternatively, older employees might have more assets than those just beginning their career and therefore be more willing to invest part of their income in shares. The factor 'duration of employment in a company' could influence feelings of identification with the company. It might also have a positive effect on employee motivation or the readiness to invest in shares.

In addition to controlling for a range of staff and country characteristics, the choice of analytical methods is decisive for the design of the study. Regarding the analysis of the effect of participation in share ownership plans on employee motivation, there are numerous conceivable influences which could explain the levels of employee participation in the share plans or the developments in performance. A multivariate analysis approach was chosen in order to control for these and other possible influences and thus to rule out the possibility of the study results actually being due to other, unobservable effects such as the economic situation in a country. Many studies only apply single variables, neglecting other conceivable impact mechanisms. These 'univariate' approaches are unsuitable for investigating complex mechanisms or controlling for a range of influences. By using multivariate analysis methodology, numerous factors can be considered simultaneously.

Organisational units within a company can only be compared with each other in a limited way. The differences between the units – the 'unobservable heterogeneity' – might be explained by specific management behaviour, for example. It is understandable that this type of property cannot be depicted in analyses but it can have an effect on organisational performance or employee contentment levels – in turn affecting motivation. The heterogeneity of these units means that a comparative, 'between' analysis is methodologically unsuitable: i.e. one organisational unit should not be compared to another. This is the reason for choosing a 'within' analysis for this study. This type of analysis examines the development of a unit through time and analyses, for example, any increase in participation in the share ownership plan within that organisational unit and how this increase affects the performance of that unit. So the problem of unobservable heterogeneity is addressed by the methodology of this study.

In addition to choosing a 'within' analysis, the choice of regression model can also address the problem of unobservable heterogeneity – i.e. the influence of factors that cannot be measured but which might distort the result. The regression procedures selected make certain assumptions about unobservable effects, such as whether the employees' preference for shares is time-invariant or not. In order to examine the research questions from different points of view, different regression procedures were applied. For example, this study uses an ordinary least squares model with clustered standard errors, a random effects model with clustered standard errors, and a generalised estimating equation model. In addition, the study controls for heterogeneity in the organisational levels examined by means of median-adjusted variables and the consideration of country- and region-specific effects. In total, more than 100 individual regressions were calculated for the empirical analyses, in order to examine the research questions from different points of view.

It is often the case that companies are compared, which in effect means that share ownership plans with different designs are being compared; this leads to the problem of distortion in the research results due to the heterogeneity of the share ownership schemes. However, where the analysis is carried out within one company, there are obviously no such problems with the comparability of the share ownership plan and company-specific effects can be avoided. For example, the specific economic situation of one company or its company culture may have an influence on the effects of any employee share ownership plan in that company. Concentrating on one single company ensures that these factors remain constant for all examined units and therefore there are no (partially) unobservable company-specific effects which could distort the result. Internal data at the level of the employees also make it possible to analyse individual behaviour in detail and this data is therefore superior to any data on the company available externally.

Furthermore, analysing at the employee level allows varying degrees of participation to be taken into account. Studies which simply analyse the existence of share ownership plans or just compare different companies with each other neglect to consider the fact that varying extents of participation have varying influences on the effect of the share ownership schemes within a company. For this reason, this study factors in the different degrees of participation at the organisational level, i.e. the average percentage of employees within each unit who participate in the scheme.

The results of most previous studies also only exhibit limited generalisability. Small sample size – analyses limited to a few companies in one country or a few sectors – does not allow for a robust verification of the general applicability of the study's results. This current study therefore starts with all employees eligible to participate. Since Siemens AG is operative worldwide and in a range of business fields and sectors, in this study it is also possible to factor in country- and sector- specific effects. This is significant because different economic situations in different countries could have an influence on the behaviour of employees regarding employee share ownership plans. The profitability of different sectors and the general current economic situation can, for example, have an effect on organisational performance in those sectors. For this reason it is important to control for these effects by choosing the largest feasible sample of units to be studied and thus ruling out the possibility of distortion in the results due to effects that cannot be covered by small sample sizes.

As well as the small sample size, another problematic aspect is carrying out the study at only one point in time. This disregards changes which occur over time, placing limitations on the statements which can be made regarding possible effects. Typical examples here include performance, which changes over time as the economic situation changes, and the performance or motivation of employees. Furthermore, statements on causality (the direction of the cause-effect relationship), can only be made to a limited extent. By carrying out the analysis at several points in time, appropriate methodology and design can be selected to ensure there is no reverse causality in the conclusions (it is not the independent variable which influences the dependent one but vice versa). Monitoring the data over a multi-year period makes a more comprehensive and realistic picture possible, enhancing the generalisability of the research results. This is why the regression analyses in this study included data for up to five years. Including data from the previous year allowed the study to control for deviations and possible delayed effects.

