

Unemployment insurance generosity in the period of crisis: the effect on post-unemployment job quality

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Abstract

Search theory predicts that the hazard to leave unemployment into employment rises when the end of the benefit period approaches, because unemployed people increase their job search intensity and also their reservation wage declines. Extensions of search theory predict that more generous unemployment benefits might increase post-unemployment job quality by relaxing the restrictions on job search and allowing people to search for a job longer. The current study explores whether at least partly the increase in the hazard rate in the end of benefit period stems from people becoming less selective and accepting jobs with lower quality i.e. with lower wage. The study uses recent data from the deep recession period for unemployment insurance benefit recipients in Estonia. The estimations show that a rise in the hazard to enter employment is always accompanied by accepting a larger drop in the wage i.e. a decrease in post-unemployment job quality.

JEL Classification: J64, J65, J31, C21, H55

Keywords: unemployment benefits; post-unemployment job quality; scar effects; economic crisis; Estonia.

Introduction

Search theory (Mortensen, 1977) predicts that an increase in the amount or in the maximum duration of unemployment benefits reduces the probability to leave unemployment into employment (the disincentive effect). In addition, its extensions that assume a finite unemployment benefit receipt period expect that the hazard to leave unemployment rises when the end of potential benefit period approaches. These effects are also often empirically substantiated (e.g. Meyer, 1990; Katz and Meyer, 1990).

In general, the conclusions drawn from search theory concerning unemployment benefits are rather negative as benefits are assumed to increase unemployment duration. Yet, a positive impact could be found on post-unemployment job quality. The relationship between the generosity of unemployment benefits and post-unemployment job quality is also shown in the current paper using the data from the recent crisis period.

Contrary to the static labour-leisure model where it is not possible to say anything about how well jobs are matched (Addison and Blackburn, 2000), the dynamic job search model implies that benefits could increase post-unemployment job quality. Unemployment benefit decreases the opportunity cost of job search and hence relaxes the restrictions on searching. An

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unemployed risk-averse person can lengthen the job search to find a better matching job increasing his or her utility in the long-run. So, unemployment benefits might support the job search rather than motivate staying unemployed (Burdett, 1979). A better matching job can mean a higher wage, a longer job duration, a better match for the person's skills, etc. Marimon and Zilibotti (1999) show in an equilibrium search-matching model that unemployment benefits help unemployed to find jobs that match their skills better and their employment is lasting longer because of that. Acemoglu and Shimer (2000) show in their model that unemployment benefits encourage risk-averse people to search for higher productivity jobs and firms to create these jobs and hence there are productivity gains arising from more generous unemployment benefit systems.

Empirically, the relationships between unemployment benefits and job quality can be more complex to test. In regards of employment duration it could be expected that unemployment benefits lead to more productive and better matches and that better matches last longer. Yet, because of unemployment benefits, job seekers may also take jobs that incur higher risk of job instability i.e. potentially bad matches that bring upon shorter employment duration (Centeno and Novo, 2006). In addition, the relationship between unemployment benefits and post-unemployment job duration can be affected by adverse selection that arises from unobserved individual characteristics and might produce spurious estimation results showing negative correlation between unemployment duration and post-unemployment job duration (Belzil, 2001). Similarly, the problem of adverse selection could also affect estimations of the relationships between unemployment benefits and post-unemployment wage.

Post-unemployment wage should be higher due to unemployment benefits as job seekers can search for work longer (and have more resources to search, i.e. can make more search effort). Yet, although the reservation wage declines during the benefit period because of approaching benefit exhaustion, it can decline also because of the expectation that the offer wage distribution might deteriorate over time (van den Berg, 1990) and hence post-unemployment wages should be *ceteris paribus* in negative correlation with the actual duration of unemployment (Fitzenberger and Wilke, 2007). The deterioration of the offer wage distribution as well as the arrival rate of offers can be expected because of stigmatization and human capital depreciation effects (Addison and Blackburn, 2000). So, it can be concluded that the impact of unemployment benefits on post-unemployment wage depends also on how quickly the offer wage distribution deteriorates.

There are few works that look at job quality after the unemployment insurance benefit period. Usually the post-unemployment wage and/or employment duration are considered. The evidence on the effect on post-unemployment wage is so far rather mixed. Gangl (2002) estimates the impact of unemployment benefits simultaneously on unemployment duration and post-unemployment wage for German and US data. He finds support for both effects in both countries and that the disincentive effect is a bit higher in US and the effect on job quality is more positive in Germany. He concludes that at the cost of a slight increase in unemployment duration, unemployment benefits substantially contribute to post-unemployment job quality. Also in another study by Gangl (2006) on US and European data it is showed that scarring effects on post-unemployment earnings are mitigated by generous unemployment benefits. Addison and Blackburn (2000) also use US data to distinguish the effect on post-unemployment wage. Yet they do not find any strong evidence as the positive effect only reveals when comparing unemployed entitled to benefits with the ones without benefits and even then this effect is very small. Fitzenberger and Wilke (2007) find on German data that unemployment benefits are only of little importance on the duration of search unemployment and on post-unemployment wages. Some evidence about higher unemployment benefits incurring higher post-unemployment wages, but also longer

unemployment spells is found in a less recent but relatively known study by Ehrenberg and Oaxaca (1976).

There are relatively more studies about post-unemployment employment duration in the recent literature than about wage and the results are more unanimous. Belzil (2001) finds on Canadian data that the exit rate increases significantly during the last five weeks before benefit exhaustion, but the jobs accepted during these five weeks are of shorter duration. An increase in the potential benefit duration prolongs both unemployment and post-unemployment job duration, though the effect on unemployment duration is greater meaning that the disincentive effect exceeds the effect on post-unemployment job quality. Centeno (2004) shows on US data that more generous unemployment benefits incur longer job tenure and that this effect is even more amplified during economic busts. Tatsiramos (2009) finds on European data that besides the commonly found effect of benefits increasing unemployment spells, there is also an indirect effect of benefits increasing post-unemployment employment spells that is more pronounced in countries that have more generous benefit systems. Caliendo, Tatsiramos and Uhlenborff (2009) find on German data evidence of a significant positive effect of longer potential unemployment benefit duration on unemployment and employment duration.

There are only few studies that address the issues of post-unemployment wage and employment duration at the same time. Centeno and Novo (2006) show that unemployment benefits increase both the expected starting wage and job tenure. In addition, they find evidence that more generous benefits reduce the thickness of the lower tail of match quality (lower wage and shorter job tenure) and increase the matching quality available to all unemployed. Gangl (2004a) shows on US and German data that though unemployment benefits prolong job search period, they also improve the post-unemployment job quality and help people to avoid wage losses, occupational mobility and subsequent employment instability.

During recent years there have been a few studies exploiting Eastern European data to explore unemployment benefit effects. Van Ours and Vodopivec (2006) use Slovenian data and find that a shorter potential benefit period increases the exit rate into employment, but also exits to active labour market programmes. They also show a sharp increase in the exit rate into employment during the last month of the benefit period. In their other study using the same data (van Ours and Vodopivec, 2008), they do not find positive effects of unemployment benefits on the post-unemployment wage or the quality of post-unemployment jobs in any other respect.

Recent studies by Lauringson (2010a, 2010b) reveal on Estonian data that unemployment benefits increase unemployment duration significantly both in good economic situation and in a period of serious recession (unemployment rose more than five times in less than two years in Estonia during the last crisis). The current study uses the same Estonian data from the recession period as Lauringson (2010b) to explore whether more generous benefits increase besides unemployment duration also post-unemployment job quality. The study shows that a longer potential benefit period indeed allows people to search longer and accept relatively higher wages (smaller drop compared to the previous wage) than if they were entitled to a shorter benefit. The effect is found during the period when the matched control group (people on the shorter benefit) has exhausted their benefit, but the treatment group (people on the longer benefit) can still continue their benefit receipt. So, the spike in the end

of the benefit period at least in some extent happens because people become less selective in the end of their benefit period and not only because of more search intensity².

The paper proceeds as follows: the first section gives a background overview of the Estonian unemployment benefit system. The second section outlines the data and methodology used in the study. The third section presents estimations of benefit effects on post-unemployment starting wage and the fourth section on post-unemployment average wage. The fifth section addresses the issue of adverse selection and the final section concludes the results.

Estonian unemployment benefit system

There is a two-tier unemployment benefit system in Estonia. Unemployment insurance benefit (UIB) is paid in case a person has a sufficient record of unemployment insurance contributions and his or her unemployment is not voluntary (employer initiated the termination of the working contract). Unemployment allowance has milder criteria about previous employment and also people who left their previous job voluntarily are eligible. The size of UIB depends on the previous average wage (50% during the first 100 days and 40% thereafter). UA is a flat and relatively low rate benefit as on average it is five times lower than UIB.

The paper focuses on UIB recipients. During the period under study it was possible to be eligible either to 180-day-UIB or 270-day-UIB. In order to be entitled to UIB at all, a person needs to have made unemployment insurance contributions for at least 12 months during the previous 36 months. To be entitled to the longer benefit for 270 days, there is an additional criterion that a person has to have made contributions for at least 56 months. Every time a person is granted UIB, he or she has to start from zero to accumulate the insurance contributions for the next unemployment period. Yet, if a person accepts a job offer during the UIB spell, but becomes unemployed again during one year since the person was granted UIB, he or she can continue receiving the benefit for the remaining days of the UIB. This should encourage unemployed to accept job offers even if there is a risk that employment might turn out to be short-lived (e.g. because of bad economic situation).

Unemployed who are entitled to 270-day-UIB can continue receiving UA after the UIB period for up to 180 days only if they have up to 180 days until the retirement age after the UIB period. 180-day-UIB recipients can continue receiving UA for 90 days after their UIB period and an additional 180 days on the same ground as 270-day-UIB recipients. UA is not granted automatically after the UIB period and a person has to apply for that. So, also the eligibility for UA is then checked and as the rules for being eligible are different for UA and UIB, a 180-day-UIB recipient is generally eligible for 90-day-UA, but not always. When both UIB and UA periods are exhausted, there are no unemployment benefits available, but only a low means-tested subsistence benefit from the local government that depends on the income of all household members. So, in general both types of UIB recipients are covered with unemployment benefits for 270 days. Yet, the cover after 180 days for 180-day-UIB recipients is very much lower.

² The spike in the end of benefit period can be explained partly also by optimized timing of job starting dates according to a model by Boone and van Ours (2009). So, besides the behaviour of unemployed people, also the nature of jobs matters.

Data and methodology

The last global economic crisis affected the labour market in Estonia more than in any other country in the European Union. During less than two years the unemployment rate grew fivefold in Estonia – from 4% in the second quarter of 2008 to 20% in the first quarter of 2010 (see Figure 1). The current study looks at unemployment insurance benefits granted during the first three quarters of the sharp increase in unemployment rate – from July 2008 until March 2009. The data of unemployment benefit recipients from the Estonian Unemployment Insurance Fund are combined with wage data from the Estonian Tax and Customs Board up to September 2010. The administrative data about taxes allows to determine joblessness and employment periods very precisely, beyond the benefit and registered unemployment periods.

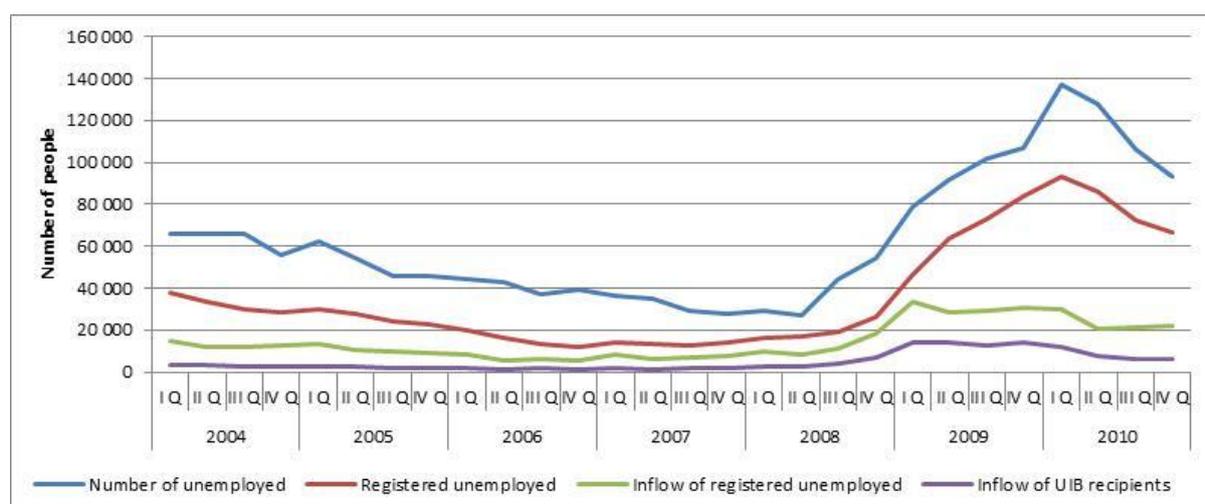


Figure 1. Number of unemployed in Estonia for 2004 – 2010

UIB – unemployment insurance benefits

Sources: Statistics Estonia, Estonian Unemployment Insurance Fund

The characteristics of the benefit recipients are somewhat different (see Table 1). The biggest difference between 180-day-UIB and 270-day-UIB recipients lies in the average previous tenure as this is highly correlated with the period of unemployment insurance contributions that determine the length of UIB. In addition, 270-day-UIB recipients have earned previously a higher wage, are more educated, older and their previous job has been with a slightly higher ranking. In addition, Table 1 presents the mean values of variables for those UIB recipients who exited unemployment latest by September 2010, whose exit to employment was at least for two months and whose exit to employment was at least for seven months (received wage at least on seven months during a nine-month-period since entering employment). These UIB recipients who enter employment have earned previously a higher wage, are more educated, younger, have worked previously on jobs with higher rankings and there is a higher share of women, native speakers and people with a knowledge of English among them. The same differences are even larger when people who enter employment for a longer term are compared with the whole sample.

