Determinants of Flexible Work Arrangements

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Abstract

Flexible work arrangements such as allowing employees to work at home are used in firms, especially since information and communication technologies have become so widespread. Using individual-level data from 10,884 German employees, this paper analyses the determinants of working at home as a form of flexible work arrangements. The analysis is based on descriptive analyses and a discrete choice model using a probit estimation approach. The results reveal that men have a higher probability to work at home but women are more likely to work at home intensively. Education, tenure and the use of computers increase the probability of working at home while firm size and a young age of employees reduce it. Having children less than six years old, overtime and work time have a positive impact on both working at home and on working at home intensively.

Keywords: work at home, telecommuting, home office, workplace organisation
JEL-Classification: J01, J10, J20

1 Introduction

Flexible work arrangements such as the opportunity to work at home are increasingly widespread among firms and employees, especially in the U.S. (e. g. Noonan et al. 2012). Since information and communication technologies (ICT) have been applied in nearly every firm, it is now easier than ever for firms to offer these arrangements to their employees or for employees to make use of them. Taking regular work home from time to time is the most common way of working flexibly. If work output is delivered to the firm by ICT, the work arrangement is known as telecommuting. Telecommuters usually maintain a traditional office in the firm but have the opportunity to work at home or in telecentres around one to three days a week (Hill et al. 1998). Telecommuting arrangements are usually agreed by contract. A special form of telecommuting is the case where employees work all their hours at home without having an office in the firm.

By making use of flexible work arrangements, women can work and provide child care at the same time (Noonan et al. 2012). Another important benefit of telecommuting is the reduction of commute time and commute stress for employees as well as the associated reduction in road congestion and pollution (Mokhtarian 1991). In line with that, telecommuting may reduce firm expenses and enhance work-life balance at the same time leading to higher employee productivity (Hill et al. 1998). Furthermore, firms can organize teamwork across different locations more efficiently by online collaboration (TNS Infratest and ZEW 2014).

Most of the studies carried out so far on the factors that influence working at home or telecommuting show mixed results. A large amount of studies point towards the fact that married female employees are more likely to telecommute compared to married male employees (e. g. Yap et al. 1990). According to Mokhtarian et al. (1998) and Popuri et al. (2003), the presence of young children in the household is also an important determinant of telecommuting. Many studies suggest that education plays a crucial role regarding telecommuting as well as the work time. The higher the education levels of employees, the higher the share of telecommuters of a firm (Perez et al. 2004 or Peters et al. 2004). According to Peters et al. (2004) and Noonan et al. (2012), telecommuters work more hours compared to non-telecommuters. In contrast, IT-skills in particular have no significant impact on telecommuting (Belanger 1999; Peters et al. 2004). The studies of Mokhtarian et al. (1997) or Popuri et al. (2003) and Perez et al. (2004) show that the need for interaction or teamwork with colleagues at the workplace are factors

that reduce telecommuting. The distance from home to the work place is found to be irrelevant for the decision to telecommute by Mannering et al. (1995) while Popuri et al. (2003) and De Graaff et al. (2003) find that age and tenure have mixed impacts. The newest study on this topic conducted by Brenke (2014) is a descriptive analysis which shows that working at home depends very much on the vocational field and qualification level. Moreover, age has no impact on working at home in his study while men work slightly more often at home than women. The presence of children leads to more working at home as well. Employees working in a full-time job work more often at home than employees working only part-time.

Using individual-level data from the BIBB/BAuA employee survey of 2006, containing information on 10,884 German employees, this paper analyses the determinants of flexible work arrangements such as working at home and working at home intensively. Both variables are dummy variables. Working at home takes the value one if employees work at home at least rarely and zero if they do not work at home at all. Working at home intensively takes the value one if employees work always or frequently at home and zero if they work sometimes, rarely or never at home. As an analytical framework, I employ a discrete choice model with working at home and working at home intensively being the outcome variables. The explanatory variables comprise employee and firm characteristics such as gender, the presence of children under six years old, education, vocational field, firm size and computer use.

The results reveal that men have a higher probability of working at home while women are more likely to work at home intensively. The presence of children less than six years old is positively related to both working at home and working at home intensively without dividing the sample by gender. A higher qualification level of employees and the use of computers encourage working at home, while employees who work in middle-sized or large firms are less active in this work arrangement. Younger employees aged less than 30 years also have a lower probability to work at home. Tenure, overtime and work time are associated with working at home while overtime and work time are positively associated with working at home intensively as well. Employees aged 50 or older are more likely to work at home frequently or always than employees between 30 and 50 years while employees younger than 30 years are less likely to work at home. Firm size reduces the probability of working at home intensively.

The paper is organized as follows: Section 2 provides an overview of the literature on flexible work arrangements. Section 3 describes the database and gives a first insight into the determinants of flexible work arrangements whereas section 4 presents the analytical framework and establishes the estimation approach. The estimation results are presented in section 5. Finally, section 6 concludes and gives an outlook on possibilities for future research.

2 Literature Review

This section positions the present paper in the literature and provides definitions of the different forms of flexible work arrangements as well as an overview of the theoretical and empirical studies completed so far on this topic. Most of the existing literature focuses on the determinants of telecommuting, leaving aside other forms of flexible work arrangements like flexitime where employees have the opportunity to schedule their work hours flexibly. Moreover, most economic studies on this topic use data from U.S. firms or employees. This is because U.S. firms were the pioneers of telecommuting for a long time. In 2011, 50 million employees in the U.S. who wanted to work at home have jobs that are at least compatible with telecommuting (Harnish et al. 2011). Matthews et al. (2005) estimated for the year 2012 that over 50 million U.S. workers, which is around 40 percent of the working population, could work from home at least part of the time while in the year 2010, 24 percent of employed Americans reported that they worked at least several hours per week at home (U.S. Bureau of Labor Statistics 2011).

In comparison to the USA, around 21 percent of German firms offered their employees the opportunity to telecommute (Statista 2012) while 4.7 million employees, being 13 percent of the workforce, worked predominantly or sometimes at home in the year 2012, although this number is decreasing since the year 2008 (Brenke 2014). A recent study conducted among ICT companies shows that 57 percent of firms offered their employees the opportunity to work at home in the year 2013 while only 12 percent of employees in the ICT sector made actually use of this opportunity (TNS Infratest and ZEW 2014).

There are various forms of flexible work arrangements. Let us first define the opportunity to work at home in general. For the purposes of this paper, "working at home" as an arrangement is when a part of the work of an employee is done at home. Working at home

is not necessarily fixed in employees' contracts. It is instead often a verbal agreement between employers and employees. The opportunity to work at home can be specified in different ways. Employers can offer their employees the possibility of telecommuting or to work at home full time. In both cases, firms can fix these work arrangements in employees' contracts or they can simply agree verbally. There are various definitions of telecommuting. The most common one is that employees work some hours of their work time or some days per week at home or at other suitable places like telecentres (Hill et al. 1998). The most common work place for telecommuters is at home. Employees deliver work output to the firm by using information and communication technologies. For instance, employees are able to access the server of the office, personal files and emails as well as to participate in video conferences and thus work almost as if they were in the office (De Graaff et al. 2003).