Results

For the three defined research questions, a range of regression models were calculated as described above and considering further factors. The following section describes the results of these analyses. Figure 9 presents an overview of the results.

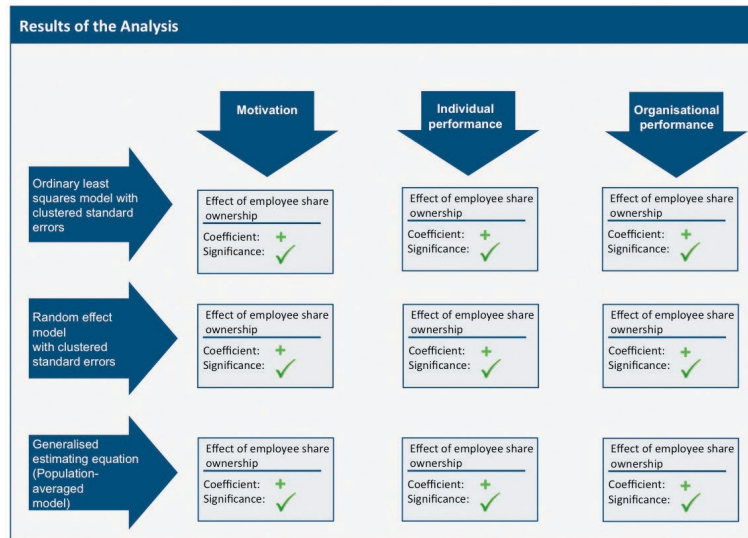


Figure 9: Analysis results

Motivation

There is a scientifically substantiated indication for the expected positive effect of stock ownership on employee motivation. Taking into account a range of control variables, country- and year-specific effects, and characteristics of employees and organisational units, and applying various empirical models, the analyses in this study revealed a significant positive relationship for the effect of employee share ownership on employee motivation. The measurement of this effect was based on the average stock ownership per organisational unit and the average motivation value of an organisational unit. Specifically, this means that with an increasing percentage of employees in a unit participating in share ownership schemes, the average employee motivation in that organisational unit rises. This study can therefore be seen to answer the first research question.

Performance

Employee level

In addition to the positive effect of employee share ownership plans on staff motivation, this study also reveals a direct significant positive influence of employee share ownership plans on staff performance. Specifically, this result means that with an increasing percentage of plan participants in an organisational unit, the average individual employee performance in that unit rises. This study can therefore be seen to answer the second research question.

Additionally, the result also takes into account the influence of year- and country-specific effects as well as individual characteristics of the employees and properties of the organisational unit. For example, the study controls for cultural differences between employees since these can play a role in the assessment of individual performance and therefore need to be considered in order to avoid any distortion in the results.

Organisational level

A positive correlation between employee share ownership plans and performance at organisational level can be expected, similar to that seen for individual employee performance. In this study, organisational performance was measured using various company-internal indicators. This revealed that the average performance of organisational units increases as the proportion of stock ownership among employees rises, answering the third research question. This analysis also controlled for country- and year-specific effects as well as staff characteristics and the properties of the organisational units. Institutional control variables such as market capitalisation expressed as a percentage of GDP were used to control for the size of the capital markets. Taking these control variables and specific effects into account, the answer to the third research question can be shown to be the confirmation of a significant, robust and positive correlation between employee share plan participation and organisational performance. With an increasing proportion of plan participants, performance at the organisational level rises.

Robustness and Generalisability of the Results

The robustness of the research results was checked using economic standards. As explained in the section on the research approach, this study's design addresses typical econometric challenges. For example, changes over time were addressed by considering year-specific effects. The study also controlled for the size of organizational units because this can, for example, indicate whether the unit is a production unit, which in turn has an influence on the performance value. Country-specific effects were also factored into the regressions in order to account for varying economic conditions in particular countries. Additionally, various statistical models were used for the analysis, which all confirmed the results as presented. Regression models sometimes make different assumptions about the characteristics and distribution of variables, for example, whether an unobservable effect such as individual management behaviour remains constant or changes over time. The application of various models allows for various effects to be controlled for, confirming the robustness of the research results.