The estimation of hazard rates by types of UIB recipients is presented in Figure 2 (less smooth hazard estimates are presented in Appendix 1). The figure reveals clear spikes in the hazard rates in the ends of UIB periods. An earlier study by Lauringson (2010b) used data about UIB and UA recipients who were granted their benefits during the same period as in the current study (July 2008 until March 2009) to examine disincentive effects in the period of a severe economic downturn. The study showed that disincentive effects remain even

during a period of crisis and both higher benefit level and maximum duration of benefit decrease significantly the hazard to leave unemployment to employment.

Table 1. Description of UIB recipients by type of benefit exit to employment

Variable	All		Enter empl.		Enter empl. for >1 months		Enter empl. for >6 months	
	UIB 180	UIB 270	UIB 180	UIB 270	UIB 180	UIB 270	UIB 180	UIB 270
Number of observations	7780	9327	4986	6293	4409	5738	1886	2875
Average previous monthly wage, EEK	9832	12590	10460	13461	10508	13590	10670	13994
Average tenure of the previous job, years	1.5	5.9	1.5	4.9	1.5	4.9	1.6	5.3
Males	57%	59%	55%	58%	54%	58%	45%	50%
Age in the beginning of UIB period	36	45	35	43	34	43	34	42
Main language Estonian	52%	57%	56%	61%	57%	61%	63%	67%
Knowledge of English	28%	19%	33%	22%	33%	23%	39%	28%
Basic education or less	21%	14%	21%	13%	20%	13%	17%	11%
Higher education	12%	16%	13%	17%	14%	17%	19%	21%
Living in a town	71%	69%	70%	68%	70%	68%	70%	66%
Disabled	7%	8%	5%	6%	5%	5%	5%	4%
Previous occupation								
Managers	6%	10%	7%	11%	7%	12%	10%	14%
Professionals	4%	6%	5%	6%	5%	6%	7%	8%
Technicians and associate professionals	8%	10%	9%	10%	9%	10%	11%	11%
Clerical support workers	6%	6%	6%	6%	6%	6%	8%	7%
Service and sales workers	14%	9%	15%	10%	15%	10%	17%	11%
Skilled agricultural, forestry and fishery workers	1%	1%	1%	1%	1%	1%	1%	1%
Craft and related trades workers	32%	29%	30%	27%	29%	27%	22%	22%
Plant and machine operators, and assemblers	10%	14%	10%	14%	10%	14%	9%	14%
Elementary occupations	19%	16%	18%	15%	17%	14%	15%	13%

Note: People who received active measures are not considered in the table as they are not used in this study.

EEK – the currency used in Estonia until 31.12.2010 (1 EUR = 15.6466 EEK).

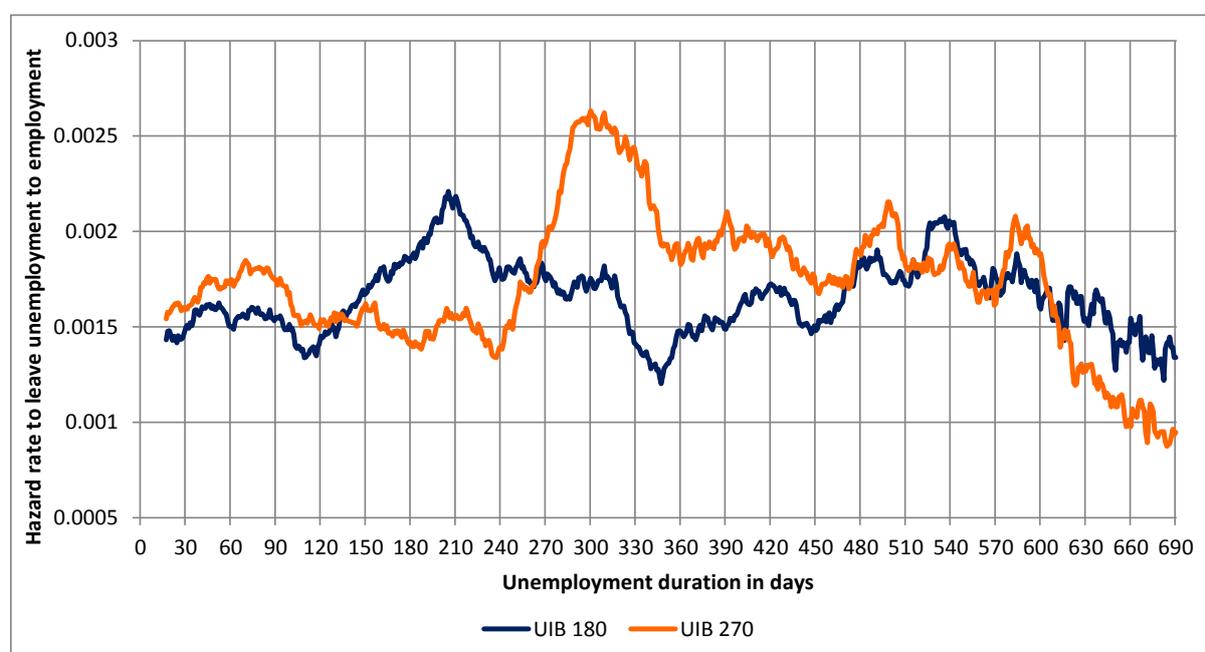


Figure 2. Smoothed hazard rates for exiting into employment

The current paper explores whether a longer unemployment benefit period improves the job match quality as this allows a person to look for a job longer with lower restriction. In regards of job match quality a rise (drop) in the starting wage and in the average wage compared to

the previous wage are looked at. In addition to the overall difference between shorter and longer term UIB recipients, also differences in different periods of the unemployment spell when exit occurs are investigated. The difference in post-unemployment job quality should occur above all when 180-day-UIB recipients are about to exhaust the benefit and when their benefit is exhausted, but 270-day-UIB recipients are still receiving their benefit. In figure 2 it is visible that the hazard to leave unemployment for 180-day-UIB recipients is higher around 150-240 days in the unemployment spell. So, this is also the period the study focuses on.

In addition, it is examined whether there is a post-unemployment job quality difference for people who accept job offers around 270-360 days of the unemployment spell as then 270-day-UIB recipients exhibit a lot higher hazard rate as their benefit has just lapsed. Also, the beginning of the unemployment spell (1-150 days) is studied where hazard rates are more similar, yet 270-day-UIB recipients demonstrate a slightly higher hazard to leave unemployment. The period under study is above all the period of crisis, i.e. the period of rising unemployment. Hence, the focus of the paper is on the exits to employment until the beginning of April 2010.

To make different groups of UIB recipients more comparable, the method of propensity score matching is applied (see thorough overview in Caliendo and Kopeining, 2008; calculating Rosenbaum-bounds in DiPrete and Gangl, 2004). For conducting estimations Stata modules by Leuven and Sianesi (2003) and Gangl (2004b) are used. Samples are matched using nearest neighbour matching with probit model, using one nearest neighbour with replacement. Average treatment effects on treated are estimated over the common support area. People who received active measures (mainly different trainings) are not used in the estimations as participation in active measures could affect the treatment effects (most benefit recipients did not receive active measures during the period under study).

Estimation results: starting wage

For studying differences in job match quality between people entitled to 180 and 270 days of benefit, first the differences in the starting wage are estimated. The starting wage is defined as the wage in the second month, because the wage on the very first month might not be for a full month. The starting wage is compared to the person's previous wage that is defined as the average wage that was the basis for granting the benefit (average for 9 employed months preceding the last 3 employed months)³.

The drop in the starting wage for 180-day-UIB and 270-day-UIB recipients is illustrated in Figure 3. The figure shows that the accepted wage declines during the unemployment spell, i.e. the scar effects are bigger the longer a person is unemployed. People, who exit unemployment already during the first three months of unemployment, might not necessarily loose in their wage. People, who have been unemployed already more than a year, might have to settle with only two thirds of their previous wage.

³ In the calculations of wage change, the rise is truncated at 100%. So, the wage change can be between -100% to 100%.

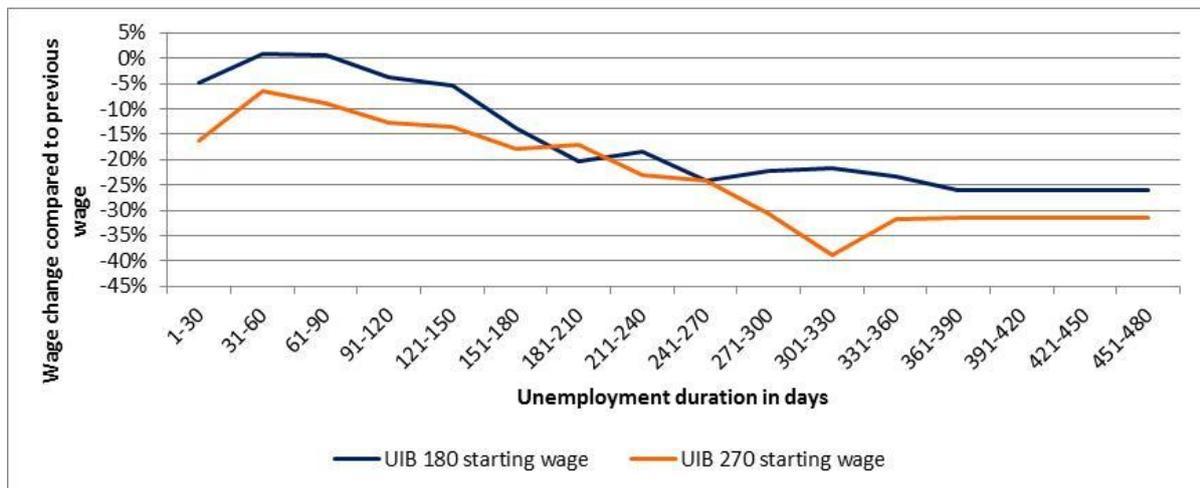


Figure 3. The change in the starting wage compared to the previous wage for 180-day-UIB and 270-day-UIB recipients

Note: Average change over intervals of 30 days up to 360 days; the last interval is 360-480 days as there are fewer observations. Only these unemployed are considered who entered employment latest by the beginning of April 2010.

The accepted wage declines particularly quickly during the benefit period as predicted also by search theory. In general, the wage drop compared to the previous wage is larger for 270-day-UIB recipients. Yet, the wage drop is larger for 180-day-UIB recipients around the period when their benefit lapses, but 270-day-UIB recipients can continue their benefit. Similarly, the drop in wage is especially large for 270-day-UIB recipients when their benefit lapses. So, even unmatched data refers that the accepted wage is influenced by the potential period of benefits (in the end of benefit period the hazard to exit unemployment rises because of larger acceptable drop in wage, not only because of higher job search intensity).

Table 2 presents the estimation results for the differences in unmatched samples and matched samples (the probit models for matching 180-day-UIB and 270-day-UIB recipients are presented in Appendix 2; the mean values of the most relevant variables for the unmatched and matched samples are presented in Appendix 3; propensity score distributions graphed in Appendix 4). The estimations are given for people who found a job latest by the beginning of April 2010 i.e. during the period when unemployment was still rising.

Table 2. Estimation results for the differences in the change in the starting wage

	Treated (270)	Controls (180)	Difference	St. dev.	T-stat	p-value
Entry to employment latest in April 2010 (model no. 1)						
Unmatched: 2nd month wage rise from previous wage	-20.5%	-12.8%	-7.7%	1.0%	-7.78	0.000
ATT: 2nd month wage rise from previous wage	-20.5%	-20.5%	0.1%	1.7%	0.03	0.976
Entry to employment during 1-150 days since the beginning of benefit period (model no. 2)						
Unmatched: 2nd month wage rise from previous wage	-11.1%	-2.1%	-9.0%	1.5%	-6.00	0.000
ATT: 2nd month wage rise from previous wage	-10.8%	-7.1%	-3.7%	2.5%	-1.46	0.144
Entry to employment during 151-240 days since the beginning of benefit period (model no. 3)						
Unmatched: 2nd month wage rise from previous wage	-19.2%	-17.4%	-1.8%	2.0%	-0.92	0.358
ATT: 2nd month wage rise from previous wage	-19.0%	-27.5%	8.4%	3.3%	2.53	0.011
Entry to employment during 271-360 days since the beginning of benefit period, latest in April 2010 (model no. 4)						
Unmatched: 2nd month wage rise from previous wage	-34.0%	-22.3%	-11.7%	2.3%	-5.00	0.000
ATT: 2nd month wage rise from previous wage	-33.3%	-34.8%	1.5%	4.3%	0.35	0.726

Both groups of benefit recipients start earning lower wage than their wage before unemployment. When wage differences between shorter and longer term benefit recipients are estimated for the overall period (model 1), the unmatched differences show that the wage declines significantly more (almost 8% more) for 270-day-UIB recipients. The matched

samples produce results that indicate to no significant differences in the drop in the post-unemployment starting wage.

