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Abstract
In recent years many employees have gained more control over temporal and locational aspects of their work via a variety of flexible work arrangements, such as flexi-time and telehomework. This temporal and locational flexibility of work (TLF) is often seen as a means to combine work and private life and as such has been recommended as a policy to increase the labour supply part-time workers. To the best of our knowledge it has not been tested empirically yet, however, whether the presumed link between this type of worker-oriented flexibility and increasing working hours actually holds. We therefore analyse whether flexi-time and telehomework arrangements increase the number of actual, contracted and preferred working hours. Based on Dutch household panel data, our results indicate that the impact of TLF on working hours is quite limited. Telehomework is associated with moderate increases in actual hours, but not in contracted or preferred hours. Flexi-time generally seems to have an ambiguous effect on working hours. Despite positive effects of TLF on job satisfaction and working time fit, it does not seem to lead to an increase in labour supply.

Keywords: flexi-time; labour supply; locational flexibility; part-time work; telehomework; temporal flexibility

**JEL classification**: J22; J32; M52; M54

1 Introduction

In recent years, employees have become increasingly able to control temporal and locational aspects of their work. Many employees can to some extent choose and modify when, where, and how long they work. This temporal and locational flexibility of work (TLF), which facilitates employees with flexibility in the schedule, location, and duration of their work, is usually implemented via a variety of flexible work arrangements, such as flexi-time, self-scheduling, and telehomework (Plantenga, 2003; Rau, 2003; Fagan, 2004; Hill et al., 2008). This development has been fostered by an increasing relevance of knowledge work and the service industries in general, new forms of work organisation, but in particular by the proliferation of information and communication technology (ICT), which has facilitated asynchronous and remote exchange of information.

In many debates, TLF is primarily viewed as a means to combine work and private life and as such highly topical in the policy debate in a number of countries (see e.g. CEA, 2010; BMFSFJ, 2012). As such, TLF arrangements have also become a common policy recommendation to increase labour supply in order to increase economic growth and to prevent labour force shortages in the future (Rürup and Gruescu, 2005; Taskforce DeeltijdPlus, 2010; Sociaal-Economische Raad, 2011). In environments with relatively high labour force participation rates and a lot of (female) part-time workers, the main focus is on increasing the number of working hours with more TLF. It has not, to the best of our knowledge, been tested empirically yet, whether this supposed link between TLF and increasing working hours actually holds, however.

The aim of this paper is therefore to analyse whether and to what extent TLF arrangements indeed influence labour supply. In particular we analyse the impact of TLF arrangements that provide schedule and location flexibility on the number of actual, contracted, and preferred working hours. The analysis is carried out on the basis of a Dutch household panel dataset. The Netherlands are a good test case in this context, because they are a highly developed service society with an excellent ICT infrastructure, which means that the scope for TLF is relatively high. Increasing working hours of part-time employees has been a policy concern for some years now (Taskforce DeeltijdPlus, 2010; Sociaal-Economische Raad, 2011) and the Dutch labour market is quite flexible already. Employees in the Netherlands have a legal right to both decrease and increase their contracted working hours for example.[1] Obstacles to adjust working hours are therefore comparatively low and contracted hours should adapt relatively quickly to new conditions, also within existing employment relations.

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[1] Every employee who has worked for a company with ten or more employees for at least one year can request a working hours adjustment. This right can be exercised once a year. The employer may only dismiss a request if it is a severe impediment to business interest. The Working Hours Adjustment Act (*Wet Aanpassing Arbeidsduur*) has been effective since mid 2000. Equal treatment of part-time and full-time employees with respect to employment conditions is furthermore stipulated in the Equal Treatment Working Hours Act (*Wet verbod op onderscheid naar arbeidsduur*), effective since 1996.
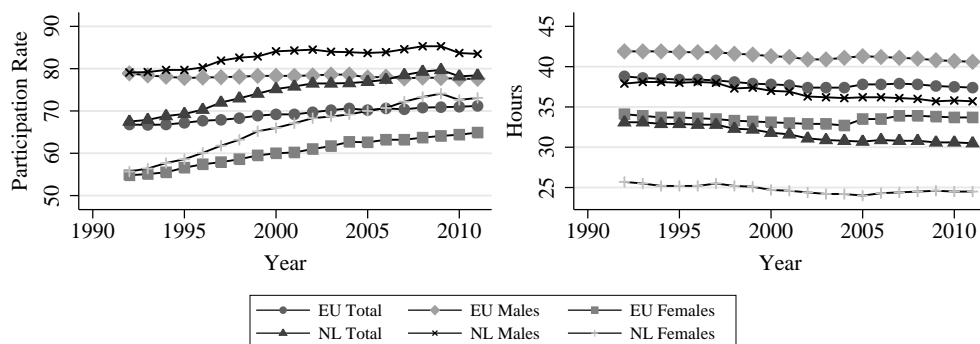
Figure 1: Participation rates and average working hours in the EU and the Netherlands, 1992–2011

Our results indicate that the effects of TLF on working hours are quite limited. Tele-homework is associated with moderate increases in actual hours, but not in contracted or preferred hours, which implies that telehomework primarily leads to more overtime. Flexi-time generally seems to have an ambiguous effect on working hours and is negatively associated with contracted and preferred working hours for females. So despite positive effects on job satisfaction and working time fit, TLF does not seem to lead to an increase in labour supply.

2 Theoretical framework

Female labour force participation rates have increased tremendously in the Netherlands in the last two decades. In recent years they have been around 73% and thus eight to ten percentage points above EU average. Average weekly working hours of females, however, have stagnated at a relatively low 25 hours per week (see figure 1). Part-time work is used extensively to combine work and private life in the Netherlands – private life here meaning any other responsibility, activity or event that is not paid work. The resulting low number of weekly and annual working hours is considered to be problematic in the face of an ageing society, the expected labour force shortages, and low economic growth in general. Various policy initiatives to increase female labour supply at the intensive margin have therefore been undertaken, among which calls for more temporal and locational flexibility. The idea is that more TLF and thus more control over working hours will improve work-life fit and induce employees to supply more hours to the labour market. As a result, arrangements such as flexi-time and telehomework can to some extent substitute part-time work as a means to reconcile work and private life.

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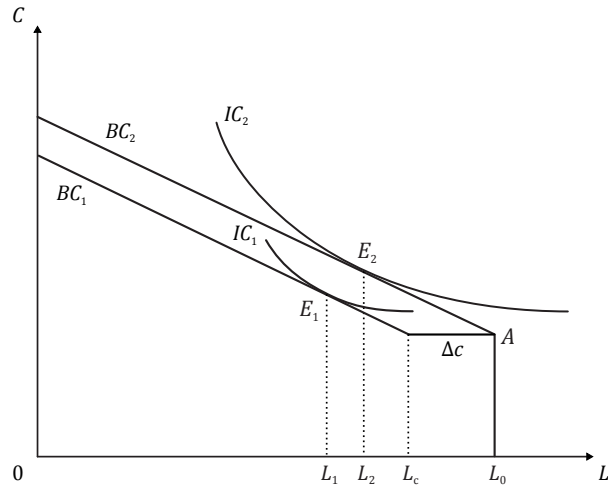
Figure 2: Commuting and labour supply

The notion that more TLF leads to an increase in labour supply has been supported by surveys in which a considerable share of respondents report that they would be willing to supply more hours to the labour market if more flexibility options were available. In a 2009 survey for example 35–41% of non-participants and 25–39% of part-time workers responded that more flexibility would be an important condition to either participate in or supply more hours to the labour market, respectively (Cloïn et al., 2010). The conditions mentioned include better reconciliation of working times and private life, finding a job with the preferred number of hours, working part of the week from home, being able to take a day off if a family member gets sick, and finding a job closer to home. If these responses are sincere, more temporal and locational flexibility and a better fit between work and private life should indeed raise labour supply.

In theory two potential channels can lead from increased flexibility to more working hours. The first one concerns a decrease in commuting time, the second a reduction of schedule constraints and a better match between work and private schedules.

Although commuting can be seen as a prerequisite for paid work, commuting time *per se* is unproductive and inefficient. Commuting time can be reduced with flexible working times, because it is possible to avoid rush hour traffic by commuting at less busy times. Commuting can even be eliminated altogether when one is working at home. This time gain can then be spent at work.[2]

While the theoretical predictions are to some extent dependent on the assumptions

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[2] Flexible working times may also induce employees to travel to work earlier and leave from work later to avoid traffic congestion, increasing work duration as a result (Arnott et al., 1993; Gutiérrez-i-Puigarnau and van Ommeren, 2010).

made, a simple model predicts exactly this.[3] In a graphical representation (figure 2), C designates the consumption of goods, L the consumption of leisure, L_0 maximum time available. The line L_0A designates non-labour income, IC is the indifference curve, corresponding to the level of utility obtained by the individual, and BC is the budget line with slope w, the wage rate. If time has to be spent on commuting, the optimal solution is situated at the tangency point E_1 of the indifference curve with the budget constraint BC_1. Here, the individual would supply L_1L_c hours on labour, spend $L_cL_0 = \Delta c$ on commuting and enjoy $0L_1$ hours of leisure.[4]

If commuting is eliminated, the budget constraint shifts to the right and utility increases. The optimal solution is now at E_2 and leisure time increases by L_1L_2. At the same time, labour supply increases by $\Delta c - L_1L_2$ and is now L_2L_0. Part of the time gain due to a reduction in commuting time will thus be spent on additional labour supply. This result holds unambiguously if we assume leisure and consumption to be normal goods (Black et al., 2014).[5]

The existing empirical evidence, however, suggests that the size of the effect of TLF due to commuting time savings alone is likely to be limited. While there is little direct evidence on the effects of commuting costs on labour supply, indirect evidence (e.g. that commuters seem to attach relatively low value to travel time) suggests that the effect of the length of the commute on labour supply is rather weak (Gibbons and Machin, 2006). More recently, Gutiérrez-i-Puigarnau and van Ommeren (2010) even found a small positive effect of commuting on the number of daily and weekly working hours, due to the interplay of working hours per day and working days per week.