Additionally, a range of dependent variables were also tested to guarantee the results' robustness. To check the effect of employee share ownership schemes on organisational performance, a range of indicators were used; these all led to the same result, which confirms the robustness of the research results for the independent variables, too. For example, profit can be significantly higher in one unit than in others if there was an acquisition in that particular year, and cash flow margins can also be influenced in one year or over a multi-year period by factors which are not directly observable. This can lead to a certain distortion in specific indicators at specific times. However, the large sample size justifies an assumption that these effects will balance themselves out. If the results stay unchanged despite different performance indicators, it can be assumed that the positive effect of employee share ownership on performance is not affected by conceivable distortions.

Typical econometric problems in empirical analyses were also addressed in these analyses and taken into account by using appropriate statistical methods. To this end, the study design factored in or controlled for unobservable heterogeneity, multicollinearity, heteroscedasticity and reverse causality.

The results can also be applied to other companies in various sectors or countries. In this regard, Siemens AG was an ideal company to study because its worldwide activities ensure the heterogeneity of its products, business sectors, workforce and the large number of countries included in the analysis. This all means that as far as the design and empirical nature of this research is concerned, there is no reason to doubt the generalisability of the core study results. In general, the positive effects of employee share ownership revealed by this study should also occur in other companies.

Outlook and Recommendations

As summarised in Figure 10, the empirical analyses demonstrate statistically significant and robust positive effects of employee share ownership plans.

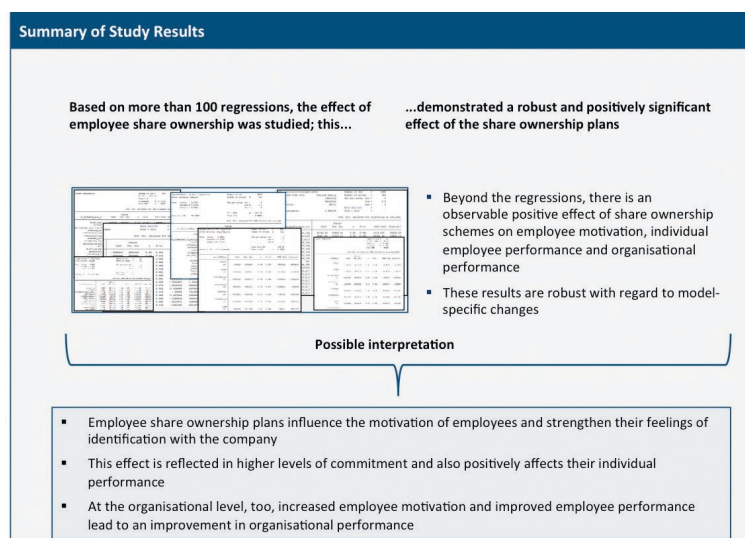


Figure 10: Results

The results show that extending share ownership plans to employees can strengthen the motivation of staff and their feelings of identification with the company. Additionally, the results indicate that participation in share ownership plans can have a direct effect on the behaviour of employees and therefore increase their individual performance. The improved individual performance is also reflected in a rise in organisational performance, which means it can be assumed that employee share ownership plans can enhance organisational performance in the long term. Therefore, the study results provide a range of indications to support the claim that employee share ownership plans can be a suitable and important instrument for incentives within the employer-employee relationship. They also support a call for more focus on this type of employee participation, from both researchers and companies themselves.

This study can be seen to provide an important contribution to current international research in the area of stock-based or stock-oriented compensation schemes. Unique access to data sets at the employee level, enabling consideration of company-internal impact mechanisms, allowed this study to perform the first analysis of a globally implemented employee share ownership plan. In this way, weaknesses in previous analyses could be addressed and research results could be significantly expanded.

From a practical point of view, the study results confirm there are good reasons for companies to set up employee share ownership plans. The results indicate that share ownership plans are a suitable instrument to enhance the motivation of employees and increase their commitment to the company. Company performance can also be raised by means of employee share ownership schemes. However, the advantages of these programs will only be achieved if certain success factors are considered, which are presented in Figure 11.