The estimation results are much more different for the period of 151-240 days of the unemployment spell, i.e. the period when benefit period lapses for 180-day-UIB recipients, but still continues for 270-day-UIB recipients (model 3). The estimation results for matched samples show that 270-day-UIB recipients exhibit an 8.4% smaller drop in the starting wage than if they were entitled to benefits only for 180 days (significant at the 0.05 level).

The estimation results for the people who leave unemployment relatively quickly (during 1-150 days of the unemployment spell, model 2) and who leave relatively slowly (during 271-360 days of the unemployment spell, model 4) show that 270-day-UIB recipients accept about 10% larger wage drops in case of unmatched samples. Matched samples show no significant differences in wage declines.

Wage changes in the starting wage using matched samples are presented in Figure 4. For matching, models 2, 3 and 4 are used (in addition, similar models for the periods of 241-270 days and 361-480 days are estimated). Wage changes are calculated as averages over 30-day-periods of exits from unemployment to employment and only the last interval is longer (361-480 days). The figure shows that for the first 150 days of unemployment the accepted wage drop slightly increases for both 270-day-UIB recipients and the control group and the wage drop is smaller for the control group. After that, the accepted wage drop plummets for the control group as their benefit lapses and afterwards their accepted wage drop deepens only to some extent. The change in the starting wage for 270-day-UIB recipients falls at a slower pace throughout their benefit period and this drop is smaller during the period when matched 180-day-UIB recipients have exhausted their benefit period, but 270-day-UIB recipients not yet. Afterwards, the wage drops of the two groups are rather similar.

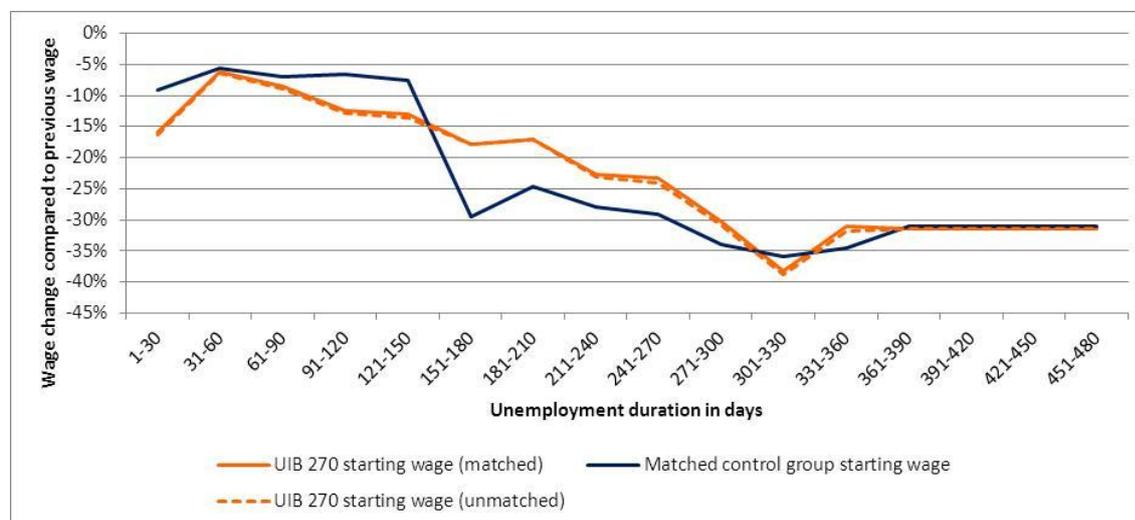


Figure 4. The change in the starting wage compared to the previous wage for 270-day-UIB recipients and for the matched control group of 180-day-UIB recipients

Note: Average change over intervals of 30 days up to 360 days; the last interval is 360-480 days as there are fewer observations. Only these unemployed are considered who entered employment latest by the beginning of April 2010.

Figure 4 shows that the drop in the accepted starting wage compared to the previous wage is particularly steep around when benefits lapse both for 180-day-UIB and 270-day-UIB recipients. After the fall, in both cases the wage change somewhat rises before gradually falling again. When comparing the graphs of smoothed hazard rates and wage changes (Figure 2 and 4 combined in Appendix 5), it is visible that the peaks in the hazard rate

coincide more or less with the larger drops in accepted wage. Also, the graphs depict clearly the inverse relationship between the hazard rates and wage changes. In the beginning of the unemployment spell 270-day-UIB recipients have higher hazard to leave unemployment in the expense of larger drops in the accepted wage. When the end of benefit period approaches for 180-day-UIB recipients, their hazard rate rises and the drop in the accepted wage quickly plummets. The approaching end of benefit for 270-day-UIB recipients causes for that group rising hazard rate and larger wage drops as well. It can be concluded that higher hazard to exit unemployment into employment means accepting larger drops in the starting wage and not only higher search intensity⁴.

Figure 5 presents the distribution of the change in the starting wage compared to the previous wage. Firstly, 270-day-UIB recipients are matched with 180-day-UIB recipients irrespective of when they leave unemployment (model no. 1). In that case it is visible that the matched 180-day-UIB recipients suffer more from more severe wage drops. However, there are also relatively more of those who start earning a very much higher wage than previously. 270-day-UIB recipients have more density around smaller wage losses and gains and hence in total the average treatment effect on treated does not turn out to be significant (the average wage losses are similar).

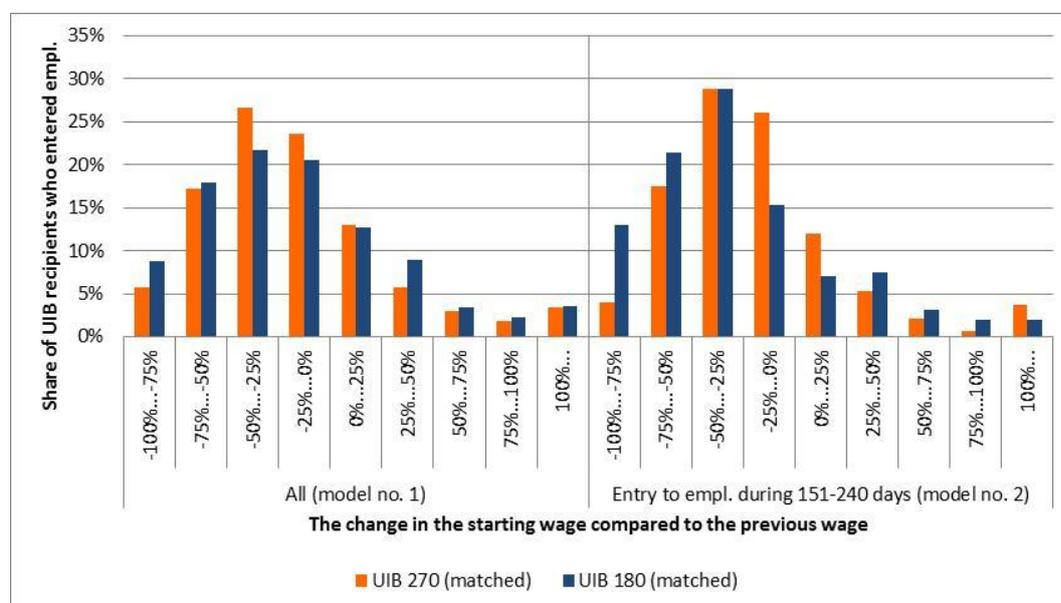


Figure 5. The distribution of the change in the starting wage compared to the previous wage (models no. 1 and 2)

Secondly, Figure 5 depicts in more detail the results of the model when only these UIB recipients are studied who leave unemployment during 151-240 days of their unemployment period (model no. 2). In that case there is even a relatively larger share of matched 180-day-UIB recipients who suffer large losses in wage and relatively more 270-day-UIB recipients who experience minor drops or minor rises in their starting wage. While 22% of 270-day-UIB recipients during that period accept wage drops of more than 50%, this share is 34% among 180-day-UIB recipients. In addition, 24% of 270-day-UIB recipients accept a higher wage than their previous wage and 26% accept a wage drop of up to a quarter. Among 180-day-UIB recipients these shares are 22% and 15%, respectively.

⁴ As the biggest difference between 180-day-UIB and 270-day-UIB recipients lies in their previous record of unemployment insurance contributions, some additional calculations were carried though for a group where only these UIB recipients were considered whose previous record of unemployment insurance contributions was between 32-79 months (see Appendix 6). The estimations showed similar results as the estimations for the whole sample.

Estimation results: average wage

Besides the starting wage, the average wage over a longer period is studied. As the previous wage used in the study (basis for benefits) is calculated over a period of nine months, the post-unemployment average wage is calculated over a period of the same length. The wage from the second until the tenth month is taken as the wage on the very first month might not be for a full month. Only these people are considered who received wage for at least seven months during those nine months. This makes it possible to include in the study also those people who are off from the work for a short while (due to vacations or sickness).

As with the starting wage, the average wage is compared to the previous wage in a similar manner (a relative wage change). The estimations are calculated for people who exited unemployment into employment latest by December 2009 as the tax data is available only until September 2010. For the same group the differences in the starting wage are calculated as well (the differences to the previous chapter are that the exit to employment had to be latest by December 2009 and that the criterion of at least seven wages during the first nine months still holds i.e. very temporary employment is not considered).

Figure 6 presents the change in the starting wage and in the average wage compared to the previous wage for people who received wage at least for seven months during the first nine months of the employment spell. The picture is similar to Figure 3 as in general 180-day-UIB recipients experience smaller drops in their wage than 270-day-UIB recipients with the exception of the period when 180-day-UIB recipients run out of the benefit. The figure shows also that the wage increases in time for both groups (the average wage over a longer period is higher than the starting wage).

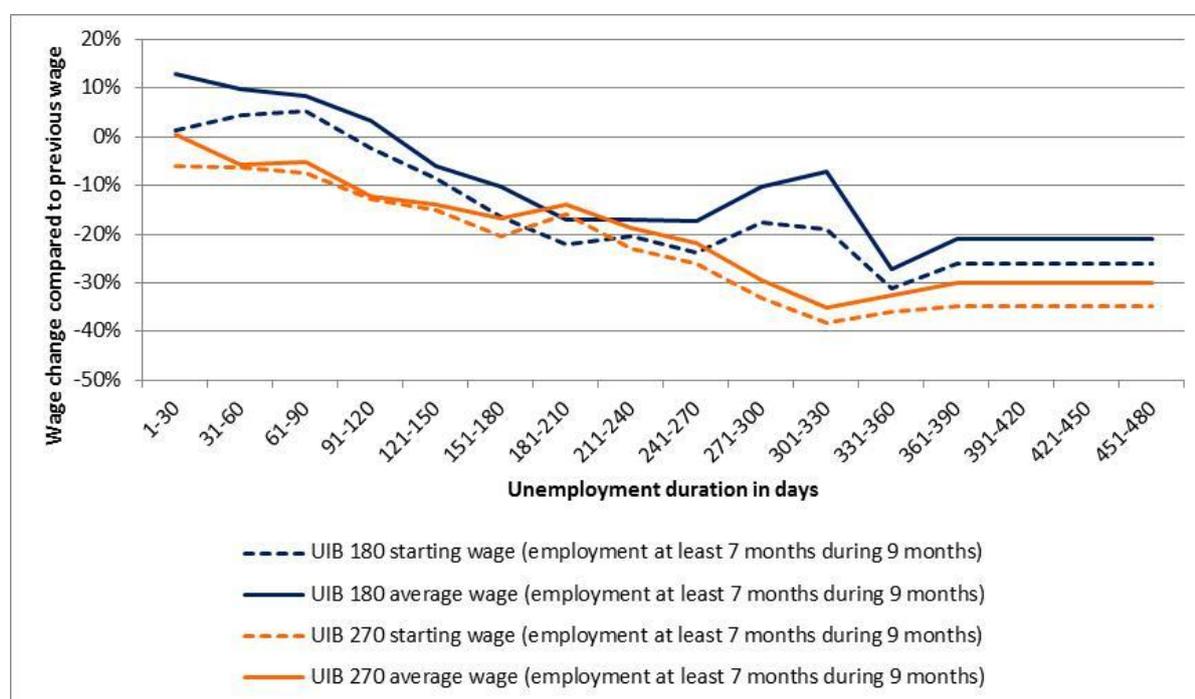


Figure 6. The change in the average wage and in the starting wage compared to the previous wage for 180-day-UIB and 270-day-UIB recipients (excluding short employment spells)

Note: Average change over intervals of 30 days up to 360 days; the last interval is 360-480 days as there are fewer observations. Only these unemployed are considered who entered employment latest by the beginning of December 2009.

Table 3 presents the estimation results for the differences in the average wage in the unmatched samples and matched samples (the probit models for matching 180-day-UIB and

270-day-UIB recipients are presented in Appendix 7; the mean values of the most relevant variables for the unmatched and matched samples are presented in Appendix 8; propensity score distributions graphed in Appendix 9). For every studied group, also the estimations for the differences in the starting wage are provided.