Telecommuting may enable women to more efficiently compete in the workplace in a way that facilitates child care at the same time (Noonan et al. 2012). Menezes et al. (2011) describe the rise of flexible work arrangements in the UK and mention that parents of young and disabled children gained the legal right to work flexibly in the UK in 2003. The law was extended to carers in 2007 and to parents with children under the age of 16 years in 2009 which points towards children being an important factor for promoting flexible work politically. Another key reason for telecommuting is the reduction of commute time for employees as well as the associated reduction in road congestion and pollution as a consequence (see Mokhtarian 1991 or Handy 1995). A special form of telecommuting is that employees work both their regular work time and overtime exclusively at home. This form might also be contractually fixed. In general, telecommuting can be performed best in the service sector in general, but especially in the financial sector or high-tech sectors as the technical requirements are provided best in these industries (Noonan et al. 2012; Tung et al. 1996; Monitoring Report of the ZEW and TNS Infratest 2014).

A large amount of research has been completed especially on the adoption of telecommuting in firms. First studies on this topic emerged in the mid-eighties. As information and communication technologies are crucial for telecommuting and those technologies have changed a lot since the 1980s, the meaning of telecommuting is different today. In the 1980s and 1990s, when information and communication technologies were far less evolved, employees could carry out simple tasks at most, but did not have the opportunity to deliver their work through those technologies to the firm. Only in the 1990s,

they could access their emails at home and could deliver work output still in a very limited way, by sending small email attachments. Only since around the year 2000 have the technologies developed to the point where the delivering of work output is possible by accessing the server of the firm with help of a client and uploading content. Thus, the evolving meaning of telecommuting must be considered in the review of the current literature on the topic.

An early analysis by DeSanctis (1984) investigates descriptively the attitudes towards telecommuting of managers and programmers of anonymous computer service firms. The study finds that the presence of children has no significant relationship with telecommuting, but women prefer telecommuting compared to men. Distance to the workplace and tenure play no significant role for telecommuting while overtime, supervisory duties and the need to interact with colleagues are relevant factors that do not support telecommuting.

Kraut (1989) focuses in an econometric study on the trade-offs of telecommuting in the U.S. This study finds the result that older workers are more likely to work at home. Kraut (1989) argues that this might be the case because they are less physically vigorous and prefer shorter commutes. Workers who live in rural areas and have work- or transportation-limiting disabilities are also more likely to telecommute. Women who are married and have young children have a higher propensity to work at home than unmarried women without children.

A small descriptive study among female computer professionals in Singapore conducted by Yap et al. (1990) reveals that telecommuting is considered as an alternative work arrangement if women are married, have a relatively high proportion of work that can be done at home and are stressed by commuting to the regular workplace. In addition, women who have a study room at home prefer to telecommute.

An econometric study conducted by Mannering et al. (1995) with different U.S. data sets analyses the factors that favour the frequency of telecommuting. They find that household size, the degree of control over scheduling job tasks and the possibility to borrow a computer from the firm as well as having children less than five years old for women are factors positively related to the frequency of telecommuting in all their models. Moreover, employees with more vehicles in the household telecommute more frequently as well as employees who supervise other employees. In contrast, factors

like distance to work, hours worked, managerial and professional occupation and the amount of time spent in face to face communication are not significant for the frequency of telecommuting.

A further econometric study is conducted by Mokhtarian et al. (1997). The study analyses the preference for telecommuting using U.S. individual-level data. The estimation results show a positive and significant relation between the preference for telecommuting and parental leave, commute stress as well as leisure and commute time. On the other hand, the need for interaction with colleagues in the workplace as well as distraction at home has a negative impact on the preference for telecommuting. Gender is insignificant for the preference for telecommuting in this study, although the results show that women feel more stressed by commuting.

Mokhtarian et al. (1998) use econometric methods to investigate employees' preferences for working in the office, in telecentres or at home. The main finding is that the presence of children younger than two years of age triggers the preference of home-based telecommuting. In contrast, household size is negatively correlated with the preference of telecommuting at home. Employees who have worked for a long time in their current position are less likely to prefer home-based telecommuting. Mokhtarian et al. (1998) argue that they might be more resistant to changes of workplace. Regarding telecommuting at telecentres, employees' age plays a significant role. Older employees prefer telecommuting at telecentres rather than at home as they might be more risk-averse or have a preference for a workplace similar to the office.

Belanger (1999) analyses descriptively workers' propensity to telecommute in a high-tech organisation. The case study finds that women have a greater propensity to telecommute than men. In contrast, the age of employees, tenure as well as computer skills show no difference between telecommuters and non-telecommuters.

De Graaff et al. (2003) investigate the determinants of at-home and out-of-home work econometrically. They find that possessing a modem increases the probability of working at home. Furthermore, the results indicate that the propensity of working at home rises with educational level and falls with age.

Popuri et al. (2003) estimate a joint model of telecommuting choice and telecommuting intensity. The results show that women are less likely to telecommute if they have no children. If there are children in the household, women have a higher probability to telecommute intensively than men. Moreover, the study indicates that older employees are more likely to telecommute frequently. Marital status plays an important role for telecommuting as well. Employees who are married have a higher propensity to telecommute and do it more frequently. According to the authors, the explanation might be that married employees are more committed to household obligations than unmarried employees. Education has a small but significant impact on telecommuting. Employees who possess a college degree are more likely to work at home. Other job-related factors such as tenure and working full-time have a positive effect on telecommuting and its frequency while the need to interact with colleagues lowers the propensity of telecommuting.

A theoretical paper by Perez et al. (2004) discusses the adoption of telecommuting in firms by using a technology adoption model. Factors that are relevant for the adoption decision of telecommuting in firms in a positive way are the intensity of information and communication technologies used in the firm, the educational level of employees, training, geographical decentralisation, outsourcing and tenure of employees. Teamwork of employees has a negative influence on adopting telecommuting while firm size and gender of employees play no significant role for the adoption decision.

Peters et al. (2004) analyse econometrically the opportunity, preference and practice of telecommuting with a representative sample of the Dutch labour force. The study reveals that telecommuters work more hours and have a greater commuting time than non-telecommuters. On average, employees who practice telecommuting are highly educated compared to those who would only prefer to do so. Regarding organisational characteristics of the firms, employees who work in firms with at least one subsidiary are more likely to telecommute.