A second channel via which more temporal and locational flexibility can lead to an increase in labour supply is a reduction of schedule constraints and a better match between schedules of work and private life. Tasks and events of both paid work and private life are not distributed randomly over the day and week. Most of the time they take place within defined schedules, because in both spheres workers depend on and interact with other individuals. Work is usually carried out in teams within and across firms and many workers deal directly with clients and business partners. Goods and

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[3] Predictions differ depending on whether one distinguishes between monetary and time costs of commuting, whether workdays, daily and total hours are allowed to vary, and whether one considers a static or dynamic approach (See e.g. Manning, 2003; Gutiérrez-i-Puigarnau and van Ommeren, 2010; Black et al., 2014).

[4] The amount of commuting time is exaggerated in the figure for better visibility.

[5] We assume here that individuals are able to choose their preferred levels of consumption and leisure without any other constraints of course. In addition, a decrease in commuting costs and thus a shift in the budget constraint to the right reduces the size of the kink in the budget line. This reduction of the fixed costs of work not only increases labour supply at the intensive margin, but also induces non-working individuals to participate and thus raises labour force participation as well (e.g. Oi, 1976; Cogan, 1981; Black et al., 2014). Since Dutch labour participation rates are relatively high already, though, we focus on the effects on hours worked in this study.

services have to be produced and handled at specific times because they are expected by other workers in the production chain, clients expect them at specific times (e.g. during opening and business hours), or because the goods and services involved are perishable or otherwise time-critical. In addition, working hours and schedules are generally limited due to legal restrictions and social norms. As a result, workers are often constrained in the choice of their working schedule.

In the same vein, the timing of leisure tasks and activities often depend on others. The schedules of working parents for example depend on their children's daycare and school schedules. Informal care often has to be performed at specific times of the day (Hassink and van den Berg, 2011). Stores, businesses as well as public and health services have limited business and opening hours. Further education classes and recreational activities (sports, clubs, etc.) take place at designated times. Since daycare, school, office and service hours usually cannot be altered by individual workers, they constitute a binding schedule constraint.

Both work and leisure activities thus impose a schedule constraint on workers, meaning that these activities can only be performed at specific times or within a specified time frame. Activities therefore have to be coordinated and their schedules matched. This matching can be achieved more easily the more flexible and controllable schedules are. When work schedules are fixed, however, they may clash with leisure activity schedules and vice versa. In this case the schedules and their limited flexibility constrain the number of hours available to the labour market. So not only the number of hours that are devoted to leisure activities limit the number of working hours (as established by standard labour supply theory), but also the schedule of both work and leisure activities do. More flexibility in work schedule and location should then improve the fit between work and leisure activities, prevent and eliminate time conflicts and improve allocative efficiency (Bosch et al., 1994; Golden, 2006).

The trade-off between working hours and schedules is easily illustrated with an extension of the standard labour supply model (Golden, 1996, 2006). According to the standard model, an individual's well-being is determined by his or her consumption and hours of leisure. This is represented by a utility function (U) with the standard consumption (C) and leisure (L) arguments. But since utility from work is also dependent on work schedule, location, and their flexibility, we add a schedule parameter (S) to the utility function:

$$U = U[C, L, S] \tag{1}$$

S represents both the schedule and location of work as well as their adaptability. Based on the considerations above, we assume that work schedules and locations that fit in well with leisure activities provide more utility than those that do not. In addition, flexible schedules and locations provide more utility than inflexible ones, because they

are more adaptable to changing circumstances for instance. Note that this is not much different from the usual assumptions about consumption and leisure in standard labour economics. Just like we assume that consumption and leisure are normal goods, i.e. that more consumption and more leisure 'is better' in the sense that it provides more utility, we assume here that more flexibility in work schedule and location (i.e. more control over timing and location of work) and thus a better schedule and working time fit 'is better' as well.

It follows that utility is strictly increasing and marginal utility decreasing in all arguments:

$$\frac{\partial U}{\partial C}, \frac{\partial U}{\partial L}, \frac{\partial U}{\partial S} > 0; \quad \frac{\partial^2 U}{\partial C^2}, \frac{\partial^2 U}{\partial L^2}, \frac{\partial^2 U}{\partial S^2} \leq 0 \tag{2}$$

Under these general assumptions, workers should be willing to trade leisure time or income for more flexibility and vice versa (Golden, 2006).[6]

We need to keep in mind, though, that consumption potentially is another channel via which a trade-off with TLF might take place. Instead of increasing labour supply, workers may be willing to trade part of their wage or future wage increases for increased flexibility and better work schedules (Altonji and Paxson, 1988; Baughman et al., 2003; Heywood et al., 2007). This will be addressed in the empirical analysis by controlling for wage.

Based on these considerations we arrive at the following hypothesis:

Hypothesis: More temporal and locational flexibility of work leads to an increase in hours worked.

In the empirical analysis we will use flexi-time and telehomework as indicators for TLF (see below). While we do not have exact theoretical predictions as to sizes of the effects, we expect telehomework to have a stronger impact on working hours than flexi-time. Telehomework potentially leads to larger time gains because commuting time can be omitted altogether, whereas flexi-time only reduces commuting time. Furthermore, telehomework potentially reduces schedule constraints more effectively than flexi-time because it allows employees to schedule working time outside of office hours, e.g. in the evening or at weekends.

Table 1: Flexi-time and telehomework by year and gender

	Male		Female		Total		N
	%	S.E.	%	S.E.	%	S.E.	
Flexi-time							
2002	36.41	(1.57)	26.72	(1.41)	31.51	(1.07)	1952
2004	45.54	(1.28)	34.37	(1.37)	40.57	(0.95)	2748
2006	43.46	(1.25)	33.52	(1.26)	38.75	(0.91)	3035
2008	47.92	(1.27)	34.73	(1.24)	41.56	(0.90)	3073
2010	43.97	(1.40)	33.23	(1.34)	38.64	(0.99)	2518
Total	44.05	(0.86)	32.85	(0.84)	38.69	(0.61)	13326
Telehomework							
2002	15.98	(1.19)	13.16	(1.09)	14.55	(0.82)	1952
2004	17.37	(0.97)	14.98	(1.02)	16.30	(0.73)	2748
2006	18.79	(0.98)	16.62	(0.98)	17.76	(0.71)	3035
2008	20.19	(1.01)	18.54	(1.01)	19.39	(0.74)	3073
2010	19.78	(1.12)	17.85	(1.08)	18.82	(0.80)	2518
Total	18.59	(0.66)	16.46	(0.66)	17.57	(0.48)	13326

Note: Share of employees with flexi-time or telehomework by year and gender. S.E. is the standard error of the mean.

Table 2: Flexi-time and telehomework by sector

Sector	Flexi-time		Telehomework		N
	%	S.E.	%	S.E.	
Agriculture	32.61	(4.01)	6.52	(2.11)	138
Industry	37.98	(1.24)	10.69	(0.79)	1543
Construction	29.93	(1.91)	10.03	(1.25)	578
Trade, gastronomy, repair	24.65	(0.99)	8.31	(0.64)	1878
Transport	31.26	(1.61)	6.47	(0.85)	835
Business services	54.84	(1.05)	18.25	(0.82)	2241
Care, Welfare	30.68	(0.89)	13.95	(0.67)	2689
Other services	43.16	(1.99)	18.52	(1.56)	621
Government	66.87	(1.30)	15.57	(1.00)	1304
Education	28.95	(1.17)	53.17	(1.29)	1499
Total	38.69	(0.42)	17.57	(0.33)	13326

Note: Share of employees with flexi-time and telehomework by sector. S.E. is the standard error of the mean.

Table 3: Average working hours by gender

Working hours	Male		Female		Total		N
	Mean	S.E.	Mean	S.E.	Mean	S.E.	
Actual hours	39.60	(0.12)	26.84	(0.14)	33.55	(0.11)	11355
Contracteel hours	36.54	(0.08)	25.05	(0.12)	31.04	(0.09)	13326
Preferred hours	35.69	(0.09)	25.02	(0.12)	30.58	(0.09)	13326

Note: Employees' average working hours by gender. S.E. is the standard error of the mean.