Table 3. Estimation results for the differences in the change in the average wage

	Treated (270)	Controls (180)	Difference	St. dev.	T-stat	p-value
Entry to employment latest in Dec 2009 (model no. 5)						
Unmatched: 2nd month wage rise from previous wage	-17.2%	-10.1%	-7.1%	1.3%	-5.59	0.000
ATT: 2nd month wage rise from previous wage	-16.7%	-17.2%	0.5%	2.2%	0.23	0.818
Unmatched: 9 month average wage rise from previous wage	-14.5%	-4.6%	-9.8%	1.2%	-8.33	0.000
ATT: 9 month average wage rise from previous wage	-13.9%	-12.5%	-1.5%	2.1%	-0.70	0.484
Entry to employment during 1-150 days since the beginning of benefit period (model no. 6)						
Unmatched: 2nd month wage rise from previous wage	-9.0%	0.6%	-9.6%	1.8%	-5.40	0.000
ATT: 2nd month wage rise from previous wage	-8.5%	-3.3%	-5.2%	2.9%	-1.79	0.074
Unmatched: 9 month average wage rise from previous wage	-7.1%	5.8%	-12.8%	1.6%	-7.97	0.000
ATT: 9 month average wage rise from previous wage	-6.6%	0.2%	-6.7%	2.8%	-2.44	0.015
Entry to employment during 151-240 days since the beginning of benefit period (model no. 7)						
Unmatched: 2nd month wage rise from previous wage	-19.8%	-19.7%	-0.1%	2.4%	-0.03	0.976
ATT: 2nd month wage rise from previous wage	-18.6%	-30.4%	11.8%	3.9%	3.04	0.002
Unmatched: 9 month average wage rise from previous wage	-16.5%	-14.8%	-1.6%	2.3%	-0.71	0.478
ATT: 9 month average wage rise from previous wage	-15.3%	-25.1%	9.9%	3.6%	2.78	0.006
Entry to employment during 271-360 days since the beginning of benefit period (model no. 8)						
Unmatched: 2nd month wage rise from previous wage	-35.2%	-20.0%	-15.2%	3.4%	-4.43	0.000
ATT: 2nd month wage rise from previous wage	-34.4%	-33.1%	-1.3%	7.5%	-0.17	0.865
Unmatched: 9 month average wage rise from previous wage	-31.7%	-11.6%	-20.1%	3.3%	-6.15	0.000
ATT: 9 month average wage rise from previous wage	-30.8%	-24.0%	-6.9%	7.6%	-0.90	0.368

The estimation results for the differences in the average wage are similar to the estimated differences in the starting wage. The differences in the wage change for the whole group under study do not turn out to be significant (model 5). Yet, large differences occur for people who exit unemployment during 151-240 days of their unemployment spell (model 7). 270-day-UIB recipients exhibit 9.9% smaller wage drops in their average wage and 11.8% smaller drop in the starting wage than the matched control group (both significant at the 0.01 level).

During the beginning of the unemployment spell, the control group entitled to 180-day-UIB accept on average the jobs where they earn rather similar wages as on their previous job (for unmatched data the increase in the average wage is 5.8%, on matched data 0.2%; model 6). 270-day-UIB recipients accept offers which involve a wage drop of about 7% which might be the reason why they exhibit higher exit rates from unemployment during that period. People exiting unemployment during the period when both types of benefit recipients have exhausted their benefits, there are no statistically significant differences in the wage drops (model 8).

So, during the beginning of the unemployment spell 270-day-UIB recipients accept jobs with relatively lower wage. When 180-day-UIB recipients' benefits lapse, then 180-day-UIB recipients have larger drops in wage. Afterwards there are no significant differences. Hence, the estimation results show no significant wage differentials for the whole period. Yet, the relative wage changes accepted by different UIB-recipients are different during different periods.

The wage change in the starting and average wage for longer employment spells using matched samples is presented on Figure 7. Models 6, 7 and 8 are used for matching (in addition, similar models for the periods of 241-270 days and 361-480 days are estimated). Wage changes are calculated the same way as in the previous chapter (averages over 30-day-periods of exits from unemployment to employment; the last interval is longer). The figure

shows increasing wage drops over benefit periods and more stable wage drops after benefit periods. The sharpest drop in wage for the control group is during 151-180 days of the unemployment spell, i.e. just when their benefit expires. 270-day-UIB recipients experience a slighter decline of wage during the benefit period. So, the decline in the average wage for the jobs accepted during 151-270 days of unemployment spell is smaller for 270-day-UIB recipients than to 180-day-UIB recipients. Yet, 270-day-UIB recipients exhibit larger drop in the accepted wage around 300 days of unemployment spell as then their benefit period also ends.

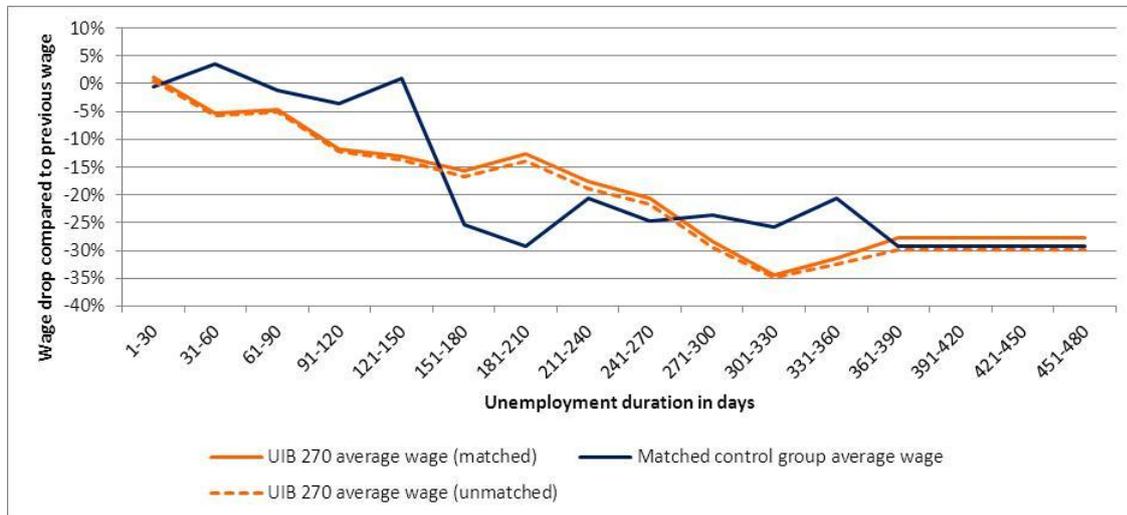


Figure 7. The change in the average wage compared to the previous wage for longer employment spells for 270-day-UIB recipients and for the matched control group of 180-day-UIB recipients

Note: Average change over intervals of 30 days up to 360 days; the last interval is 360-480 days as there are fewer observations. Only these unemployed are considered who entered employment latest by the beginning of December 2009.

Similar conclusions as from Figure 5 that depicts the distribution of changes in the starting wage can be drawn from Figure 8 that illustrates the distribution of the change in the average wage. When UIB recipients who exit unemployment in the period of 151-240 days of the unemployment spell are matched, the estimations show that there is a relatively larger share of 270-day-UIB recipients who experience a minor drop in the average wage compared to their previous wage and a relatively larger share of matched 180-day-UIB recipients who suffer large drops in the average wage. 25% of 180-day-UIB recipients who have exited unemployment during 151-240 days of the unemployment spell, experience wage drops of more than 50% compared to their previous wage. The share of these severe wage drops among 270-day-UIB recipients is only 13%. 22% of 180-day-UIB recipients have higher post-unemployment average wage than their previous wage, while the share among 270-day-UIB recipients is 24%.

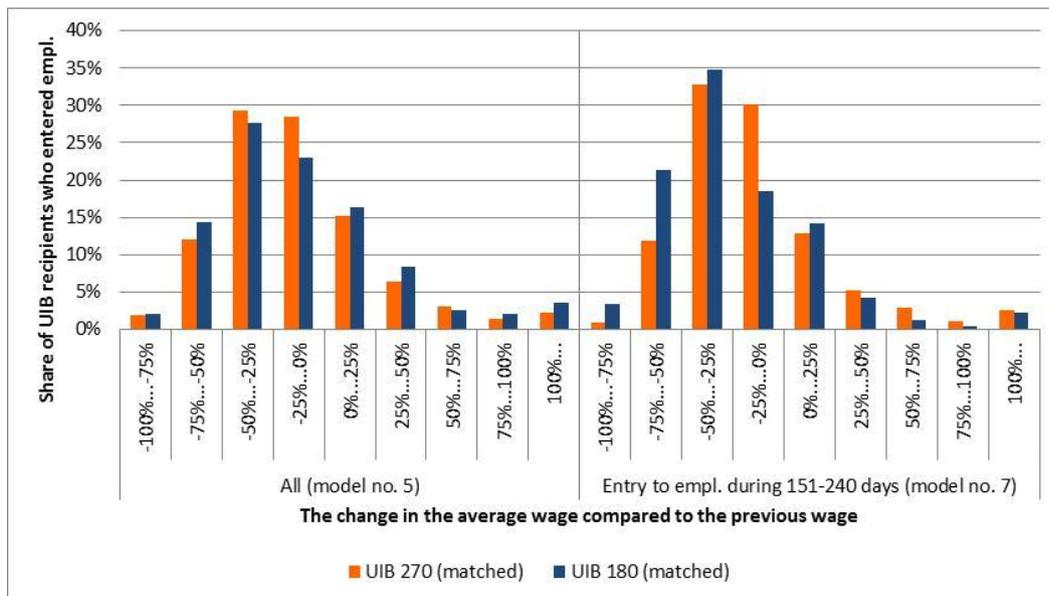


Figure 8. The distribution of the change in the average wage compared to the previous wage (models no. 5 and 7)

Addressing the problem of adverse selection

Previous chapters showed that in general the drop in accepted wage is larger as unemployment spell lengths. In addition, the drop in accepted wage tends to be sharper around the end of benefit period. This raises a question whether the movements in changes of accepted wage are caused by individual characteristics. Appendix 10 presents some individual characteristics (education, occupations, language, age, previous tenure) of unemployed exiting into employment during different unemployment spells. It is visible that the pool of unemployed leaving unemployment in different time periods is indeed changing over time (individual characteristics tend to gradually deteriorate). Basically this shows the same effects as different covariates estimated with hazard models by Lauringson (2010b). Yet, the changes in these characteristics are not as severe around the end of benefit period as the relative changes in accepted wage.

Another indicator that should reflect the value of human capital and that also directly influences the calculation of change in the accepted wage compared to the previous wage is the previous wage itself. The graphs in Appendix 11 depict the starting wage and the previous wage in absolute terms for both 180-day-UIB and 270-day-UIB recipients. Both matched and unmatched data for previous wage reveal that there is actually no deterioration in regards of the previous wage along the unemployment spell. Yet, the unmatched data shows that people who exit at around the end of benefit period have had previously higher wage. In the matched data these hikes are much smaller.

The amount of unemployment benefits is based on the previous average wage. Hence, the reasons behind the changes in the previous average wage during the unemployment spell rather reflect the level of unemployment benefits. Hence, these people who leave unemployment for employment straight after the unemployment benefit period tend to be these people who get higher unemployment benefits (see Figure 9 and Appendix 12). So, this paper confirms again that people with higher unemployment benefits are less eager to exit unemployment during the unemployment benefit spell, but the hazard to enter employment for them rises in the end of benefit period. Yet, in the matched data these effects are rather

inexistent and do not cause the effects in post-unemployment wage studied in the previous chapter (if, then only for 270-day-UIB recipients in the end of their benefit).

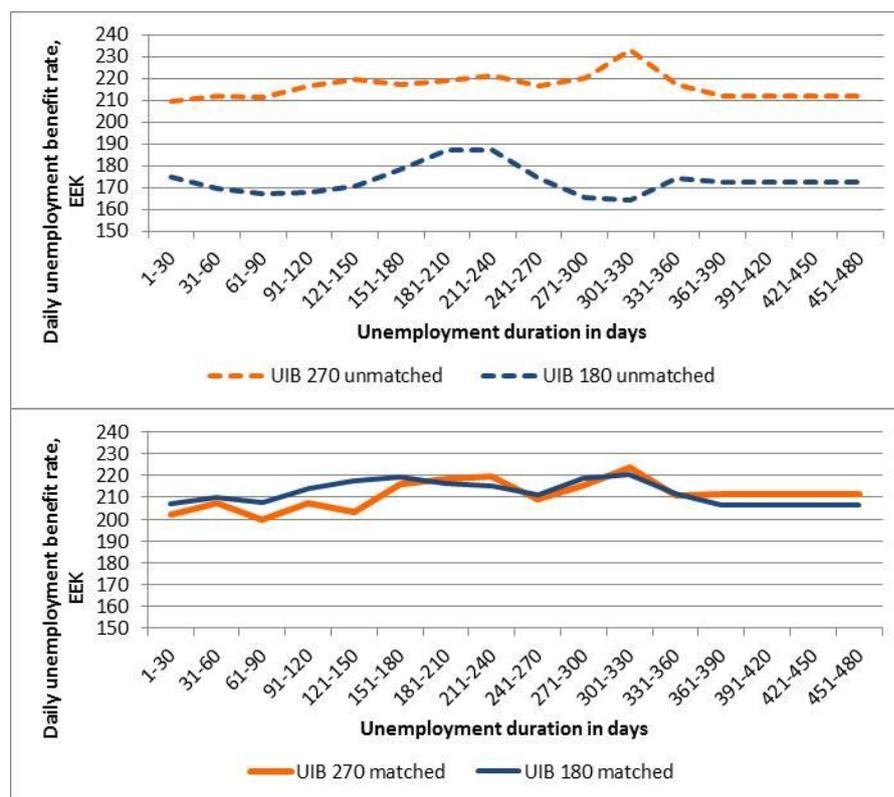


Figure 9. Daily unemployment benefit rate during the first 100 days for 270-day-UIB recipients and for 180-day-UIB recipients

It can be concluded from these graphs that the severe drop in the accepted wage in the end of benefit period for 180-day-UIB recipients is indeed there because they accept much lower wage when their benefit period lapses. The bigger drop in the accepted wage for 270-day-UIB recipients in the end of their benefit period is caused partly because of the willingness to accept a lower wage as well. Though, it might be partly caused also by the fact that in the end of benefit period there are relatively more exits to employment by people with higher unemployment benefit i.e. higher previous wage.