A recent econometric study on telecommuting was conducted by Noonan et al. (2012). The central result of this study is that telecommuting in U.S. workplaces is linked to long working hours and overtime. This might lead to an intensification of work demands instead of relieving employees. In general, parents are only slightly more active in telecommuting than non-parents. Furthermore, the study shows that mothers do not telecommute more than fathers. Thus, it seems that telecommuting is not used primar-

ily by women to improve child care without taking a complete break from work. In addition, college-educated employees have a higher probability of telecommuting than the population as a whole.

The newest descriptive analysis on this topic which is until now the only one using German individual-level data is done by Brenke (2014). Brenke (2014) considers a time period from 1992 to 2012. The results of his study indicate that the share of employees working at home has hardly changed over the years. Moreover, he shows that vocational field and qualification level are crucial determinants for working at home. Moreover, age is no determinant for working at home while men work slightly more often at home than women. The presence of children increases working at home as well. Employees working full-time also work more often at home than employees working only part-time. My study differs from Brenkes (2014) study by using econometric methods for the analysis with German individual-level data.

The summary of the studies on the determinants of working at home and telecommuting in particular shows the following results: most studies point towards the fact that being a woman and married has a positive influence on telecommuting. The presence of small children in the household also represents a crucial determinant for telecommuting. A large amount of studies also suggest that education plays an important role regarding telecommuting as well as the vocational field and the work time. The higher the educational level of employees, the higher the share of telecommuters. On the other hand, the need for interaction with colleagues at the workplace and teamwork are factors that have a negative impact on telecommuting. Commute time as well as age and tenure have mixed impacts on the decision to telecommute.

3 Description of Data

The dataset used in this study is the Employee Survey of the Federal Institute for Occupational Safety and Health (Bundesanstalt für Arbeitsschutz und Arbeitsmedizin, BAuA) and the Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung, BIBB) conducted in 2006. It is a representative survey of about 20,000 employees who are between 15 and 70 years old and work at least 10 hours per week in Germany. The survey was conducted via computer-assisted telephone inter-

views (CATI).[1] The survey contains detailed information about employees and their workplaces. It focuses on job characteristics, skill requirements, education, training and conditions of work. I use the survey of 2006 for my analysis as the information about flexible work arrangements is only included in this wave.

The central research question of this paper treats the factors which trigger working at home and working at home intensively. Based on the results of the previous literature, I expect the most important determinants to be gender, the presence of children, age, education, firm size, computer use, tenure as well as commute time, overtime, work time and industry. I use these factors for a descriptive analysis in a first step. I then investigate the determinants with econometric methods. The difference between this study and the previous studies concerning this topic is that I investigate this research question econometrically with a German data set while most of the previous studies were done with U.S. data sets. Only one recent study is done descriptively by Brenke (2014) using German data until now.

Flexible work arrangements are measured in the BIBB/BAuA survey of 2006 via four variables. The first measures if the employees work at home at least rarely. With this information I construct a dummy variable that takes the value one if the employees work at home at least rarely and zero if they do not work at home at all. The second variable represents working at home intensively. It is a dummy variable that takes the value one if employees work always or frequently at home and zero if they work sometimes, rarely or never at home. The third variable represents telecommuting if working at home consists in telecommuting agreed by contract. Again, the dummy variable for telecommuting takes the value one if the opportunity to work at home is related to telecommuting agreed by contract, and zero otherwise. Only employees who work always or frequently at home are considered as potential telecommuters in the survey as working at home rarely or only from time to time is considered an exception. The last form of flexible work arrangement is represented by a dummy variable for working at home completely. The variable takes the value one if the employees who have the opportunity to work entirely at home as agreed by contract and zero otherwise.

Table 1 shows summary statistics for all variables that measure flexible work arrangements as well as the potential determinants. 30 percent of the employees work at home.

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[1]BIBB/BAuA 2012 is the most recent of the BIBB Employee Surveys, which were conducted in a similar way in 1979, 1986, 1992, 1999 and 2006. See Hall (2009) for further information about the 2006 survey.

Table 1: Summary Statistics

Variable	Mean	N
work at home (share of employees)	0.30	10,884
intensive work at home (share of employees)	0.12	10,884
telecommuting (share of employees)	0.014	10,884
work at home entirely (share of employees)	0.006	10,884
male (share of employees)	0.47	10,884
female (share of employees)	0.53	10,884
children < 6 years (share of employees)	0.14	10,884
no degree (share of employees)	0.005	10,884
only secondary school (share of employees)	0.03	10,884
secondary school and vocational education (share of employees)	0.55	10,884
only Abitur (share of employees)	0.02	10,884
Abitur and vocational education (share of employees)	0.30	10,884
Abitur and studies (share of employees)	0.09	10,884
age (years)	41.79	10,884
share of employees < 30 years	0.13	10,884
share of employees 30–50 years	0.63	10,884
share of employees > 50 years	0.24	10,884
work with computers (share of employees)	0.82	10,884
tenure (years)	12.50	10,884
overtime (hours per month)	14.62	10,884
work time (hours per week)	39.17	10,884
commute time (minutes)	24.46	10,884
firm with 1 - 19 employees (share of employees)	0.24	10,884
firm with 20-99 employees (share of employees)	0.28	10,884
firm with > 100 employees (share of employees)	0.48	10,884

Source: BIBB/BAuA Employee Survey 2006, own calculations.

Table 1 further indicates that 12 percent of employees work at home frequently or always. Telecommuting is done by 1.4 percent of employees and 0.6 percent of employees have an agreement by contract to work only at home. Due to the fact that the share of employees who telecommute and work entirely at home is so low that the dummy variable has hardly any variation, I focus in this study on the first two measures of flexible work arrangements. Concerning gender, 47 percent of employees in the sample are male while only 14 percent have children in pre-school age. The qualification structure of employees reveals that most of the employees have either secondary school and vocational education (55 percent) or Abitur[2] and vocational education (30 percent).

The average age of employees is around 42 years. 82 percent of employees work with computers showing that computers were integrated in most work tasks in the year 2006.

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[2]The German Abitur is the qualification gained in Germany by students completing their secondary education, usually after twelve or thirteen years of schooling. It is comparable to GCE Advanced Levels, the International Baccalaureate or Advanced Placement tests.

Employees worked in their current jobs for 12.5 years on average and they work around 15 hours of overtime per month. The average work time of employees is about 39 hours per week including overtime and additional part-time jobs while the average commute time is around 25 minutes. Concerning firm size, the three size classes show that almost half of the employees are employed in large firms with at least 100 employees.