3 Data and variable description

The data for the analysis is taken from the Dutch Labour Supply Panel (*Arbeidsaanbod-panel*, AAP), a biennial panel survey of a representative sample of Dutch households.[7] The panel survey is conducted to study developments in labour market behaviour and working conditions in the Netherlands and covers a broad range of work- and life-course-related items. The target population consists of the Dutch labour force aged 16 to 66 years. The AAP has existed since 1985, but questions about (tele)homework were first asked in 2002, so only the waves from 2002 onwards are suitable for an analysis of TLF. This means that we have five waves available for this analysis, for every other year since 2002 to the last publicly available wave from 2010. We restrict the sample to employees (i.e. we exclude self-employed, unemployed, full-time students, etc.), which results in an unbalanced panel of 17136 observations from 7771 individuals.

We use flexi-time and telehomework as indicators for TLF. The flexi-time variable was obtained from the following survey question:

> 'Can you say whether each of the following characteristics does or does not apply to the work you do? [...] Determine start- and end-time myself'

The telehomework variable was obtained from the following question:

> 'Do you work at home every now and then in your current job?'[8]

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[6] Note that this model also captures workers who do not have binding private schedule constraints in the above sense, but just a preference for work at certain intervals, e.g. due to certain life-style choices. Nevertheless the degree to which private schedule constraints are binding certainly differs between workers and depends *inter alia* on whether they have care responsibilities or not.

[7] The panel was formerly known as the OSA Labour Supply Panel is now conducted on behalf of the Social Cultureel Planbureau. The data and its documentation are in Dutch and available via http://easy.dans.knaw.nl (`urn:nbn:nl:ui:13-4js-jl3`).

[8] While the question refers to work at home and not explicitly to telework, only 2.2% of the respondents who work at home do not use ICT. Hence we label this variable telehomework.

We only count those respondents as telehomeworkers who state that they work at home once a week on average.[9] On average, 39% of the respondents in the sample can determine the start- and end-times of their work and 18% work at home at least once a week. The shares of flexi-timers and telehomeworkers are generally larger for male than for female employees (see table 1). Over the five waves, 1017 respondents change their flexi-time and 713 change their telehomework status (i.e. they were e.g. working at home in at least one wave and not working at home in another). The availability and use of flexi-time and telehomework varies greatly across sectors (see table 2), which suggests that job-related factors play an important role here.

We use actual, contracted, and preferred hours as outcome variables. Prior research has found a positive relationship between telehomework and hours worked (Peters and van der Lippe, 2007; Eldridge and Wulff Pabilonia, 2008; Noonan and Glass, 2012). This has been mainly attributed to an increase in work demands and overtime, as well as an expansion of the standard working week via an increase in actual hours (Peters and van der Lippe, 2007; Noonan and Glass, 2012). If only actual and (unpaid) overtime hours increase but contracted and preferred hours do not, workers may not benefit from the increase in working hours through higher income (assuming that the hourly wage would stay the same after an increase in contracted hours). Furthermore the work-life fit of employees may not increase but rather decrease if preferred hours stay the same. We therefore not only analyse the impact of TLF on actual working hours, but consider contracted and preferred hours as well.

The contracted and actual hours variables were obtained from the following survey questions:

> 'How many hours do you work according to your contract? Overtime-hours should not be considered.' And

> 'How many hours per week do you actually work on average?'

Actual working hours are only available from 2004 onwards, whereas contracted and preferred hours are also available for previous waves. The preferred hours variable was derived from the following question:

> 'Are you satisfied with the current number of contract hours or would you like to work more or fewer hours? Take into account that your hourly wage does not change and that others in your household will not work more or fewer hours.' The answer categories are: 'Yes, satisfied with hours; No, I

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[9] Telehomeworkers were asked how often they were working at home on average. From 2004 onwards the answer categories were less than once per month, less than twice per month, once per week or twice or more often per week. We only count the latter two categories as telehomeworkers. In 2002 the answer categories were once per month, twice per month, three times per month, more than three times per month. We include only the latter as telehomeworkers.

Table 4: Descriptive statistics

Variables	Gross sample Mean	Gross sample S.E.	Net sample Mean	Net sample S.E.	Min	Max
Actual hours	31.45	(0.110)	33.55	(0.108)	0	90
Contracted hours	30.52	(0.083)	31.04	(0.087)	0	91
Preferred hours	30.04	(0.083)	30.58	(0.087)	0	91
Flexi-time	0.37	(0.004)	0.39	(0.004)	0	1
Telehomework	0.17	(0.003)	0.18	(0.003)	0	1
Age	41.05	(0.091)	42.36	(0.095)	16	66
Marital status						
Married	0.64	(0.004)	0.68	(0.004)	0	1
Cohabiting	0.11	(0.002)	0.11	(0.003)	0	1
Single	0.24	(0.003)	0.20	(0.003)	0	1
Child(ren)	0.53	(0.004)	0.56	(0.004)	0	1
Primary school	0.03	(0.001)	0.02	(0.001)	0	1
Education						
Lower secondary	0.23	(0.003)	0.22	(0.004)	0	1
Higher secondary	0.39	(0.004)	0.38	(0.004)	0	1
Vocational college	0.25	(0.003)	0.26	(0.004)	0	1
Academic	0.10	(0.002)	0.11	(0.003)	0	1
Work experience	20.40	(0.087)	20.87	(0.095)	0	52
Permanent contract	0.83	(0.003)	0.87	(0.003)	0	1
Empl. status change	0.35	(0.004)	0.33	(0.004)	0	1
2nd job	0.07	(0.002)	0.07	(0.002)	0	1
Supervised employees						
None	0.70	(0.003)	0.69	(0.004)	0	1
1–9 employees	0.21	(0.003)	0.22	(0.004)	0	1
10–49 employees	0.08	(0.002)	0.08	(0.002)	0	1
50 or more employees	0.02	(0.001)	0.02	(0.001)	0	1
Occupational level						
Elementary	0.06	(0.002)	0.04	(0.002)	0	1
Lower	0.25	(0.003)	0.23	(0.004)	0	1
Medium	0.35	(0.004)	0.37	(0.004)	0	1
Higher	0.26	(0.003)	0.28	(0.004)	0	1
Scientific	0.07	(0.002)	0.08	(0.002)	0	1
Sector						
Agriculture	0.01	(0.001)	0.01	(0.001)	0	1
Industry	0.11	(0.002)	0.12	(0.003)	0	1
Construction	0.04	(0.001)	0.04	(0.002)	0	1
Trade, gastronomy, repair	0.16	(0.003)	0.14	(0.003)	0	1
Transport	0.06	(0.002)	0.06	(0.002)	0	1
Business services	0.16	(0.003)	0.17	(0.003)	0	1
Care, Welfare	0.21	(0.003)	0.20	(0.003)	0	1
Other services	0.05	(0.002)	0.05	(0.002)	0	1
Government	0.09	(0.002)	0.10	(0.003)	0	1
Education	0.11	(0.002)	0.11	(0.003)	0	1

Table 4: Descriptive statistics *(cont.)*

Variables	Gross sample		Net sample			
	Mean	S.E.	Mean	S.E.	Min	Max
No. of employees (/1000)	0.50	(0.017)	0.52	(0.018)	0	70
2002	0.18	(0.003)	0.15	(0.003)	0	1
2004	0.19	(0.003)	0.21	(0.004)	0	1
2006	0.22	(0.003)	0.23	(0.004)	0	1
2008	0.21	(0.003)	0.23	(0.004)	0	1
2010	0.20	(0.003)	0.19	(0.003)	0	1
Observations	17136		13326			

Note: The gross sample comprises the observations of all employees in the sample, the net sample those observations used for estimation after list-wise deletion due to missing values. S.E. is the standard error of the mean.

would like to work X MORE hours per week; No, I would like to work X FEWER hours per week.'

Contracted hours were used as the basis for the preferred hours variable, to which X hours were added or subtracted depending on whether respondents indicated that they wanted to work more or fewer hours. On average, employees in the sample actually work 33.55h (39.60h and 26.84h for male and female employees, respectively, see table 3). Contracted hours are a little lower at 31.04h (36.54h for males and 25.05h for females). Preferred hours are again slightly lower, but have been slowly increasing for female employees in the period under consideration (from 23.55h in 2002 to 25.29h in 2010; not shown).

In order to rule out confounding factors due to differences in individual, household and job characteristics, we add a number of control variables to our models. These are respondents' age, marital status, children at home, level of education, work experience, changes in employment (e.g. promotions and demotions within the same job as well as job switches), two or more jobs, contract type, level of occupation, number of supervised employees, sector, firm size and a time trend. Observations with missing values on any of these variables are dropped from the analysis by listwise deletion, resulting in a net sample of 13326 observations from 6398 individuals. Table 4 shows the descriptive statistics for both this net sample and the gross sample ($N = 17136$) without listwise deletions.