Conclusion

The current study uses Estonian data from the period of the last global economic downturn when unemployment in Estonia grew more than in any other EU country. A previous study on that data has shown that the behaviour of unemployed people is seriously affected by the receipt of benefits even during a period of crisis. So, higher or longer benefits incur lower hazards to leave unemployment and the hazard rate reaches its highest level in the end of the benefit period, after which it drops significantly. The current study shows that at least some part of that rise in the hazard rate occurs because people become less selective and are forced to accept jobs with lower quality i.e. lower wage and not only because of increased job search intensity.

In this study two groups of unemployment benefit recipients are examined – unemployed receiving unemployment insurance benefit for 270 days and unemployed receiving the benefit for 180 days. The estimations over the matched samples show that people eligible for

a longer benefit period experience a gradual wage decline over their benefit period and afterwards their accepted wage stabilizes at a lower level. The control group of shorter unemployment insurance benefit recipients accepts during their benefit period wage offers incurring relatively lower wage drops compared to their previous wage. In the end of their benefit period they exhibit a serious drop in the accepted wage and a spike in the hazard rate to exit unemployment to employment. Afterwards, the drop in the accepted wage slowly expands and stabilizes at a similar level as of longer benefit recipients. In total, recipients of shorter benefit accept relatively smaller wage drops during their benefit period, but a lot larger after their benefit is exhausted than the longer-term benefit recipients who can still continue receiving their benefit. After both groups have exhausted their benefits, the relative wage drops are alike.

Similar conclusions are drawn from the estimations of the average treatment effects on treated (people eligible for the longer benefit considered as treated). A significant difference occurs during the period when 180-day-UIB recipients are exhausting their benefit (and have a rise in the hazard rate to leave unemployment), but 270-day-UIB recipients can still continue on their benefit. During that period the average drop in the accepted wage (both the starting wage and the average wage) compared to their previous wage is almost 10% smaller for 270-day-UIB recipients (and statistically significant). The wage decline for these longer-term benefit recipients is smaller on average, because there is a lesser share of people who accept a very large wage decline compared to the group of shorter-term benefit recipients. There are 34% of shorter-term benefit recipients who accept a wage drop of at least 50% during that period, but only 22% among longer-term benefit recipients. Yet, the overall difference in the drop of accepted wage for all possible unemployment spells does not turn out to be significant, because the control group of 180-day-UIB recipients with shorter unemployment spell rather accepts relatively smaller wage drops and in case of longer unemployment spells both groups accept similar wage drops.

The study shows that the hazard to leave unemployment and the accepted wage are very tightly connected. A higher hazard rate to leave unemployment into employment occurs in the data always in the expense of accepting larger drops in the wage.

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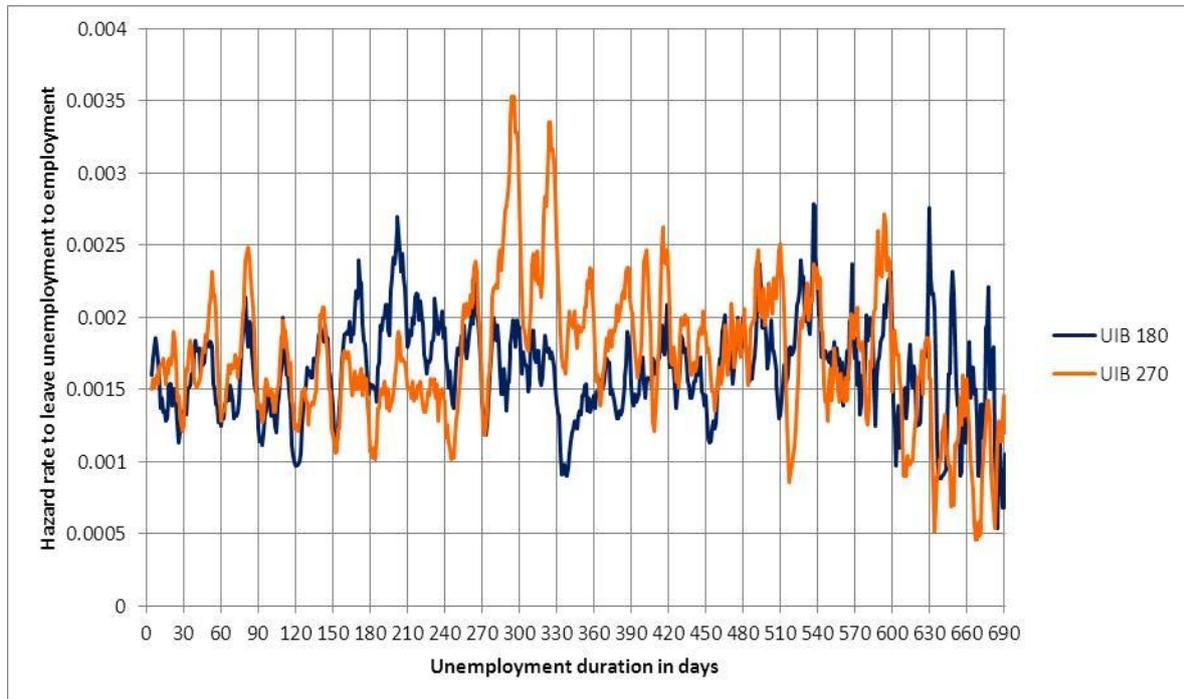
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Appendix 1. Smoothed hazard rates for exiting unemployment into employment



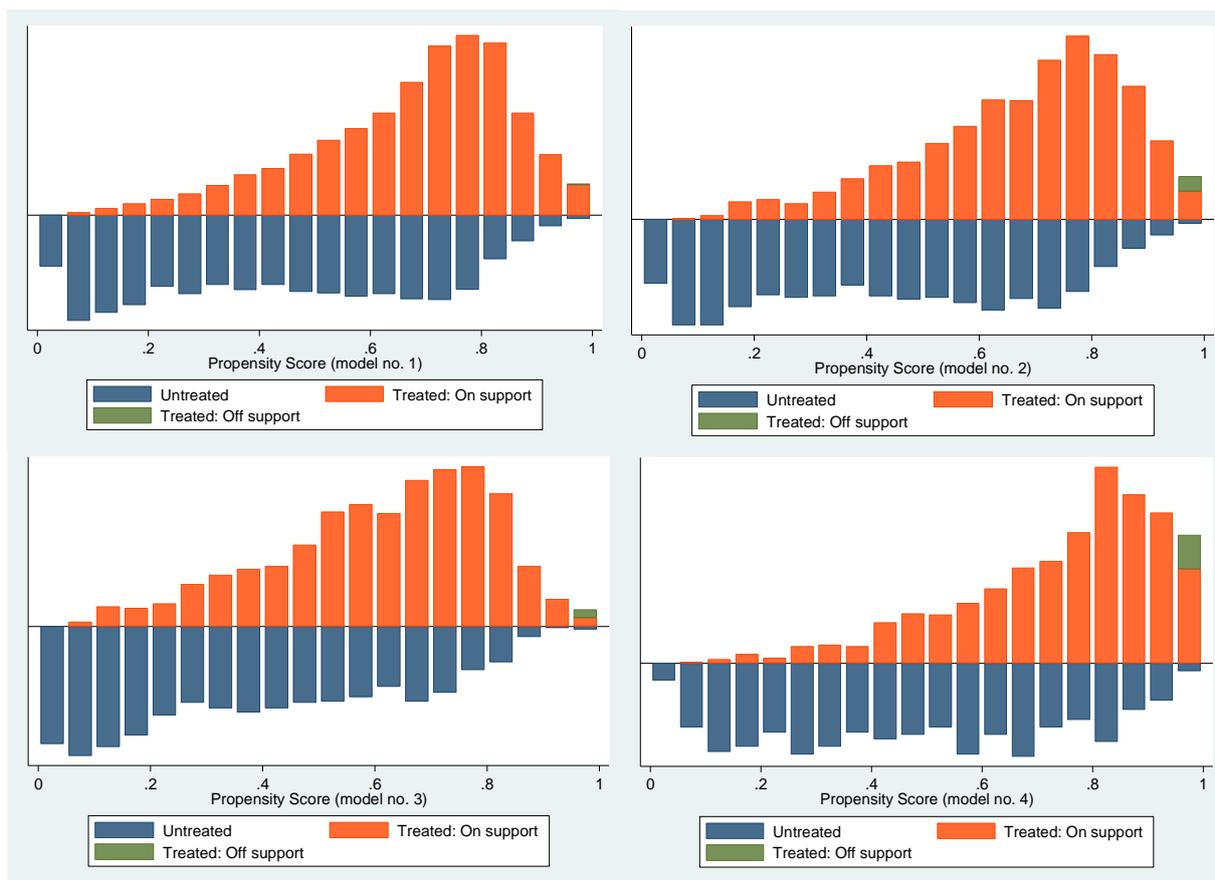
Appendix 2. Probit model for matching (starting wage)

Variable	Model no. 1 (all)		Model no. 2 (exit 1-150)		Model no. 3 (exit 151-240)		Model no. 4 (exit 271-360)	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
Beginning of benefit period: IV Q 2008								
III Q 2008	0.135	0.010	0.138	0.046	0.206	0.107	0.045	0.735
I Q 2009	0.096	0.030	0.000	0.998	0.042	0.642	0.163	0.050
Male	0.163	0.000	0.182	0.001	0.135	0.079	0.040	0.649
Age	0.269	0.000	0.291	0.000	0.310	0.000	0.167	0.000
Age square	-0.003	0.000	-0.003	0.000	-0.003	0.000	-0.001	0.000
Previous wage (EEK) / 1000	0.033	0.000	0.036	0.000	0.033	0.000	0.050	0.000
Education: general secondary								
Elementary or less	-0.143	0.351	-0.063	0.780	-0.592	0.080	0.206	0.597
Basic	0.022	0.649	-0.015	0.850	0.011	0.919	0.065	0.592
Vocational secondary	0.045	0.236	0.105	0.076	-0.004	0.957	0.077	0.423
Professional secondary	-0.141	0.019	-0.083	0.361	0.070	0.601	-0.446	0.003
Vocational higher	-0.108	0.210	-0.108	0.370	-0.290	0.184	-0.146	0.517
Bachelor	-0.115	0.060	-0.049	0.589	-0.174	0.193	-0.421	0.010
Master or doctor	-0.092	0.307	-0.155	0.228	-0.046	0.832	-0.122	0.635
Previous occupation: technician								
Manager	0.089	0.199	0.120	0.256	-0.037	0.800	0.156	0.396
Professional	0.173	0.032	0.178	0.126	0.129	0.502	0.120	0.580
Clerk	0.134	0.083	0.237	0.038	0.117	0.507	-0.020	0.921
Service and sales worker	-0.098	0.130	-0.040	0.682	-0.053	0.711	-0.372	0.027
Agriculturist	-0.312	0.039	-0.507	0.019	-0.188	0.565	-0.694	0.064
Craft and related trades worker	-0.030	0.615	0.018	0.850	0.016	0.901	-0.358	0.016
Plant and machine operator	0.129	0.054	0.229	0.034	0.204	0.140	-0.291	0.090
Elementary occupation	-0.010	0.872	0.043	0.665	0.025	0.851	-0.277	0.082
Main language Estonian	0.172	0.000	0.183	0.003	0.240	0.006	0.055	0.563
Reason of unemployment: end of fixed-term contract								
Unsuitability for the job	0.187	0.074	0.265	0.094	-0.244	0.385	0.103	0.655
Unsatisfactory results of a probationary period	0.231	0.000	0.143	0.113	0.398	0.010	0.120	0.479
Bankruptcy	0.520	0.000	0.692	0.000	0.173	0.337	0.603	0.002
Liquidation	0.549	0.000	0.652	0.000	0.498	0.141	0.349	0.241
Lay-off	0.461	0.000	0.480	0.000	0.458	0.000	0.517	0.000
Long-term incapacity for work	0.001	0.998	0.685	0.079	-0.160	0.767	-1.133	0.037
Violation by employer	0.474	0.000	0.648	0.000	0.463	0.000	0.567	0.000
Living in a town	0.064	0.071	-0.003	0.955	0.156	0.038	0.007	0.937
Region: Central and Western								
Northern	-0.026	0.491	0.010	0.869	-0.044	0.598	-0.099	0.283
Southern	-0.015	0.847	0.039	0.704	-0.263	0.128	-0.025	0.907
North-Eastern	0.123	0.097	0.130	0.138	-0.101	0.522	0.222	0.132
Disabled	-0.150	0.026	-0.204	0.056	-0.186	0.198	-0.044	0.785
Tenure on previous job less than 1 year	-0.133	0.001			-0.154	0.081		
Regional registered unemployment rate	-0.011	0.337			0.003	0.892		
Knowledge of English					-0.143	0.144		
Constant	-6.663	0.000	-7.176	0.000	-7.552	0.000	-4.630	0.000
Pseudo R2	0.199		0.208		0.207		0.225	
LR chi2	2404.9	0.000	1091.5	0.000	548.5	0.000	444.0	0.000
Number of observations	8834		3851		1913		1526	