Table 2: Descriptives I

Variable	Working at Home	No Working at Home	T-Test
share of men	0.47	0.47	0.0002 (0.023)
share of women	0.53	0.53	0.0002 (0.023)
share of men with children < 6 years old	0.17	0.16	-0.015 (-1.380)
share of women with children < 6 years old	0.13	0.12	-0.005 (-0.554)
average age (years)	43.29	41.15	-2.139*** (-10.214)
share of employees < 30 years	0.08	0.15	0.070*** (10.048)
share of employees 30–50 years	0.64	0.62	-0.012 (-1.214)
share of employees > 50 years	0.28	0.23	-0.057*** (-6.406)
average tenure (years)	12.93	12.32	-0.609*** (-2.980)
average commute time (minutes)	25.05	24.20	-0.849*** (-2.044)
average overtime (hours per month)	19.22	12.69	-6.543*** (-16.499)
average work time (hours per week)	41.49	38.19	-3.295*** (-13.923)
share of employees working with a computer	0.86	0.80	-0.063*** (-7.831)
1 - 19 employees	0.27	0.22	-0.044*** (-4.957)
20 - 99 employees	0.34	0.26	-0.206*** (-15.632)
> 100 employees	0.39	0.52	0.208*** (14.203)

Source: BIBB/BAuA Employee Survey 2006, own calculations. T-statistics in parentheses.
*: 10%, **: 5%, ***: 1%.

Other studies often show differences between men and women concerning work at home. Table 2 shows that 47 percent of the employees who work at home are men while 53 percent of employees who work at home are women. The shares of employees who do not work at home are the same for men and women. Both shares are the same as the share of men and women in the whole sample. The t-test that serves the purpose of testing the difference between employees working at home and those who do not is insignificant for both genders.

The presence of children is often mentioned as a reason for why women prefer telecommuting. As women are involved in child care more intensively than men, telecommuting might be a good way of providing work and being able to care for children at the same time (Mokhtarian 1997). Table 2 presents the shares of employees with children less

than six years old by gender and engagement in working at home. 17 percent of all men who work at home have children less than six years old while the share of men who do not work at home and have children in this age group is 16 percent. The corresponding shares for women are 13 and 12 percent. The t-tests of differences in mean for men and women who have children in this age group with respect to working at home is insignificant in both cases. The results show that a higher share of men has children less than 6 years old than women. This result might be driven by the fact that a part of the women having children in this age group does not work at all and is therefore not included in the sample. The result that there is no significant difference for both genders is surprising as the opportunity to work and provide childcare at the same time is discussed as one main reason for working at home in the literature on this topic. On the other hand, the fact that many women in the sample work full-time might explain this result.

In order to analyse if the age of employees plays an important role for flexible work arrangements, Table 2 also lists the average age of employees as well as the share of employees in different age groups with respect to working at home. Employees who work at home are about 43 years old on average, while employees who do not work at home are about 41 years old. The age difference is rather small for these two categories but nonetheless significant. The share of employees over 50 years old is larger among those working at home while the share of employees under 30 years old is larger among those not working at home. Both differences are significant suggesting that with an increasing age, working at home occurs more often which is consistent with the result of the average age.

I investigate if the tenure of employees might have an influence on working at home as well. Employees who have worked for a longer time in a firm and are more experienced might get the opportunity to work at home more readily than newer employees (Belanger 1999). Employees who work at home are employed in the firms for around 13 years on average. Employees who spend all their work time in the office are employed for 12 years on average. The difference in tenure is only a few months, but significant.

A large literature, e. g. Peters et al. (2004), dealing with the topic of telecommuting mentions the distance to the workplace as a relevant determinant. Table 2 shows that the average commute time to the workplace is 25 minutes for employees who work at home and around 24 minutes for employees who work entirely at the office. According to the t-

test, this difference is significant suggesting that employees with a shorter commute time work more seldom at home than employees who have a longer commute time, although a difference in commuting of about one minute is negligible for employees.

Several studies on the topic of telecommuting argue that overtime might play a role for telecommuting (e. g. Noonan 2012). Additional hours of work beside the regular work time represent overtime. Table 2 sheds some light on this issue. Employees who work at home have around 19 hours of overtime per month on average while employees who do not work at home have around 13 hours. Concerning regular work time, Table 2 indicates that employees who work at home work about 41 hours per week on average while employees who do not work at home work 38 hours per week. The differences are both significant.

In conjunction with overtime, the regular work time which is contractually fixed might be relevant. It may be the case that employees who have a full-time job are supposed to work more additional hours than employees who work only a part-time job. Table 9 in the Appendix shows that employees who work overtime have a contractually fixed work time of about 40 hours. In contrast, employees who do not work additional hours have an average work time of about 33 hours. It seems that employees who have longer working hours are indeed the ones who tend to work more additional hours.

Many empirical studies about telecommuting, e. g. Noonan et al. (2012) argue that this work arrangement is best deployable in jobs where employees work with computers. In IT-intensive sectors, telecommuting is particularly well established. Table 2 shows that the share of employees who work with computers is 86 percent for those who work at home and 80 for those who work completely at the firm. The t-test indicates that the difference between both mean values is significant.

A further factor which may be relevant but at the same time ambivalent for working at home is firm size. It may be the case that employees who work for larger firms have more opportunities to work at home. The reason for that is that large firms' technical and organisational structure leaves them more disposed to offer flexible forms of work arrangements. The Monitoring Report conducted by TNS Infratest and ZEW (2014) shows that flexible work arrangements are indeed diffused especially in large firms in the ICT sector. On the other hand, smaller firms may have a more familial business culture. The idea behind a familial business culture is that it is built on trust towards

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employees concerning their work. Firms trust them to fulfil their work tasks outside the workplace without being supervised. Thus, employees in small firms may work at home more often. Table 2 indicates that 27 percent of employees who work at home are employed in small firms with one to 19 employees while 34 percent are employed in middle-sized firms with 20 to 99 employees. The corresponding shares of employees who do not work at home and are employed in firms of those size are 22 and 26 percent. The t-tests indicate that the shares of employees working in small and middle-sized firms are higher for employees who work at home. The results for large firms with more than 100 employees are reversed. The share of employees working in large firms is 39 percent for employees who work at home and 52 percent for employees who do not work at home. The results are again significant.

Table 3: Descriptives II

Variable	Working at Home Intensively	No or Rarely Working at Home	T-Test
share of men	0.41	0.48	0.070*** (4.760)
share of women	0.59	0.52	-0.070*** (-4.760)
share of men with children < 6 years old	0.17	0.16	-0.015 (-0.926)
share of women with children < 6 years old	0.13	0.12	-0.011 (-0.935)
average age (years)	44.76	41.38	-3.372*** (-11.430)
share of employees < 30 years	0.06	0.14	0.078*** (7.925)
share of employees 30–50 years	0.58	0.63	0.051 (3.564)
share of employees > 50 years	0.36	0.23	-0.129*** (-10.183)
average tenure (years)	14.28	12.26	-2.019*** (-7.011)
average commute time (minutes)	24.74	24.42	-3.266 (-0.557)
average overtime (hours per month)	19.46	13.96	-0.027*** (-2.728)
average work time (hours per week)	41.72	38.82	-2.900*** (-8.642)
share of employees working with a computer	0.83	0.81	-0.015 (-1.313)
1 - 19 employees	0.24	0.24	-0.002 (-0.0184)
20 - 99 employees	0.46	0.26	0.134*** (12.956)
> 100 employees	0.30	0.50	0.208*** (14.203)

Source: BIBB/BAuA Employee Survey 2006, own calculations. T-statistics in parentheses.
*: 10%, **: 5%, ***: 1%.