4 Empirical analysis

Our analysis starts out with a simple cross-tabulation of the TLF and working hours variables (table 5). A comparison of working hours of employees with and without TLF seems to support the hypothesis that TLF is associated with increased labour supply.

Table 5: Average working hours by flexi-time and telehomework

Working hours	Flexi-time				Telehomework			
	Yes		No		Yes		No	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Actual hours	36.27	(0.17)	31.75	(0.14)	37.03	(0.17)	31.80	(0.13)
Contracted hours	32.86	(0.13)	29.89	(0.11)	32.90	(0.13)	30.14	(0.11)
Preferred hours	32.13	(0.13)	29.60	(0.11)	32.07	(0.13)	29.86	(0.11)

Note: Employees' average working hours by flexi-time and telehomework. S.E. is the standard error of the mean.

Contracted and preferred hours are on average two to three hours longer for flex-timers and telehomeworkers than for their colleagues without those types of TLF. Actual hours are even five hours longer for employees with TLF.

Not surprisingly, this finding is supported by simple correlations between the TLF and working hours variables (table 6). All correlation coefficients are positive and significantly different from zero, except for the male sample, where the correlations between telehomework and contracted and preferred hours, respectively, are not significant. The correlation coefficients on actual hours are always larger than those on contracted and preferred hours and the coefficients on flexi-time are larger than those on telehomework (with one exception, namely actual hours of female employees). Again, this does not reject our hypothesis, so that based on simple descriptives the notion that TLF is associated with a longer work duration appears to be supported by the data.

These simple correlations do not take any confounding factors like individual and job characteristics into account of course. These are likely to play an important role, however. Availability and usage of TLF arrangements as well as working hours differ across jobs, organisations, and industries for example (see table 2 for example). The differences in TLF availability are on the one hand related to structural differences in production processes and institutional settings. Telehomework for instance is hard to implement in assembly line jobs, while it is a common feature of consultancy jobs nowadays. On the other hand, the degree of availability depends on employers' cost and benefit differentials in the implementation and support of flexibility arrangements. Supervision and monitoring costs differ between jobs and tasks but are likely to be larger if employees are not predictably available at the workplace for example. Firm characteristics may also play a role. In small establishments for example, each member of a team is often seen as critical to business operations, which is why managers may be more reluctant to allow their employees to work at home. Availability and usage of TLF as well as work length are therefore to a certain extent determined by and dependent on job characteristics, some of which may not be directly observable. It is therefore necessary to control for job-related heterogeneity in the analysis.

Table 6: Pairwise correlations of variables

	Actual hours	Contracted hours	Preferred hours	Flexi-time
Total (N = 13326)				
Flexi-time	0.19***	0.14***	0.12***	1
Telehomework	0.16***	0.059***	0.046***	0.18***
Male (N = 6946)				
Flexi-time	0.18***	0.083***	0.061***	1
Telehomework	0.17***	0.012	−0.0033	0.21***
Female (N = 6380)				
Flexi-time	0.13***	0.11***	0.086***	1
Telehomework	0.17***	0.087***	0.072***	0.14***

*** $p < 0.01$

Individual employee characteristics are also likely to influence both TLF arrangement availability and use as well as working hours. Preferences for working hours and TLF depend both on changes in individual and household characteristics (marital status, children, etc.), as well as on the more general intrinsic preferences for work and leisure. These preferences also influence job choice. Since the availability of TLF arrangements differs between jobs and organisations, employees with stronger preferences for TLF may sort into firms and jobs that are more likely to provide TLF arrangements. In addition, employees with preferences for fewer work hours, e.g. due to private responsibilities, may sort into jobs with more TLF as well, because they give them more room to combine work and private life.

So as a next step in the analysis, we would like to control for individual and job-related heterogeneity without putting too much structure on the data. We therefore regress the working hours variables as well as the two indicators for TLF, flexi-time and tele-homework, on the same set of control variables (see section 3) and calculate correlations between the residuals from these regressions. This will essentially give us correlation coefficients between TLF and working hours after controlling for a number of confounding factors. The regression models are given by the following equation:

$$F_{it} = \gamma' Z_{it} + \alpha_i + \varepsilon_{it} \tag{3}$$

F_{it} designates a vector of outcome variables (flexi-time and telehomework as well as actual, contracted and preferred hours, respectively)[10], and Z_{it} a vector of control variables. α_i is the individual-specific and ε_{it} the idiosyncratic error term. i denominates the individual and t the wave (Δt is two years in this biennial panel). γ is a vector of parameters to be estimated.

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[10] A superscript to indicate the different outcome variables is omitted.

Table 7: Pairwise correlations of residuals after fixed-effects estimation

	Actual hours	Contracted hours	Preferred hours	Flexi-time
Total (N = 13326)				
Flexi-time	0.015	−0.015*	−0.0041	1
Telehomework	0.047***	0.017**	0.017**	0.036***
Male (N = 6946)				
Flexi-time	0.027**	0.0066	0.025**	1
Telehomework	0.035***	0.0013	0.016	0.037***
Female (N = 6380)				
Flexi-time	−0.0025	−0.039***	−0.043***	1
Telehomework	0.051***	0.020	0.011	0.033***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Note: See tables 9 and 10 in the appendix for regressors used and parameter estimates.

We estimate equation 3 with a fixed-effects specification to control for individual-specific effects. This rules out that individual preferences influence the use of TLF and the number of working hours at the same time for example. It also controls for time-invariant job-related heterogeneity.[11] Furthermore we estimate the model for the total sample and separately for male and female employees, because male and female employees usually have different non-work responsibilities and react differently to labour market incentives (e.g. Blau and Kahn, 2007).[12] After estimating these models, we further estimate the residuals from the regressions (i.e. the term ε_{it} in equation 3) and calculate the correlations between these.

Table 7 shows the pairwise correlations between the residuals. In general the correlations are small and often not significantly different from zero. There is essentially no significant correlation between flexi-time and actual or preferred hours for the total sample, and a small negative correlation between flexi-time and contracted hours. The

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[11] We estimated the model with a random-effects specification as well. The crucial assumption of a random-effects specification however is that the individual-specific error term α_i is not correlated with the right-hand side variables Z_{it}, otherwise the estimated coefficients will be biased. Since the availability and usage of TLF and the number of working hours quite likely depend on various job and individual characteristics this assumptions seems rather strong. The random-effects specification was thus firmly rejected by a Hausman specification test in favour of the fixed-effects specification for all models and (sub-)samples considered.

[12] Note that since the flexi-time and telehomework indicators are binary, we effectively estimate linear probability models for these TLF variables. We do not control for the other TLF arrangement in these models (i.e. flexi-time is not controlled for in the telehomework regression and vice versa). The linear probability models for flexi-time behave well, as no observations are predicted outside the unit-interval. For telehomework, 5.0%, 15.7%, and 11.5% of the observations are predicted outside the unit-interval for the total, male, and female sample respectively.

correlation between flexi-time and actual or preferred hours remain positive for male employees. For the female sample, however, the correlations between flexi-time and contracted or preferred hours even turn out to be negative. The correlations between telehomework and actual hours are positive and significantly different from zero for all samples. For contracted and preferred hours, the correlations with telehomework are only significantly different from zero for the total sample. The results imply that much of the raw correlation between working hours and TLF arrangements is due to individual and job-related heterogeneity, because the correlations are much smaller – down to a third at least – than those between the raw variables or even turn out negative. After controlling for this heterogeneity, there remains no unambiguous correlation between flexi-time and work hours and a small positive correlation between telehomework and actual work hours.

These results suggest already that the association between TLF and the number of working hours is rather small in general after controlling for individual and job-related factors . Ideally though, we would also like to quantify the relative effects of both TLF arrangements on working hours. We therefore estimate a simple model in which working hours depend on whether employees have flexible working times or can work at home. This model, which many readers may be more familiar with, allows us to estimate the relative effects of both TLF arrangements at the same time. It also allows us to easily estimate the effects for different sub-samples. The model looks as follows:

$$H_{it} = \beta_1 ft_{it} + \beta_2 tw_{it} + \kappa' Z_{it} + \omega_i + \eta_{it} \tag{4}$$

H_{it} designates three different measures of working hours (actual, contracted and preferred hours, respectively), ft flexi-time, tw telehomework, and Z a vector of control variables. ω_i is the individual-specific and η_{it} the idiosyncratic error term. β and κ are (vectors of) parameters to be estimated. Again we estimate the model with a fixed-effects specification for the total, male and female sub-samples.[13] The data would support the hypothesis if the beta coefficients are positive and significantly different from zero.

Strictly speaking, fixed-effects specifications based on equation 4 still do not statistically imply causality and a few empirical issues may bias the estimates. One of these potential biases are self-selection and other sources of endogeneity, like common shocks that may at the same time influence the availability and usage of TLF on the one hand and the number of working hours on the other. Many employees may for example be simultaneously choosing working hours and working conditions as parts of a whole employment package at the start of a contract.[14] Employers may also award TLF to

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[13] The random-effects specification was again firmly rejected by a Hausman specification test for all samples.

