Master Thesis Economics of Management and Organisation

ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Social Support, Social Ties, and Mental Health:

Self-Employment vs. Organizational Employment

Abstract

The increase of work-related mental health problems is a growing concern for the Netherlands. This paper contributes to the body of literature concerning the relationship between social factors and mental health by comparing self-employment with organizational employment. A major difference between the types of employment is the presence of colleagues, supervisors and an organization that is incentivized to create a productive work environment. This paper investigates the relationship between the type of employment on the hand and social support, social contacts, loneliness and mental health on the other. Due to the difference in the social work environment and by following literature stressing the positive effect of social ties and social support on mental health, I predict that self-employed workers experience less support at work, are less satisfied with their contacts, have a higher level of social loneliness and a lower level of mental health. These predictions are tested with extensive data from the Dutch LISS Panel using random and fixed effects estimators. The results provide some support for my predictions.

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1. Introduction

In recent years, several studies show an increase in the number of burn-outs in the Netherlands (Nederlands Centrum voor Beroepsziekten [NCvB], 2016; van Muijen & Melse, 2017), which is one of the reasons why mental health related topics are of increasing importance within the Dutch political debates concerning the labour market. With these debates, the aim should be to increase the societal wellbeing and to lower the economic burden. But, for policymakers to create effective policies, for employers to create healthy work environments, and for healthcare to be optimal, it is required to study and understand the underlying mechanisms.

Mental health is subject to a complicated interplay between exogenous and endogenous factors (Maas & Jansen, 2000). Besides physical health, genetics, and stressful or traumatic experiences, amongst others, social factors are also proclaimed to be highly important in relation to mental health. Moreover, sociologists and social psychologist often provide terms that refer to different properties of the social environment, and several of these constructs may have implications for health-related outcomes (Cohen, 2004). One dimension of these social environmental factors is related to social ties and social support, which are the constructs this research is focused on.

Due to issues with reversed causality and unobserved personal traits it is challenging to proof a causal relationship between social ties, social support and mental health. Despite these difficulties, there is a wide consensus about the positive effect of social ties and social support on mental health, which is supported by a large body of research showing that social ties and social support are positively related to mental health (Berkman, 1995; Cohen, 2004; Ertel, Glymour, & Berkman, 2009; House, Landis, & Umberson, 1988; Hughes, 1981; Kawachi & Berkman, 2001; Kessler, Price, & Wortman, 1985; Seeman, 1996; Umberson & Karas Montez, 2010; Wethington & Kessler, 1986; Wills & Cohen, 1985). A broad range of studies from various disciplines have investigated the possible psychosocial mechanisms that explain the relationship between social ties, social support and mental health. The 'main effect' model and the 'stress-buffering' model are two widely used conceptual models provided by Wills and Cohen (1985). The former model hypothesizes that social support has a positive effect on mental health, regardless of stress and the latter model states that social support buffers the negative effects of stress on mental health (Kawachi & Berkman, 2001; Wills & Cohen, 1985). These models are both supported by evidence (S. E. Taylor, 2011). This paper analyses the relationship between social ties, social support and mental health within a work-related context.

According to NCvB (2016), burn-out and depression are the most commonly reported mental disorders in the Netherlands during 2015. From the cases where the cause was reported as work-related, 21 percent of burn-outs and 44 percent of depressions are caused by factors related to social ties and

social support. These results show that the (lack of) social environmental factors of the workplace are often reported as the cause of mental disorders, but this study provides limited insight in what type or what aspects of the social work environment is increasing the probability of incurring such disorders.

To investigate the relationship between the social work environment on the one hand and social support, social ties and mental health on the other, it would be ideal to observe randomly assigned workers change between jobs, which only differ in the social environment, at random. A similar situation arises when comparing organizational employment with self-employment. The performed work is similar, but compared to self-employed workers, workers in organizational employment generally have a supervisor and colleagues. Also, an organization is incentivized to create a healthy and supporting work environment for its employees, because of productivity-related reasons, amongst others (Danna, 1999). These differences result in a different social work environment, which is expected to contribute to a difference in social support, social ties and ultimately, mental health. One particular challenge is to isolate the difference in the social work environment by controlling for other differences like autonomy, stress, income etc., when they are expected to relate to mental health. Fortunately, the data provides a lot of relevant work-related variables.

Analyzing these relationships between workers and their type of employment is difficult in general, since selection into jobs is not random. To partly deal with this self-selection problem, this research follows the same individuals over time. Another advantage of using panel data, is the possibility to control for all time invariant factors, lowering the concern of an omitted variable bias. Panel data research that is most closely related to this paper investigates the relationship between job satisfaction or happiness and the type of employment (Andersson, 2008; Benz & Frey, 2004; M. Taylor, 2004), However, these papers do not focus on the difference in the social work environment and social outcomes and, to my knowledge, the relationship between the two types of employment in relation to mental health has not been analyzed using panel data from the Netherlands. Therefore, this paper contributes to the existing body of literature concerning self-employment and organizational employment by focusing on differences in the social work environment, social outcomes and mental health, using Dutch panel data.

More specifically, following the theoretical approach of comparing self-employment with organizational employment, this paper investigates the relationship between the social work environment on the one hand and social support, social ties and mental health on the other. The aim is to answer the following questions with the emphasis on the social context:

A.   Is the type of employment related to mental health?

B.   Is the type of employment related to social ties?

C.   Is the type of employment related to support at work?

In terms of structure, chapter 2 elaborates on how I hope to answer these questions and the theoretical path that leads to several predictions and chapter 3 provides a detailed description of the data. Further, chapter 4 describes the methodology, chapter 5 provides the results, chapter 6 further discusses the results and the seventh and final chapter concludes by elucidating the main findings, drawbacks, further considerations and final remarks.

2. Hypotheses

Previous economic and social studies that are most closely related to this paper are comparing mental health, job stress, job satisfaction and/or well-being between organizationally employed and self-employed workers by using cross-sectional data (Chay, 1993; Eden, 1975; Hundley, 2001; Jamal, 1997; Lewin-Epstein & Yuchtman-Yaar, 1991; Naughton, 1987; Parslow et al., 2004; Prottas & Thompson, 2006), as well as longitudinal data (Andersson, 2008; Benz & Frey, 2004; M. Taylor, 2004). However, the findings are reasonably inconclusive and several studies don't observe a difference in mental health between the types of employment (Chay, 1993; Eden, 1975; Jamal, 1997; Parslow et al., 2004; Prottas & Thompson, 2006), while Lewin-Epstein & Yuchtman-Yaar (1991) argue that self-employed workers experience lower health. In contrast, other studies provide evidence suggesting a higher quality of working life (Hundley, 2001; Naughton, 1987) and job-satisfaction (Andersson, 2008; Benz & Frey, 2004; M. Taylor, 2004) for the self-employed. It is not suprising to observe alternate findings considering the complexity of relationship and the possible differences between countries and samples. Relating to the complexity of the relationship, some consesus exists about work-related factors that are expected to differ between type of employment and relate to mental heath. In particular, the difference in the level of stress, autonomy and jobsecurity is often adressed. However, the focus of this research is the difference in the social work environment between the two types of employment and how this relates to social support, social ties and ultimately, mental health.