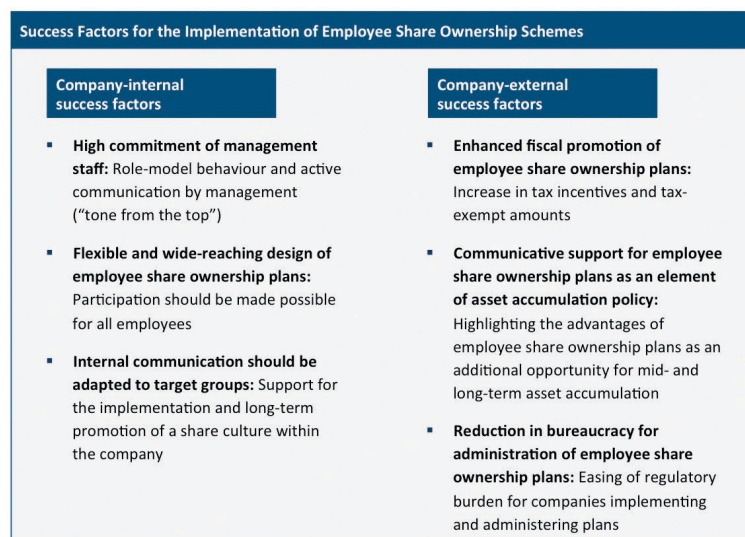


Figure 11: Implications of the study results

These indications also suggest that the issue of employee share ownership deserves more attention within companies themselves. For successful implementation, specific conditions need to be established both within companies and in the general business environment. Within companies, employee share ownership plans offer an opportunity to motivate employees and assist long-term positive business development but this requires management support. As role models, management staff need to actively promote a culture of participation within the company and communicate this ("tone from the top"). Additionally, employee share ownership plans in companies need to be designed in such a way that they allow participation for all employees; an example would be enabling small amounts to be invested by employees with low incomes. Ongoing and targeted communication, both globally and locally, is also necessary to support the implementation of employee share ownership plans and to maintain long-term awareness of the schemes among employees. In particular, local communications strategies adapted to the individual characteristics of the workforce structure of a country can contribute to a scheme's success, since this type of communication can more easily take into account cultural differences and the situation in individual countries. One example here would be for a communication strategy to reach production staff who often do not have an e-mail account or use media such as the company intranet. So this group of employees need to be addressed with other approaches, such as an information stand at the workplace. Global management needs to be included in the communication, but increasing involvement of local management staff also helps since they have a closer operational relationship to their staff.

Broader support for employee share ownership plans across companies requires stronger fiscal promotion of the plans, such as an increase in the tax-exempt investment amounts. This could make employee share ownership plans more attractive. Additionally, employee share ownership plans need closer attention as an element of mid- and long-term wealth creation. The current period of low interest and a lack of other attractive investment opportunities would make company stock options for employees a useful form of wealth creation worthy of fiscal incentives. Here, too, communication plays an important role in raising awareness of the importance of private wealth creation. A comparison with other countries shows that the potential of employee share ownership in Germany is by no means exhausted; the results of this study show it is worth investing in this field. Furthermore, advantages would be gained by reducing the bureaucracy involved in setting up and administering these schemes, especially as far as the regulatory demands are concerned. In particular, laws and regulations relating to accounting, employment and capital markets all have to be considered when a company considers setting up an employee share ownership plan.

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Authors



Prof. Dr. Michael Wolff - Georg August University, Göttingen

Prof. Dr. Michael Wolff is a university professor and incumbent in the Chair of Management and Control at Georg August University in Göttingen. Before starting at the University of Göttingen, he was Professor for Corporate Governance at the Johannes Gutenberg University in Mainz and Consultant at McKinsey & Company. He studied at the Johann-Wolfgang von Goethe University in Frankfurt and gained his Dr. rer. Oec. at the HHL-Leipzig Graduate School of Management.

In addition to questions of business strategy and governance, his main re-search areas are the design and implementation of incentive systems for management and employees as well as their influence on company behaviour and business performance. Prof. Dr. Michael Wolff has published numerous articles in the German and international specialist press covering both theoretical and practical aspects of these issues. He also teaches in the fields of company strategy, value-oriented company management and corporate governance for postgraduate, MBA and PhD courses.

Contact: Michael.Wolff@wiwi.uni-goettingen.de



Ulrike Zschoche - Georg August University, Göttingen

Ulrike Zschoche is a research assistant and PhD student at the Chair of Management and Control in the Faculty of Economic Science at the Georg August University, Göttingen. Her particular areas of research focus are the determinants and effects of incentive systems and employee share ownership plans.

Ulrike Zschoche graduated with a Bachelor in International Management from the Otto-von-Guericke University, Magdeburg, and a Master in Business Management from the Georg August University, Göttingen.

Contact: Ulrike.Zschoche@wiwi.uni-goettingen.de

Contact:
Chair of Management and Control
Prof. Dr. Michael Wolff
Platz der Göttinger Sieben 3
37073 Göttingen
Germany
Phone: +49 (0)551 / 39-7275
Fax: +49 (0)551 / 39-7274
Email: Michael.Wolff@wiwi.uni-goettingen.de
controlling@wiwi.uni-goettingen.de

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Wirtschaftswissenschaftliche Fakultät
Professur für Management und Controlling