[14] Note however that more than half of the employees for which TLF status changes have no change in their employment status. This indicates that a considerable share of employees in our sample do not make these choices simultaneously.

employees with the largest productivity, status, or authority (cf. Golden, 2009; Winder, 2009; Noonan and Glass, 2012). Since we control for changes in employment as well as for time-fixed-effects both of these confounding factors are only relevant, however, if they are time-varying and independent of promotions and job switches for example.

Underlying this specification is furthermore that the idiosyncratic error term ε_{it} is strictly exogenous, i.e. that time-varying unobserved variables from any time period may not be correlated with any of the explanatory variables from all time periods. This assumption would be violated for example, if there were reverse causality or a feedback mechanism going on. This might be the case for TLF, because instead of being a policy for improved working conditions and work-life fit, employees might get more TLF, when (actual) working hours and workloads increase in order to get the job done (Noonan and Glass, 2012). This means that causality would run from increased hours to TLF and not the other way around. Prior research has indeed shown that employees at the high end of the hours spectrum have considerably more access to flexi-time for example than those with a standard 40h working week. Part-time employees, however, enjoy greater availability than full-time employees as well, so access to TLF seems to actually be U-shaped in working hours (Golden, 2008, 2009). So there might be a feedback mechanism that may work in both directions which means that the overall impact on our estimates is unclear.[15]

Table 8 presents the parameter estimates of flexi-time and telehomework on working hours per week. According to our estimations, the flexi-time coefficient with respect to actual hours is not significantly different from zero for all samples. With respect to contracted and preferred hours, the flexi-time coefficient is also not significantly different from zero for the male sub-sample and the total sample, but it turns out negative for the female sub-sample. This implies for example that female employees who can determine the start- and end-time of work prefer to work 42 min./week (i.e. 0.707 h/week * 60 min./h) less than those without this flexibility. This reduction is somewhat surprising and may be caused by the above-mentioned simultaneous choices of working hours and TLF arrangements or some other omitted factor, e.g. informal care for elderly.

The coefficients on telehomework are only positive and significantly different from zero with respect to actual hours. The estimates indicate an increase of around 50 minutes in actual working hours per week for the total sample. This translates into an increase of

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[15] We checked whether these potential biases can be eliminated from the analysis by means of an instrumental variable analysis and tried to find suitable instrumental variables for TLF and working hours. We tested various autonomy measures for telehomework and flexi-time such as 'I can determine how I do my job', 'I can determine my work speed', or 'I can determine in which order I do my work'. For working hours we used marital status and a self-reported measure on how well knowledge and skills match with the actual work. All of these variables turned out to be weak instruments in the fixed-effects specification, however, and would therefore lead to biased estimates. Hence, we were not able to find any suitable instrumental variables in our data.

Table 8: TLF arrangements on working hours

	Actual hours			Contracted hours			Preferred hours		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Flexi-time	0.198	0.381	-0.0821	-0.193	0.0701	-0.547**	-0.0763	0.386	-0.707**
	(0.231)	(0.294)	(0.357)	(0.168)	(0.201)	(0.270)	(0.206)	(0.282)	(0.292)
Telehomework	0.829***	0.580*	0.934***	0.262	0.0132	0.346	0.334	0.274	0.237
	(0.247)	(0.334)	(0.357)	(0.168)	(0.201)	(0.275)	(0.229)	(0.320)	(0.321)
Observations	11355	5974	5381	13326	6946	6380	13326	6946	6380
Individuals	5641	2954	2687	6398	3301	3097	6398	3301	3097

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Note: Parameter estimates of TLF arrangements on working hours. Clustered standard errors in parentheses. See table 11 in the appendix for the full-specification.

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2.5% in actual hours (50 min. relative to 33.51 mean actual hours in the sample). For female employees the coefficient suggests an increase of 56 min./week. For the male sub-sample the coefficient is only significant at the 10% level and indicates an increase of some 35 min./week. These findings fit in with previous research, which found a positive association between telehomework and overtime (Peters and van der Lippe, 2007; Peters et al., 2009; Noonan and Glass, 2012).

In general, the estimates from equation 4 are in line with the results obtained from the correlation of residuals. Our results are therefore not sensitive to either specification and both estimation strategies show that the association between TLF arrangements and hours worked is generally small.

Until now we did not include wage per hour in the specifications above, even though wage is a potentially important factor in the relationship between TLF and working hours, because employees may trade wage instead of leisure for more flexibility (see equations 1 and 2). The classic interpretation is that more flexibility and control for employees implies compensating wage differentials, assuming that it provides utility to employees but costs to employers (Altonji and Paxson, 1988; Baughman et al., 2003; Heywood et al., 2007). TLF may, however, also provide (net) benefits to employers, e.g. through higher employee productivity, effort, and (employer-oriented) flexibility, or lower turnover, costs for office space, and absenteeism (Possenriede et al., 2014). Most previous empirical analyses regarding the TLF-wage relationship indeed seem to suggest that the net effect of TLF on wages is either absent or positive (e.g. Johnson and Provan, 1995; Gariety and Shaffer, 2001; Anderson et al., 2003; Bonke et al., 2004; Gariety and Shaffer, 2007; Lowen and Sicilian, 2009).

Due to the so-called division bias (Borjas, 1980), however, we cannot just add wage as an independent variable to equation 4.[16] We therefore instrument wage with lagged wage from the previous wave and add this to equation 4. This leads to a significant drop in sample size but gives comparable results with respect to the baseline specifications nevertheless.[17]

As a sensitivity analysis we also estimated equation 4 separately for employees with children (for which we can assume that they have more private responsibilities and therefore would expect a larger effect), as well as professionals (i.e. employees with a 'higher' or 'scientific' level of occupation which have better access to TLF).[18] We also

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[16] Hourly wages are calculated by dividing net wages per month by hours per month. This causes measurement error in hours to enter both sides of equation 4 and results in a spurious negative correlation between wages and hours.

[17] The coefficients are even more similar when we compare the specification with wage included with the baseline specification with wage excluded both estimated on the same sample. In their study on labour supply and commuting, Gutiérrez-i-Puigarnau and van Ommeren (2010) also find that the inclusion of an instrumented wage variable does not affect their results.

[18] It might seem desirable to estimate this model on the sub-sample of part-time working (female) employees as well. Part-time employment may be an alternative strategy to combine work and private life

estimate the model for contracted and preferred hours on the actual hours sample, i.e. the 2004–2010 waves, to rule out that the differences in effects with respect to actual, contracted, and preferred is merely caused by differences in data availability. Finally we experimented with the inclusion of lags of flexi-time and telehomework in order to take possible adjustment lags into account. The results did not change significantly for all these sub-samples and different specifications, however.

5 Discussion and conclusion

In this paper we analyse the effect of temporal and locational flexibility of work (TLF) on the number of working hours using Dutch household panel data spanning the period from 2002 to 2010. We test the claim that more TLF leads to an increase in labour supply due to a better fit between work and private life. An increase of TLF has been a common policy recommendation to increase the labour supply in order to increase economic growth and to prevent labour force shortages in the future.

According to our estimates, the general effects of TLF on working hours are moderate at best. Telehomework is positively associated with actual hours and our results imply an increase of around 50 minutes per week. Contracted and preferred working hours are not affected significantly by telehomework. Telehomework therefore does not seem to be associated with a structural increase in contracted nor preferred working hours, but seems to be primarily associated with an increase in actual working hours.

At least part of the positive effect of telehomework on actual hours seems to be driven by an increase in unpaid overtime hours. Preliminary estimates indicate that unpaid overtime hours increase by one hour per week for male employees and half an hour per week for female employees who work at home at least once a week.[19] This suggests that TLF may also be used for work intensification and an increase in overtime hours, a result that has been discussed before (Peters and van der Lippe, 2007; Noonan and Glass, 2012). An alternative interpretation is that employees may reciprocate TLF availability by exerting extra effort (Akerlof, 1982; Kelliher and Anderson, 2010). Previous findings that TLF increases job satisfaction (Possenriede and Plantenga, 2014) and job performance (Hill et al., 1998; Baltes et al., 1999; Eaton, 2003; Gajendran and Harrison, 2007) support

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and one thus might expect the largest effects of schedule and location flexibility here. Empirically, this is incorrect, however, because one would select the sample on the dependent variable and thus get biased estimates. Furthermore we are interested in the net effect of TLF, not just the effect on part-timers. Given the distribution of working hours across gender in the Netherlands, i.e. male employees mostly working full-time and female employees mostly working part-time, one could interpret gender as a proxy for part-time/full-time employment, however.

[19] We estimated a model like equation 4 on paid and unpaid overtime hours. These results are only indicative, however, due to the large number of employees with zero overtime hours. Estimates are therefore not shown.

this interpretation. Both explanations, i.e. telehomework as a means for employers to intensify work on the one hand and more work effort from employees in exchange for more flexibility on the other, may nevertheless apply, particularly at different ends of the job spectrum.

With respect to flexi-time the results are even more ambiguous. Most coefficients are not significantly different from zero at the 5% level. For females our estimates suggest that flexi-time is negatively associated with the number of working hours. Flexi-time therefore does not seem to be associated with an increase in hours worked, but possibly even with a decrease for female employees.