This paper theorizes that the social work environment, through social outcomes described as social support and social ties, is related to mental health. This paper starts analyzing this relationship by estimating the effect of the type of employment on mental health. As previously mentioned, it is expected to be difficult to isolate the relationship between the social work environment and mental health. This is the case because, besides the difference in the social work environment, the types of

employment also have other mental health-related differences. Although this problem will be partly solved by contolling for some of those factors, interpretating the results requires additional caution. Nevertheless, based on the differences in the social work environment and theory about the positive relationship between social ties and social support on the one hand and mental health on the other, I predict that self-employed workers experience lower mental health than organizational employees after controlling for work stress, autonomy and job security (H1).

The next step in the analysis is to focus on social ties, which theoretically links the social work environment with mental health. To investigate this relationship, this paper estimates the effects of a change in the type of employment on social ties, measured by the level of social loneliness and satisfaction about social contacts. Due to the presence of coworkers and therefore the possibility to enter a social relationship with them, I expect that self-employed workers experience more loneliness (H2) and are less satisfied with their social contacts (H3).

The final step in the analysis is to investigate whether workers in different types employment experience a difference in the level of support experienced at work. In general, workers in organizational employment have a supervisor and colleagues, and work for an organization that can be incentivized to create a healthy and supporting work environment for its employees. Therefore, I predict that self-employed workers experience less support at work (H4).

3. Data

This research explores the data from the Dutch LISS Panel (Longitudinal Internet Studies for the Social sciences) administered by CentERdata (Tilburg University, The Netherlands), which contains a representative sample of the Dutch population since the panel is based on a true probability sample of households drawn from the population register by Statistics Netherlands. The data comprises around 8000 individuals, is unbalanced and available in yearly waves from 2008 till 2017. The LISS Core Study is designed to follow changes in the life course and living conditions of the panel members containing information about health, social integration and leisure, work and schooling, personality, income, and politics and values. The scope of this study is limited to people within the labour force.

The key dependent variables used in this paper aims to measure 'mental health', while the independent variable of interest is 'type of employment'. Mental health is measured by using questions about feeling calm, down, depressed, happy and anxious. The question that was asked was: "For every question, can you best describe how you felt during this past month?". Which could be answered by never, seldom, sometimes, often, mostly and continuously. These questions form the

simple, but widely used, mental health inventory (MHI-5). It has been shown to be a valid measure of mental health (Berwick et al., 1991; Driessen, 2011; Thorsen, Rugulies, Hjarsbech, & Bjorner, 2013). With the answers to these questions a 0-25 scale mental health inventory is constructed for each observation. Unfortunately, the mental health data for the year 2014 is unavailable, which means that this year is excluded from the estimation.

The independent variable of interest 'self-employment' is a dummy that equals one if a worker is self-employed and zero if a worker is an organizational employee. A worker is categorized as self-employed when they reported to be an autonomous professional, a freelancer, self-employed, a majority shareholder director without employees, or director of a limited liability or private limited company without employees. All other types of paid work are considered as organizational employment. The share of workers in the sample that are self-employed fluctuates over the years between the 9 and 12 percent, which is in line with findings provided by the Centraal Plan Bureau (CPB, 2016).

Other dependent variables used to further investigate the social dimension of the relationship between mental health and type of employment refer to the 'level of social loneliness', 'satisfaction about social contacts' and 'social support at work'. The former is measured with the use of the 3-item De Jong Gierveld Loneliness Scale ranging from 0-6, which has shown to be a reliable and valid instrument to measure loneliness (De Jong Gierveld & Van Tilburg, 2006). Social loneliness can occur when there is a lack of a wider social network. The question that was asked is: "To what extent do the following statements apply to you, based on how you are feeling at present?". The following statements could be answered by 'yes', 'more or less', or 'no': "There are enough people I can count on in case of a misfortune", "I know a lot of people that I can fully rely on" and "There are enough people to whom I feel closely connected to".

Furthermore, the satisfaction about someone's social relationships is obtained by rating the following question on a 0-10 scale: "How satisfied are you with your social contacts, in real life?". Support at work is measured by reacting on the next statement with 'disagree entirely', 'disagree', 'agree' or 'agree entirely': "I get (/got) sufficient support in difficult situations." To have a first idea about the differences between self-employed and organizationally employed workers, table 1 presents a collection of descriptive statistics. The statistics include a mean comparison between the two groups, but inevitably experience problems of serial correlation. As the necessary assumptions are not met, the results of the t-test are spurious and not sufficient for derivation. Instead, it serves merely to give an indication about the significance of the differences.

The full sample consists of 23288 observations of 6618 individuals, which, on average, are around 45 years old, have a tenure of about 11 years, earn 1773 euros net per month and work around 30 hours

a week. In the sample 10% of the observations is self-employed and compared to organizational workers, seem to be older and more often male, experience higher levels of social loneliness, have higher education and income, can more often decide their work pace, and experience more autonomy and job insecurity. Furthermore, organizational workers seem to be living with children more often and in a more urban area, and experience more support, stress and time pressure at work. Most importantly, the table shows that the measure of mental health (MHI-5) does not suggest any difference between the types of employment on average. The same holds for the level of satisfaction about social contacts.

Emphasizing again the limitations of this comparison, it is nevertheless a clear starting point of the analysis. In contrast, a better and later applied method of analyzing the differences between the types of employment is to observe people that switch between self-employment and organizational employment. It is therefore appropriate to mention that, from the 6618 individuals in the sample, 276 or 4.2% switch at least once between the types of employment. From the observed switches in the sample, 27% switched to organizational employment and 73% to self-employment.

Table 1: Descriptive Statistics

	Total		**Self-employed** (10%)		**Employed** (90%)		**Difference**
	mean	sd	mean	sd	mean	sd	
MHI-5	18.87	3.88	19.00	3.77	18.86	3.90	-0.142
Social loneliness	1.09	1.48	1.15	1.47	1.08	1.48	-0.0653*
Contacts	7.23	1.52	7.25	1.59	7.23	1.51	-0.0217
Support	2.84	0.63	2.69	0.71	2.86	0.62	0.176***
Age	44.73	12.56	50.19	12.27	44.11	12.44	-6.081***
Male	0.49	0.50	0.55	0.50	0.48	0.50	-0.0663***
Education	3.92	1.40	4.07	1.47	3.90	1.39	-0.171***
Partner	0.76	0.43	0.78	0.42	0.76	0.43	-0.0146
Children	0.53	0.50	0.47	0.50	0.53	0.50	0.0613***
Urbanity	3.01	1.29	2.81	1.36	3.03	1.28	0.223***
Income	1773	2967	1898	1884	1759	3064	-139*
Tenure	11.44	10.85	10.92	11.34	11.50	10.79	0.576*
Hours	30.19	15.01	30.24	18.93	30.19	14.51	-0.0504
Stress	1.30	0.60	1.08	0.61	1.32	0.59	0.238***
Time pressure	2.20	0.76	2.00	0.73	2.22	0.76	0.223***
Own pace	1.58	0.61	1.79	0.47	1.56	0.62	-0.231***
Autonomous	3.02	0.72	3.33	0.70	2.98	0.71	-0.349***
Job insecurity	2.16	0.82	2.23	0.88	2.15	0.81	-0.0769***
N	23288		2343		20945		23288
Individuals	6618		823		6011		6618

