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Influence of health on labour market transitions

A research on the difference in effect for people close to retirement

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Handing in this thesis concludes the final part of my academic career. By defending this thesis I hope to have contributed to the knowledge regarding the influence of health on labour market transitions. However, it should be clear that I could not have achieved this on my own. That is why I would like to thank a few people.

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Abstract

Due to the economic crisis, labour market transitions have become an even larger topic of interest for a lot of actors in the field of employment. The effect of health on labour market transitions has been quantified several times, but only for the individuals who are close to retiring. In this thesis an effort was made to assess the effect of health on labour transitions to work, but also to non-employment. By correcting for the effect of health on the transitions by using several demographic, health-, household- and job characteristics, the influence of health has been quantified. The dataset used for this model is the Dutch Household Survey, which consists of 18 waves. Additional to the variables, we added region and time dummies. Due to the fact that we look at transitions and the binary dependent variable we used a logit model, but also a linear probability fixed effects model to correct for the unobserved heterogeneity. The outcomes of the marginal effects showed that health did influence the transition to employment. The probability of an individual to transition to work is 2.4 percentage points higher when someone reports that he has good health, compared with someone who has reported to have bad health. This is only the case when an individual belonged to the age category 50+. Self-assessed health also influenced the transition to non-employment by decreasing the probability by 8.8 percentage points for someone with good health in the younger age category, compared to people with bad health ceteris paribus.

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1. Introduction

Due to the economic crisis labor participation rates have become under threat. In the Netherlands the unemployment rate has risen significantly to 6.4 in 2012 from 3.8 in 2008 when the economic crisis started (CBS. 2012). Most of transitions to non-employment are instigated by the choices employers have to make due to the economic crisis. This means that the remaining labour force needs increase their work productivity, which comes under strain due to the shrinking labor force (Prudential. 2012). To keep work productivity realistically high, without depleting the employees to the point that they transition to non-employment, it is important to understand which factors influence the labor market transitions. By understanding which factors influence the labor participation we might be able to keep the labor participation rates as high as possible. An important factor influencing the work productivity and labor participation rate is the health of the employees. It decreases the amount of employees in the labor force through health shocks (Jiménez-Martín, Labeaga & Vilaplana. 2006), but also decreases the transitions to employment (Coile. 2004). This makes it interesting to focus on the role of health on labor market transitions.

Research has shown that a period of not working has a negative effect on the health, both mental and physical (Kessler. 1988). This is mainly due to the social isolation, which follows with staying home due to not having a job. The effects of non-employment are apparent. The health, especially mental health, declines the longer someone is unemployed ceteris paribus (Linn et al. 1985; Dorling. 2009). However, the evidence of the effect of health and other health related factors on labour transitions is not conclusive in the literature. In some articles claims are made that there is correlation between gender and health, in which women with poor health have lower chances to get employed than men with the same health status (Schuring et al. 2007).

In this thesis we will try to do something else by comparing the influence of health on labor transitions between two age groups: individuals below and above 50 years of age. This is interesting because most of the literature concerning labour market transitions is based on the group of individuals who are close to retiring. In this thesis the focus of the research will be on the effect of health on both the labour transition to non-employment as employment for people aged below 50 years. This is the case because, as the literature suggests, there are a lot of studies which focus on the topic of the effect of health on the transition to employment for the elderly. Even though this group is very important, they represent a large labor potential that is valuable due their labour experience, I focus on the group which has not been that much

focused in research. The group of younger individuals which face labor transitions might be more interesting, because they have a longer period of working to go, which makes them valuable human capital.

A research question will be formulated as follows:

How does health influence labour market transitions for individuals aged below 50 years compared with people close to retiring (over 50)?

We will start with the theoretical framework, in which the different factor of significant will be described. The effects of these determinants upon returning to work will be discussed and will form the basis for their expected outcomes. After the theoretical framework, the dataset that will be used in this thesis will be described. After the data section, the methods which will be used for the analysis will be described. Afterwards the results of the regressions will be discussed and a conclusion and answer to the main research question will be given.

2. Literature review

Given the fact that there will be made use of several variables, these will be divided in multiple categories. The categories in which these factors are divided are the following: Demographic factors, job-related factors and health-related factors.

2.1 Demographic factors

According to the ONE-report (Davies and Johnson. 2001), a qualitative research study on the factors influencing transitions to work, age influences the attitude on going back to work. Transitions to employment are influenced by age. The older someone gets, the less he is likely to want to go to work. This effect of age on the employment is also validated in other researches. The probability of getting non-employment are higher for the group older than 50, than the younger individuals ceteris paribus (Tetlow and Emmerson. 2006). Riphahn (1999) reached the same conclusion when researching the effect of health shocks on the probability of unemployment, but focusing on ages from 40 to 59. In a research conducted by Koster and Fleischman (2012), individuals aged below 55 have higher probability in transitioning to unemployment, compared to individuals between 55 -64 years of age. However for individuals aged between 18 -25 years the probability to transition to non-employment are lower compared to individuals aged 55-64. The effect of age on returning to work according to this research is the opposite. Individuals aged below 55 have better probability to transition to employment compared with individuals aged above 55.

Education influences the transition to employment. Bartley and Owen (1996) also showed that social status, which is partially explained by education, influences the employment rate. An individual with a higher socio-economic status has a higher chance of getting employed than someone with a lower socio-economic status. If the influence of health on labor transitions needs to be assessed and the effect of education on transitions needs to be corrected, inactivity with students needs to be considered as well. Even though the dataset involves households, there still might be household members who are part-time students. Tyrell (2003) assessed the effect of education on inactivity. In his research, Tyrell discovers that economic inactivity occurs more often with students who are following higher education compared with lower educated students. Shaienks & Gluszynski (2009) claim that among the people who left school prematurely, most of them got to work fulltime. This is more often than the people who finished their school ceteris paribus. This might indicate that indicate that a higher education level does

not have to increase the probability to transition to employment. Russell and O'Connell (2001) concluded that the degree of education increases the probability on transitioning to employment ceteris paribus. However this research was based on the labour market transitions of younger individuals (below 50 years).

2.2 Job related factors

One job-related factor that influences the transition from non-employment to employment is wealth. Unemployment benefits decrease the probability of returning work as they increase (Bloemen.2002). However, next to the fact that unemployment benefits influence the probability on transitioning to employment, the assets and other forms of wealth decrease the probability that an individual will want to (Algan et al. 2003). Next to that, Algan states that the richer an individual is, the higher the probability that this individual will resign voluntarily ceteris paribus. Thus, according to Algan, Increasing wealth increases the probability to transition to non-employment ceteris paribus.