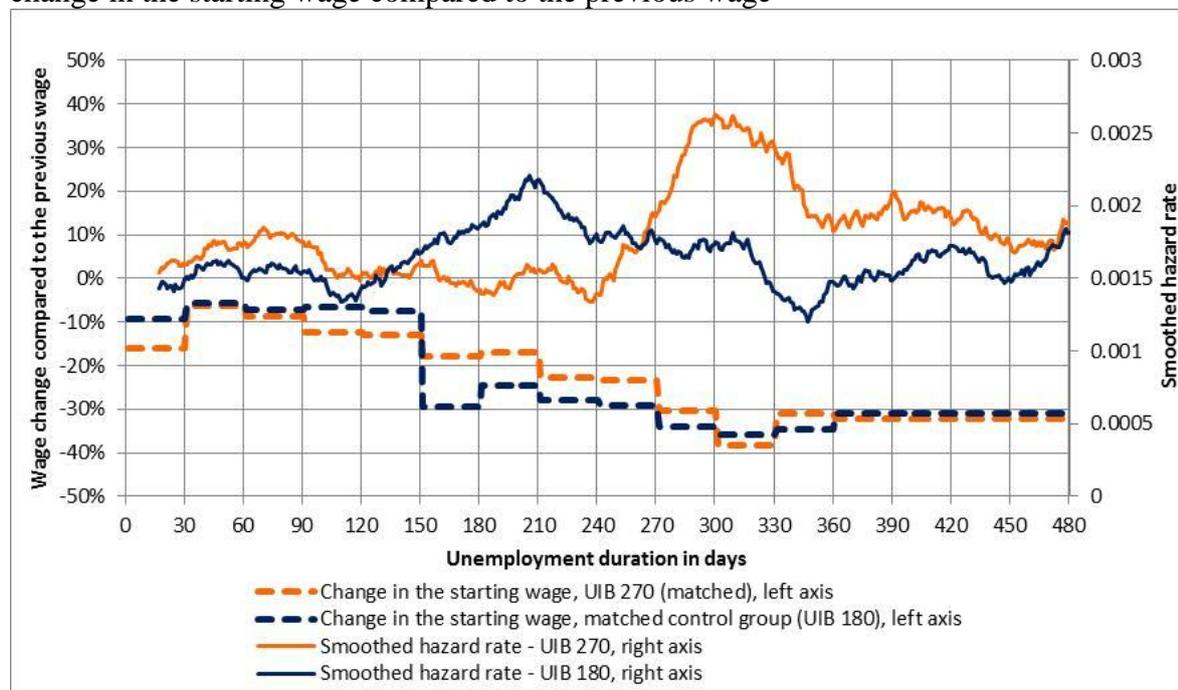
Appendix 3. Unmatched and matched variables (starting wage)

Variable	Model no. 1 (all)						Model no. 2 (exit 1-150)					
	Unmatched			Matched			Unmatched			Matched		
	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias
Beginning of benefit: IV Q 2008	0.239	0.264	-5.9	0.239	0.245	-1.3	0.230	0.229	0.3	0.230	0.228	0.5
III Q 2008	0.170	0.125	12.7	0.170	0.170	0	0.213	0.159	14	0.214	0.223	-2.5
I Q 2009	0.555	0.568	-2.7	0.555	0.551	0.7	0.525	0.571	-9.4	0.524	0.520	0.9
Male	0.559	0.524	7.1	0.559	0.554	1.1	0.511	0.472	7.7	0.510	0.515	-1
Age	42.5	34.5	74.5	42.5	42.5	0	41.9	34.1	73.7	41.9	42.2	-3.1
Previous wage (EEK)	13698	10592	38.6	13651	13852	-2.5	13655	10362	39.4	13035	13184	-1.8
Education: general secondary	0.298	0.302	-0.9	0.299	0.297	0.3	0.286	0.294	-1.6	0.288	0.301	-2.7
Elementary or less	0.006	0.016	-9.5	0.006	0.009	-2.5	0.006	0.018	-10.9	0.006	0.005	1.2
Basic	0.120	0.177	-16.1	0.120	0.124	-1.2	0.106	0.170	-18.4	0.107	0.111	-0.9
Vocational secondary	0.320	0.294	5.5	0.320	0.336	-3.5	0.318	0.283	7.7	0.321	0.299	4.9
Professional secondary	0.078	0.067	4.3	0.078	0.083	-2	0.082	0.069	4.7	0.081	0.103	-8.6
Vocational higher	0.035	0.034	0.4	0.035	0.027	4.5	0.046	0.044	0.7	0.045	0.036	4
Bachelor	0.093	0.087	2.2	0.093	0.088	1.5	0.101	0.094	2.2	0.099	0.092	2.1
Master or doctor	0.050	0.023	14.7	0.050	0.036	7.8	0.055	0.028	13.8	0.053	0.053	0
Previous occupation: technician	0.102	0.094	2.8	0.102	0.101	0.4	0.099	0.091	2.9	0.098	0.097	0.6
Manager	0.122	0.074	16.2	0.122	0.108	4.8	0.125	0.078	15.6	0.120	0.106	4.8
Professional	0.064	0.050	6.1	0.064	0.052	4.8	0.076	0.060	6.4	0.074	0.073	0.5
Clerk	0.061	0.065	-1.8	0.061	0.062	-0.7	0.069	0.075	-2.4	0.069	0.045	9.5
Service and sales worker	0.101	0.157	-16.7	0.101	0.096	1.5	0.123	0.186	-17.5	0.124	0.122	0.5
Agriculturist	0.010	0.013	-3.2	0.010	0.009	0.8	0.009	0.016	-6.7	0.009	0.007	1.2
Craft and related trades worker	0.255	0.278	-5.2	0.255	0.303	-10.8	0.232	0.246	-3.3	0.234	0.256	-5.2
Plant and machine operator	0.136	0.097	12.2	0.136	0.115	6.6	0.123	0.079	14.6	0.124	0.128	-1.4
Elementary occupation	0.148	0.172	-6.4	0.148	0.152	-1.1	0.146	0.170	-6.8	0.147	0.166	-5.2
Main language Estonian	0.626	0.588	7.7	0.625	0.599	5.5	0.660	0.621	8.1	0.657	0.589	14.1
Living in a town	0.674	0.698	-5.1	0.674	0.687	-3	0.657	0.703	-9.9	0.656	0.685	-6.3
Tenure on previous job less than 1 year	0.262	0.444	-38.8	0.262	0.293	-6.6	0.295	0.473	-37.2	0.297	0.317	-4.2
Regional registered unemployment rate	5.7	5.916	-7	5.7	5.805	-2.7	5.6	5.915	-10.6	5.6	5.610	1.3
Variable	Model no. 3 (exit 151-240)						Model no. 4 (exit 271-360)					
	Unmatched			Matched			Unmatched			Matched		
	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias
Beginning of benefit: IV Q 2008	0.237	0.285	-10.9	0.236	0.235	0.2	0.246	0.308	-13.8	0.248	0.263	-3.5
III Q 2008	0.122	0.073	16.4	0.123	0.120	1.1	0.117	0.109	2.5	0.119	0.148	-9.1
I Q 2009	0.598	0.588	2.1	0.598	0.599	-0.2	0.584	0.532	10.5	0.581	0.575	1.2
Male	0.602	0.566	7.3	0.600	0.588	2.4	0.586	0.558	5.6	0.578	0.580	-0.4
Age	41.8	34.3	70.2	41.8	42.2	-2.9	43.6	35.0	81.3	43.5	43.2	3.1
Previous wage (EEK)	13684	11173	33.6	13447	13447	0	14082	10153	50.7	13190	13013	2.3
Education: general secondary	0.301	0.299	0.5	0.301	0.331	-6.6	0.294	0.323	-6.2	0.296	0.256	8.7
Elementary or less	0.005	0.017	-11.3	0.005	0.009	-3.1	0.007	0.011	-4.5	0.007	0.003	4.3
Basic	0.129	0.184	-15.2	0.129	0.126	0.9	0.127	0.170	-12.2	0.130	0.102	7.9
Vocational secondary	0.340	0.312	5.9	0.341	0.329	2.5	0.328	0.294	7.3	0.336	0.400	-13.8
Professional secondary	0.081	0.052	11.8	0.082	0.075	2.6	0.074	0.083	-3.2	0.076	0.088	-4.2
Vocational higher	0.019	0.028	-5.5	0.019	0.015	2.8	0.037	0.028	5	0.036	0.029	4.1
Bachelor	0.085	0.089	-1.5	0.084	0.087	-1.1	0.082	0.075	2.5	0.077	0.092	-5.4
Master or doctor	0.040	0.019	12	0.039	0.028	6.4	0.050	0.015	19.8	0.040	0.030	5.8
Previous occupation: technician	0.100	0.104	-1.5	0.100	0.124	-7.8	0.118	0.079	13.2	0.119	0.136	-5.9
Manager	0.117	0.088	9.6	0.115	0.110	1.8	0.136	0.055	27.8	0.118	0.111	2.1
Professional	0.047	0.042	2.6	0.046	0.034	5.7	0.057	0.042	7.3	0.056	0.052	1.9
Clerk	0.047	0.053	-2.7	0.047	0.031	7.4	0.063	0.049	6.2	0.065	0.057	3.6
Service and sales worker	0.094	0.129	-10.9	0.095	0.075	6.2	0.078	0.162	-26	0.081	0.068	3.8
Agriculturist	0.011	0.014	-3.2	0.011	0.002	7.8	0.011	0.011	-0.3	0.011	0.007	3.9
Craft and related trades worker	0.260	0.277	-3.6	0.260	0.300	-9	0.273	0.323	-10.8	0.281	0.294	-2.9
Plant and machine operator	0.170	0.114	16.1	0.171	0.179	-2.2	0.110	0.108	0.9	0.114	0.112	0.3
Elementary occupation	0.153	0.180	-7.1	0.154	0.144	2.6	0.153	0.172	-5.2	0.157	0.162	-1.4
Main language Estonian	0.640	0.608	6.5	0.638	0.584	11.1	0.593	0.545	9.7	0.584	0.580	0.8
Living in a town	0.674	0.661	2.7	0.673	0.704	-6.4	0.672	0.728	-12.4	0.672	0.671	0.2
Tenure on previous job less than 1 year	0.255	0.436	-38.7	0.255	0.305	-10.6	0.216	0.411	-43.1	0.217	0.244	-5.9
Regional registered unemployment rate	6.0	6.199	-7.5	6.0	6.070	-2.4	5.9	5.693	9.5	5.9	5.784	6.6

Appendix 4. Propensity score distribution (starting wage)

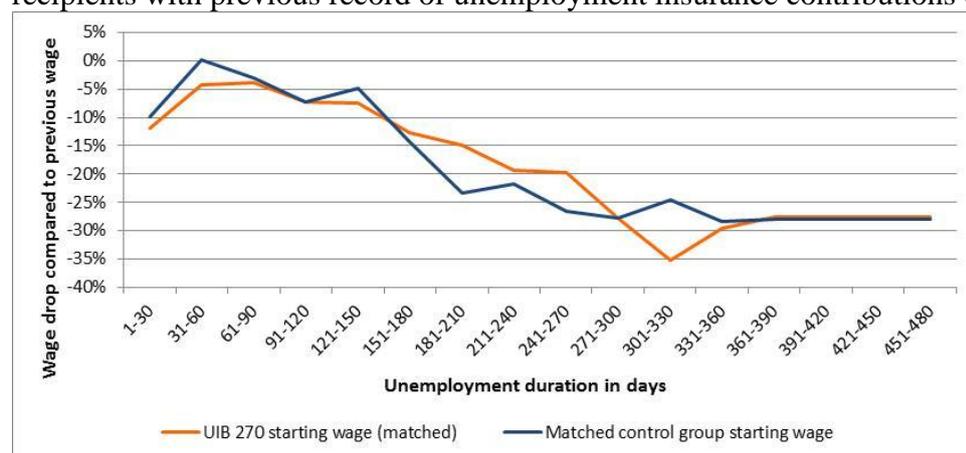


Appendix 5. Smoothed hazard rates for exiting unemployment into employment and the change in the starting wage compared to the previous wage



Note: For changes in the wage, average change over intervals of 30 days up to 360 days; the last interval is 360-480 days as there are fewer observations. Only these unemployed are considered who entered employment latest by the beginning of April 2010.