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Furthermore, figures 1 to 4 show the distributions of the dependent variables for the organizationally employed and self-employed workers separately. Although the shapes of the distributions are very similar, there are some differences in density that are worth mentioning. The self-employed workers seem to have a higher density at higher levels of 'mental health', but have a lower density for higher levels of 'support at work'. So far, this paper merely discussed the characteristics of the raw data, without considering that the data has a longitudinal dimension. Hence, next chapter will discuss the methods used to further analyze the panel data and test the hypotheses.

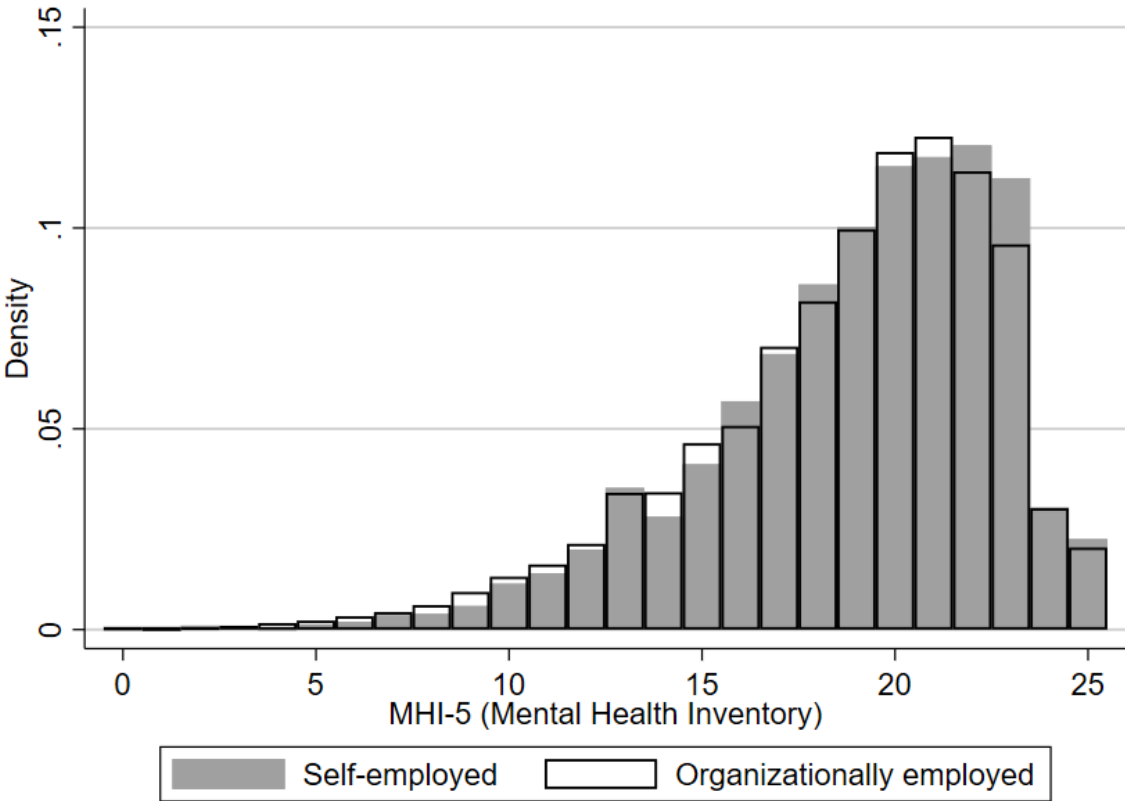*Figure 1: Distribution of 'Mental health' by type of employment*

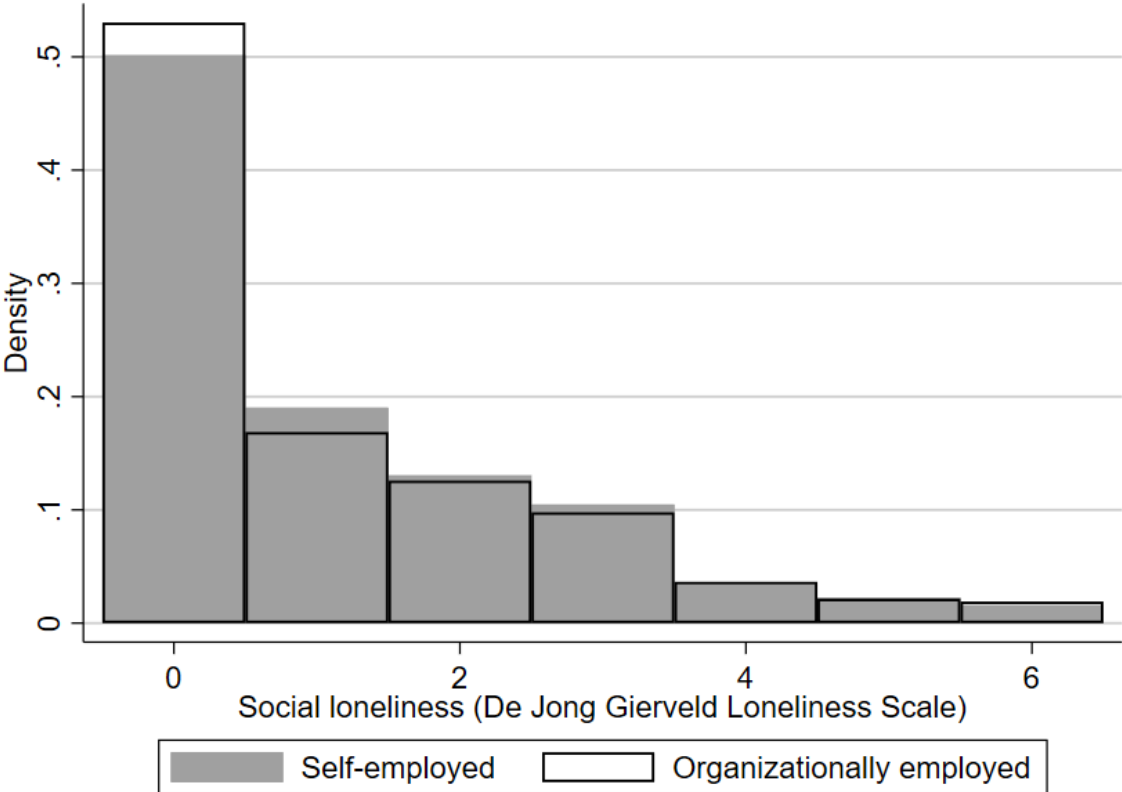*Figure 2: Distribution of 'Social loneliness' by type of employment*