The working conditions have an influence on the transition to employment after a spell of non-employment. When someone is impaired after this health shock and this individual wants to work again, then the working conditions have to accommodate this individual. Crook, Moldofsky & Shannon (1998) show that after having controlled for psychological distress, age, gender and functional disability, the rate of transitions to employment is higher when the work conditions match the expectations of the work seeker, than when they do not. Stressful work, and implicitly tense psychosocial work conditions (Feuerstein et al. 2001) also create low return to work results. For working conditions we use the amount of hours worked a week. The expectation is that this will increase the probability that someone transitions out of employment.

A possible variable of importance might be the duration of the non-employment spell. Research conducted by Russell & O'Connell (2001) show that the duration of a non-employment spell negatively influences the chances of transitioning to employment. Hence, if someone has not been employed for a long time, he will be a less attractive asset for a company and this company will not hire him. In a research conducted on a sample of individuals aged over 40 (Meghir and Whitehouse. 1997) it showed that non-employment durations over a year decrease the probability of transitioning to employment. Non-employment durations lower than a year show to increase the probability to return to work ceteris paribus.

2.3 Health related factors

Self-Assessed Health (SAH) is an accepted alternative (Linnand Linn, 1980; Crossley and Kennedy, 2002) to general health measures in which the health is measured more objectively, and is used very often in empirical research as a measure of health (Crossley & Kennedy, 2000). The merit of SAH has is derived from the multidimensional aspect of this measure. Assessing health by SAH is dependent on more than the mere question how someone rates his health. According to Simon et al (2005), self-assessed health also measures other dimensions. First, it measures the extent in how someone thinks how he can perform certain tasks (functional dimension). Next to the functional dimension, the extent to which the individual is adapted to their existing illness also gets measured (Coping dimension). Finally, the wellbeing of the individual at that moment is taken into the equation as well. These dimensions give Self-assessed health an advantage over objective health measures. The influence of health on transitions to employment is conclusive to the point that a low level of health or a too severe drop in health will reduce the probability to return to work after a spell of non-employment (Riphahn. 1999). Riphahn (1999) found that such a drop in health might result in an increase of 84 % in probability to transition into non-employment. As stated in the beginning, self-assessed health is a widely used proxy for health, so a low self-assessed health is a decent representation of bad health.

The Body Mass Index is a measure to determine the relation between the body weight and the body length of an individual. A healthy BMI is regarded to be between 18.5 and 24.9 points. When a BMI-score exceeds 24.9 points, then a person is considered overweight, which is unhealthy. Also being underweight is hazardous for the health. The hazard inflicted by an unhealthy BMI might influence the transition back to work, because employers might not be keen to hire overweight or underweight individuals due to a high chance of absence due to illnesses (Ramshaw. 2012). It might also be possible that an individual might not be healthy enough to work due to their BMI being too high or too low. The effect of BMI on health is found predominantly in the prevalence of chronic diseases. A too high BMI is associated with the high prevalence of chronic disease like rheumatic arthritis and Diabetes.

3. Data and methodology

3.1 Dataset

The dataset used for this research is retrieved from the Dutch Household Survey (DHS). This dataset is under the maintenance of the Centerdata, which is a research body of Tilburg University. The dataset makes it possible to do research on psychological and economical aspects of financial behavior. With these concepts it is possible to do research on the factors influencing labor transitions. This is due to the fact that the variables covering health, income, work and personal characteristics are included in the dataset. The DHS is a standardized longitudinal survey, which was carried out yearly, from 1993 and on, across 2000 households. To assess the effect health has on the labour market transition to work and non-employment; we have made use of two different samples. The first sample targets individuals who were non-employed at time period *t* but are employed in *t+1.* Individuals who were employed on *t* and who turn to non-employment in *t+1* form the second sample. The samples used for the regressions consist of individuals aged between 16 and 65 who transition into a paid job and individuals who transition to non-employment. We also dropped the individuals with outliers in their values in the variables weight and age. This resulted in a larger decrease of individuals used in the samples.

3.2 Variables

Variable	Description
Bet	1 if individual has a paid job, 0 if otherwise
bet_next	Labour market status t+1, 1 if individual has a paid job, 0 if otherwise
Unemp_next	Non-employment status t+1, 1 if individual is unemployed/non active, 0 if otherwise
Health	1 for good health, 0 for bad health
health_plus	1 if health increases, 0 if otherwise
Health_min	1 if health decreases, 0 if otherwise
Male	1 if individual is male, 0 if otherwise
age_cat	1 if individual is aged over 50, 0 if individual is aged between 16 and 50 years
Hoogopl	1 if individual is highly educated, 0 if otherwise
Bmi	Body mass index
Broodwin	1 if individual is breadwinner, 0 if otherwise
hrwork	Hours of work
Children	1 if individual has children, 0 if otherwise
Ntot	Total income in 1000 euros
Duration	Non-employment duration in years
Married	Marital status, if 1 individual is married, 0 if otherwise

Table 1: List of variables

In table 1 the variables which are used in the analysis are summarized. Self-assessed health (gezondheid) is measured with a five point scale: 1.Excellent 2.Good 3.Fair 4.Not so good 5.Poor.The variable got recoded binomially, meaning that a split was made for fair to excellent and not so good to poor. In this form, SAH had more value in the logit model using the new coding. Next to the SAH, we also used a variable, which stated if the health of an individual increased or decreased compared to a year before. Initially this variable had a five point scale: 1. much better 2. Somewhat better 3. about the same 4. Somewhat worse 5.much worse. We recoded this into three variables: 1.better 2. Equal 3. Worse. In the regressions we excluded the variable which stated that health status did not change.

For the Labor market status there will be made use of a variable stating if someone is conducting paid labor: bet. We do not differentiate between self-employed and employed. Neither do we count the amount of hours worked per week to assess if someone is doing a part-time job. For the group of employed individuals the variable has a value of one (bet=1). For the non-employed this is when the value of the variable is zero (bet=0). The transitions do not take place throughout all the waves, but start from 1995 instead of from 1993. However we kept 1993 in the dataset. The amounts of transitions are visible in the descriptive part of this chapter. To make it easier to interpret the results of the regressions for the transition to non-employment we created a variable, which states if someone is unemployed on t+1.

The body mass index (BMI) will be computed using the length and weight variables and recoding them into BMI. We recode computed BMI values below 0 and over 60 as missing, due to the fact that these values were a product of illogical values of length and weight.