The negative effect of flexi-time on working hours is somewhat surprising. It is not clear theoretically, why this should be a genuine effect of flexi-time on working hours. Time-invariant factors are not likely a cause of this, since we control for them through our fixed-effects estimation. An explanation might be that females may gain access to flexi-time and reduce their working hours at the same time due to a common shock, e.g. care responsibilities other than towards their own children, for which we cannot control in the analysis.

A possible explanation for the moderate effects of TLF on working hours in general is that the changes are just too small to matter. Commuting for example seems to have small, ambiguous effects on labour supply in general (Gibbons and Machin, 2006; Gutiérrez-i-Puigarnau and van Ommeren, 2010) and a reduction of commuting time therefore may not have a clear effect on labour supply. In addition, telehomework is partly used to just transfer some work home, so working time at the office is substituted for working time at home (Peters and van der Lippe, 2007; Noonan and Glass, 2012). Another explanation is that employees may not be willing to increase labour supply but may just as well enjoy their improved work-life fit from increased TLF. Labour market imperfections may allow them to do so, since TLF seems to be primarily distributed among higher-status jobs with possibly less supply side competition (Felstead et al., 2002; Golden, 2008, 2009; Smulders et al., 2011). Norms and societal preferences may reinforce this trend further, in the sense that work norms have eroded due to proliferation of part-time work in the Netherlands (Wielers and Raven, 2013) and that it is therefore not 'attractive' to increase working hours (see e.g. Bosch et al., 2010; Booth and van Ours, 2013).

The merits of this study are that we consider two TLF arrangements, namely flexi-time and telehomework, at the same time and that we utilized data spanning eight years from different sectors. The results further indicate the importance of controlling for unobserved heterogeneity in jobs and individuals in these types of analyses. A limitation of our study is that we cannot completely rule out endogeneity and reverse causality and therefore do not identify a true causal effect. Since the correlation between TLF and working hours after controlling for several individual and job-related factors turns to be small, this does not seem to be a major issue, however. Future research could extend this analysis with other TLF arrangements, like self-scheduling or working time accounts.

Overall the hypothesis that more temporal and locational flexibility of work leads to an increase in hours worked appears to be mostly rejected. The findings suggest that TLF does not have strong effects on labour supply at the intensive margin with the exception of telehomework and actual hours. This implies that the arguments regarding increases in labour supply in the debate about policy support for TLF are not empirically supported. This does not take away that there may be other good reasons to support policies for more TLF.

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Tables

Table 9: Control variables on working hours

	Actual hours			Contracted hours			Preferred hours		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Age	0.0515*	-0.109	0.258***	0.0339	-0.0552	0.149***	0.129***	0.0788	0.192***
	(0.0467)	(0.0693)	(0.0603)	(0.0366)	(0.0533)	(0.0481)	(0.0457)	(0.0681)	(0.0598)
Martial status									
Ref: Married									
Cohabiting	0.985*	-0.455	2.270***	0.759*	-0.329	1.782***	0.392	-0.768	1.411*
	(0.532)	(0.626)	(0.811)	(0.395)	(0.389)	(0.623)	(0.539)	(0.711)	(0.775)
Single	1.932**	-1.083	3.761***	1.885***	0.255	3.027***	2.384***	0.898	3.468***
	(0.754)	(0.942)	(0.984)	(0.603)	(0.677)	(0.815)	(0.698)	(0.785)	(0.977)
Child(ren)	-1.457***	-0.0626	-2.892***	-1.140***	0.356	-2.682***	-0.874***	0.111	-1.877***
	(0.314)	(0.363)	(0.501)	(0.254)	(0.255)	(0.418)	(0.313)	(0.402)	(0.458)
Lower secondary	1.817*	2.017*	0.410	1.028	0.922	0.862	1.466	1.513	0.973
	(0.929)	(1.102)	(1.707)	(0.796)	(0.968)	(1.343)	(0.953)	(1.277)	(1.227)
Education									
Ref: Primary School									
Higher secondary	2.535**	2.237*	1.888	1.691**	1.370	1.863	2.570***	2.289*	2.561**
	(0.992)	(1.178)	(1.808)	(0.829)	(0.999)	(1.406)	(0.979)	(1.302)	(1.305)
Vocational college	4.876***	4.111***	4.692**	3.335***	2.510**	3.980**	3.782***	2.894**	4.365***
	(1.128)	(1.369)	(1.975)	(0.933)	(1.131)	(1.562)	(1.073)	(1.420)	(1.475)
Academic	5.256***	4.452***	4.878*	4.064***	2.693**	5.358***	4.789***	3.148*	6.351***
	(1.332)	(1.507)	(2.448)	(1.096)	(1.268)	(1.912)	(1.217)	(1.535)	(1.840)
Work experience	-0.0164	-0.0211	-0.0314	-0.00725	-0.00985	-0.0149	-0.0216	-0.0226	-0.0318
	(0.0326)	(0.0532)	(0.0342)	(0.0247)	(0.0395)	(0.0276)	(0.0310)	(0.0472)	(0.0392)
Permanent contract	0.696*	0.345	1.063*	0.427	0.462	0.371	-0.0880	-0.287	0.0137
	(0.397)	(0.536)	(0.558)	(0.326)	(0.434)	(0.461)	(0.341)	(0.500)	(0.457)
Empl. status change	0.292	-0.229	0.809***	0.0633	-0.275	0.398**	0.0538	-0.222	0.285
	(0.179)	(0.248)	(0.248)	(0.132)	(0.173)	(0.193)	(0.166)	(0.238)	(0.225)
2nd job	-0.755	-0.884	-0.796	-1.219**	-1.761***	-0.886	-0.923*	-1.480**	-0.628
	(0.545)	(0.812)	(0.721)	(0.482)	(0.653)	(0.680)	(0.511)	(0.701)	(0.721)

Table 9: Control variables on working hours *(cont.)*

	Actual hours			Contracted hours			Preferred hours		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Supervised employees									
Ref: None									
1-9 employees	1.060***	0.860***	1.204***	0.422**	0.240	0.540*	0.236	0.0119	0.442
	(0.243)	(0.284)	(0.404)	(0.173)	(0.198)	(0.295)	(0.209)	(0.279)	(0.309)
10-49 employees	1.688***	1.645***	1.537*	0.563**	0.374	0.643	0.535	0.387	0.544
	(0.439)	(0.491)	(0.844)	(0.285)	(0.309)	(0.570)	(0.343)	(0.404)	(0.642)
50 or more employees	3.357***	3.698***	1.364	1.359	1.551**	0.0937	1.485	1.918**	-0.646
	(0.954)	(1.013)	(2.164)	(0.883)	(0.710)	(2.786)	(0.969)	(0.835)	(3.011)
Occupational level									
Ref: Medium									
Elementary	-1.858***	-2.340***	-1.457	-1.224**	-1.556**	-0.792	-1.392***	-1.767***	-1.066
	(0.670)	(0.896)	(1.045)	(0.513)	(0.638)	(0.852)	(0.537)	(0.613)	(0.958)
Lower	-0.428*	-0.209	-0.511	-0.260	-0.213	-0.201	0.0231	0.249	-0.109
	(0.231)	(0.307)	(0.330)	(0.190)	(0.238)	(0.278)	(0.234)	(0.353)	(0.303)
Higher	0.521**	0.438	0.412	0.354**	0.255	0.393	0.261	0.246	0.177
	(0.220)	(0.279)	(0.354)	(0.170)	(0.213)	(0.276)	(0.216)	(0.290)	(0.320)
Scientific	0.376	0.762*	-0.443	0.239	0.495*	-0.269	0.153	0.304	-0.148
	(0.356)	(0.433)	(0.617)	(0.231)	(0.291)	(0.382)	(0.320)	(0.401)	(0.536)
Sector									
Ref: Agriculture									
Industry	0.299	-0.746	2.393	0.695	-0.0474	2.273	0.369	-0.551	2.499*
	(0.819)	(0.658)	(1.899)	(0.813)	(0.521)	(2.220)	(0.770)	(0.824)	(1.402)
Construction	0.752	-0.391	3.450	1.760*	0.884	3.967	0.925	0.116	2.870
	(0.906)	(0.772)	(2.149)	(0.899)	(0.649)	(2.797)	(0.844)	(0.881)	(2.220)
Trade, gastronomy, repair	-0.347	-1.328*	2.346	0.250	-0.497	2.305	0.409	-0.384	2.404*
	(0.875)	(0.721)	(2.007)	(0.868)	(0.558)	(2.334)	(0.811)	(0.882)	(1.435)
Transport	0.957	-1.059	6.332**	1.431	-0.434	6.371**	0.620	-0.747	3.923**
	(1.077)	(1.017)	(2.499)	(1.080)	(0.924)	(2.738)	(1.026)	(1.125)	(1.994)
Business services	0.992	-0.788	4.797**	1.358	0.329	3.761	1.021	0.287	2.882**
	(0.841)	(0.698)	(2.042)	(0.839)	(0.585)	(2.306)	(0.805)	(0.876)	(1.466)
Care, Welfare	1.346	-1.082	5.183**	1.389	-0.0381	3.960*	1.199	-0.389	3.717**
	(1.031)	(1.098)	(2.152)	(0.973)	(0.932)	(2.386)	(0.984)	(1.392)	(1.573)
Other services	0.482	-1.254	4.196*	0.563	-0.606	2.977	0.628	-0.421	2.763*