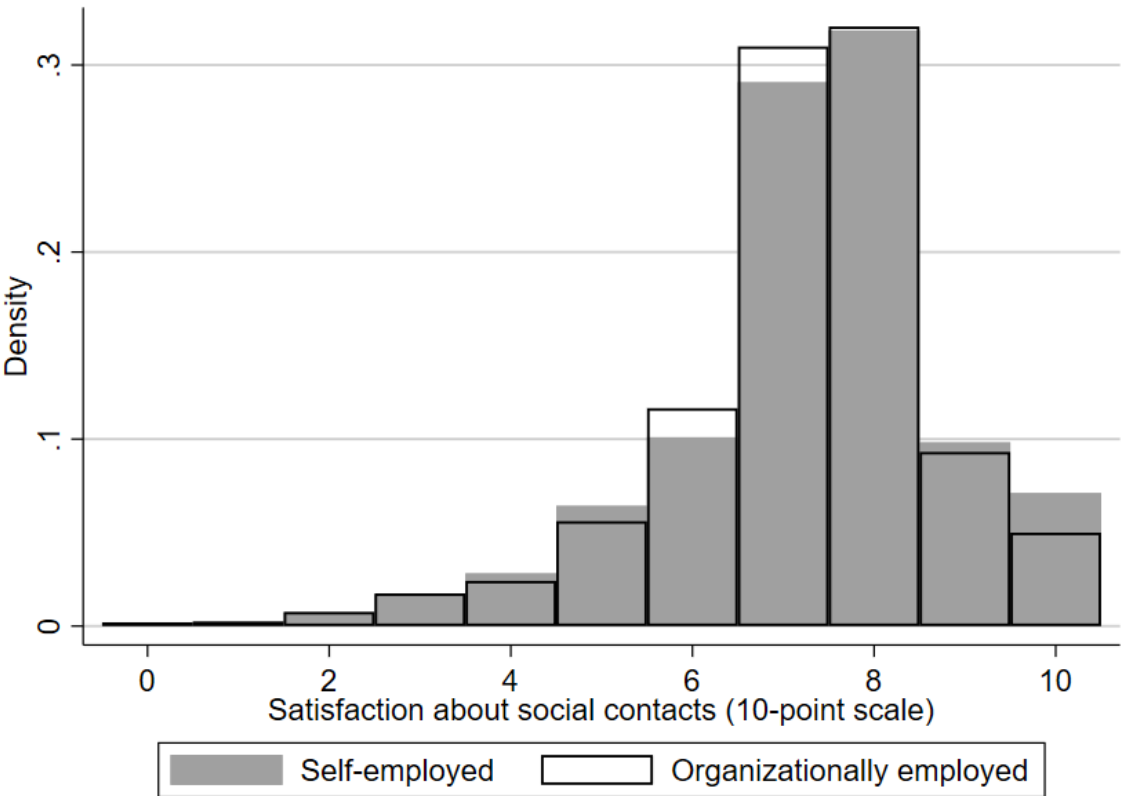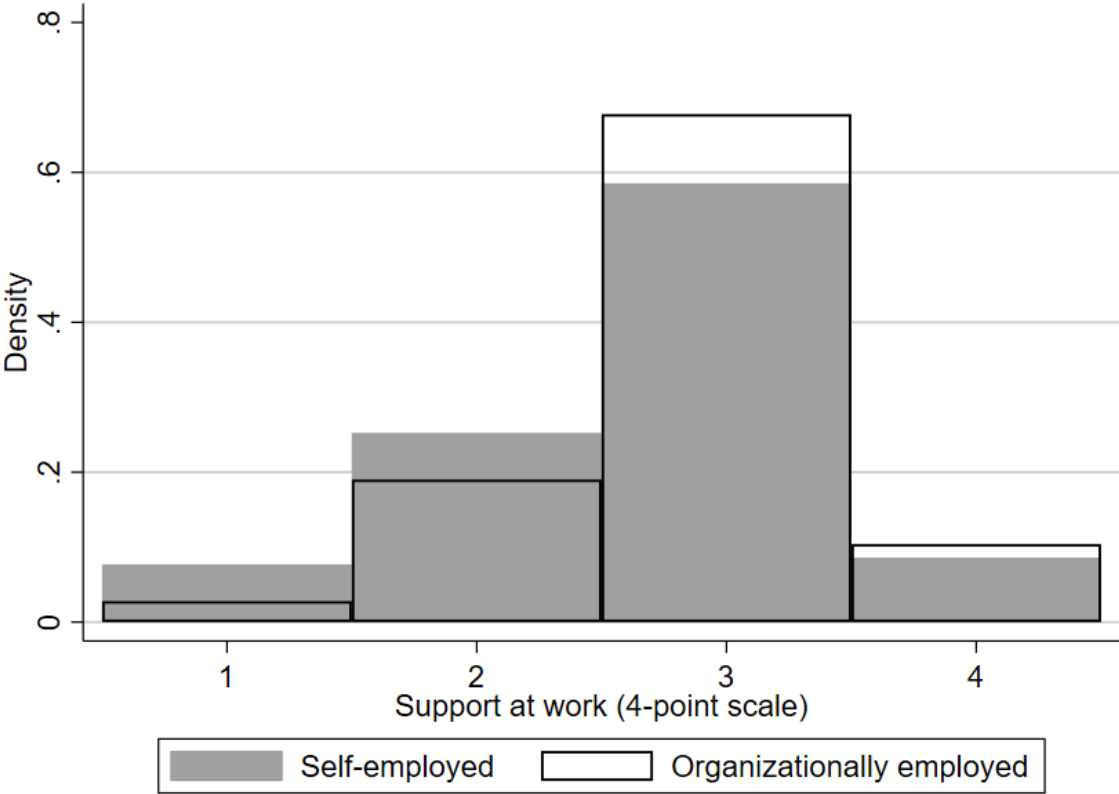*Figure 3: Distribution of 'Social contacts' by type of employment*

Figure 4: Distribution of 'Support at work' by type of employment

4. Method

To analyze the relationships between the type of employment on one hand and mental health, social ties and the social work environment on the other, this paper provides fixed-effect and random-effect estimations. Both estimation methods have their pro and cons regarding these relationships, as mental health and social ties are subject to a lot of unobservable factors and change in type of employment is often endogenous. If the unobservable factors are correlated with the explanatory variables, e.g. being self-employed, a RE estimation will give inconsistent results. In contrast, FE estimation will partly deal with the omitted variable bias as it controls for unobserved time-invariant factors. In this case, omitted variables will not create a bias when the explanatory variables are only correlated with time-invariant variables (and not with time-variant variables) and when the effect of these time-invariant variables is the same over time.