Table 3 shows descriptive statistics for the category working at home intensively. The results do not differ much in comparison with Table 2. Only the results concerning gender, commute time and firm size are slightly different. 41 percent of the employees working at home frequently or always are male. In contrast, 48 percent of employees who work at home only sometimes, rarely or never are men. The corresponding shares for women are reversed and take the values 59 and 52 percent indicating that women are

more active in working at home intensively. The t-test are for both genders significant compared to the gender differences in Table 2. Concerning working at home intensively, the average commute time hardly shows any differences compared to Table 2 and is even insignificant for working at home intensively.

The results concerning firm size are also slightly different than in Table 2. The shares of employees working in small firms do not show any significant differences for employees who work at home intensively and those who do not. In contrast, 46 percent of employees who work at home intensively are employed in middle-sized firms while the corresponding share is 26 percent for employees who do not work at home intensively. 30 percent of employees working at home at least frequently work in large firms while 50 percent of employees who do not work at home intensively are employed in large firms. The t-test shows that the differences for middle-sized and large firms are significant. All other results show only minor differences compared to Table 2 and remain qualitatively unchanged.

Table 4: Descriptives III: Share of Employees in Educational Categories Working at Home by Gender

	Men		Women	
Variable	Share Working at Home	Share Working at Home Intensively	Share Working at Home	Share Working at Home Intensively
no degree	0.08	0.05	0.12	0.04
only secondary school	0.10	0.02	0.11	0.02
secondary school and vocational education	0.19	0.04	0.19	0.06
only Abitur	0.20	0.07	0.21	0.05
Abitur and vocational education	0.45	0.19	0.44	0.24
Abitur and studies	0.56	0.24	0.53	0.28

Source: BIBB/BAuA Employee Survey 2006, own calculations.

Education plays a crucial role regarding opportunities for working at home. Employees who have higher qualifications tend to be more often engaged in flexible work arrangements (Noonan et al. 2012). In contrast to the former tables, the values in Table 4 are interpreted the other way around: in Tables 2 and 3 I displayed the share of men, young employees, employees in small firms, etc. *within the population working at home*. Now I show the share of people working at home *within educational categories*. Thus, Table 4

displays the shares of employees working at home and working at home intensively by gender. The same argument and interpretation is also valid for industries and vocational fields in Table 5.

Since gender is often considered as an important determinant of working at home, I additionally consider differences by qualification for men and women separately. The results indicate that working at home is related to qualification in a similar way for men and women. In general, the higher the degree, the higher the shares of employees working at home. The highest shares of work at home for both genders occur for employees with Abitur and vocational education and Abitur and further studies. The corresponding shares are 45 and 56 percent for men and 44 and 53 percent for women. The shares do not differ much between genders, although they are slightly higher for men.

Working at home intensively shows similar results. Again, the highest shares for both genders can be found for employees with Abitur and either vocational education or further studies. While only 19 percent of men who have Abitur and vocational education work at least frequently at home, 24 percent of men who have Abitur and further studies do so. The shares for women are 24 and 28 percent, respectively. Comparing the shares for men and women, the results indicate that once women decide to work at home, they do it slightly more frequently which is consistent with the results in Table 3.

There are certain jobs that are more suitable for the opportunity to work at home. In particular, IT-related jobs or jobs that belong to the service sector are often considered as suitable for working flexibly. The results of table 5 show that the public sector delivers, with 38 percent, the highest share of employees working at home followed by the service sector without craft and trade with a share of 31 percent. It seems that the industry in which employees work plays a crucial role for working at home. The public sector is also leading concerning working at home intensively. Nearly one quarter of employees report to work at home frequently or always.

In order to analyse the relationship between working at home and different jobs, table 5 also shows the shares of employees working at home and working at home at least frequently with respect to vocational field.[3] Table 5 reveals that the teaching profession in particular is by far the most suitable for working at home. 90 percent of teachers work at home. As teaching belongs to the public sector, the result is consistent with the

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[3] Table 8 in the Appendix shows the distribution of industries and vocational fields in the sample.

Table 5: Descriptives IV: Share of Employees with Flexible Work Arrangements by Industry and Vocational Field

Variable	Share Working at Home	Share Working at Home Intensively
Industry		
public sector	0.38	0.22
manufacturing industry	0.22	0.05
craft	0.24	0.06
trade	0.18	0.04
other services	0.31	0.08
Vocational Field		
mining	0.39	0.07
manufacturing and restoring	0.13	0.03
manufacturing and maintenance	0.05	0.01
trade	0.19	0.05
traffic and logistics	0.10	0.02
gastronomy and cleaning	0.25	0.05
commercial services	0.23	0.05
mathematics and natural sciences	0.35	0.09
law, business and economics	0.60	0.19
humanities and art	0.48	0.12
health and social sciences	0.32	0.10
teaching	0.90	0.79

Source: BIBB/BAuA Employee Survey 2006, own calculations.

finding that the public sector has the highest shares of employees who work at home. The vocational fields law, business and economics as well as humanities and art are also quite fitting for working at home. The shares of employees who work at home are 60 and 48 percent. Both fields are either part of the public sector or the service sector in general which is again consistent with the former results concerning industries.

Working at home intensively has the same tendencies among vocational fields. The shares of employees working at home at least frequently are 79 percent for teaching, 19 percent for law, business and economics and 12 percent for humanities and art. Those are the highest shares among all vocational fields.

4 Analytical Framework and Estimation Procedure

In order to investigate the determinants of working at home econometrically, I assume that the way employees choose these work arrangements can be described by a discrete choice model. The outcome of the choice of employee i is represented by a dummy variable WH_i that relates the determinants of the decision to work at home to the outcome of the decision which is determined jointly by the employer and the employee:

$$WH_i = \alpha X_i + \beta ED_i + \gamma Y_i + \delta Z_i + \phi VF_i + \theta ID_i + \epsilon_i \tag{1}$$

where WH_i denotes the choice of employee i to work at home. WH_i is measured by two dummy variables: work at home and intensive work at home. The determinants are represented by the following explanatory variables: X_i contains personal characteristics of employee i. It comprises gender, age and the presence of children less than six years old. The variable ED_i represents the qualification structure while Y_i includes tenure, overtime, work time and commute time of employee i. Firm characteristics are represented by Z_i which contains firm size as well as IT intensity of the work tasks of employee i. VF_i and ID_i reflect control dummies for vocational field and industry. The error term denoted by ϵ_i is assumed to be independent and identically distributed. Due to the binary character of the outcome variables, I use a probit estimation.[4] The following section describes the measures of all variables used in the estimations. All variables were measured in the year 2006.