The variable of yearly net income (ntot) shows the amount of money an individual earns. This includes the salary as main component, but also profits gained from capital. As expected this variable is coded continuously. There were no recodes necessary for the conversion of the former Dutch currency Gulden to the Euro. However, the coefficients retrieved from the regression will be multiplied by 1000 to increase the intuitiveness of the interpretation.

Education is a categorically coded in which all the possible qualifications are mentioned, at least the qualifications valid for the Netherlands. To make it comparable with other countries, a distinction has been made. People with a university degree, academic or applied sciences, will be located in the highly educated group (hoogopl=1). The rest will be put in the lower educated group (hoogopl=0).

Even though we are not focusing but comparing transitions for individuals close to retiring to the group aged below 50, age still has value in explaining transitions to work from inactivity. The age ranges which will be excluded from the research are all individuals aged below 16 and over 65. This is because the individuals aged below 16 are not to be counted to eligible to join the working population. The individuals over 65 are excluded due to the fact that they are eligible for retirement. This makes it less beneficial to include them, because of the small amount of labour market transitions. Age will be included in the analysis in two forms. First, age is a continuous variable which will be included in all the regressions, with the restriction that all ages over 65 and below 16 are dropped. Next to that, age will be categorized into two age categories, for ages between 16 and 50 and between 50 and 65. This variable (age_cat) will function as condition for the conditional regressions to distinguish the difference in effect of health on the transitions back to work and to non-employment for the two different age categories and pooled results.

Duration is the variable that counts the amount of years an individual has been unemployed. This variable cumulatively counts the amount of years of non-employment per individual. When there is a missing value between consecutive waves, the non-employment duration gets counted from the start. By counting cumulatively, it will be possible to count the average amount of years an individual has been unemployed.

3.3 Descriptives

Year	Transitions to employment(total)	Transitions to non-employment(total)
1993	-	-
1994	0	0
1995	66(1.184) 5.57%	75 (444) 16.89%
1996	71 (962) 7.38%	40 (368) 10.87%
1997	44 (803) 5.48%	38 (357) 10.65%
1998	26 (638) 4.08%	29 (265) 10.94%
1999	24(544) 4.41%	16 (222) 7.21%
2000	10 (344) 2.91%	12 (136) 8.82%
2001	9 (415) 2.17%	11 (228) 4.82%
2002	18 (470) 3.83%	14 (288) 4.86%
2003	21 (502) 4.18%	27 (326) 8.28%
2004	26 (595) 4.37%	28 (352) 7.95%
2005	40 (606) 6.6%	28 (337) 8.31%
2006	26 (641) 4.06%	28 (371) 7.55%
2007	31 (630) 4.92%	29 (356) 8.15%
2008	35 (559) 6.26%	23 (329) 6.99%
2009	23 (522) 4.41%	27 (332) 8.13%
2010	33 (513) 6.43%	22 (312) 7.05%
2011	25 (535) 38.18%	44 (329) 13.37%
Total	528	491

Table 2: Amount of transitions to work and non-employment per year

Table 2 shows the amount of transitions to work, and the amount of transitions to non-employment/non-employment per year. In 1994 there were no transitions visible to employment or non-employment. Considering the percentages shown in both labour market transitions, the amounts of people who are employed do not form a large group. If we take 1996 as an example, the year the amount for both types of transitions peak, we see that there are 368

individuals who are employed out of the 1330 in total, after deleting the individuals older than 65 and younger than 16 years of age. The amount of transitions to employment was higher than the amount of transitions to non-employment. Both transitions peak in 1996.

Variable		Employed	Non-employed	Missing values
Age (average)		36.04	45.51	0%
Annual net income (average)		16334	17138	29.91%
Non-employment duration		**-**	3.40	0%
BMI (average)		23.96	24.79	25.15%
Hours of work(average)		35.92	-	51.41%
Education	Higher Educated	1,590 40.92%	1,957 29.71%	
	Lower Educated	2,296 59.08%	4,629 70.29%	51.17%
Gender	Man	3,379 44.86%	6,292 41.34%	
	Woman	4,153 55.14%	8,927 58.66%	0%
Breadwinner	Somebody	5,230 74.79%	8,903 64.55%	
	me	1,763 25.21%	4,889 35.45%	8%
Children	Yes	5,512 73.18%	8,174 53.71%	
	No	2,020 26.82%	7,045 46.29	0%
Self-assessed health	Good	6,632 96.70%	12,980 93.15%	
	Bad	226 3.30%	954 6.85%	25%
Difference SAH	Positive	679 59,6%	1,380 54,4%	45%
	Negative	459 40,4%	1,157 45,6%	45%

Table 3: descriptive per sample

In table 3, the descriptives of both samples are presented. Looking at age, the unemployed are older on average than the employed. This is the case after deleting all observations of individuals older than 65 and younger than 16. A possible explanation for this fact is found in the literature review in which age has shown to decrease the probability of employment. Hence, the older an individual is the less likely is to be employed.

The result which stands out the most is the fact that the average annual net income in the group of the non-employed is higher than the group of employed. When looking at the range of values for total annual income for both age categories, it seems that there are more individuals who are wealthy in the sample of unemployed than in the employed sample. This might form a plausible explanation for the higher average, because the highest earning individual in the unemployed sample earns 1.1 million Euros and for the employed it is 2.2 million Euros.

Non-employment duration on average is 3.40 years. This is regardless if an individual transitions to employment. Most of the unemployed (70.29 %) are lower educated individuals. However, most of the employed also are lower educated individuals.

Looking at the proportions of the amount of individuals who have assessed their health of being good, these were nearly equal in both samples. In both samples, most individuals had assessed their health on being good. Looking at the differences in change of health compared with a year ago, it has shown that most of the differences were positive.

Hours of work and education level show the most missing values. A possible explanation for the amount of missing values for the variable *hrwork* might be due to the fact that unemployed individuals have the missing values.

On average, the employed individuals worked around 36 hours a week and, for both the employed and non-employed majority was lower educated.