Table 9: Control variables on working hours *(cont.)*

	Actual hours			Contracted hours			Preferred hours		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	(0.981)	(0.969)	(2.157)	(0.922)	(0.751)	(2.399)	(0.962)	(1.153)	(1.619)
Government	1.223	-0.550	4.722**	0.839	-0.606	3.549	1.239	-0.237	3.865**
	(0.969)	(0.917)	(2.153)	(0.922)	(0.766)	(2.376)	(0.906)	(1.037)	(1.584)
Education	3.253***	-0.278	8.331***	2.585**	0.436	5.937**	2.340**	-0.385	6.002***
	(1.234)	(1.303)	(2.416)	(1.121)	(0.984)	(2.601)	(1.162)	(1.283)	(1.957)
No. of employees (/1000)	0.0405	0.0604*	0.0209	0.0249	0.0387	0.0218	0.0110	0.0315	-0.0222
	(0.0289)	(0.0338)	(0.0515)	(0.0216)	(0.0260)	(0.0392)	(0.0325)	(0.0293)	(0.100)
Constant	26.59***	42.21***	8.147**	26.12***	36.95***	12.83***	21.47***	30.36***	11.00***
	(2.046)	(2.573)	(3.397)	(1.743)	(2.030)	(3.196)	(2.073)	(2.921)	(2.885)
Observations	11355	5974	5381	13326	6946	6380	13326	6946	6380
Individuals	5641	2954	2687	6398	3301	3097	6398	3301	3097

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Note: Parameter estimates of control variables only on working hours. Year (wave) dummies included. Clustered standard errors in parentheses.

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Table 10: Control variables on TLF arrangements

	Flexi-time			Telehomework		
	Total	Male	Female	Total	Male	Female
Age	0.00389	0.000814	0.00704**	0.00561***	0.00394	0.00814***
	(0.00241)	(0.00329)	(0.00349)	(0.00192)	(0.00264)	(0.00282)
Martial status						
Ref: Married						
Cohabiting	-0.0283	-0.0428	-0.0158	-0.0126	-0.0676*	0.0371
	(0.0309)	(0.0475)	(0.0401)	(0.0245)	(0.0365)	(0.0325)
Single	-0.0192	-0.0500	0.00692	-0.0255	-0.0887	0.0224
	(0.0381)	(0.0698)	(0.0433)	(0.0309)	(0.0563)	(0.0350)
Child(ren)	0.0381**	0.0586**	0.0198	0.0326**	0.0600***	0.00364
	(0.0190)	(0.0281)	(0.0248)	(0.0164)	(0.0222)	(0.0237)
Lower secondary	-0.0120	0.0494	-0.151*	-0.0268	-0.000359	-0.0864**
	(0.0389)	(0.0375)	(0.0798)	(0.0233)	(0.0275)	(0.0403)
Education						
Ref: Primary School						
Higher secondary	-0.0249	0.0459	-0.170*	-0.0145	0.00691	-0.0664*
	(0.0426)	(0.0408)	(0.0868)	(0.0259)	(0.0338)	(0.0401)
Vocational college	-0.0177	0.0487	-0.151	-0.0107	0.0629	-0.126**
	(0.0493)	(0.0525)	(0.0939)	(0.0347)	(0.0463)	(0.0513)
Academic	-0.00644	0.00691	-0.0653	0.0555	0.112*	-0.0305
	(0.0592)	(0.0675)	(0.106)	(0.0498)	(0.0669)	(0.0760)
Work experience	0.000175	0.00305	-0.00287	0.000474	0.000532	0.0000345
	(0.00156)	(0.00191)	(0.00238)	(0.00112)	(0.00147)	(0.00173)
Permanent contract	0.00377	-0.0297	0.0247	0.00970	0.000770	0.0177
	(0.0193)	(0.0294)	(0.0254)	(0.0146)	(0.0227)	(0.0190)
Empl. status change	0.0155	0.0146	0.0135	0.0102	0.00500	0.0167
	(0.0103)	(0.0148)	(0.0144)	(0.00893)	(0.0131)	(0.0120)
2nd job	-0.00435	-0.00620	-0.00580	-0.00168	-0.0466	0.0262
	(0.0229)	(0.0377)	(0.0284)	(0.0210)	(0.0355)	(0.0248)
Supervised employees						
Ref: None						
1-9 employees	0.0264*	0.0141	0.0444*	0.0312**	0.0227	0.0378*
	(0.0145)	(0.0188)	(0.0227)	(0.0134)	(0.0179)	(0.0204)
10-49 employees	0.0655***	0.0619*	0.0631	0.0498**	0.0376	0.0588

Table 10: Control variables on TLF arrangements *(cont.)*

	Flexi-time			Telehomework		
	Total	Male	Female	Total	Male	Female
	(0.0254)	(0.0320)	(0.0404)	(0.0229)	(0.0274)	(0.0405)
50 or more employees	0.0179	0.0265	-0.0359	0.0567	0.0621	0.0107
	(0.0542)	(0.0626)	(0.108)	(0.0531)	(0.0597)	(0.115)
Occupational level						
Ref: Medium						
Elementary	-0.0509*	-0.0964***	-0.000304	0.000811	0.0141	-0.0191
	(0.0278)	(0.0341)	(0.0457)	(0.0147)	(0.0212)	(0.0198)
Lower	-0.0273*	-0.0245	-0.0270	-0.0138	-0.00306	-0.0249*
	(0.0140)	(0.0207)	(0.0195)	(0.00975)	(0.0136)	(0.0140)
Higher	0.00545	0.00890	-0.00472	-0.0143	-0.0197	-0.00852
	(0.0149)	(0.0196)	(0.0230)	(0.0133)	(0.0174)	(0.0204)
Scientific	0.0215	0.0431	-0.0193	-0.0458**	-0.0517*	-0.0399
	(0.0214)	(0.0264)	(0.0365)	(0.0227)	(0.0285)	(0.0374)
Sector						
Ref: Agriculture						
Industry	-0.112	-0.0913	-0.148	0.0173	-0.00795	0.0718
	(0.0818)	(0.0934)	(0.165)	(0.0470)	(0.0583)	(0.0816)
Construction	-0.0981	-0.0739	-0.116	0.0341	0.0172	0.0715
	(0.0866)	(0.0960)	(0.218)	(0.0521)	(0.0607)	(0.146)
Trade, gastronomy, repair	-0.158*	-0.126	-0.219	0.0438	0.0318	0.0654
	(0.0824)	(0.0953)	(0.158)	(0.0480)	(0.0606)	(0.0824)
Transport	-0.121	-0.0700	-0.230	0.0225	-0.00460	0.0976
	(0.0898)	(0.105)	(0.166)	(0.0505)	(0.0622)	(0.0902)
Business services	-0.0864	-0.0612	-0.136	0.0252	-0.00418	0.0758
	(0.0819)	(0.0944)	(0.159)	(0.0483)	(0.0583)	(0.0895)
Care, Welfare	-0.0639	-0.00826	-0.134	0.0708	0.128*	0.0741
	(0.0870)	(0.109)	(0.163)	(0.0549)	(0.0772)	(0.0904)
Other services	-0.100	-0.00899	-0.251	0.0575	0.0521	0.0819
	(0.0888)	(0.104)	(0.167)	(0.0536)	(0.0675)	(0.0938)
Government	-0.0305	-0.0120	-0.0711	0.0401	0.0416	0.0587
	(0.0881)	(0.103)	(0.168)	(0.0520)	(0.0627)	(0.0940)
Education	-0.133	-0.172	-0.139	0.0376	-0.0523	0.129
	(0.0933)	(0.113)	(0.171)	(0.0613)	(0.0725)	(0.105)

Table 10: Control variables on TLF arrangements *(cont.)*

	Flexi-time			Telehomework		
	Total	Male	Female	Total	Male	Female
No. of employees (/1000)	-0.0000914	0.000348	-0.000801	0.00429	0.00401	0.00711
	(0.00134)	(0.00126)	(0.00401)	(0.00270)	(0.00297)	(0.00523)
Constant	0.295**	0.345**	0.349*	-0.125	-0.0491	-0.204
	(0.127)	(0.165)	(0.212)	(0.0880)	(0.122)	(0.135)
Observations	13326	6946	6380	13326	6946	6380
Individuals	6398	3301	3097	6398	3301	3097

$* p < 0.10$, $** p < 0.05$, $*** p < 0.01$
Note: Parameter estimates of control variables on flexi-time and telehomework. Year (wave) dummies included. Clustered standard errors in parentheses.