The gender of employees is measured by a dummy variable that takes the value one if the employee is male and zero if female. The variable representing the presence of children less than six years old is constructed in the same way. It takes the value one if employees have children under the age of six years and zero if they do not have children in this age group. The age of employees is measured by three dummy variables: the first one takes the value one if employees are less than 30 years old and zero otherwise, the second one takes the value one if employees are between 30 and 49 years old (reference category) and zero otherwise while the third one takes the value one if employees are aged 50 or older and zero otherwise.

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[4]For more details on the probit estimation see Wooldridge (2010).

I also consider the qualification structure of employees by creating six dummy variables: the first one takes the value one if employees have no degree at all and zero otherwise (reference category), the second variable takes the value one if employees have only secondary school degree and zero otherwise, the third dummy is one if employees have secondary school and vocational education while the fourth variable takes the value one if employees have only Abitur and zero if they do not. The last two variables take the value one if employees have Abitur and vocational education or Abitur and studies and zero otherwise.

Tenure, the amount of overtime and work time as well as the commute time to the workplace are relevant issues for flexible forms of workplace organisation. I control for tenure of employees by the number of years they spent working for the firm. Overtime is measured by the number of additional work hours per month while I control for the work time by the number of work hours per week. Commute time to the workplace is quantified by the time measured in minutes employees need to get to their workplace. Overtime might lead to an endogeneity problem, as it is not clear if overtime leads to working at home or if working at home results in a higher workload for employees which in turn leads to overtime as firms know that employees have the opportunity to work at home at any time.

In order to control for firm size, I create three dummy variables representing the number of employees in the firm. The first variable takes the value one if the firm where the employee works has 1 to 19 employees and zero otherwise. This is the reference category. The second dummy takes the value one if the firm has 20 to 99 employees and zero otherwise while the third variable takes the value one if the firm has 100 or more employees and zero if they have less.

I proxy the IT intensity of employees' work tasks by using a dummy variable that takes the value one if employees work with computers and zero otherwise. At the same time this variable measures workers' technological skills (Bertschek et al. 2010). In addition, dummy variables control for industry-specific fixed effects and vocational field.

5 Results

Table 6 shows the marginal effects of the probit estimation of equation 1.[5] The dependent variable is working at home. In the first specification I include only gender and children less than six years old as explanatory variables in the estimation equation, the most frequently discussed reasons for working at home. Both variables are insignificant.

In the second specification I add dummy variables for education, age of employees and firm size to the estimation equation. In addition, industry dummies and dummy variables for vocational field are included in order to control for potential sectoral and occupational differences. The impact of gender becomes highly significant when including the mentioned variables. Men have a probability of working at home that is about 8.5 percentage points higher than women. The presence of children less than six years old remains insignificant. The combination of Abitur with either vocational education or studies has a positive influence on working at home. The probability of working at home rises for both degrees by 25.7 and 33.0 percentage points compared to employees with no degree. Employees less than 30 years old have a 10.5 percentage points lower probability of working at home compared to prime age workers between 30 and 49 years old. In contrast, the impact of employees being at least 50 years old is not significant. Larger firm size reduces the probability of working at home. Employees who work in middle-sized firms with 20 to 99 employees have a 4.5 percentage point lower probability of working at home than employees working in small firms. The propensity to work at home decreases by 10.7 percentage points for employees who work in large firms with at least 100 employees. All results are significant at the one percent level.

In the third specification, further control variables are included. The estimation equation is extended by a dummy variable for computer use and discrete variables for tenure, overtime, work time and commute time. The impact of gender on working at home remains qualitatively unchanged. Men are with 4.0 percentage points more likely to work at home than women which is a surprising result as women are generally rather expected to work at home. The impact of children less than six years old turns significant at the five percent level indicating that employees who have children in this age group have a 3.4 percentage point higher propensity to work at home. The qualification structure leads to similar results as well. The only difference is that the effect of employees with only

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[5]The coefficients of the first stage regression can be found in table 10 in the Appendix.

Abitur becomes significant at the ten percent level. The results concerning education indicate a 17.6 percentage points higher probability to work at home for employees with only Abitur, a 23.5 percentage point higher probability for employees with Abitur and vocational education and a 29.2 percentage point increase for employees with Abitur and studies. These three educational levels lead to the highest probability increase on working at home of all variables in the regression equation.

Being younger than 30 years is once again highly significant and decreases the probability of working at home by 10.0 percentage points. Firm size remains for middle-sized and large firms qualitatively unchanged. The probabilities of working at home decrease by 6.2 and 13.6 percentage points respectively pointing towards the fact that working at home occurs more often in small firms with a familial business culture built on trust. Furthermore, the results show that computer use is a relevant determinant for working at home. It increases the propensity to work at home by 5.6 percentage points. Tenure, overtime and work time are also important factors that influence working at home. Tenure increases the probability of working at home by 0.1 percentage points per year while overtime and work time lead to an increase of the probability of working at home by 0.2 and 0.3 percentage points per hour. Although the impacts of tenure, overtime and work time are highly significant, the probability increase is rather small. In contrast, commute time is insignificant.

Table 7 reports the marginal effects of the probit estimation with an alternative outcome variable.[6] The dependent variable is now working at home intensively. The explanatory variables are the same as in Table 6. Most results of the third specification lead to similar and qualitatively unchanged results as in Table 6 concerning the variables children less than six years old, firm size, overtime and work time. In contrast to Table 6 where men have a higher probability of working at home, they have a 1.0 percentage points lower probability of working at home intensively compared to women. Therefore, women are more likely to work at home frequently or always once they decide to work at home although the difference is not very high compared to men. Furthermore, education is insignificant for all qualification levels indicating that the formerly high impact of education on working at home disappears for working at home intensively. Computer use and tenure are not significant as well for working at home intensively compared to the results in Table 6. On the other hand, age plays a noticeable role for working at home intensively. While employees younger than 30 years old have a 3.9 percentage

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[6]The coefficients of the first stage regression are in table 11 in the Appendix.