Demographics					
Transition from		**Work T-1**		**Non-employment (t-1)**	
		Work	non-employed	non-employed	employed
Age (average)		39.21	36.12	48.25	35.36
Education	Highly educated	559 57.36%	76 34.55%	869 26.74%	73 34.43%
	Lower educated	752 42.64 %	144 65.45%	2381 73.26%	139 65.57%
Gender	Male	1,143 45.68%	177 48.76%	2886 40.27%	187 46.52%
	Female	1,359 54.32%	186 51.24%	4,280 59.73%	215 53.48%
Bread winner	Somebody	1,878 75.94%	255 70.64%	4,580 64.12%	292 72.64%
	me	595 24.06%	106 29.36%	2,563 35.88%	110 27.36%
Children	Yes	1,813 72.46%	225 61.98%	3,224 44.99%	284 70.65%
	No	689 27.54%	138 38.02%	3,942 55.01%	118 29.35%
Job related factors					
Annual net Income		16659	13420	17098	10739
Years of non-employment		-	-	4.36	2.62
Hours of work		17.17	-	-	14.51

Table 4: Demographics and job-related factors

Table 4 covers the descriptive of the demographical and job-related factors. Individuals who did not transition back to work were the oldest subsample on in terms of age. However, the individuals who transition to non-employment are younger than the individuals who keep working. This is consistent to the findings of the theoretical framework, in which was stated that with increasing age, the probability of returning to work decrease. Hence, the average age of people who are unemployed gets higher.

The lower educated individual transitions back to work more often than the higher educated. This corresponds to the literature review in which it is stated that individuals with a lower level of education have higher probability on returning to work, compared to the higher educated individuals. Women transition to work more often than men; however they transition towards non-employment the most as well.

The average income of someone who transitions to work after a spell of non-employment is lower than the income of someone who was already working. This is feasible due to the fact that salaries might rise after experience gained in a job.

Individuals who transition to employment, on average, have shorter non-employment spells compared with individuals who stay unemployed.

Health related variables		**Work(t-1)**		**Non-employment (t-1)**	
		Work	Non-employment	Non-employment	employment
Self-Assessed Health	Good health	4,861 96.84%	460 94.46%	9,841 93.02%	506 96.75%
	Bad Health	156 3.16%	27 5.54%	739 6.98%	17 3.25%
Difference in SAH	Increase	438 58.80%	89 67.43%	936 50.45%	71 68.67%
	Decrease	305 42.20%	43 32.57%	831 49.55%	34 31.33%
BMI		24.10	24.32	24.93	23.69

Table 5: Health related variables

Table five showed that the highest proportion of people who had a good level of self-assessed health were the people who returned back to work (91.75%). Looking in absolute numbers this was the case for the people who stayed non-employed and didn't transition into labor. The differences in percentages between the people in good health throughout the different labour statuses are not that significant.

The BMI of the non-employed was relatively higher than the BMI (24.93) of the other groups. This finding is consistent to the theory that people who work are generally healthy.

3.4 Empirical model

We created a model to assess the effect of health on labour transitions between employment and non-employment. The methods we used to make our estimations are based on the fact that our dependent variables are binary.

As stated earlier, we make use of two different samples for both labour market transitions. For the transition back to work we made use of individuals who are non-employed in the current time, and will work the next year. The second sample consists of individuals who are employed in the current time, but get non-employed after a year.

The dependent variable is binary coded. Where an individual can be employed or non-employed for both dependent variables, but the reference value is the opposite. Due to the fact that the outcome measures or the dependent variables are a 0 or 1, we can choose between a probit and a logit model. Making a choice between both models is mainly dependent on what you would like to estimate. If we would like to look at probability ratios, we would have to use a logit. If not, we could use a probit. We were not interested in using probability ratios making both options optional. Using the Bayesian information criteria we try to make a decision between both models. The results show that there was no big difference in which model fitted the best, but that the logit model was weakly supported. We have chosen to use a logit model to assess the effect of health on the transition to employment or non-employment.

$$1{:}Employment\ t+1^{*} = \beta_0 + \beta_1 health + \beta_2 health_{plus} + \beta_3 health_{min} + \beta_4 male + \beta_5 age + \beta_6 hoogopl + \beta_7 bmi + \beta_8 kostwin + \beta_9 children + \beta_{10} trabant + \beta_{11} marital + \sum time + \sum region + \varepsilon_y$$

$Employment\ t+1^{*}$=1 if y >0

$Employment\ t+1^{*}$=0 if y ≤0

Equation number 1 shows the transition to employment. As described earlier, the dependent shows the employment status on t+1. The sample used in this analysis only consists of the people who were non-employed at time t. These individuals could transition to employment at *t+1* or they can stay in non-employment.

When an individual makes a transition to non-employment, the value of the dependent variable is higher than 0, the logit can be written in this way:

$$P(Y=1) = P(y^* > 0)$$
$$= P\left(\beta_0 + \beta_1 health + \beta_2 health_{plus} + \beta_3 health_{min} + \beta_4 male + \beta_5 age + \beta_6 hoogopl + \beta_7 bmi + \beta_8 kostwin + \beta_9 children + \beta_{10} trabant + \beta_{11} marital + \sum time + \sum region + \varepsilon_y > 0\right) =$$
$$\Lambda\left(\beta_0 + \beta_1 health + \beta_2 health_{plus} + \beta_3 health_{min} + \beta_4 male + \beta_5 age + \beta_6 hoogopl + \beta_7 bmi + \beta_8 kostwin + \beta_9 children + \beta_{10} trabant + \beta_{11} marital + \sum time + \sum region\right) =$$
$$\frac{\beta_0 + \beta_1 health + \beta_2 health_{plus} + \beta_3 health_{min} + .. + \sum time + \sum region}{1 - \beta_0 + \beta_1 health + \beta_2 health_{plus} + \beta_3 health_{min} + \cdots . + \sum time + \sum region}$$

The same logic holds for the logit for the individuals who transition to non-employment from employment, or who stay employed. However, on time *t* individuals are employed. When the dependent variable has a value of 1 the individual transitions to non-employment on *t+1*. If the value is 0, the individual stays employed.

2: $Non - employment\ t+1^* = \beta_0 + health\beta_1 + health_{plus}\beta_2 + health_{min}\beta_3 + male\beta_4 + age\beta_5 + * hoogopl\beta_6 + bmi\beta_7 + kostwin\beta_8 + uurwerk\beta_9 + children\beta_{10} + marital\beta_{11} + \sum time + \sum region + \varepsilon_y$

$$\varepsilon_y \sim NID(0,1)$$

$non\ employment\ t+1^*$=1 if y >0

$non\ employment\ t+1^*$=0 if y ≤0

$$P(Y=1) = P(y^* > 0)$$
$$= P\left(\beta_0 + health\beta_1 + health_{plus}\beta_2 + health_{min}\beta_3 + male\beta_4 + age\beta_5 + * hoogopl\beta_6 + bmi\beta_7 + kostwin\beta_8 + uurwerk\beta_9 + children\beta_{10} + marital\beta_{11} + \sum time + \sum region + \varepsilon_y > 0\right) =$$

$$\Lambda(\beta_0 + health\beta_1 + health_{plus}\beta_2 + health_{min}\beta_3 + male\beta_4 + age\beta_5 + * hoogopl\beta_6 + bmi\beta_7 + kostwin\beta_8 + uurwerk\beta_9 + children\beta_{10} + marital\beta_{11} + \sum time + \sum region + \varepsilon_y) =$$

$$\frac{\beta_0 + \beta_1 health + \beta_2 health_{plus} + \beta_3 health_{min} + .. + \sum time + \sum region}{1 - \beta_0 + \beta_1 health + \beta_2 health_{plus} + \beta_3 health_{min} + \cdots . + \sum time + \sum region}$$