Although the FE estimation is less likely to produce biased coefficients, other problems might arise. The most prominent one occurs when individuals experience no or limited change of a variable over time, which seems to be the case if we compare the within and between variation of a worker's type

of employment. Type of employment has a within and between standard deviation of 0.099 and 0.297 respectively, while 95,8 % of the sample do not change their type of employment. As the fixed-effects approach analyses this limited within-individual variation, this method is likely to produce large standard errors.

Furthermore, it could be that the gains from working in different types of employment are individual specific. This leads to self-selection in situations where people have heterogeneous preferences and a choice. If the dependent variable is endogenous to the selection into a certain type of employment, the effects of the type of employment can neither be estimated without a bias by comparing variation between individuals, nor by analyzing within variation for those who voluntarily switch between the types of employment. The latter problem is likely to occur with FE estimation and could potentially lead to overestimation of the effect of self-employment as 73% of the observed employment switches are from organizational employment to self-employment. Also, as only 4.2% of the sample switches between types of employment it seems that a large part of sample already selected themselves into a certain type of employment. Therefore, the effects of each type of employment on, for example, mental health or social ties could be underestimated with the FE estimator and hence, give biased results.

In light of above mentioned considerations, rather than choosing one approach over the other, both methods have sufficient grounds to be used for this research. Therefore, the uneven econometric equations will be estimated by RE and the even by FE estimation. The difference is that RE estimation assumes that the $Cov(X_{i,t}, \alpha_i) = 0$ and therefore does not explicitly model the individual fixed effects. The following hypotheses (H1-H4) will be tested by the estimation of the two corresponding econometric specifications (1-8):

H1: Self-employed workers experience lower mental health than employees after controlling for work stress, autonomy and job security ($\beta_1 < 0$ & $\beta_2 < 0$).

$$MH_{i,t} = \beta_0 + \beta_1 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad (1)$$

$$MH_{i,t} = \alpha_i + \beta_0 + \beta_2 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad (2)$$

H2: Self-employed workers experience more social loneliness than employees ($\beta_3 > 0$ & $\beta_4 > 0$).

$$LN_{i,t} = \beta_0 + \beta_3 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad (3)$$

$$LN_{i,t} = \alpha_i + \beta_0 + \beta_4 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad (4)$$

H3: Self-employed workers are less satisfied with social contacts than employees ($\beta_5 < 0$ & $\beta_6 < 0$).

$$SC_{i,t} = \beta_0 + \beta_5 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad\qquad (5)$$

$$SC_{i,t} = \alpha_i + \beta_0 + \beta_6 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad\qquad (6)$$

H4: Self-employed workers experience less support at work than employees ($\beta_7 < 0$ & $\beta_8 < 0$).

$$SS_{i,t} = \beta_0 + \beta_7 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad\qquad (7)$$

$$SS_{i,t} = \alpha_i + \beta_0 + \beta_8 S_{i,t} + \theta X_{i,t} + \tau_t + \varepsilon_{i,t} \qquad\qquad (8)$$

To analyze these relationships the above-mentioned equations are estimated without (1, 3, 5 & 7) and with (2, 4, 6 & 8) the individual fixed effects. Respectively, $MH_{i,t}, LN_{i,t}, SC_{i,t}$ and $SS_{i,t}$ are measures of mental health, social loneliness, satisfaction of social contacts and support at work of person i at time period t; α_i is the individual fixed effect; β_0 is the intercept; $S_{i,t}$ is a dummy that equals one if worker i is self-employed at time period t; $X_{i,t}$ is a vector of (time varying) control variables; τ_t is the time fixed effect. The estimation results will be presented in the next chapter.

5. Results

Since this chapter presents the estimation results of the ten specifications proposed in chapter 4, it is for structural reasons sensible to start with portraying the generic properties of the estimations. The effects of the type of employment on all five dependent variables (Mental health, Social loneliness, Social contacts and Support at work) are estimated with a Random Effects (RE) and Fixed Effects (FE) estimator. The results for every dependent variable are presented in a separate subsection (5.1-5.4), consisting of the estimation results from the corresponding econometric specifications (1-8). Every subsection includes a regression table (table 2-5), where the uneven econometric specifications are estimated with RE in columns [1], [3] and [5] and the even econometric specifications with FE in columns [2], [4] and [6]. All estimations are performed with time fixed effects, while column [2], [4] and [6] also include individual fixed effects. The standard errors are clustered at individual level to correct for correlation of the error term over time.

For all regression tables in every subsection holds that the columns [1] and [2] show the effect of type of employment on the particular dependent variable without any control variables. Columns [3] and [4] include control variables which are not directly related to work: 'age', 'living with a partner', 'living with children', 'the level of urbanity', 'level of education' and 'being a male'. The latter two are

excluded for the FE estimations, as education and gender don't vary over time and are therefore already controlled for. All these non-work control variables are included and the same for every dependent variable. Age, the level of education and gender are expected to relate to a worker's type of employment, mental health, social ties and to how a person perceives their social work environment. Living with a partner or with children and the level of urbanity are included because it directly relates to a worker's social environment and therefore indirectly to their mental health, social ties and perception of the social work environment.

Moreover, the aim is to compare jobs in self-employment with jobs in organizational employment that are as similar as possible, apart from the social work environment. To isolate this effect of the social work environment, it is important to control for job characteristics that are expected to differ between the types of employment and relate to the dependent variable. This is especially challenging with 'mental health' as this variable is dependent on a large variety of employment-related factors other than the social work environment. Therefore, in column [5] and [6] of every regression table the following work-related control variables are added: 'monthly income', 'tenure', 'weekly work hours', 'stress at work', 'time pressure at work', 'profession', 'industry', 'autonomous work pace', 'autonomy' and 'job insecurity'. The latter three variables are only included with 'mental health' as dependent variable, because autonomy and job insecurity are expected to differ for the types of employment and to relate to mental health, while this is probably not the case with social ties ('Social loneliness' and 'Social contacts') and the perception of the social work environment ('Support at work').

Before explaining the inclusion of the other variables and their relation to the dependent variables, it is not cumbersome to state that all the work-related control variables are expected to relate to the type of employment by nature. Income is thought to directly and positively relate to mental health and it is also thinkable that income can be used to invest in social ties and that jobs with different income levels have different social environments. Tenure is included mostly because it is thought that the social work environment changes with tenure, as is the relationship with mental health and social ties. It is expected that jobs with different working hours have a different effect on mental health, social ties and social work environment, as, for example, spending more time with colleagues increases social ties and changes the perception of the social work environment. Stress and time pressure at work are ought to directly relate to mental health, but could also indirectly relate to social ties and the perception of the work environment by, for example, a change in social preferences. Profession and industry are controlled for to take into account the differences in social environments for different types of jobs.

The following subsections each present the results for each dependent variable separately and are thereafter discussed in chapter 6. To improve readability and maintain focus on the key variable (self-employment), the above-mentioned control variables are not separately displayed in the regression tables. Instead, the extensive version the tables are included in the appendix.