Table 11: TLF arrangements on working hours

	Actual hours			Contracted hours			Preferred hours		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Flexi-time	0.198	0.381	-0.0821	-0.193	0.0701	-0.547**	-0.0763	0.386	-0.707**
	(0.231)	(0.294)	(0.357)	(0.168)	(0.201)	(0.270)	(0.206)	(0.282)	(0.292)
Telehomework	0.829***	0.580*	0.934***	0.262	0.0132	0.346	0.334	0.274	0.237
	(0.247)	(0.334)	(0.357)	(0.168)	(0.201)	(0.275)	(0.229)	(0.320)	(0.321)
Age	0.0419	-0.113	0.244***	0.0332	-0.0553	0.150***	0.127***	0.0774	0.195***
	(0.0467)	(0.0692)	(0.0607)	(0.0366)	(0.0532)	(0.0481)	(0.0456)	(0.0679)	(0.0597)
Martial status									
Ref: Married									
Cohabiting	1.000*	-0.398	2.231***	0.757*	-0.325	1.761***	0.394	-0.733	1.391*
	(0.530)	(0.624)	(0.812)	(0.396)	(0.391)	(0.625)	(0.538)	(0.706)	(0.776)
Single	1.942***	-1.042	3.743***	1.888***	0.259	3.023***	2.391***	0.942	3.467***
	(0.753)	(0.937)	(0.985)	(0.603)	(0.674)	(0.819)	(0.697)	(0.780)	(0.981)
Child(ren)	-1.486***	-0.115	-2.895***	-1.141***	0.352	-2.672***	-0.882***	0.0718	-1.864***
	(0.313)	(0.363)	(0.501)	(0.254)	(0.255)	(0.419)	(0.312)	(0.398)	(0.456)
Lower secondary	1.859**	2.000*	0.509	1.033	0.919	0.809	1.474	1.494	0.887
	(0.930)	(1.103)	(1.709)	(0.795)	(0.968)	(1.336)	(0.952)	(1.278)	(1.211)
Education									
Ref: Primary School									
Higher secondary	2.577***	2.233*	1.955	1.690**	1.366	1.793	2.573***	2.270*	2.457*
	(0.993)	(1.177)	(1.808)	(0.828)	(0.999)	(1.398)	(0.978)	(1.302)	(1.287)
Vocational college	4.918***	4.068***	4.816**	3.334***	2.505**	3.941**	3.784***	2.858**	4.288***
	(1.128)	(1.367)	(1.973)	(0.932)	(1.131)	(1.552)	(1.072)	(1.420)	(1.457)
Academic	5.223***	4.382***	4.915**	4.049***	2.691**	5.333***	4.770***	3.115**	6.312***
	(1.331)	(1.503)	(2.445)	(1.096)	(1.269)	(1.904)	(1.216)	(1.535)	(1.820)
Work experience	-0.0161	-0.0226	-0.0303	-0.00734	-0.0101	-0.0165	-0.0217	-0.0239	-0.0339
	(0.0325)	(0.0531)	(0.0342)	(0.0248)	(0.0396)	(0.0276)	(0.0310)	(0.0471)	(0.0392)
Permanent contract	0.689*	0.346	1.058*	0.425	0.464	0.378	-0.0909	-0.275	0.0270
	(0.398)	(0.537)	(0.557)	(0.325)	(0.434)	(0.459)	(0.340)	(0.500)	(0.455)
Empl. status change	0.285	-0.236	0.799***	0.0636	-0.276	0.400**	0.0515	-0.229	0.290
	(0.179)	(0.248)	(0.248)	(0.132)	(0.173)	(0.192)	(0.166)	(0.238)	(0.225)
2nd job	-0.748	-0.868	-0.806	-1.219**	-1.760***	-0.898	-0.923*	-1.465**	-0.638
	(0.546)	(0.812)	(0.722)	(0.482)	(0.652)	(0.680)	(0.511)	(0.703)	(0.720)

Table 11: TLF arrangements on working hours *(cont.)*

	Actual hours			Contracted hours			Preferred hours		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Supervised employees									
Ref: None									
1-9 employees	1.025***	0.835***	1.182***	0.418**	0.238	0.552*	0.227	0.000236	0.465
	(0.244)	(0.285)	(0.406)	(0.173)	(0.198)	(0.295)	(0.209)	(0.279)	(0.308)
10-49 employees	1.651***	1.610***	1.510**	0.563**	0.369	0.658	0.523	0.353	0.575
	(0.438)	(0.489)	(0.844)	(0.286)	(0.310)	(0.573)	(0.344)	(0.405)	(0.644)
50 or more employees	3.291***	3.630***	1.315	1.348	1.549**	0.0703	1.468	1.891**	-0.674
	(0.955)	(1.014)	(2.176)	(0.884)	(0.711)	(2.788)	(0.968)	(0.833)	(3.009)
Occupational level									
Ref: Medium									
Elementary	-1.850***	-2.320***	-1.427	-1.234***	-1.549**	-0.786	-1.396***	-1.734***	-1.061
	(0.669)	(0.895)	(1.046)	(0.512)	(0.636)	(0.850)	(0.538)	(0.616)	(0.951)
Lower	-0.408*	-0.200	-0.476	-0.262	-0.211	-0.207	0.0257	0.260	-0.122
	(0.231)	(0.308)	(0.331)	(0.190)	(0.239)	(0.278)	(0.235)	(0.354)	(0.303)
Higher	0.532**	0.442	0.425	0.358**	0.254	0.394	0.266	0.248	0.176
	(0.220)	(0.279)	(0.352)	(0.169)	(0.213)	(0.275)	(0.215)	(0.288)	(0.319)
Scientific	0.422	0.779*	-0.386	0.256	0.493*	-0.266	0.170	0.302	-0.152
	(0.354)	(0.433)	(0.609)	(0.232)	(0.290)	(0.379)	(0.322)	(0.401)	(0.533)
Sector									
Ref: Agriculture									
Industry	0.306	-0.707	2.297	0.669	-0.0409	2.167	0.354	-0.514	2.377*
	(0.839)	(0.684)	(1.948)	(0.814)	(0.521)	(2.222)	(0.769)	(0.820)	(1.356)
Construction	0.746	-0.380	3.395	1.733*	0.889	3.878	0.906	0.140	2.771
	(0.923)	(0.791)	(2.199)	(0.898)	(0.648)	(2.800)	(0.843)	(0.879)	(2.198)
Trade, gastronomy, repair	-0.350	-1.295*	2.263	0.208	-0.488	2.162	0.383	-0.344	2.234
	(0.894)	(0.743)	(2.056)	(0.868)	(0.558)	(2.335)	(0.811)	(0.880)	(1.391)
Transport	0.959	-1.045	6.232**	1.402	-0.429	6.211**	0.603	-0.719	3.737*
	(1.092)	(1.033)	(2.543)	(1.080)	(0.924)	(2.736)	(1.025)	(1.121)	(1.951)
Business services	0.984	-0.775	4.718**	1.335	0.334	3.660	1.006	0.312	2.768*
	(0.861)	(0.719)	(2.095)	(0.840)	(0.585)	(2.310)	(0.805)	(0.874)	(1.428)
Care, Welfare	1.313	-1.136	5.106***	1.359	-0.0392	3.861	1.170	-0.421	3.605**
	(1.046)	(1.114)	(2.198)	(0.973)	(0.934)	(2.388)	(0.983)	(1.384)	(1.533)
Other services	0.445	-1.294	4.097*	0.529	-0.606	2.811	0.601	-0.431	2.566

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Table 11: TLF arrangements on working hours *(cont.)*

	Actual hours			Contracted hours			Preferred hours		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	(0.997)	(0.986)	(2.203)	(0.923)	(0.751)	(2.403)	(0.961)	(1.149)	(1.582)
Government	1.197	-0.565	4.677**	0.822	-0.606	3.490	1.224	-0.243	3.800**
	(0.984)	(0.930)	(2.201)	(0.923)	(0.766)	(2.379)	(0.906)	(1.034)	(1.546)
Education	3.255***	-0.205	8.233***	2.550**	0.449	5.817**	2.317**	-0.304	5.873***
	(1.245)	(1.320)	(2.452)	(1.120)	(0.983)	(2.598)	(1.157)	(1.283)	(1.909)
No. of employees (/1000)	0.0360	0.0572*	0.0142	0.0238	0.0387	0.0189	0.00952	0.0302	-0.0244
	(0.0281)	(0.0330)	(0.0496)	(0.0216)	(0.0261)	(0.0392)	(0.0326)	(0.0292)	(0.101)
Constant	26.78***	42.19***	8.581**	26.21***	36.93***	13.09***	21.53***	30.24***	11.29***
	(2.051)	(2.590)	(3.402)	(1.741)	(2.037)	(3.179)	(2.068)	(2.921)	(2.845)
Observations	11355	5974	5381	13326	6946	6380	13326	6946	6380
Individuals	5641	2954	2687	6398	3301	3097	6398	3301	3097

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Parameter estimates of TLF arrangements on working hours. Year (wave) dummies included. Clustered standard errors in parentheses.