Next to using a logit model, there will be made use of a linear probability fixed effects model to account for unobserved heterogeneity. By choosing for the Fixed Effects model, STATA subtracts the group means from each observation, omitting time invariant variables. In our case this is gender. The reason why we choose a linear probability fixed effects model is due to the large amounts of observations. If we would use a logit fixed effects model, the computational time would be severely longer, than for the LPM fixed effects. To correct for heteroskedasticity and autocorrelation, there will be made use of the *robust*-option to cluster standard-errors.

$$y_{it} = \propto_i + x'_{it}\beta + \varepsilon_{it}$$

In order to interpret the results of the logit models we can only focus on the sign and significance of the variables. However, we are interested in the magnitude of the effect of health on the labour market transitions. To make the magnitude interpretable we have to use marginal effects. The marginal effects give a simple analogy to the OLS regression that is the marginal change is just the coefficient. We derive the marginal effect as the slope of the probability curves ceteris paribus, assuming that the change of that variable is very small. We can compute the marginal effects of an individual with specific characteristics, the marginal effects of the average individual or the total average marginal effects. In the latter we calculate the average of each individual's marginal effect. Those three methods give different results. The choice of which method we use is on based on what we would like to proof. Since we are interested in the general effect of health on the labour market transitions the only right method to use is the average marginal effect. By using the average marginal effect we look at the magnitude of the effects on average of all the individuals in the sample. If we would have used at means marginal effects we would have lost a lot of variation because we would have used the average of the values. Next to that, there are no real individuals who have the average values of all variables. Finally, if the marginal effect at means is significantly different in comparison with the average marginal effects, as in our case that suggests that at means marginal effect is a good reflection of the marginal effects if only the values are at their means (Long and Freese. 2003). That is why we use the average marginal effects.

First, the pooled results will be generated using all the variables, and not distinguishing in age categories. Because there will be made use of a dataset with eighteen waves, there needs to be corrected for possible time effects. To account for this, there will be made use of year dummies. The choice of reference dummy year is the year 1994 so that we can make a comparison over the years. We chose 1994, because it was the first year in which transitions occurred. We also corrected for region effects for which *region1* is the reference region. This region encompasses the three largest cities.

After the pooled results, the same regressions will be conducted, but for the different age categories: <50 and >50. When this analysis is conducted it becomes possible to assess the magnitude of the influence of health on the transition back to work for the two age groups.

4. Results

The interpretation of empirical results would be separated into two parts. In the first part we will look at the pooled results. Not only will they include the transitions towards returning to work, but also the transition towards non-employment. After the pooled results, we will analyze the results between the age groups above and under 50 years of age. The results we exhibit in both tables are the estimated average marginal effects. For the fixed effects model this was not needed, due to the fact that the fixed effects were applied on a linear probability model.

4.1 Pooled results transitions

4.1.1 Pooled results transition to employment

First we will start with the transition towards work. As explained in the methods, next to the average marginal effects on the logit model that is used to estimate the effects, there will be made use of a fixed effects model to account for unobserved heterogeneity.

Looking at the logit model the first thing that stands out is the amount of statistically insignificant variables. Of the twelve variables entered in the analysis six variables of the amount was statistically insignificant: gender, changes in self-assessed health, marital status, BMI and education. The effect of the year dummies and region dummies is also statistically insignificant. Looking at the goodness of fit the logit model has a pseudo R-squared of 0.1238 and the model is statistically significant according to the F-test.

Due to the fact that we want to account for the unobserved heterogeneity, we also add a LPM Fixed effects model. If we compare the results of the logit with the results of the Fixed effects model, we see that the amount of statistically significant variables which explain the transition back to work, decrease. Having children is a statistically insignificant factor in the fixed effects models.

First, when looking at the influence of a difference in health in the logit we see that this does contribute significantly in a change in of the probability in returning to work. According to the beta-coefficient of self-assessed health, having a good self-assessed health gives an individual better probability to transition to employment compared with someone who assessed their health as not good. In the logit model, having good health gives this individual 6.6 percentage points higher probability to transition to employment, compared with someone who reported his health to be unhealthy. Using the Fixed effects, the magnitude of the probability on returning to

work decreases to 2.6 percentage points higher probability. Even though self-assessed health influences the transition to work from non-employment significantly, differences in self-assessed health, positive or negative, do not influence the labour market transitions.

Age is a significant factor in explaining the variance of the labor transition back to work in the logit and FE. Both models show that an increasing age decreases the probability that someone returns to work. In the logit, an increase of age by a year will lead to a 0.1 percentage point decrease of the probability in returning to work ceteris paribus, where in the FE this is 3.6 percentage points ceteris paribus.

In the logit model, being the breadwinner in the household increases the probability that an individual returns to work. Individuals who state that they are the breadwinner of the household have 2.2 percentage points higher probability to transition to work compared to individuals who are not the breadwinner, ceteris paribus. In the fixed effects model, the breadwinner-variable did not show to influence the labour market transitions significantly.

Having children gives an individual 2.0 percentage points higher probability of returning to work, compared with not having children. After correcting for unobserved heterogeneity, having children did not seem to have an influence in the transition to employment.

The total yearly income decreases the probability in returning to work by 0.06 percentage points per 1000 Euros in the logit and 0.01 percentage points per 1000 Euros in the FE ceteris paribus.

The length of a non-employment spell influences the transition back to work. After correction for unobserved heterogeneity, a year of non-employment decreases the probability in returning back to work by 0.5 percentage points when all other factors are held the same.

4.1.2 Pooled results non-employment

Next to looking at the transition back to work, the transition towards non-employment will be researched. This will be done in the same way as the pooled results researching the transition back to work except the fact that the non-employment duration because this should not affect the transition to non-employment.