5.1 Mental Health

Table 2 shows the estimation of the econometric specifications (1) and (2) with and without individual fixed effects, where column [1] and [2] present the effect of the type of employment on mental health without any control variables. Here it is shown that, with both estimators (RE and FE), self-employed workers experience higher levels of mental health on average, but this effect is highly insignificant. While controlling for non-work-related factors, although insignificant as well, columns [3] and [4] show opposite signs for the RE and FE estimation. The effect has become negative for the RE estimation and has somewhat decreased for the FE estimation. The small change for FE is expected, as the variation of the added control variables is low or occasionally absent and therefore captured by the individual fixed effects. Column [5] and [6] display the results when the work-related controls are added in the regression, including the experienced work stress, work pace, time pressure, autonomy and job security. In these columns, the RE estimation of the effect of being self-employed has become even more negative and shows that self-employed workers score 0.287 points lower on the 0-25 mental health inventory (MHI-5) on average. This effect is significant with a p-value of 0.013. The estimated effect with FE has also become negative (-0.160), but remains insignificant. Additionally, the substantive significance is small with an estimated difference of 0.287 points on a 0-25 scale with a mean of 18.87. Both results in column [5] and [6] of the RE and FE estimations provide some support for H1, which predicts that self-employed workers experience lower mental health than organizational employees after controlling for work stress, autonomy and job security. However, the estimated size questions whether the results provide any valuable information.

Table 2: Random and fixed effects estimation of the effect of being self-employed on mental health

Dependent variable: Mental health (mean = 18.87, sd = 3.88, min = 0, max = 25)						
Column:	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**
Random/Fixed Effects:	**RE**	**FE**	**RE**	**FE**	**RE**	**FE**
Self-employed	0.170	0.0206	-0.0714	0.0128	-0.287[*]	-0.160
	(0.117)	(0.197)	(0.116)	(0.197)	(0.116)	(0.194)
Non-work controls	NO	NO	YES	YES	YES	YES
Work controls	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	23288	23288	23288	23288	23288	23288
Individuals	6618	6618	6618	6618	6618	6618

Standard errors in parentheses and clustered at individual level
[*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$

5.2 Social loneliness

Table 3 presents the estimation of the econometric specifications (3) and (4) with and without individual fixed effects, where column [1] and [2] present the effect of the type of employment on social loneliness without any control variables. Again, adding non-work controls in column [3] and [4] did not change the results much in contrast to adding work-related controls in [5] and [6]. The results for the relationship between the type of employment and the level of social loneliness are all pointing to the same direction, which is that self-employed workers experience a higher level of social loneliness on average. But hence, this effect is only significant when the between variation and the work-related control variables are included, as presented in column [5]. It is found that self-employed workers on average experience 0.0978 points higher on the 6-point social loneliness scale than organizationally employed workers, which is significant with a p-value of 0.036. To give it some context, the difference of 0.0978 comprises around 9% of the mean value. This is in line with the result from the fixed effect estimation in column [6]. Altogether, it seems that there is some support for H2, which states that self-employed workers experience more social loneliness than organizational employees.

Table 3: Random and fixed effects estimation of the effect of being self-employed on social loneliness

Dependent variable: Social loneliness (mean = 1.09, sd = 1.48, min = 0, max = 6)						
Column:	[1]	[2]	[3]	[4]	[5]	[6]
Random/Fixed Effects:	RE	FE	RE	FE	RE	FE
Self-employed	0.0493	0.00658	0.0391	0.00529	0.0978[*]	0.0447
	(0.0445)	(0.0729)	(0.0449)	(0.0729)	(0.0466)	(0.0726)
Non-work controls	NO	NO	YES	YES	YES	YES
Work controls	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	22093	22093	22093	22093	22093	22093
Individuals	6388	6388	6388	6388	6388	6388

Standard errors in parentheses and clustered at individual level
[*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$

5.3 Social contacts

The with and without individual fixed effects estimation results of econometric equations (5) and (6) are presented in table 4. Here, the focus is the relationship between the type of employment and the satisfaction about social contacts. For all FE and RE estimations the sign of the estimated effect is the same and negative, where adding non-work controls do not alter the results as much as adding work-related control variables. All estimated effects are insignificant except for the result with a p-value of 0.026 in column [6], which shows that workers that switch from organizational employment to self-employment (self-employment to organizational employment) decrease (increase) their satisfaction about social contacts on average with 0.191 points on a 10-point scale with a sample average of 7.23. Although the substantive significance is not very high, the results show some support for H3, which predicts that self-employed workers are less satisfied with social contacts than organizational employees.

Table 4: Random and fixed effects estimation of the effect of being self-employed on satisfaction about social contacts

Dependent variable: Social contacts (mean = 7.23, sd = 1.52, min = 0, max = 10)						
Column:	[1]	[2]	[3]	[4]	[5]	[6]
Random/Fixed Effects:	RE	FE	RE	FE	RE	FE
Self-employed	-0.0229	-0.144	-0.0205	-0.146	-0.0896	-0.191[*]
	(0.0513)	(0.0852)	(0.0516)	(0.0852)	(0.0530)	(0.0858)
Non-work controls	NO	NO	YES	YES	YES	YES
Work controls	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	21688	21688	21688	21688	21688	21688
Individuals	6335	6335	6335	6335	6335	6335

Standard errors in parentheses and clustered at individual level
[*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$

5.4 Support at work

The results of the with and without individual fixed effects estimation of econometric equations (7) and (8) is displayed in table 5, which is aimed at the relationship between the type of employment and the level of support at work. All results are significant and have the same sign, for which the effect becomes larger when work-related controls are added in column [5] and [6] and are significant with a p-value of 0.000. Here, column [6] shows that workers that switch from organizational employment to self-employment (self-employment to organizational employment) experience lower (higher) levels of support at work on average with 0.178 points on a 4-point scale. This effect is similar in size compared to column [5], where self-employed workers experience lower levels of support at work by 0.214 points on average. The size of the estimated effect is around 7% of the sample mean of 2.84. Overall, these findings support H4, which states that self-employed workers experience less social support at work than organizational employees.