Table 6: Probit Estimation: Average Marginal Effects

	Dependent Variable: Work at Home		
	(1)	(2)	(3)
male	−0.001	0.085***	0.040***
	(0.008)	(0.011)	(0.011)
children < 6 years	0.017	0.019	0.034**
	(0.012)	(0.014)	(0.014)
only secondary school		0.044	0.042
		(0.091)	(0.092)
secondary school and			
vocational education		0.105	0.090
		(0.077)	(0.078)
only Abitur		0.140	0.176*
		(0.102)	(0.106)
Abitur and			
vocational education		0.257***	0.235***
		(0.087)	(0.088)
Abitur and studies		0.330***	0.292***
		(0.094)	(0.097)
employees < 30 years		−0.105***	−0.100***
		(0.012)	(0.013)
employees > 50 years		0.006	0.001
		(0.011)	(0.012)
firm with 20 - 99 employees		−0.045***	−0.062***
		(0.012)	(0.012)
firm with > 100 employees		−0.107***	−0.136***
		(0.012)	(0.012)
computer use			0.056***
			(0.013)
tenure			0.001*
			(0.000)
overtime			0.002***
			(0.000)
work time			0.003***
			(0.001)
commute time			0.001
			(0.001)
dummies for vocational field	no	yes	yes
industry dummies	no	yes	yes
number of observations	10,844	10,844	10,844

Significance levels: *: 10%, **: 5%, ***: 1%. Standard errors in parentheses. Reference categories: unqualified employees, small firms.

points lower probability of working at home frequently or always compared to prime age workers, employees aged 50 or older have a 1.3 percentage points higher probability. The results concerning age indicate that the older employees are the higher is the probability of working at home intensively.

Table 7: Probit Estimation: Average Marginal Effects

	Dependent Variable: Intensive Work at Home		
	(1)	(2)	(3)
male	−0.030***	0.009	−0.010*
	(0.006)	(0.005)	(0.005)
children < 6 years	0.011	0.026***	0.033***
	(0.009)	(0.008)	(0.008)
only secondary school		−0.038	−0.037
		(0.026)	(0.023)
secondary school and vocational education		−0.020	−0.026
		(0.041)	(0.040)
only Abitur		0.003	0.015
		(0.047)	(0.051)
Abitur and vocational education		0.028	0.017
		(0.046)	(0.042)
Abitur and studies		0.035	0.017
		(0.053)	(0.046)
employees < 30 years		−0.041***	−0.039***
		(0.006)	(0.006)
employees > 50 years		0.014**	0.013*
		(0.006)	(0.007)
firm with 20 - 99 employees		−0.012*	−0.018***
		(0.006)	(0.006)
firm with > 100 employees		−0.041***	−0.050***
		(0.006)	(0.006)
computer use			0.007
			(0.006)
tenure			0.001
			(0.001)
overtime			0.001***
			(0.000)
work time			0.001***
			(0.000)
commute time			0.001
			(0.001)
dummies for vocational field	no	yes	yes
industry dummies	no	yes	yes
number of observations	10,844	10,844	10,844

Significance levels: *: 10%, **: 5%, ***: 1%. Standard errors in parentheses. Reference categories: unqualified employees, small firms.

Men are more likely to work at home. The same result is also found by Brenke (2014), while some earlier studies point to a higher prevalence of working at home among women. The presence of children has a positive and robust impact on working at home that is confirmed by almost all studies so far on this topic. Kraut (1989), Mannering et al.

(1995), Mokhtarian et al. (1998) as well as Noonan et al. (2012) support the result concerning the presence of small children. Concerning working at home intensively, the study by Mannering at al. (1995) confirms the results of Table 7: the presence of small children favours the more frequent working from home. The results for the qualification levels are also consistent with former studies. De Graaff et al. (2003), Popuri et al. (2003), Perez et al. (2004) as well as Peters et al. (2004) and Noonan et al. (2012) find that employees who are highly educated have a higher propensity to be active in flexible work arrangements. One explanation might be that a high qualification level is related to higher positions in a firm wherein working at home occurs more often (Noonan et al. 2012).

The relevance of computers or information and communication technologies for flexible work arrangements is also confirmed by Mannering et al. (1995), De Graaff et al. (2003) and Perez et al. (2004). As the literature finds mixed results on the impact of tenure on telecommuting, the slightly positive effect I find in this study is confirmed only by Popuri et al. (2003). The positive impact of overtime and work time on working at home is also found by Popuri et al. (2003), Peters et al. (2004) and Noonan et al. (2012) showing that telecommuters have longer working hours compared to non-telecommuters.

A sensitivity check splitting the sample up by gender was done in order to find out if there are gender-based differences in the results. The comparison of the marginal effects listed in tables 12 and 13[7] indicates that there are no differences concerning education, overtime and work time. While Abitur and vocational education and Abitur and studies have the biggest positive and significant impacts on working at home, overtime and work time have very small but highly significant effects for both genders. Differences between both genders occur in age, computer use and tenure. While computer use and tenure are significant for men, they remain insignificant for women. Men aged 50 or older have a higher probability to work at home compared to male prime age workers between 30 and 50 years old. For women, age plays a completely different role. Women under 30 years old as well as women aged 50 or older have both a lower probability to work at home compared to prime age women. All other variables are insignificant for both genders.

In summary, men have a higher probability of working at home in general while women are more likely to work at home frequently or always. The presence of small children also increases employees' probability of working at home and working at home inten-

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[7]The coefficients of the first stage regression are available from the author upon request.

sively. While the probability of working at home increases with the qualification level, employees in large or middle-sized firms are less likely to work at home. Employees younger than 30 years have a lower probability to work at home while employees who work with computers are more likely to work at home. Tenure, overtime and work time are positively associated with working at home while overtime and work time are relevant determinants for working at home intensively.

6 Conclusion

The current analysis sheds light on the determinants of flexible work arrangements, specifically working at home and working at home intensively. Most determinants for German employees are consistent with those of other studies where individual-level data from other countries is used.

The results in this study reveal that working at home and working at home intensively occur mainly in small firms. A possible practical implication for middle-sized and large firms might be to support flexible work arrangements in order to enable their employees to benefit from the advantages linked to those work arrangements and benefit themselves from cost-savings concerning office equipment and more efficient organisation structures. The most surprising result of this study is that men are more likely to work at home than women. The reason might be that women work more often part-time or not at all compared to men. Children also influence the probability to work at home, but the effect is similar for women and men. Education plays a far larger role for the probability to work at home than gender.

However, the topic of this paper needs further research. A panel data analysis or an adequate instrument for working at home might solve the potential endogeneity problem between overtime and working at home. I leave this to future research. Furthermore, the impacts of flexible work arrangements on employee satisfaction would be interesting to investigate.

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7 Appendix

Table 8: Distribution of Industries in the Sample

Variable	Observations	Percentage
Industry		
public sector	3852	35.39
manufacturing industry	2496	22.93
craft	754	6.93
trade	1125	10.34
other services	2064	18.96
other sectors	593	5.45
sum	10,884	100
Vocational Field		
mining	72	0.66
manufacturing and restoring	920	8.45
manufacturing and maintenance	700	6.43
trade	959	8.81
traffic and logistics	864	7.94
gastronomy and cleaning	204	1.87
commercial services	2927	26.89
mathematics and natural sciences	1028	9.45
law, business and economics	505	4.64
humanities and art	300	2.76
health and social sciences	1586	14.57
teaching	819	7.52
sum	10,884	100

Source: BIBB/BAuA Employee Survey 2006, own calculations.