Looking at the logit model of the labor transition towards non-employment the first thing which stands out compared with the transition back to work is that the addition of the amount of hours an individual works per week explains a significant part of the variation of the transition. The effect of the year dummies and region dummies is statistically insignificant as well. Looking at the goodness of fit, the logit model is specified very well according to the F-test which deemed the model to be statistically significant. The pseudo r-squared is 0.0909.

Contrary to what is stated in the literature review, self-assessed health is not significant factor influencing the probability to go into non-employment. We expected that the effect of health on this transition would be negative when health is good.

Age is not a significant factor in making people transition towards non-employment in the logit model. However, after correcting for unobserved heterogeneity it is. For every increase of age by a year the probability to transition to non-employment increases by 2.5 percentage points ceteris paribus.

The amount of hours an individual works is statistically significant in the fixed effects model and in the logit model. With every hour someone works per week, the probability of getting non-employed decreases by 0.2 percentage points in the logit model. After correction for unobserved heterogeneity this becomes 1.1 percentage points ceteris paribus.

Having at least one child seemed to be a significant factor for the transition to non-employment. In the logit model having at least one child decreases the probability of transitioning to non-employment by 4.4 percentage points. In the fixed effects model this was not the case.

Annual net income influences the transition to non-employment significantly. For every 1000 euros someone earns, the probability that this individual transitions to non-employment decreases by 0.04 percentage points after correction for heterogeneity.

		Transition to employment		Transition to non-employment	
Variables		**logit**	**FE**	**logit (Full)**	**LPM**
Health		.066**	.026*	-.087	-.165
SE		.024	.015	.040	.014
Health difference	+	.024	.019	.022	-.019
SE		.009	.021	.021	.021
	-	.031	.017	.027	-.022
SE		.012	.022	.025	.023
Gender		-.005	--	.027	-
SE		.008	.033	.016	.040
Age		-.001***	-.036**	3.1e-4	.025**
SE		.0004	.013	9.0e-4	.004
Education		-.0002	-.018	-.054**	-.102*
SE		.009	.023	.020	.057
BMI		-.001	.001	-.004**	.014**
SE		.0008	.002	.001	.002
Breadwinner		.022*	.015	.024	-.036
SE		.011	.031	.024	.115
Hours of work		-------	-------	-.002**	-.011**
SE		.0003	.0004	8.5e-4	.004
Children		.020**	-.043	-.044**	-.057
SE		.009	.052	.018	.129
Total income		-6.11e-04	-1.58e-04**	-8.70e-07	-3.87e-03**
SE		4.31e-07	7.39e-08	1.00e-06	3.29e-08
Years of non-employment		-.005*	.051***	-	-
SE		.001	.013	-	-
Married		-.006	-.003	-.027	-.003
SE		-.002	.049	.021	.081
Year effects		Non-significant	Non-significant	-	-
Region effects		Non-significant	Non-significant	-	-
Pseudo R-squared		0.1238	0.062	0.1153	0.062
F-test		0.000	0.000	0.000	0.000
OBS		2557	2557	501	501

Table 6: Average marginal effects full sample

***P< 0.1**
****P<0.05**
*****P<0.01**

4.2 Age-specific transitions

4.2.1 Age-specific transition transitions to work

The main goal of this research is to assess the effect of health on returning to work and also to distinguish if this is different when someone is closer to retirement (aged over 50) or younger. After having assessed the effect of health on returning to work as well as on the transition towards non-employment, in this part of the results these transitions will be reassessed taking into consideration the two different age groups.

We first start looking at the significant factors influencing the transition to employment and comparing them between people below 50 years of age and over. When looking at the age-specific results the first variable that is statistically significant is Self-assessed health. In the logit model, this variable is statistically significant for both age categories. For individuals aged below 50 and in good health the probability of transitioning to work are 7.9 percentage points higher than for individuals with bad health. When we look at the magnitude for people with the same condition in the older age category, this is 5.6 percentage points ceteris paribus. However, after correcting for heterogeneity the effect of health on the transition only holds for individuals aged above 50. The magnitude of the effect decreases, to 2.4 percentage points higher probability in returning to work compared to people who have reported to have bad health if all other factors are held equal.

Age seemed to only be a factor for individuals over 50 in the FE model. Age decreased the probability to transition to employment by 4.6 percentage points per year.

Individuals aged above 50 have higher probability in returning to work when they are breadwinners than when they are not ceteris paribus. According to the logit model these probability are 4.8 percentage points higher. In the Fixed effects model, the variable is not significant.

There is only one factor that is statistically significant in both the fixed effects model as well as in the logit model, but in different age categories and that is net annual income. Income decreases the probability in returning to work as it increases. The probability for individuals who belong to the older age category decreases by 0.06 percentage points for every 1000 euros of income in the logit model. After having corrected for heterogeneity, the effect of income becomes insignificant for the age category above 50, but it becomes significant for the16-50 age category. For individuals aged below 50, the probability to transition to employment decreases by 0.02 percentage points for every 1000 euros.

Marital status influences the probability in returning to work for individuals younger than 50. If all other factors stay the same, the probability that individuals who are married transition to work are 3 percentage points lower than individuals who are not married. In the fixed effects model it is not a significant factor.

The body mass index showed to decrease the probability in transitioning to employment for individuals aged over 50. For an increase in BMI by a point the probability to transition to non-employment decreases by 0.1 percentage points for ceteris paribus. After correcting for unobserved heterogeneity, this variable is not statistically significant.

The duration of the non-employment spell also influences the probability in transitioning to employment. After correction for heterogeneity it influences the probability for both age categories. The probability that an individual returns to work decreases by 5.1 percentage points per year for the younger age category and 5.7 percentage points per year for the older age category, ceteris paribus.

4.2.2 Age specific transition to non-employment

Now we look at the transition to non-employment. For this transition, health also is a significant factor. Contrary to the transition to employment, having good health decreases the probability to transition. The probability for individuals aged over 50 to transition to non-employment when their health is good are 8.8 percentage points lower, compared to individuals who assessed their health as being bad. This is the case after correcting for unobserved heterogeneity.

For the individuals aged below 50, age is a significant variable. After having corrected for unobserved heterogeneity, if an individual aged between 16 and 50 gets older by a year, the probability in transitioning to non-employment increases by 1.4 percentage points. Age did not show to be a factor for individuals older than 50 years of age.

The amount of hours worked a week also influenced the transition to non-employment. For every hour worked a week the probability to transition to non-employment decrease by 1.4 percentage points ceteris paribus.