Table 5: Random and fixed effects estimation of the effect of being self-employed on support at work

Dependent variable: Support at work (mean = 2.84, sd = 0.63, min = 1, max = 4)						
Column:	[1]	[2]	[3]	[4]	[5]	[6]
Random/Fixed Effects:	RE	FE	RE	FE	RE	FE
Self-employed	-0.167***	-0.115*	-0.165***	-0.116*	-0.214***	-0.178***
	(0.0216)	(0.0475)	(0.0219)	(0.0475)	(0.0223)	(0.0481)
Non-work controls	NO	NO	YES	YES	YES	YES
Work controls	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	23288	23288	23288	23288	23288	23288
Individuals	6618	6618	6618	6618	6618	6618

Standard errors in parentheses and clustered at individual level
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6. Discussion

This chapter presents a summary and discussion of the main results Accordingly, table 6 summarizes the main results found for each dependent variable and these will be used to discuss whether and to what length the following research questions can be answered with the emphasis on the social context:

A.   Is the type of employment related to mental health?

B.   Is the type of employment related to social ties?

C.   Is the type of employment related to support at work?

In terms of forward reasoning, the discussion starts with question C and the results found for support at work in columns [7] and [8] of table 6. Although there is a difference in the social work environment between the types of employment by design, it is not evident that workers experience these differences in terms of, for example, social support at work. It is therefore important to find meaningful results, as the difference in social work environment is the cornerstone of this analysis. Comfortingly, the results are in line with the expectations and highly significant. It is also noticeable that, with the social environment as a starting point, workers experience about the same level of support at work regardless whether they switched between the types of employment or not. Simply said, the within and between individual comparison comprises to about the same estimated effect. In conclusion and by answering question C, the findings seem to support the idea that the difference in the social work environment is reflected by a higher level of support at work experienced by organizational employees.

Column [3] to [6] in table 6 show the main results of the estimation of the type of employment on the level of social loneliness and satisfaction about social contacts, which are both considered to give an indication about a worker's social ties. The social ties of organizational workers are expected to be higher due to a difference in the social work environment, but analyzing this relationship is not without issues. The most prominent problem is the threat of biased results due to the self-selection problem, which occurs when the measures of social ties are endogenous to a certain type of employment. For example, when relatively more asocial people decide to be self-employed, a found effect could be driven by the inability of those people to connect with others. However, it could also be the case that relatively more self-employed workers are very satisfied with their private contacts. Therefore, the effects of different types of employment can neither be estimated without a bias by simply comparing variation between individuals nor from exploring the changes in the dependent variable for those who voluntarily switch between types of employment. The latter problem is likely to occur with FE estimation and could potentially lead to overestimation of the effect of self-employment as 73% of the observed employment switches are from organizational employment to self-employment. Also, as only 4.2% of the sample switches between types of employment it seems that a large part of sample already selected themselves into a certain type of employment. Therefore, the effects of each type of employment on the satisfaction about social contacts or the level of social loneliness could be underestimated and hence, give biased results. In conclusion, for both the FE and RE estimation it is likely to have some bias in the results, but it is difficult to determine the size and direction. However, there is some reassurance with the knowledge that people often report to decide upon the type of employment for reasons unrelated to social ties. More research is needed to confidently answer question B, but the results in column [3] to [6] in table 6 give some support to an affirmative answer.

The main estimation results of the effect of the type of employment on mental health are shown in columns [1] and [2] of table 6. Here, the same issue with self-selection applies as it did for the measures of social ties. The rhetoric is the same, besides the fact that choosing a job for reasons (indirectly) related to mental health is more likely to occur. This ultimately makes a bias in the results more likely, which could especially occur with the FE estimation results as, for example, people switch between types of employment with the goal to improve their mental health. If workers indeed switch to gain a higher level of mental health and succeed, the fact that 73% of the switchers switch to self-employment could result in an underestimation of the negative effect of self-employment on mental health. This could potentially explain the difference in size and significance between the results in column [1] and [2] of table 6. However, both results have the same sign and could be carefully considered to be in support of answering question A with: "If controlling for the experienced work stress, autonomy and job security successfully isolated the effects of the social work environment, it seems to be that the social aspects of the type of employment are related to mental health. However, further research is needed for a convincing answer."

Table 6: Summarizing the main RE and FE estimation results of the effects of being self-employed

Dep. variable:	Mental health		Social ties				Social support	
	MHI-5		Soc. loneliness		Social contacts		Support at work	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	RE	FE	RE	FE	RE	FE	RE	FE
Self-employed	-0.287*	-0.160	0.0978*	0.0447	-0.0896	-0.191*	-0.214***	-0.178***
	(0.116)	(0.194)	(0.0466)	(0.0726)	(0.0530)	(0.0858)	(0.0223)	(0.0481)
Non-work controls	YES	YES	YES	YES	YES	YES	YES	YES
Work controls	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES	NO	YES
N	23288		22093		21688		23288	
Individuals	6618		6388		6335		6618	

Standard errors in parentheses and clustered at individual level
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7. Conclusion

This chapter contains a disquisition of drawbacks, further considerations and final remarks, but starts with concluding that this paper has succeeded to provide considerable support for the predictions about the relationship between the social work environment on one hand and support at work, social ties and mental health on the other. It seems that, compared to the self-employed, a higher social work environment for organizational employees positively effects their experienced support at work,

their social ties and mental health. Even though the results are to be considered with caution and provide no convincing evidence, they are, in my opinion, providing fuel for further research.

Ideally, some issues that occurred in this research have to be overcome. Though convenient for comparing the difference in the social work environment, comparing self-employed with organizationally employed workers is far from ideal. The drawbacks arise because the two types of employment differ in too many other ways, even though this is partly solved by controlling for these differences. Also, the static nature of being in a certain type of employment makes the comparison less suitable for fixed effect estimation, as this data analysis is based on the within individual variation. Predominantly, the biggest issue to overcome is the previously discussed self-selection problem resulting in biased results.

A setting that deals with these issues is created when key variables are measured over time for a large random sample of the workforce and workers observably switch at random and frequent between jobs that only differ in their social environment. Obviously, such a setting is hard to accomplish, but a solution might be to analyze self-employed and organizationally workers that work for the same companies. If self-employed workers hired by the company are often enough joining the company, this would overcome the problem of too many job differences. This would solve the selection problem when they are forced to join, but this is clearly not feasible. Also, the problems that might arise in this situation are related to the amount of observations and the fact that switches from organizational employment to self-employment are probably not observed. Nevertheless, one unpleasant conclusion about dealing with the self-selection problem is that a remedy is far from reach. Further research might be better off with utilizing the setting proclaimed in this paper, but by asking the respondents about the reason for their switch in employment. With this information, people who switch for reported reasons related to the outcome variable could be conveniently excluded from the analysis. Finally, I want to stress the importance for further research concerning this topic, as work-related (mental) health problems are (noticeably) increasing within the Netherlands over the past few years.