Table 9: Descriptives: Average Hours of Work per Week by Overtime

Variable	Mean	N
overtime: yes	40.13	9370
overtime: no	33.21	1514
total	39.17	10,884

Source: BIBB/BAuA Employee Survey 2006, own calculations.

Table 10: Probit Estimation I: Coefficient Estimates

	Dependent Variable: Dummy for Work at Home		
	(1)	(2)	(3)
male	−0.001	0.258***	0.123***
	(0.025)	(0.032)	(0.035)
children < 6 years	0.049	0.059	0.103**
	(0.036)	(0.040)	(0.041)
only secondary school		0.130	0.125
		(0.259)	(0.265)
secondary school and vocational education		0.325	0.279
		(0.241)	(0.246)
only Abitur		0.388	0.483*
		(0.264)	(0.270)
Abitur and vocational education		0.735***	0.678***
		(0.242)	(0.247)
Abitur and studies		0.883***	0.788***
		(0.244)	(0.250)
employees < 30 years		−0.351***	−0.335***
		(0.046)	(0.048)
employees > 50 years		0.020	0.003
		(0.034)	(0.038)
firm with 20 - 99 employees		−0.140***	−0.197***
		(0.039)	(0.040)
firm with > 100 employees		−0.327***	−0.423***
		(0.038)	(0.039)
computer use			0.179***
			(0.043)
tenure			0.003*
			(0.001)
overtime			0.008***
			(0.001)
work time			0.010***
			(0.001)
commute time			0.001
			(0.001)
dummies for vocational field	no	yes	yes
industry dummies	no	yes	yes
constant term	−0.542***	0.779***	0.254
	(0.017)	(0.072)	(0.267)
observations	10,884	10,884	10,884
χ^2-statistic	1.91 ($p = 0.385$)	2779.48 ($p = 0.000$)	3078.21 ($p = 0.000$)

Significance levels: *: 10%, **: 5%, ***: 1%. Standard errors in parentheses. Reference categories: unqualified employees, small firms.

Table 11: Probit Estimation II: Coefficient Estimates

	Dependent Variable: Dummy for Intensive Work at Home		
	(1)	(2)	(3)
male	−0.152***	0.068	−0.079*
	(0.031)	(0.044)	(0.047)
children < 6 years	0.057	0.181***	0.236***
	(0.044)	(0.053)	(0.055)
only secondary school		−0.368	−0.399
		(0.345)	(0.353)
secondary school and vocational education		−0.153	−0.205
		(0.304)	(0.311)
only Abitur		0.027	0.109
		(0.341)	(0.348)
Abitur and vocational education		0.202	0.129
		(0.305)	(0.311)
Abitur and studies		0.230	0.123
		(0.308)	(0.314)
employees < 30 years		−0.387***	−0.383***
		(0.072)	(0.075)
employees > 50 years		0.102**	0.099*
		(0.045)	(0.051)
firm with 20 - 99 employees		−0.095*	−0.150**
		(0.052)	(0.053)
firm with > 100 employees		−0.309***	−0.397***
		(0.051)	(0.053)
computer use			0.065
			(0.058)
tenure			0.002
			(0.002)
overtime			0.007***
			(0.001)
work time			0.011***
			(0.002)
commute time			0.001
			(0.001)
dummies for vocational field	no	yes	yes
industry dummies	no	yes	yes
constant term	−1.121***	0.693**	0.214
	(0.021)	(0.319)	(0.334)
observations	10, 884	10, 884	10, 884
χ^2-statistic	24.47 ($p = 0.000$)	2789.68 ($p = 0.000$)	2934.68 ($p = 0.000$)

Significance levels: *: 10%, **: 5%, ***: 1%. Standard errors in parentheses. Reference categories: unqualified employees, small firms.

Table 12: Probit Estimation: Average Marginal Effects, Only Men

	Dependent Variable: Work at Home		
	(1)	(2)	(3)
children < 6 years	0.023	0.033	0.029
	(0.017)	(0.018)	(0.019)
only secondary school		0.083	0.071
		(0.136)	(0.136)
secondary school and vocational education		0.142	0.111
		(0.103)	(0.105)
only Abitur		0.118	0.184
		(0.141)	(0.150)
Abitur and vocational education		0.295**	0.250**
		(0.124)	(0.126)
Abitur and studies		0.374***	0.317**
		(0.130)	(0.136)
employees < 30 years		−0.063***	−0.029
		(0.020)	(0.023)
employees > 50 years		0.045***	0.034*
		(0.016)	(0.018)
firm with 20 - 99 employees		−0.017	−0.030
		(0.020)	(0.019)
firm with > 100 employees		−0.066***	−0.089***
		(0.019)	(0.020)
computer use			0.090***
			(0.017)
tenure			0.002**
			(0.001)
overtime			0.002***
			(0.000)
work time			0.005***
			(0.001)
commute time			0.001
			(0.001)
dummies for vocational field	no	yes	yes
industry dummies	no	yes	yes
number of observations	5119	5119	5119

Significance levels: *: 10%, **: 5%, ***: 1%. Standard errors in parentheses. Reference categories: unqualified employees, small firms.

Table 13: Probit Estimation: Average Marginal Effects, Only Women

	Dependent Variable: Work at Home		
	(1)	(2)	(3)
children < 6 years	0.010	0.006	0.034
	(0.018)	(0.020)	(0.021)
only secondary school		0.016	0.014
		(0.126)	(0.128)
secondary school and			
vocational education		0.078	0.066
		(0.114)	(0.117)
only Abitur		0.174	0.188
		(0.149)	(0.154)
Abitur and			
vocational education		0.229*	0.213*
		(0.125)	(0.128)
Abitur and studies		0.287**	0.249*
		(0.138)	(0.142)
employees < 30 years		−0.134***	−0.142***
		(0.016)	(0.163)
employees > 50 years		−0.031*	−0.028*
		(0.015)	(0.017)
firm with 20 - 99 employees		−0.066***	−0.083***
		(0.016)	(0.016)
firm with > 100 employees		−0.138***	−0.167***
		(0.015)	(0.016)
computer use			0.022
			(0.019)
tenure			−0.001
			(0.001)
overtime			0.003***
			(0.001)
work time			0.002***
			(0.001)
commute time			−0.001
			(0.001)
dummies for vocational field	no	yes	yes
industry dummies	no	yes	yes
number of observations	5765	5765	5765

Significance levels: *: 10%, **: 5%, ***: 1%. Standard errors in parentheses. Reference categories: unqualified employees, small firms.