The Education level, being the breadwinner and the variable signifying if someone has children are all statistically significant in the logit model, but after correcting for heterogeneity they are not. A variable of significance in the transition to work is the annual net income. For every 1000 Euros, the probability that an individual aged above 50 transitions into non-employment decrease by 0.01 percentage points ceteris paribus. After correcting for heterogeneity, annual net income affected the individuals in the age category covering the individuals below 50. The effect decreased in magnitude, where the probability decreased by 0.05 percentage points per 1000 Euros.

The uniqueness of this model lies in the fact that the year dummies, which are not omitted, all are statistically significant. This shows that the effects of the other variables are corrected for the different years. The beta-coefficients of the year dummies show an increase in the effect of time on the model. This is only the case for the age group over 50.

		Transition to employment				Transition to non-employment			
Variables		**logit (Full)**		**FE**		**logit**		**FE**	
Age category		**<50**	**>50**	**<50**	**>50**	**<50**	**>50**	**<50**	**>50**
Health		.079*	.056 **	.047	.024*	-.052*	-.11**	-.088***	-.034
SE		.048	.025	.048	.014	. 059	.058	.118	.331
Health difference	+	.052	.007	.083	-.002	-.025	.064	-.083	.006
SE		.017	.010	.059	.022	.024	.040	.059	.023
	-	.049	.018	.023	.022	.062	.014	.022	-.027
SE		.024	.010	.055	.024	.036	.048	.024	.026
Gender		-.010	-.001	-	-	.017	.028	-	-*
SE		.016	.008	-	-	.017	.036	-	-*
Age		-.001	-.001	-.014	-.046**	.007	.013*	.014**	.033
SE		.001	.0009	.023	.018	.001	.004	.018	.027
Education		.009	-.005	.010	-.015	-.057**	-.006	-.015	.003
SE		.019	.009	.065	.021	.020	.044	.021	.013
BMI		.0002	-.001*	.006	-3.3e-04	-.003*	-.003	3.3e-04	.001
SE		.001	.001	.009	.021	-.002	.003	.001	.001
Breadwinner		-.034	.048***	.074	.022	.012	.011	.022	-.053
SE		.024	.014	.094	.038	.034	.043	.038	.046
Hours of work		-	-	-	-	-.002**	6.6e-5	2.5e-04	-.014**
SE		-	-	-	-	.001	.001	2.8e-04	3e-04
Children		.029	.006	-.059	-.067	-.018	-.058	-.067	-.116
SE		.035	.012	.099	.061	.029	.044	.061	.203
Total income		-9.43e-03	-6.44e-04**	-2.64e-04**	-5.47e-04	-7.24e-03	-1.37e-04**	5.47e-04**	-3.59e-03
SE		1.49e-06	3.39e-04	8.37e-08	3.40e-07	1.55e-03	1.55e-04	3.40e-07	4.82e-03
Married		-.031**	.010	.130	-.049	-.020	-.026	-.130	.156
SE		.027	.011	.118	.054	.024	.046	.118	.129
Non-employment duration		-.0005	-.004**	-.051**	-.057**	-	-	-	-
SE		.005	.001	.020	.018	-	-	-	-
Year effects		Non	Non	Non	Non	Yes	Non	Non	Non
Region effects		Non	Non	Non	Non	Non	Non	Non	Non
Observations		838	1719	838	1719	311	190	311	190

Table 7: Average marginal effects age specific transitions

***P< 0.1**
****P<0.05**
*****P<0.01**

6. Discussion

By using a literature review certain determinants were provided to construct the model for the assessment of the effect that health has on the probability of an individual to the transition to employment after a period of non-employment. After this, the same determinants were used for the transition to non-employment. In this part of the thesis we will discuss the results thematically starting with health related variables.

6.1 Health related variables

In the theoretical framework showed that we expected that self-assessed health should be a significant factor influencing the transition towards work. In the pooled results it has been shown that this is the case. However, this was the case when we used different categories for the variable. When we used the original five categories variable self-assessed health did not influence the transition. This could be the case due to the fact that there were a couple of categories which had few observations. Accounting for this fact, we changed the five categories to three categories: poor, okay, good. After changing the categories, the variable still did not influence the transition. Eventually we changed it to be a dichotomous variable, which influenced the transition significantly. Some might argue if the effect of the variable on the transition is achieved by the variable itself or due to the recodes done. The fact that results concluded that self-assessed health was only a factor when taking into consideration people aged over 50 was in line with the theoretical framework. The expectation that a difference in self-assessed health would increase the probability that people transition back to work was also met in the results. However, a difference in health over time showed to be a non-significant variable influencing the labour market transitions. This could be the case due to the fact that not many people who changed from bad health to good health.

Body mass index was hypothesized to influence the probability in returning to work negatively. The probability would decrease by the BMI point increase. However, BMI did not show to be a significant factor in the transition towards non-employment. A possible explanation why this was not the case, could be the fact that this part of the variance might have been explained by self-assessed health.

6.2 Demographic variables

One of the most important variables considered in the analysis is age. Next to the fact that we tried to distinguish the effect of health on the transition back to work for the two different age categories, we entered age in both the regressions towards employment and non-employment. In both regressions they were significant variables. Assessing the effect of age on the transition to work, this decreased the probability by 4.6 percentage points per year for individuals older than 50 ceteris paribus. Not regarding the magnitude, this was conforming to the statements made in the literature review. If all other factors are held equal, age increases the probability to transition to non-employment by 1.4 percentage points per year for individuals younger than 50 years. This is a surprising find. A possible explanation might be that individuals aged below 50, still might have a chance to get fired or stop working due to injuries that might come from work. Whilst individuals who already are 50 and working might have jobs which are not physical, making age not a significant factor to stop working. Using this assumption, the results might indicate that the variables for labour conditions are insufficient.

The fact that education did not influence the transition to employment could be due to the indirect relationship with health. Education influences the effect of health shocks on labor transitions. It might be the case that the part of the variance of education is explained in the variable self-assessed health thus rendering self-assessed health statistically insignificant. However, this argument would not hold when looking at the transition to non-employment, where education is a significant variable.

Gender is not a statistically significant factor which influences the transition back to work, contrary to what was expected. It was expected the probability to transition to work were higher for men compared to women. The reason for this is not known.

Marital status held ambiguous expectations. There were enough signs showing that the sign could be positive or negative. In the results we saw that marital status influences the probability of returning to work negatively if someone is married, compared with someone who is not. This could be in line with the results if the negative sign could be attributed to the fact that the effect of marital status on the transition is mainly due to gender. In the theoretical framework we hypothesized that marriage decreases the probability to transition to work significantly. After correcting for heterogeneity, marital status did not show to influence both transitions significantly.