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Appendix

Table A1: Random and fixed effects estimation of the effect of being self-employed on mental health

Dependent variable: Mental health (mean = 18.87, sd = 3.88, min = 0, max = 25)						
Column:	[1]	[2]	[3]	[4]	[5]	[6]
Random/Fixed Effects:	RE	FE	RE	FE	RE	FE
Self-employed	0.170	0.0206	-0.0714	0.0128	-0.287[*]	-0.160
	(0.117)	(0.197)	(0.116)	(0.197)	(0.116)	(0.194)
Age			0.0368[***]	0.0252	0.0337[***]	0.0245
			(0.00311)	(0.0353)	(0.00349)	(0.0288)
Partner			0.601[***]	0.158	0.571[***]	0.159
			(0.0927)	(0.157)	(0.0908)	(0.156)
Children			-0.0997	-0.325[*]	-0.0844	-0.302[*]
			(0.0795)	(0.133)	(0.0772)	(0.131)
Urbanity			-0.112[***]	0.0426	-0.0992[***]	0.0236
			(0.0306)	(0.0773)	(0.0300)	(0.0755)
Education			0.171[***]	-	0.107[**]	-
			(0.0282)		(0.0330)	
Male			0.680[***]	-	0.654[***]	-
			(0.0822)		(0.0922)	
Income					-0.000	-0.000
					(0.000)	(0.000)
Tenure					0.000449	-0.0195[***]
					(0.00365)	(0.00578)
Hours					0.000788	-0.00190
					(0.00196)	(0.00222)
Stress					-0.132[**]	-0.0229
					(0.0434)	(0.0478)
Time pressure					-0.315[***]	-0.170[***]
					(0.0385)	(0.0423)
Own pace					0.157[***]	0.0761
					(0.0470)	(0.0533)
Autonomous					0.198[***]	0.121[**]
					(0.0369)	(0.0404)
Job insecurity					-0.255[***]	-0.0805[*]
					(0.0316)	(0.0356)
Profession	NO	NO	NO	NO	YES	YES
Industry	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	23288	23288	23288	23288	23288	23288
Individuals	6618	6618	6618	6618	6618	6618

Standard errors in parentheses and clustered at individual level
[*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$

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Table A2: Random and fixed effects estimation of the effect of being self-employed on social loneliness

Dependent variable: Social loneliness (mean = 1.09, sd = 1.48, min = 0, max = 6)						
Column:	[1]	[2]	[3]	[4]	[5]	[6]
Random/Fixed Effects:	RE	FE	RE	FE	RE	FE
Self-employed	0.0493	0.00658	0.0391	0.00529	0.0978*	0.0447
	(0.0445)	(0.0729)	(0.0449)	(0.0729)	(0.0466)	(0.0726)
Age			0.00269*	0.0258***	0.00460**	0.0279***
			(0.00122)	(0.00753)	(0.00141)	(0.00739)
Partner			-0.129***	-0.0247	-0.121***	-0.0327
			(0.0343)	(0.0542)	(0.0342)	(0.0543)
Children			0.0247	0.00692	0.0263	-0.00158
			(0.0292)	(0.0473)	(0.0290)	(0.0473)
Urbanity			0.0000262	-0.0593*	0.000745	-0.0551*
			(0.0117)	(0.0272)	(0.0118)	(0.0272)
Education			-0.0574***		-0.0183	
			(0.0111)		(0.0136)	
Male			0.171***		0.151***	
			(0.0322)		(0.0372)	
Income					-0.000	-0.000
					(0.000)	(0.000)
Tenure					-0.00124	0.00225
					(0.00154)	(0.00250)
Hours					-0.000844	-0.000299
					(0.000776)	(0.000877)
Stress					0.0463**	0.0387*
					(0.0176)	(0.0194)
Time pressure					0.0688***	0.0261
					(0.0143)	(0.0158)
Profession	NO	NO	NO	NO	YES	YES
Industry	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	22093	22093	22093	22093	22093	22093
Individuals	6618	6618	6618	6618	6618	6618

Standard errors in parentheses and clustered at individual level
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3: Random and fixed effects estimation of the effect of being self-employed on social contacts

Dependent variable: Social contacts (mean = 7.23, sd = 1.52, min = 0, max = 10)						
Column:	[1]	[2]	[3]	[4]	[5]	[6]
Random/Fixed Effects:	RE	FE	RE	FE	RE	FE
Self-employed	-0.0229	-0.144	-0.0205	-0.146	-0.0896	-0.191[*]
	(0.0513)	(0.0852)	(0.0516)	(0.0852)	(0.0530)	(0.0858)
Age			-0.000559	-0.0199	-0.00147	-0.0218
			(0.00134)	(0.0120)	(0.00150)	(0.0112)
Partner			0.172[***]	0.0246	0.167[***]	0.0243
			(0.0398)	(0.0661)	(0.0396)	(0.0661)
Children			-0.131[***]	-0.102[*]	-0.136[***]	-0.101[*]
			(0.0315)	(0.0491)	(0.0314)	(0.0492)
Urbanity			-0.00296	0.0217	0.000527	0.0202
			(0.0132)	(0.0345)	(0.0132)	(0.0343)
Education			-0.00610		-0.0177	
			(0.0119)		(0.0145)	
Male			-0.162[***]		-0.149[***]	
			(0.0348)		(0.0398)	
Income					-0.000	-0.000
					(0.000)	(0.000)
Tenure					0.00147	-0.00311
					(0.00143)	(0.00204)
Hours					-0.0000523	0.000939
					(0.000766)	(0.000858)
Stress					-0.0771[***]	-0.0639[***]
					(0.0175)	(0.0190)
Time pressure					-0.0833[***]	-0.0287
					(0.0150)	(0.0164)
Profession	NO	NO	NO	NO	YES	YES
Industry	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	21688	21688	21688	21688	21688	21688
Individuals	6335	6335	6335	6335	6335	6335

Standard errors in parentheses and clustered at individual level
[*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$

Table A4: Random and fixed effects estimation of the effect of being self-employed on support at work

Dependent variable: Support at work (mean = 2.84, sd = 0.63, min = 1, max = 4)						
Column:	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**
Random/Fixed Effects	RE	FE	RE	FE	RE	FE
Self-employed	-0.167***	-0.115*	-0.165***	-0.116*	-0.214***	-0.178***
	(0.0216)	(0.0475)	(0.0219)	(0.0475)	(0.0223)	(0.0481)
Age			-0.000640	0.0106***	-0.000626	0.00810*
			(0.000476)	(0.00284)	(0.000554)	(0.00333)
Partner			0.00531	0.00908	0.00104	0.0144
			(0.0141)	(0.0278)	(0.0138)	(0.0281)
Children			-0.00522	-0.0121	-0.00146	-0.00538
			(0.0122)	(0.0244)	(0.0119)	(0.0243)
Urbanity			-0.0107*	-0.00759	-0.0124**	-0.0121
			(0.00461)	(0.0154)	(0.00458)	(0.0154)
Education			0.00703		-0.0157**	
			(0.00433)		(0.00512)	
Male			-0.0366**		-0.0294*	
			(0.0121)		(0.0139)	
Income					-0.000	-0.000
					(0.000)	(0.000)
Tenure					-0.00240***	-0.00729***
					(0.000628)	(0.00132)
Hours					0.00124***	0.000815
					(0.000361)	(0.000444)
Stress					-0.0428***	-0.0383***
					(0.00854)	(0.00993)
Time pressure					-0.103***	-0.0665***
					(0.00742)	(0.00881)
Profession	NO	NO	NO	NO	YES	YES
Industry	NO	NO	NO	NO	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	NO	YES	NO	YES
N	23288	23288	23288	23288	23288	23288
Individuals	6618	6618	6618	6618	6618	6618

Standard errors in parentheses and clustered at individual level
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$