Appendix 6. The change in the starting wage compared to the previous wage for UIB recipients with previous record of unemployment insurance contributions of 32-79 months



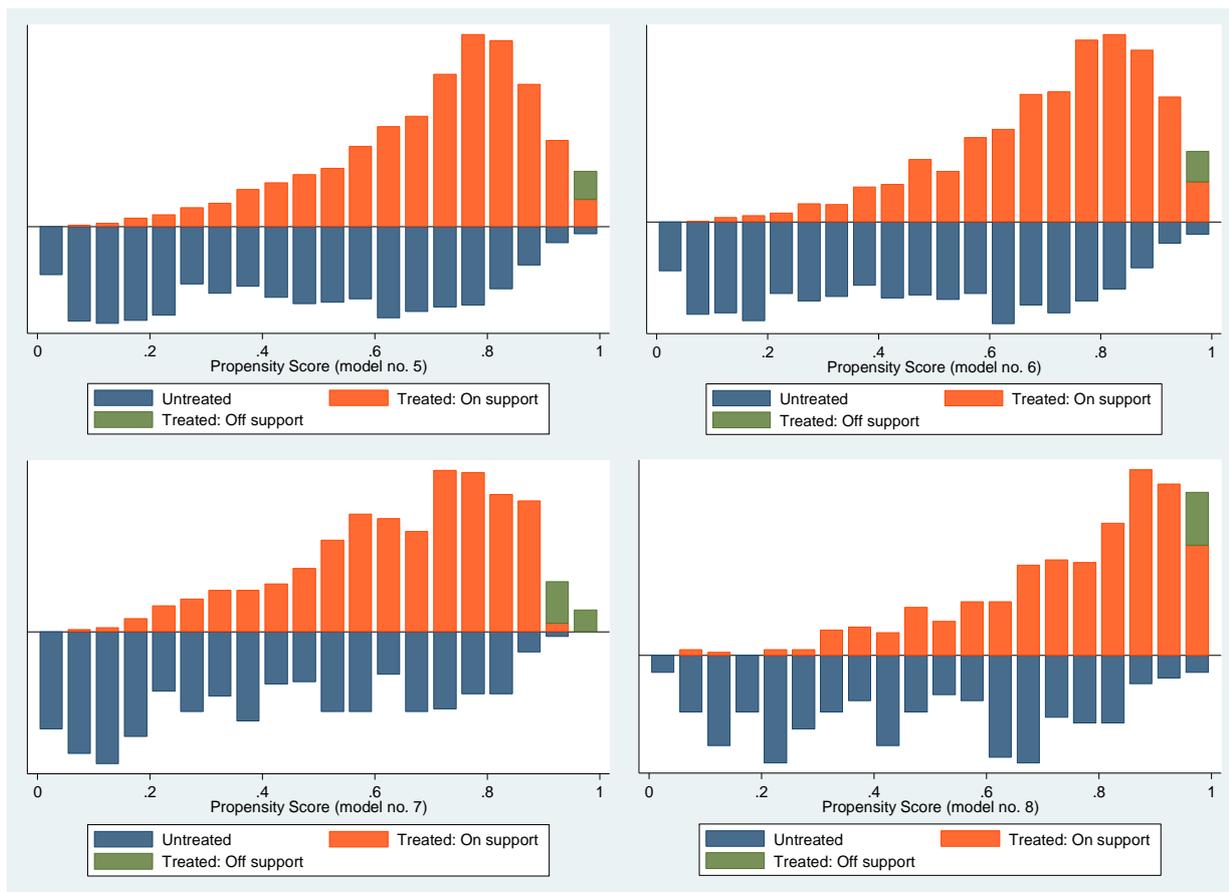
Appendix 7. Probit model for matching (average wage)

Variable	Model no. 5 (all)		Model no. 6 (exit 1-150)		Model no. 7 (exit 151-240)		Model no. 8 (exit 271-360)	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
Beginning of benefit period: IV Q 2008								
III Q 2008	0.172	0.012	0.033	0.732	0.332	0.026	0.234	0.183
I Q 2009	0.133	0.030	0.072	0.415	0.046	0.624	0.327	0.013
Male	0.140	0.004	0.146	0.039	0.094	0.332	0.063	0.656
Age	0.291	0.000	0.309	0.000	0.324	0.000	0.202	0.000
Age square	-0.003	0.000	-0.003	0.000	-0.003	0.000	-0.002	0.001
Previous wage (EEK) / 1000	0.043	0.000	0.041	0.000	0.041	0.000	0.056	0.000
Education: general secondary								
Elementary or less	-0.045	0.840	-0.121	0.690	-0.430	0.423	0.430	0.443
Basic	-0.043	0.556	-0.078	0.450	0.046	0.755	-0.002	0.991
Vocational secondary	0.036	0.503	0.107	0.159	0.047	0.655	-0.010	0.946
Professional secondary	-0.150	0.072	-0.135	0.245	0.017	0.919	-0.579	0.018
Vocational higher	-0.039	0.721	-0.037	0.801	-0.399	0.123	-0.103	0.755
Bachelor	-0.233	0.003	-0.183	0.093	-0.269	0.089	-0.564	0.024
Master or doctor	-0.190	0.104	-0.238	0.122	-0.122	0.636	-0.172	0.672
Previous occupation: technician								
Manager	0.030	0.732	0.039	0.758	-0.064	0.715	-0.006	0.984
Professional	0.146	0.149	0.116	0.400	0.098	0.661	0.073	0.820
Clerk	0.188	0.062	0.191	0.167	0.153	0.479	0.108	0.732
Service and sales worker	-0.076	0.372	-0.100	0.401	-0.109	0.531	-0.417	0.109
Agriculturist	-0.269	0.198	-0.479	0.084	0.002	0.996	-0.614	0.277
Craft and related trades worker	0.075	0.362	0.029	0.809	0.228	0.145	-0.348	0.133
Plant and machine operator	0.191	0.037	0.312	0.022	0.212	0.224	-0.453	0.079
Elementary occupation	0.025	0.773	0.005	0.968	0.076	0.657	-0.382	0.117
Main language Estonian	0.180	0.001	0.108	0.169	0.299	0.006	-0.018	0.907
Reason of unemployment: end of fixed-term contract								
Unsuitability for the job	0.246	0.093	0.289	0.178	0.084	0.795	0.257	0.555
Unsatisfactory results of a probationary period	0.197	0.031	0.074	0.538	0.439	0.028	0.320	0.231
Bankruptcy	0.588	0.000	0.625	0.001	0.399	0.083	0.644	0.056
Liquidation	0.296	0.062	0.285	0.181	0.361	0.476	0.378	0.300
Lay-off	0.439	0.000	0.371	0.000	0.505	0.000	0.669	0.000
Long-term incapacity for work	0.420	0.284	1.493	0.032				
Violation by employer	0.468	0.000	0.584	0.000	0.435	0.003	0.612	0.008
Living in a town	0.007	0.878	-0.058	0.395	0.087	0.363	0.121	0.393
Region: Central and Western								
Northern	-0.056	0.286	0.007	0.928	-0.083	0.420	-0.224	0.126
Southern	-0.012	0.914	0.078	0.588	-0.469	0.033	0.546	0.277
North-Eastern	0.221	0.036	0.222	0.130	-0.084	0.601	0.290	0.230
Disabled	-0.191	0.055	-0.107	0.473	-0.236	0.267	-0.298	0.226
Tenure on previous job less than 1 year	-0.050	0.371	-0.049	0.524				
Regional registered unemployment rate	-0.023	0.146	-0.021	0.348				
Knowledge of English	-0.021	0.724						
Constant	-7.064	0.000	-7.158	0.000	-8.108	0.000	-5.362	0.000
Pseudo R2	0.210		0.217		0.219		0.245	
LR chi2	1341.0	0.000	709.2	0.000	352.9	0.000	197.7	0.000
Number of observations	4761		2468		1168		638	

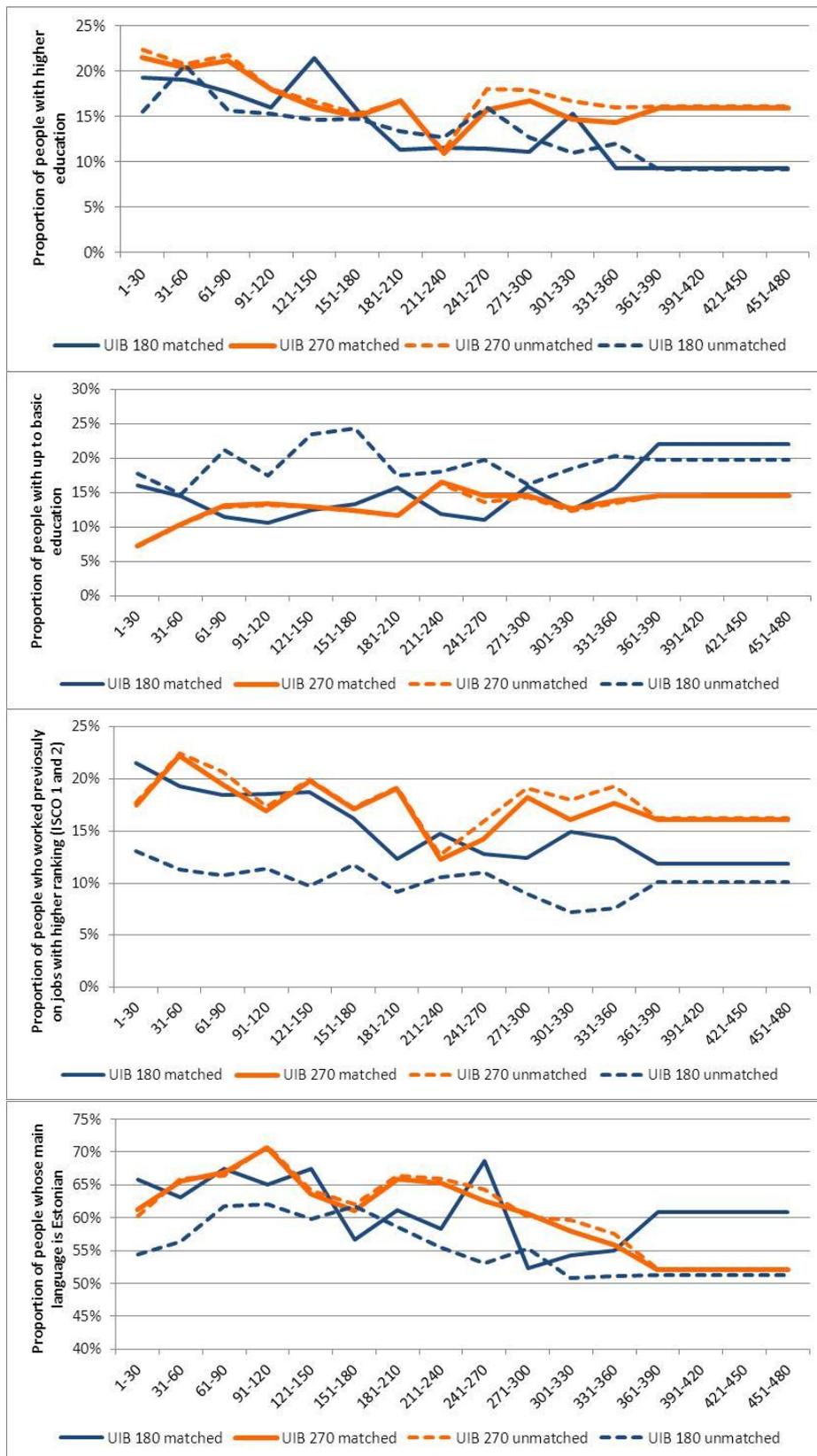
Appendix 8. Unmatched and matched variables (average wage)