Having children only influences the transition positively when the parents are aged below 50 years. The fact that it is not a significant factor for individuals older than 50 years old might be the case due to the fact that parents aged over 50, tend to have older children who can tend to themselves, making it that it does not influence the transition. After correcting for heterogeneity, it is not a significant factor for both transitions.

6.3 Job characteristics

Of the Job characteristics, the income was presumed to be one of the most important reasons to transition to work. This turned out to be the case. The higher the income of an individual is, the lower the probability that someone transitions to employment. For every 1000 euros the probability decreases by 0.02 percentage points for individuals below 50.

Income also influenced the transition to non-employment for every 1000 euros the probability to transition to non-employed decreases by 0.05 percentage points.

The amount of hours worked prior to non-employment is supposed to be a proxy for working conditions of a job. The expectation was that the higher the amount of hours work per week of a job is, the lower the probability that an individual will transition to employment. This showed to be a statistically significant factor for the explanation of the transition. For individuals over 50 the probability decreases to transition to non-employment.

Non-employment duration was supposed to decrease the probability of returning to work. This is confirmed in the results for the individuals from both age categories. If non-employment duration increases by a year the probability to transition to employment decreases by 5.1 percentage points for the youngsters and 5.7 for the individuals above 50.

6.4 Limitations

This research is subject to a couple of limitations which need to be addressed. First, there were a lot of gaps consisting of missing values throughout consecutive waves. This made it harder to create a variable which showed the non-employment spell. If person “A” shows a labour market transition between wave 2 and 3, but does not participate in the six waves following the third wave, it is impossible to correctly count the non-employment spell if data is missing for those waves. The high amounts of missing values in variables made it necessary to recode as well. Something that occurred a lot was that values were not filled in, consequently resulting in gaps in a variable over time when an individual is followed. This does not have to be a problem for the computation of the results. For example in the variable gender gaps do not have to be an issue because we presume that gender stays the same, and having gaps in that variable can be corrected using recodes copying the values.

There are some variables in which this might lead to wrongly copied values, biasing the results a bit. A variable like total annual income is susceptible to such form of bias, but the most important variable in which this was a problem was Self-assessed health. Due to the fact that there were a lot of missing values and sometimes there were not enough observation to fill the original categories of Self-assessed health, we had to change the coding from a five-category variable to a binomial variable. Because of this coding, we miss a part of sensitivity in the gradations of self-assessed health.

The final and largest limitation is that there were some irregularities in the dataset, which are being addressed by Centerdata, and which taint the results to an extent that is not to clear. Certain individuals filled in the survey for someone else. For gender this meant that gender changed over time for certain individuals. Even though this was cleaned, there might still be some irregularities. This has been confirmed by Centerdata, the organization which compiled the dataset. They have stated that they are in the process of cleaning the dataset.

The amount of people who had a paid job was surprisingly low. Especially considering that the non-employment rate in the Netherlands has not been higher than 8.1 percent (1995) of the population eligible to work in the period 1991-2011 (CBS). This raises questions about the strength of the dataset.

7. Conclusion

The aim of the research which has been conducted for this thesis is to look whether the effect of health on returning to work differs if we distinguish this effect between to age groups: people close to retiring and all other younger individuals. To assess this effect we made use of a couple of variables which might influence this labour transition as well. Due to the fact that we made use of panel data with twenty waves, the years were added as dummy variables. Conducting a Linear probability model fixed effects, next to the logit made it possible to correct for any unobserved heterogeneity which might influence the results.

In the pooled results we saw that health had significantly influenced the probability on returning to work. When an individual has assessed his health as being good, the probability on returning to work were better than for someone who rated his health to be poor. This was the case for both models. The variables that influenced the transition negatively were: total income, non-employment duration and Age. The following variables influenced the transition positively: Self-assessed health, breadwinner. Self-assessed health was the most important significant factor. Self-assessed health or health influenced the probability in returning to work positively.

When we distinguished between age-groups we found out that health is only a factor when looked at people aged over 50. For people in the younger age group, health is not a factor. The year dummies did not influence the regressions, as did the region dummies, which signified the regions where the individuals lived or came from.

We also looked at the effect of (self-assessed) health on the transition to non-employment. In the pooled results and, health did not influence the probability of individuals to enter non-employment. Looking at the individuals aged under 50, having good health did influence the transition to non-employment negatively.

7.1 Policy implications

Looking at ways to incorporate this information into workable policy, there are some options. When focusing on creating programs to get people to transition to employment it might be useful to use programs which target the statistically significant factors according to age category.

The most important factor to regard in this is (self-assessed) health. An option might be to create jobs, or alter them in a way that individuals with impaired health could be reintegrated better. When there are return-to work programs accommodating people who feel impaired or not healthy, there might be a gain to recover from individuals aged over 50.

Policies might also be targeted to stop people transitioning to non-employment. In the analysis, being married showed to be an important factor in people to transition to non-employment. In which way marriage influences the transition towards non-employment is not fully clear, but it is very suggestible that marriage results in one of the individuals in the couple to assume the role of breadwinner and the other tends for the children. Most of the time, women leave the labour force due to this. To stop this, it might be possible to make arrangements as employers so that the individuals leaving the labour force might feel tempted to stay. Creating interventions targeting women to keep them working after getting married, by for instance creating plans between employer and employee to make it possible to work on her terms, so that she can combine this with her marriage life.

The duration of non-employment was found to be a significant variable for the transition back to work. Even though it is hard to force employers to employ individuals who are non-employed for a long time, it might be possible to create an incentive. Government might subsidize companies which employ these individuals.

7.2 Recommendations

For future research I highly recommend to use a dataset where there are more proxies of job characteristics like the type of job the individual holds, and possibly what kind of jobs he held prior. Also, it might be useful to have a data set with less missing values. What the dataset missed was the jobs the individuals held prior to transitioning to non-employment. If we had a variable for this, we could attribute that to a variable work conditions and make distinctions in how the effects the models showed could be attributed to job sectors and their jobs. This would make it a more specific report, which could be picked up by companies, so that they can tailor fit it to their solutions. Another point for further research concerns the dependent variable. The dependent variable (bet) showed that someone has a paid job. However, using this definition they also included part-time or people getting very incidental payments into having a paid job. It would be interesting if it was possible to distinguish the individuals who held a full-time job and part-time job so that you have a choice. Also having a variable in the dataset in which is filled in how long the individual has been unemployed prior to that point in time would give a better representation of the influence of the variable. If someone else would use the Dutch Household Survey panel, they should be aware of its limitations concerning incorrect data for certain variables and should wait till the dataset is cleaned properly.

8. References

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