Variable	Model no. 5 (all)						Model no. 6 (exit 1-150)					
	Unmatched			Matched			Unmatched			Matched		
	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias
Beginning of benefit: IV Q 2008	0.254	0.276	-5.1	0.254	0.270	-3.5	0.242	0.238	0.8	0.242	0.259	-4.2
III Q 2008	0.207	0.152	14.5	0.207	0.197	2.6	0.223	0.194	7.1	0.224	0.228	-0.8
I Q 2009	0.510	0.528	-3.7	0.509	0.500	1.7	0.504	0.522	-3.7	0.503	0.484	3.9
Male	0.502	0.451	10.1	0.495	0.500	-0.9	0.467	0.417	10.2	0.460	0.456	0.9
Age	42.2	34.3	75.3	42.2	42.2	0	41.7	33.9	75	41.7	41.9	-2.4
Previous wage (EEK)	13994	10670	40	13064	13074	-0.1	13952	10447	40	12899	12872	0.3
Education: general secondary	0.297	0.305	-1.6	0.301	0.290	2.2	0.287	0.295	-1.9	0.289	0.295	-1.3
Elementary or less	0.006	0.014	-8.8	0.006	0.003	2.5	0.005	0.018	-12.1	0.005	0.011	-5.6
Basic	0.101	0.151	-15.3	0.103	0.121	-5.6	0.096	0.150	-16.7	0.098	0.092	1.6
Vocational secondary	0.313	0.277	7.9	0.318	0.286	7	0.309	0.262	10.4	0.315	0.293	4.7
Professional secondary	0.076	0.067	3.6	0.077	0.083	-2.5	0.077	0.070	2.7	0.077	0.093	-6.4
Vocational higher	0.045	0.040	2.4	0.043	0.045	-1.1	0.054	0.045	4.1	0.053	0.047	2.5
Bachelor	0.105	0.119	-4.4	0.101	0.115	-4.7	0.111	0.125	-4.1	0.107	0.106	0.2
Master or doctor	0.058	0.028	15.1	0.053	0.056	-1.4	0.061	0.034	12.6	0.057	0.061	-1.9
Previous occupation: technician	0.111	0.110	0.2	0.110	0.112	-0.7	0.108	0.101	2.3	0.106	0.128	-7.4
Manager	0.137	0.097	12.5	0.126	0.120	1.8	0.137	0.100	11.4	0.128	0.133	-1.7
Professional	0.079	0.067	4.5	0.076	0.075	0.5	0.090	0.078	4.3	0.086	0.086	0.2
Clerk	0.067	0.075	-3.3	0.068	0.052	6.4	0.074	0.086	-4.6	0.075	0.049	9.8
Service and sales worker	0.113	0.172	-16.8	0.116	0.110	1.5	0.128	0.193	-18	0.130	0.122	2.2
Agriculturist	0.010	0.012	-1.5	0.010	0.012	-1.4	0.008	0.015	-6.1	0.009	0.013	-4.3
Craft and related trades worker	0.216	0.222	-1.5	0.221	0.247	-6.3	0.198	0.202	-0.9	0.203	0.206	-0.7
Plant and machine operator	0.136	0.091	14.4	0.139	0.138	0.4	0.131	0.072	19.8	0.134	0.134	0.2
Elementary occupation	0.131	0.155	-6.8	0.134	0.135	-0.2	0.126	0.153	-7.8	0.128	0.129	-0.2
Main language Estonian	0.668	0.627	8.6	0.661	0.647	3.1	0.695	0.665	6.4	0.689	0.645	9.4
Living in a town	0.658	0.702	-9.4	0.658	0.662	-0.8	0.640	0.696	-11.9	0.641	0.647	-1.3
Tenure on previous job less than 1 year	0.249	0.406	-33.9	0.252	0.259	-1.5	0.277	0.435	-33.6	0.281	0.282	-0.3
Regional registered unemployment rate	5.4	5.619	-7.7	5.4	5.438	0.2	5.5	5.621	-5.2	5.5	5.433	3
Variable	Model no. 7 (exit 151-240)						Model no. 8 (exit 271-360)					
	Unmatched			Matched			Unmatched			Matched		
	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias	Treated (270)	Controls (180)	%bias
Beginning of benefit: IV Q 2008	0.211	0.249	-9.1	0.209	0.221	-2.8	0.383	0.510	-25.6	0.388	0.400	-2.5
III Q 2008	0.143	0.075	21.9	0.140	0.143	-1.1	0.187	0.157	7.9	0.188	0.193	-1.3
I Q 2009	0.593	0.615	-4.5	0.595	0.568	5.5	0.430	0.333	19.9	0.424	0.407	3.5
Male	0.561	0.524	7.5	0.546	0.543	0.7	0.521	0.467	10.9	0.507	0.644	-27.3
Age	42.0	33.9	76.8	41.9	42.0	-0.3	43.6	35.4	75.2	43.6	42.6	8.7
Previous wage (EEK)	14021	11481	33.7	12906	12839	0.9	14401	9986	53.1	13076	13040	0.4
Education: general secondary	0.305	0.321	-3.2	0.312	0.309	0.7	0.301	0.319	-3.8	0.307	0.344	-7.9
Elementary or less	0.003	0.011	-9.3	0.003	0.008	-6	0.009	0.014	-4.6	0.010	0.002	6.8
Basic	0.101	0.139	-11.7	0.106	0.113	-2.1	0.110	0.167	-16.5	0.115	0.137	-6.4
Vocational secondary	0.341	0.295	9.9	0.344	0.320	5.1	0.318	0.281	8	0.327	0.339	-2.7
Professional secondary	0.084	0.059	9.7	0.084	0.086	-0.7	0.068	0.076	-3.3	0.071	0.085	-5.7
Vocational higher	0.023	0.035	-7.4	0.022	0.027	-3	0.049	0.038	5.4	0.046	0.037	4.8
Bachelor	0.095	0.121	-8.4	0.094	0.089	1.6	0.089	0.090	-0.6	0.085	0.044	14.5
Master or doctor	0.048	0.020	15.5	0.034	0.047	-7.4	0.056	0.014	22.8	0.039	0.012	14.6
Previous occupation: technician	0.108	0.125	-5.2	0.110	0.096	4.2	0.138	0.086	16.6	0.139	0.112	8.5
Manager	0.138	0.110	8.6	0.120	0.118	0.5	0.145	0.062	27.5	0.120	0.117	0.8
Professional	0.055	0.055	-0.1	0.047	0.030	7.4	0.065	0.048	7.7	0.063	0.122	-25.3
Clerk	0.050	0.060	-4.6	0.051	0.078	-11.8	0.075	0.052	9.2	0.076	0.037	11.2
Service and sales worker	0.103	0.150	-14.2	0.108	0.140	-9.7	0.086	0.157	-21.7	0.090	0.054	11.2
Agriculturist	0.011	0.007	4.1	0.012	0.002	10.5	0.014	0.014	-0.2	0.015	0.005	8.2
Craft and related trades worker	0.252	0.253	-0.1	0.261	0.243	4.3	0.224	0.252	-6.6	0.234	0.305	-16.6
Plant and machine operator	0.154	0.099	16.7	0.159	0.152	2	0.105	0.138	-10.1	0.110	0.098	3.7
Elementary occupation	0.129	0.141	-3.6	0.133	0.142	-2.5	0.147	0.190	-11.6	0.154	0.151	0.7
Main language Estonian	0.672	0.626	9.6	0.659	0.641	3.9	0.610	0.567	8.8	0.595	0.680	-17.3
Living in a town	0.664	0.685	-4.5	0.663	0.710	-10.1	0.678	0.710	-6.9	0.673	0.615	12.7
Tenure on previous job less than 1 year	0.240	0.366	-27.8	0.241	0.246	-1.1	0.199	0.414	-48	0.200	0.244	-9.8
Regional registered unemployment rate	5.9	6.168	-9.6	6.0	5.832	6.1	4.8	4.415	16.6	4.8	5.048	-14.3

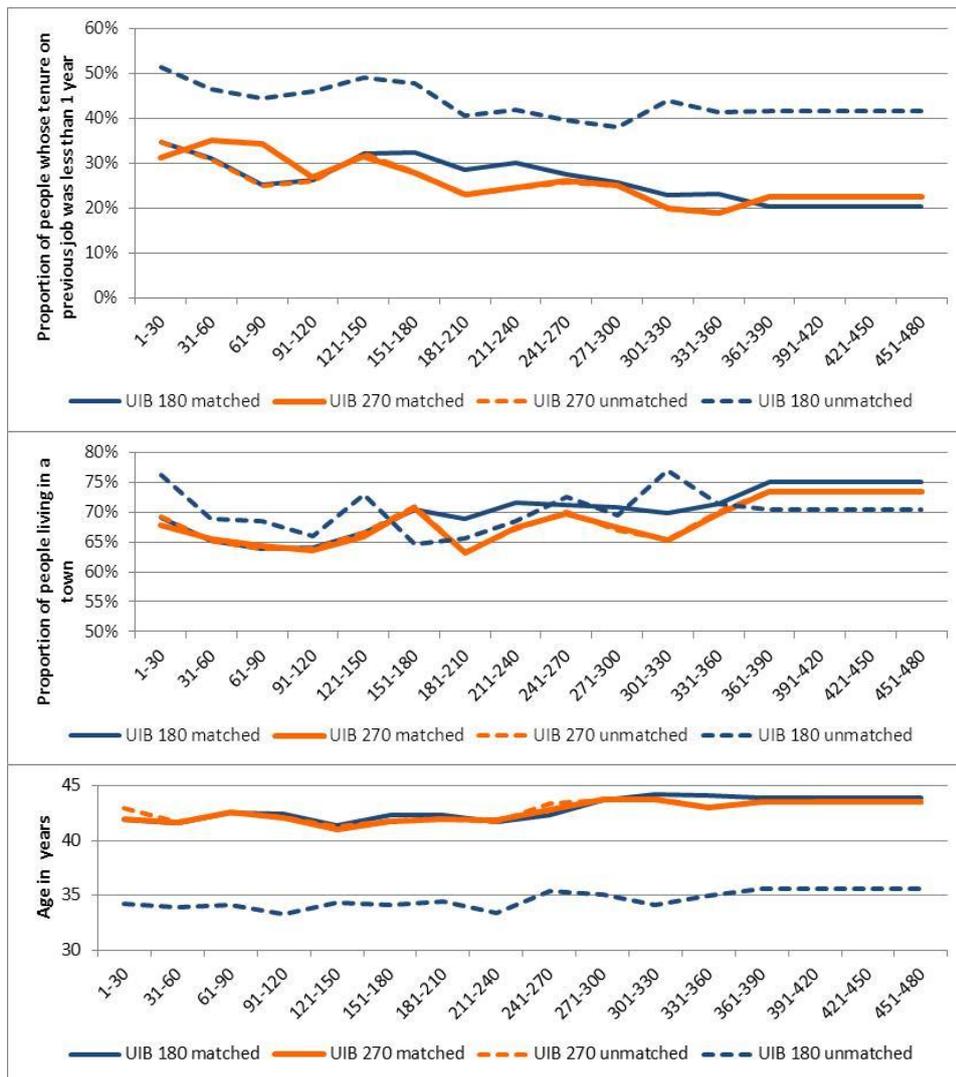
Appendix 9. Propensity score distribution (average wage)



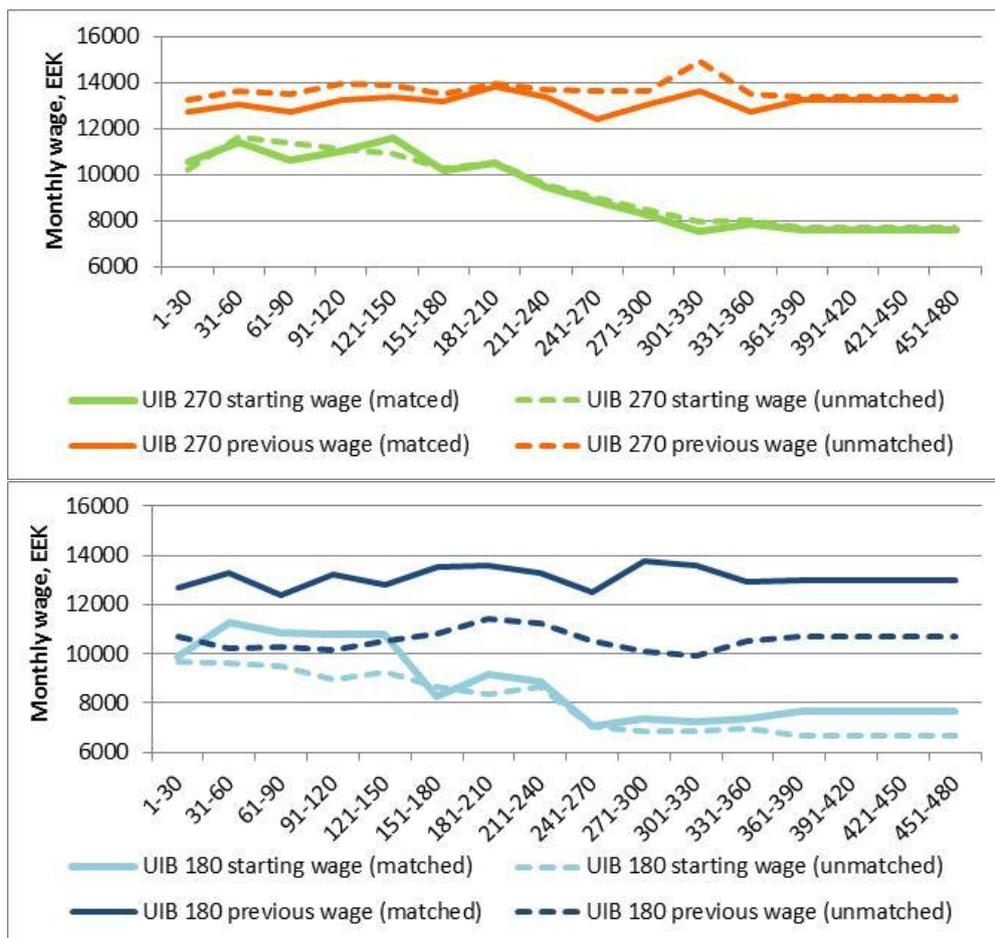
Appendix 10. Individual characteristics of unemployed exiting into employment during different unemployment spells



Appendix 10. Individual characteristics of unemployed exiting into employment during different unemployment spells (*continuous*)



Appendix 11. The starting wage and the previous wage for 270-day-UIB recipients and for 180-day-UIB recipients



Appendix 12. Unemployed receiving UIB on the level of the upper quartile and exiting unemployment as a share of all UIB recipients exiting unemployment into employment during the interval (unmatched data)

